YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

Draft
Environmental Impact Report

State Clearinghouse Number 2020060424

Sutter Butte Flood Control Agency
Post Office Box M
Yuba City, CA 95992

APPENDICES

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LIST OF APPENDICES

A – Notice of Preparation (NOP)

B – NOP Distribution List and Scoping Comments
- B1 - NOP Distribution List
- B2 - Scoping Comments

C – Air Quality & GHG Emissions
- C1 - Air Quality Emissions
- C2 - Greenhouse Gas Emissions
- C3 - Energy Details

D – Biological Resources Documentation
- D1 - Biological Resources Assessment, Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)
- D2 - Information for the U.S. Fish and Wildlife Service
- D3 - Biological Assessment for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

E – Cultural Resources Documentation

F – Noise Output Files

G – Water Quality Documentation
- G1 - Sediment Sampling Analytical Results (Blackburn Consulting, Inc. 2020)
- G2 - Summary of Sampling Results
- G3 - Water Quality Monitoring Plan for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

H – Persons and Agencies Contacted

I – 65% Design Drawings for Phase 1

J – Site Photographs

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APPENDIX A

Notice of Preparation (NOP)

Notice of Preparation

To: **All Interested Parties**

Subject: **Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project**

Date: **June 19, 2020**

Lead Agency Name and Physical Address:	**Contact Person and Mailing Address:**
Sutter Butte Flood Control Agency 1445 Butte House Road Suite B Yuba City, CA 95993	Michael Bessette, PE, Executive Director P.O. Box M Yuba, City CA 95992 (530) 755-9859

Sutter Butte Flood Control Agency (SBFCA) is the Lead Agency pursuant to the California Environmental Quality Act (CEQA) and will produce an Environmental Impact Report (EIR) for the Yuba City Boat Ramp Sediment Removal Project (Proposed Project). ECORP Consulting, Inc. will prepare the EIR and is requesting information regarding the environmental issues and reasonable alternatives to be included in the EIR from any interested parties.

Due to the time limits mandated by State law, your response to this NOP must be sent at the earliest possible date ***but not later than 30 days*** after issuance of this NOP. The response deadline is **July 20, 2020**. Please send your response to Michael Bessette, Executive Director at the Contact Person address shown above or via email at m.bessette@sutterbutteflood.org. Please include the project title, shown below, in the subject line of your email or letter.

Project Title:	**Project Location:**
Yuba City Boat Ramp Sediment Removal Project	Yuba City Boat Launch 80 Second St, Yuba City, CA 95991

Project Location

The Project is located in a portion of un-sectioned Rancho New Helvetia Land grant lands within the Olivehurst, California and Yuba City, California 7.5-minute quadrangles (U.S. Geological Survey [USGS] 1952a, photo revised 1973 and 1952b, photo revised 1973, respectively). The approximate center of the Yuba City location is 39.273783° latitude, -121.631017° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code [HUC] #18020159, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016) (see Figure 1. *Project Location and Vicinity*.)

Existing Site Conditions

For planning purposes, the study area includes the confluence of the Feather and Yuba rivers, the Yuba City Boat Launch (operated by Sutter County) and surrounding lands on the west bank of the Feather River, the City's inactive wastewater ponds between the Feather River and the Yuba River, and a narrow area of shoreline on the eastern bank of the Feather and Yuba rivers. The developed portions of the boat

ramp includes a paved roadway, parking areas, the boat launch ramp, and the Feather River R.V. Park. The undeveloped areas around the boat launch include riverbank habitat, ruderal weedy roadside habitats, and unimproved areas of compacted dirt that are used for overflow parking and/or fishing access. The City of Marysville wastewater ponds area includes constructed/excavated wastewater ponds of varying shapes and sizes and a narrow corridor of riparian habitat along the Feather and Yuba rivers. The wastewater ponds are surrounded by gravel and dirt-surfaced access roads. The eastern bank of the Feather and Yuba rivers is an undeveloped riparian corridor with a number of scattered homeless encampments.

Vegetation communities or land cover types found within the Yuba City location include riparian woodland, weedy ruderal, constructed wastewater ponds, and paved/developed areas. The riparian woodland community is found along the riverbanks. The riparian woodland vegetation is a relatively narrow corridor of mature trees with varying densities of understory cover, depending on levels of human use.

Project Description

Sediment buildup in portions of the Feather River, exacerbated by the Oroville Dam Spillway incident of 2017, has created dangerous conditions for recreational users, made some boat launch facilities nearly unusable, and has hampered public safety as it has affected emergency vessel launching capabilities. The Project has received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River. Restoring river access and fish passage conditions at boat ramps in Yuba and Sutter Counties will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) brings commerce to local restaurants, hotels, and other businesses.

The Proposed Project will improve access to the Feather River by removing sediment at the Yuba City boat ramp facility. The Project will use hydraulic or mechanical dredging to remove approximately 65,600 cubic yards (cy) of sediment and debris within approximately13.5 acres adjacent to and downstream of the Yuba City Boat Launch. The material removed from the Project site would require offsite disposal. Two dredging methods and three alternatives for disposal are being considered, which are discussed below. Approximate locations of dredging, potential staging/access and sediment dewatering and one disposal option are depicted in Figure 2. *Project Components*.

Two potential dredging methods are being evaluated for the sediment removal aspect of the Project (hydraulic and mechanical). Hydraulic mining would consist of a barge using suction to remove sediment from the river bottom and pumping the material to a location on the east or west side of the river, allowed to dewater, and then hauled by truck to a disposal site(s). Mechanical dredging would involve equipment such as an excavator with a bucket removing the sediment from shore and/or a barge, transporting the material to the dewatering area, then to the disposal site(s).

Potential sediment disposal options include landfills, soil for farmlands, and/or placement in the City of Marysville's closed northern wastewater ponds as fill material, located adjacent to the Yuba City location on the east side of the Feather River and north of the Yuba River. Soil sampling of the sediment to be

removed is currently underway to assist in determining the most viable option. Brief descriptions of each disposal option are provided below.

Potential Disposal Options

Landfill

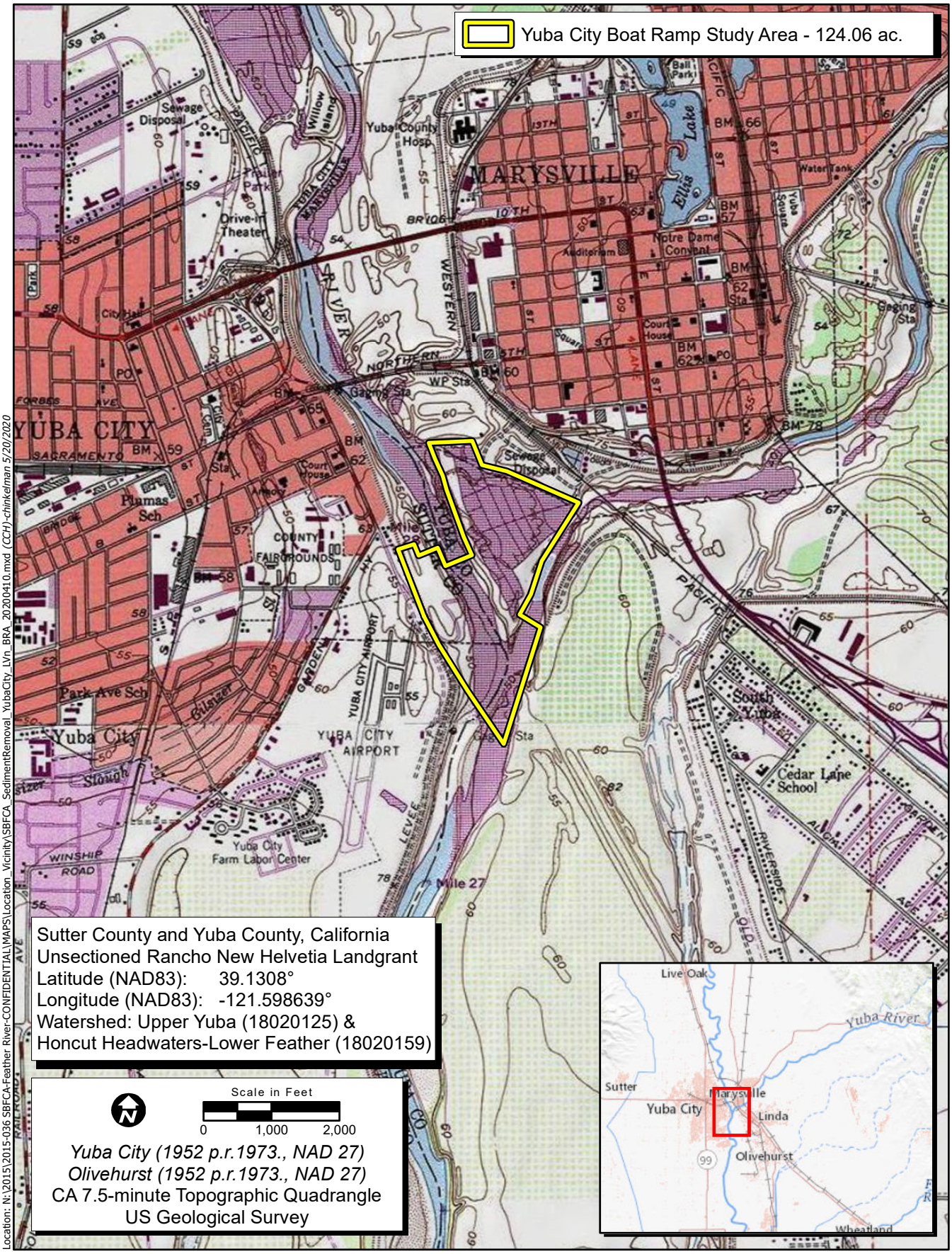
The nearest landfill to the Yuba City site is the Recology Ostrom Road Landfill located at 5900 Ostrom Road, Wheatland, California. This landfill is approximately 17 miles by road from the Yuba City site and has a maximum daily throughput of 3,000 tons (see Figure 3. *Potential Disposal Locations*). This landfill is the only landfill in the general area of the Yuba City site permitted to accept potentially contaminated soils.

Agricultural Soil

When dredged material is free of contaminants, nuisance weeds, and has the proper balance of nutrients, it has similar characteristics as productive agricultural soils and can be beneficial for increasing crop production when incorporated or mixed with native soils. Potential for use as agricultural soil is considered as a viable disposal option. However, the specific location for agricultural soil disposal has not been determined at this time.

City of Marysville Wastewater Ponds

The City of Marysville (City) has recently modified its wastewater collection and treatment system to connect to the Linda County Water District Regional Wastewater Treatment Facility for treatment and discharge. As such, the City's existing percolation/evaporation ponds (referred to as wastewater ponds throughout) are no longer needed, and the City intends to formally close and restore the wastewater ponds. The dredged material would be utilized in reclamation of the area. The wastewater ponds are located on the east side of the Feather River and north of the Yuba River. This option is currently being discussed with the City to determine if it is a viable option.



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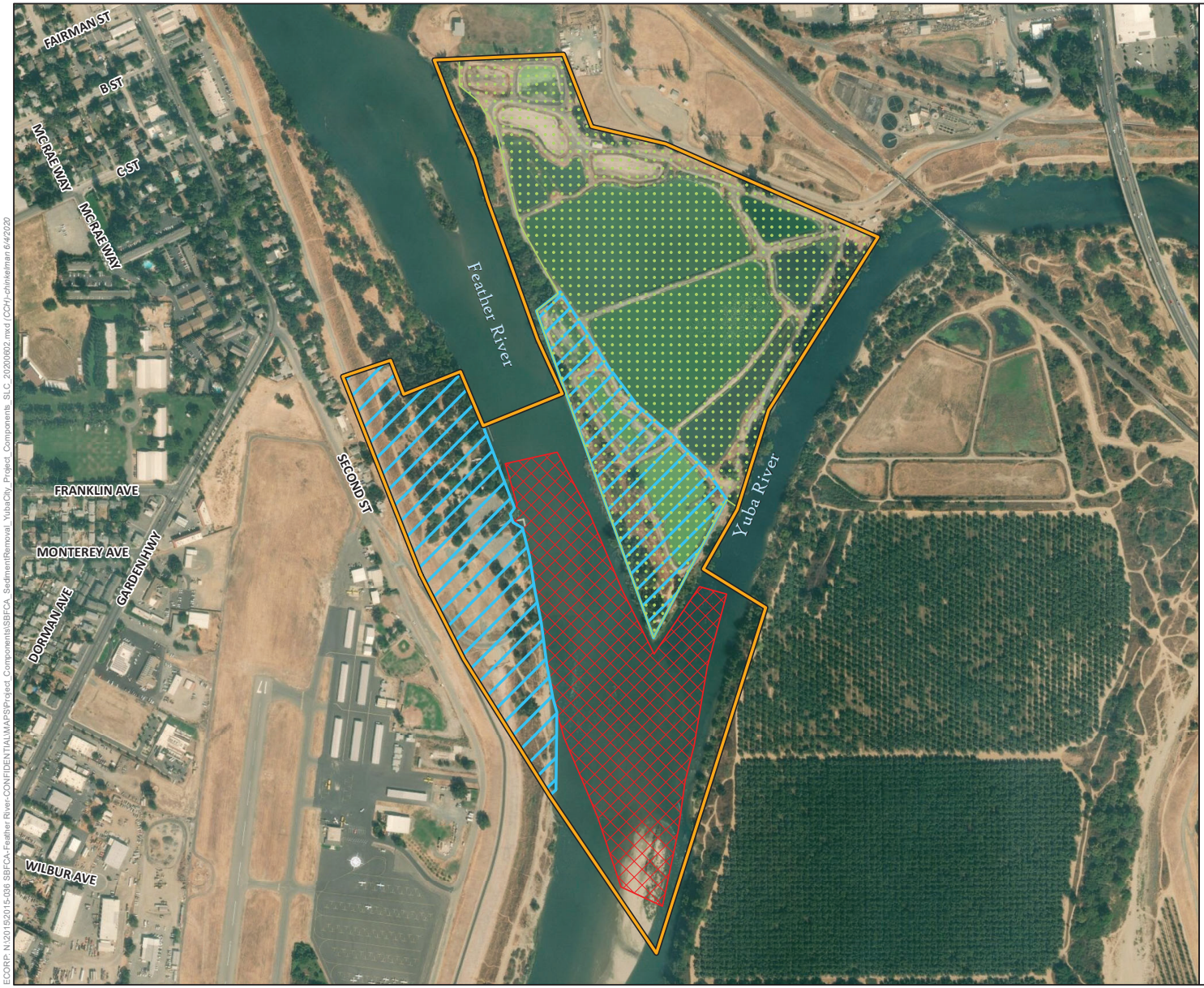
Map Date: 5/20/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Project Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Yuba City Boat Ramp Sediment Removal Project



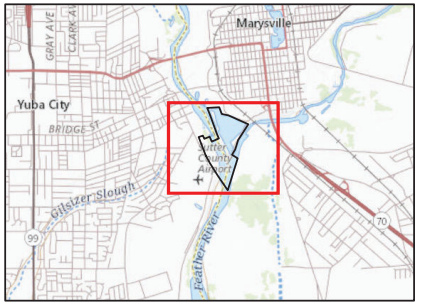
Map Features

- Yuba City Boat Ramp Study Area - 124.06 ac.

Project Components

- Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



Map Date: 6/4/2020

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ENVIRONMENTAL CONSULTANTS

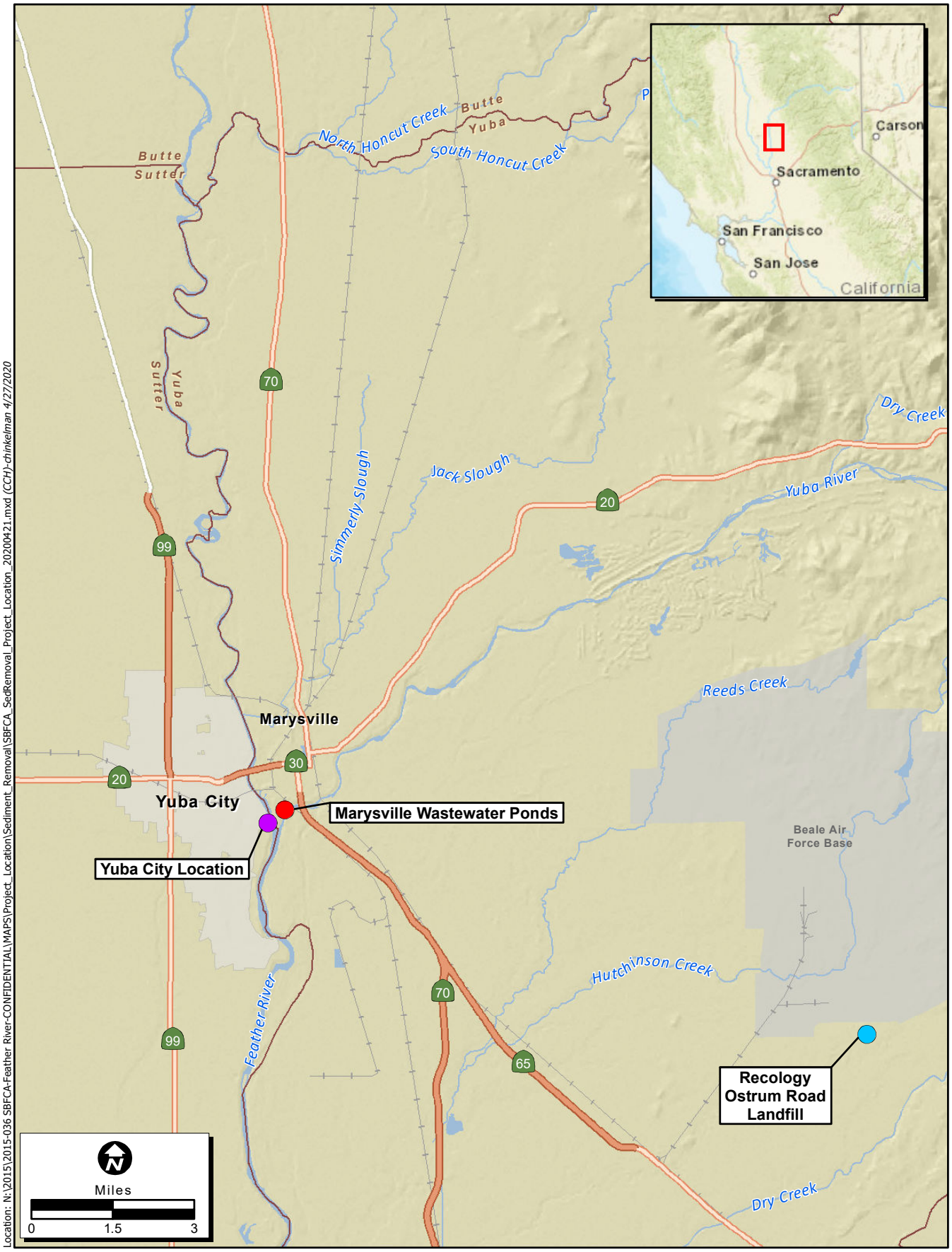
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Figure 2. Project Components

Yuba City Boat Ramp Sediment Removal Project

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Map Date: 4/27/2020

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 3. Potential Disposal Locations

Yuba City Boat Ramp Sediment Removal Project

APPENDIX B

NOP Distribution List and Scoping Comments

- B1 NOP Distribution List
- B2 Scoping Comments

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JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* **(916) 574-1810**
California Relay Service TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**

Established in 1938

July 20, 2020

File Ref: SCH # 2020060424

Sutter Butte Flood Control Agency
Attn: Michael Bessette, PE, Executive Director
P.O. Box M
Yuba City, CA 95992

VIA ELECTRONIC MAIL ONLY (m.bessette@sutterbutteflood.org)

Subject: Notice of Preparation (NOP) for an Environmental Impact Report (EIR) for the Yuba City Boat Ramp Sediment Removal Project, Sutter County.

Dear Mr. Bessette:

The California State Lands Commission (Commission) staff has reviewed the subject NOP for an Environmental Impact Report (EIR) for the Yuba City Boat Ramp Sediment Removal Project (Project), which is being prepared by the Sutter Butte Flood Control Agency (Agency). The Agency, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project may involve work on State sovereign land, the Commission may act as a responsible agency. Commission staff requests that the Agency consult with us on preparation of the Draft EIR as required by CEQA section 21153, subdivision (a), and the State CEQA Guidelines section 15086, subdivisions (a)(1) and (a)(2).

Commission Jurisdiction and Public Trust Lands

The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The state holds these lands for the benefit of all people of the state for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the state holds fee ownership of the bed of the waterway landward to the ordinary low-water mark and a Public Trust easement landward to the ordinary high-water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

Based on the information provided and a review of in-house records, the proposed project extends into the beds of the Feather and Yuba Rivers which at this location is within the jurisdiction of the Commission. According to the project description, sediment buildup in portions of the Feather River, exacerbated by the Oroville Dam Spillway incident of 2017, has created dangerous conditions for recreational users, made some boat launch facilities nearly unusable, and has hampered public safety as it has affected emergency vessel launching capabilities. Currently, the Commission does not have a detailed project plan and sufficient information to determine the extent of the proposed dredging project. Once more detailed plans are prepared, please submit them to Commission staff for further review. These detailed plans are necessary to determine whether a lease or other authorization will be required by the Commission.

Project Description

The Proposed Project will improve access to the Feather River by removing sediment at the Yuba City boat ramp facility. The Project will use hydraulic or mechanical dredging to remove approximately 65,600 cubic yards (cy) of sediment and debris within approximately 13.5 acres adjacent to and downstream of the Yuba City Boat Launch.

The material removed from the Project site would require offsite disposal. Two dredging methods (hydraulic and mechanical) and three alternatives for disposal are being considered (landfills, soil for farmlands, and/or placement in the City of Marysville’s closed northern wastewater ponds).

The Agency proposes the proposed project to meet its objectives and needs as follows:

- Remove sediment at the Yuba City boat ramp facility within the Feather River.
- Remove sediment from the Yuba River and within the confluence of the Feather and Yuba Rivers with mechanical and hydraulic techniques.
- Dispose of the dredge spoils at three potential sites.

From the Project Description, Commission staff understands that the Project would include the following components that have potential to affect State sovereign land:

- Project Component 1. Dredging in the river channels of the Feather and Yuba Rivers.

- Project Component 2. Disposal locations of the sediment will potentially include landfills, farmlands, or City of Marysville's closed northern wastewater ponds.

Environmental Review

Commission staff requests that the Agency consider the following comments when preparing the EIR, to ensure that impacts to State sovereign land are adequately analyzed for the Commission's use of the EIR to support a future lease approval for the Project.

General Comments

1. Project Description: A thorough and complete Project Description should be included in the EIR in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives. The Project Description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that may be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material disposal, etc.), as well as the details of the timing and length of activities. Specifically, show on figures and engineering plans and provide written description of activities occurring waterward of the mean high tide line for Project area waterways. Thorough descriptions will facilitate Commission staff's determination of the extent of the Commission's leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the potential for subsequent environmental analysis to be required.

Biological Resources

2. General: For land under the Commission's jurisdiction, the EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The Agency should conduct queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. The EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.

3. Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the EIR should consider the Project's potential to establish or proliferate aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats, barges, and construction heavy earth-moving equipment brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the EIR finds potentially significant AIS impacts, possible mitigation could include

contracting vessels and barges from nearby or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).

4. Construction Noise: The EIR should also evaluate noise and vibration impacts on fish and birds from construction, restoration, and flood control activities in the water, on the levees, and for landside supporting structures. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, or NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.

5. Dredging Impacts: The EIR should be as precise as possible in describing the amount, duration and timing of the proposed dredging, as these would affect the intensity of any environmental impacts. For example, dredging activities may impact aquatic and terrestrial species and their habitat several ways. Disturbance of fine sediments may generate turbidity; wherein suspended particulates can impede light penetration and photosynthesis of submerged vegetation and impede organism's ability to respire in aquatic environments. Also, excessive turbidity may react with and reduce dissolved oxygen in the water column. If toxic metals lay buried in the sediment from historic gold mining activities, they may be reintroduced into the environment and, potentially, enter the food chain, affecting both water quality and the health of humans and wildlife. Finally, dredging equipment can entrain and kill organisms in the sediment and water column when removing dredge material. An extensive sediment sampling evaluation of the proposed Project area within the riverbeds of the Feather and Yuba Rivers will determine if sediment is suitable for beneficial reuse or must be disposed of in the appropriate disposal site.

   The EIR should analyze these potential impacts to biological resources and water quality from the dredging component of the Project. If impacts prove potentially significant, possible mitigation could include the employment of silt curtains or other best management practices.

Climate Change

6. Greenhouse Gases (GHG): A GHG emissions analysis consistent with the California Global Warming Solutions Act (Assembly Bill 32) and required by the State CEQA Guidelines should be included in the EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result Project activities, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce them to the extent feasible.

Cultural Resources

7. Submerged Resources: The EIR should evaluate potential impacts to submerged cultural resources in the Project area. The Commission maintains a shipwrecks database that can assist with this analysis. Commission staff requests that the Agency contact Staff Attorney Jamie Garrett (see contact information below) to

obtain shipwrecks data from the database and Commission records for the Project site. The database includes known and potential vessels located on the State's tide and submerged lands; however, the locations of many shipwrecks remain unknown. Please note that any submerged archaeological site or submerged historic resource that has remained in state waters for more than 50 years is presumed to be significant. Because of this possibility, please add a mitigation measure requiring that in the event cultural resources are discovered during any construction activities, Project personnel shall halt all activities in the immediate area and notify a qualified archaeologist to determine the appropriate course of action.

8. Title to Resources: The EIR should also mention that the title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the state and under the jurisdiction of the California State Lands Commission (Pub. Resources Code, § 6313). Commission staff requests that the Agency consult with Staff Attorney Jamie Garrett, should any cultural resources on state lands be discovered during construction of the proposed Project. In addition, Commission staff requests that the following statement be included in the EIR's Mitigation and Monitoring Plan: "The final disposition of archaeological, historical, and paleontological resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission."

9. Tribal Cultural Resources: *Tribal Engagement and Consideration of Tribal Cultural Resources*. Commission staff recommends that the Agency include information and impact analyses in the EIR to reflect the September 2016 update to the State CEQA Guidelines Appendix G Checklist Form (see https://www.opr.ca.gov/s_ab52.php) and include the discussion of Tribal engagement and consideration of Tribal Cultural Resources in order to demonstrate compliance with AB 52 (Gatto; Stats. 2014, ch. 532), which applies to all CEQA projects initiated after July 1, 2015.[1] Commission staff notes that the NOP does not identify or mention how the Agency has complied or will comply with AB 52 provisions, which provide procedural and substantive requirements for lead agency consultation with California Native American Tribes, consideration of effects on Tribal Cultural Resources (as defined in Pub. Resources Code, § 21074), and examples of mitigation measures to avoid or minimize impacts to these resources. Even if no Tribe has submitted a consultation notification request for the Project area covered by the EIR, the Agency should:

    - contact the Native American Heritage Commission to obtain a general list of interested Tribes for the Project area;
    - include the results of this inquiry within the EIR; and
    - disclose and analyze potentially significant effects to Tribal Cultural Resources; and avoid impacts when feasible.

    Since the NOP does not disclose if notification or outreach to interested Tribes has occurred and does not document their response, Commission staff recommends that the Agency include this information in the EIR to maintain a clear record of the Agency's efforts to comply with AB 52.

[1] Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 were added to CEQA pursuant to AB 52.

Mitigation and Alternatives

10. Deferred Mitigation: In order to avoid the improper deferral of mitigation, mitigation measures must be specific, feasible, and fully enforceable to minimize significant adverse impacts from a project, and "shall not be deferred until some future time." (State CEQA Guidelines, §15126.4, subd. (a)). For example, references to the preparation of a permit from the CDFW to reduce an impact, without calling out the specific activities that will be included in the permit to reduce that particular impact to a less than significant level, is considered deferral. Commission staff requests that more specific information be provided in such mitigation measures (MMs) to demonstrate how the MM is going to mitigate potential significant impacts to less than significant.

11. Alternatives: In addition to describing mitigation measures that would avoid or reduce the potentially significant impacts of the Project, the Agency should identify and analyze a range of reasonable alternatives to the proposed Project that would attain most of the Project objectives while avoiding or reducing one or more of the potentially significant impacts (see State CEQA Guidelines, § 15126.6). Consider evaluating the uses of the removed sediment as potential substrate for restoration projects within the Feather and Yuba River system.

Thank you for the opportunity to comment on the NOP for the Project. As a trustee and responsible agency, Commission staff requests that you consult with us on this Project and keep us advised of changes to the Project Description and all other important developments. Please send additional information on the Project to the Commission staff listed below as the EIR is being prepared.

Please refer questions concerning environmental review to Christopher Huitt, Senior Environmental Scientist, at (916) 574-2080 or Christopher.Huitt@slc.ca.gov. For questions concerning archaeological or historic resources under Commission jurisdiction, please contact Staff Attorney Jamie Garrett, at (916) 574-0398 or Jamie.Garret@slc.ca.gov. For questions concerning Commission leasing jurisdiction, please contact Mary Jo Columbus, Public Land Management Specialist, at (916) 574-0204 or MaryJo.Columbus@slc.ca.gov.

Sincerely,

Eric Gillies, Acting Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
C. Huitt, Commission
M.J. Columbus, Commission
J. Garrett, Commission

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STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY **GAVIN NEWSOM,** GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Ste. 170
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682

July 10, 2020

Mr. Michael Bessette, PE
Executive Director
Sutter Butte Flood Control Agency
P.O. Box M
Yuba, City California 95992

Subject: Yuba City Boat Ramp Sediment Removal Project, Notice of Preparation, SCH No. 2020060424

Location: Sutter County

Dear Mr. Bessette,

Central Valley Flood Protection Board (Board) staff has reviewed the subject document and provides the following comments:

The proposed project is within the Feather River, a regulated stream under Board jurisdiction, and may require a Board permit prior to construction.

The Board's jurisdiction covers the entire Central Valley including all tributaries and distributaries of the Sacramento and San Joaquin Rivers, and the Tulare and Buena Vista basins south of the San Joaquin River.

Under authorities granted by California Water Code and Public Resources Code statutes, the Board enforces its Title 23, California Code of Regulations (Title 23) for the construction, maintenance, and protection of adopted plans of flood control, including the federal-State facilities of the State Plan of Flood Control, regulated streams, and designated floodways.

Pursuant to Title 23, Section 6 a Board permit is required prior to working within the Board's jurisdiction for the placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee.

Permits may also be required to bring existing works that predate permitting into compliance with Title 23, or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the works has not been clearly established or ownership and use have been revised.

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Other federal (including U.S. Army Corps of Engineers Section 10 and 404 regulatory permits), State and local agency permits may be required and are the applicant's responsibility to obtain.

Board permit applications and Title 23 regulations are available on our website at http://www.cvfpb.ca.gov/. Maps of the Board's jurisdiction are also available from the California Department of Water Resources website at http://gis.bam.water.ca.gov/bam/.

Encroachment permit applications received on or after July 1, 2019 are subject to fees, additional information is available on the Board's website at http://cvfpb.ca.gov/fees-2019/.

Please contact James Herota at (916) 574-0651, or via email at James.Herota@CVFlood.ca.gov if you have any questions.

Sincerely,

Andrea Buckley

Andrea Buckley
Environmental Services and Land Management Branch Chief

cc: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

NATIVE AMERICAN HERITAGE COMMISSION

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June 22, 2020

Michael Bessette
Sutter Butte Flood Control Agency
P.O. Box M
Yuba City, CA 95992

Re: 2020060424, Yuba City Boat Ramp Sediment Removal Project, Sutter County

Dear Mr. Bessette:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

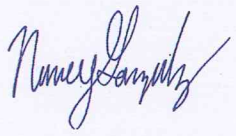
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,



Nancy Gonzalez-Lopez
Cultural Resources Analyst

cc: State Clearinghouse

20 July 2020

Michael Bessette
Sutter Butte Flood Control Agency
P.O. Box M
Yuba City, CA 95992

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT, SCH#2020060424, SUTTER COUNTY

Pursuant to the State Clearinghouse's 19 June 2020 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Preparation for the Draft Environmental Impact Report* for the Yuba City Boat Ramp Sediment Removal Project, located in Sutter County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has

adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State

Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage

under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4684 or Peter.Minkel2@waterboards.ca.gov.

Peter Minkel
Engineering Geologist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Michael Bessette
m.besette@sutterbutteflood.org

From:	Michelle Wilson
To:	Michelle Wilson
Subject:	FW: Comments USACE Regulatory - Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project (UNCLASSIFIED)
Date:	Thursday, November 5, 2020 1:38:30 PM

From: Michael Bessette <m.bessette@sutterbutteflood.org>
Sent: Monday, June 29, 2020 8:43 AM
To: Bjorn Gregersen <BGregers@ecorpconsulting.com>; Emily Mecke <emecke@ecorpconsulting.com>; Chris Fritz <cfritz@pbieng.com>
Subject: FW: Comments USACE Regulatory - Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project (UNCLASSIFIED)

All,
See below. Please forward within the team as appropriate.

Thanks,

Michael W. Bessette, PE
Executive Director
Sutter Butte Flood Control Agency
1445 Butte House Road, Suite B
P.O. Box M
Yuba City, CA 95992
m.bessette@sutterbutteflood.org
www.SutterButteFlood.org
cell: 530.415.0983
office: 530.755.9859

Please note SBFCA's new physical office location

From: Stovall, Jesse T CIV USARMY CESPK (USA) <Jesse.T.Stovall@usace.army.mil>
Sent: Friday, June 26, 2020 10:18 AM
To: Michael Bessette <m.bessette@sutterbutteflood.org>
Subject: Comments USACE Regulatory - Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Good morning,

This office has received your Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project and would like to provide comment.

Regulatory Division (SPK-2020-00506)

Sutter Butte Flood Control Agency
Attn: Mr. Michael Bessette
P.O. Box M
Yuba City, California 95991
m.bessette@sutterbutteflood.org

Dear Mr. Bessette:

We are responding to your June 23, 2020 request for comments on the Notice of Preparation of a Draft Environmental Impact Report for the Yuba City Boat Ramp Sediment Removal Project. The Sutter Butte Flood Control Agency (SBFCA) project identification is Yuba City Boat Ramp Sediment Removal Project. The approximately 124.06-acreacre project site is located at, Latitude 39.27378°, Longitude -121.63102°, , Sutter County, California.

The Corps of Engineers' jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, marshes, wet meadows, and seeps. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.

To ascertain the extent of waters on the project site, the applicant should prepare a wetland delineation, in accordance with the "Minimum Standards for Acceptance of Preliminary Wetlands Delineations" and “Final Map and Drawing Standards for the South Pacific Division Regulatory Program” under "Jurisdiction" on our website at the address below, and submit it to this office for verification. A list of consultants that prepare wetland delineations and permit application documents is also available on our website at the same location.

The range of alternatives considered for this project should include alternatives that avoid impacts to wetlands or other waters of the United States. Every effort should be made to avoid project features which require the discharge of dredged or fill material into waters of the United States. In the event it can be clearly demonstrated there are no practicable alternatives to filling waters of the United States, mitigation plans should be developed to compensate for the unavoidable losses resulting from project implementation.

Specifically this project could avoid impacts to waters of the US that included fill. Based on the information you have provided a floating barge that would perform a suction dredge of the bottom and place no fill besides incidental fall back may not require a verification or permit from the Corps. However; the use of heavy equipment within the waters may be considered redistribution of fill and would likely require a permit or verification. You should contact this office directly to discuss the details of the plan to ascertain if a permit from the Corps is required.

Please refer to identification number SPK-2020-00506 in any correspondence concerning this project. If you have any questions, please contact me , by email at

Jesse.T.Stovall@usace.army.mil, or telephone at (916) 557-7506. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Jesse Stovall
Project Manager, California South Section

Regulatory Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814
916-557-7506
Jesse.t.stovall@usace.army.mil

Jesse Stovall
Project Manager, California South Section
US Army Corp of Engineers

916-557-7506

As of March 18, 2020 I will be teleworking for at least the next 3 weeks, likely longer depending on how things progress regarding Covid-19. All phone calls will be forwarded to my work cell and will do my best to answer all calls promptly. Due to the unprecedented number of people teleworking with the USACE we are experience intense strain on our internet and VPN systems. Work will continue but will certainly be impacted by these issues. I will do my best to respond as quickly as possible but delays will be likely while our systems are upgraded to accommodate the traffic. If you need an immediate response a call to the number above will get you the most prompt response. Thank you for your patience during this time.

(We do not have "out of office" auto reply. Email not returned in a reasonable amount of time means I am not in the office, however, my voicemail is kept up to date.)

For information on the Regulatory Program.
http://www.spk.usace.army.mil/Missions/Regulatory.aspx
For all FTP Submittals:
https://safe.amrdec.army.mil/safe/Welcome.aspx

The Army's out of office has been disconnected. If you have emailed any Regulatory Division employee, and haven't received a reply, please send an email to CESPK-REGUALTORY-INFO@USACE.ARMY.MIL. This inbox is monitored daily.

APPENDIX C

Air Quality and GHG Emissions

C1 Air Quality Emissions

C2 Greenhouse Gas Emissions

C3 Energy Details

Project Marine Vessels Emissions

Yuba City Boat Ramp Sediment Removal Project

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - ME Barge and Dredge (Drege Boat)	**NOx**	0.0029	**5.84**	**0.25**
	ROG	0.0001	**0.18**	**0.01**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0007	**1.46**	**0.06**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - ME Barge and Dredge (Potential Barge)	**NOx**	0.0029	**5.84**	**0.25**
	ROG	0.0001	**0.18**	**0.01**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0007	**1.46**	**0.06**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Project Marine Vessels Emissions

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Tow Boats	NOx	0.0069	13.78	0.60
	ROG	0.0011	2.22	0.10
	PM10	0.0003	0.54	0.02
	PM2.5	0.0003	0.50	0.02
	CO	0.0053	10.66	0.46
	SO2	0.0000	0.00	0.00

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Others (Rescue)	NOx	0.0004	0.84	0.04
	ROG	0.0001	0.16	0.01
	PM10	0.0000	0.04	0.00
	PM2.5	0.0000	0.04	0.00
	CO	0.0003	0.60	0.03
	SO2	0.0000	0.00	0.00

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Project Marine Vessels Emissions

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Work Boat (Support)	NOx	0.0023	**4.54**	**0.20**
	ROG	0.0003	**0.64**	**0.03**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0017	**3.30**	**0.14**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
Combined Total	NOx	0.0154	**30.84**	**1.34**
	ROG	0.0017	**3.38**	**0.15**
	PM10	0.0005	**1.06**	**0.05**
	PM2.5	0.0009	**1.80**	**0.08**
	CO	0.0087	**17.48**	**0.76**
	SO2	0.0000	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Replacement - Generators

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	14.00	Acre	14.00	609,840.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Dregding season = June 15 - October 15

Off-road Equipment - Dredging support equipment

Trips and VMT - No worker commutes modeled in this model

Yuba City Boat Ramp Sediment Replacement - Generators - Sacramento Valley Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	89.00
tblConstructionPhase	PhaseEndDate	11/30/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.0952	9.5423	11.1101	0.0197	0.0000	0.5131	0.5131	0.0000	0.5131	0.5131	0.0000	1,869.1048	1,869.1048	0.0976	0.0000	1,871.5441
Maximum	**1.0952**	**9.5423**	**11.1101**	**0.0197**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**1,869.1048**	**1,869.1048**	**0.0976**	**0.0000**	**1,871.5441**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.0952	9.5423	11.1101	0.0197	0.0000	0.5131	0.5131	0.0000	0.5131	0.5131	0.0000	1,869.1048	1,869.1048	0.0976	0.0000	1,871.5441
Maximum	**1.0952**	**9.5423**	**11.1101**	**0.0197**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**1,869.1048**	**1,869.1048**	**0.0976**	**0.0000**	**1,871.5441**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2626	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.2626**	**1.0000e-005**	**1.4300e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0600e-003**	**3.0600e-003**	**1.0000e-005**	**0.0000**	**3.2600e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.2626	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.2626**	**1.0000e-005**	**1.4300e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0600e-003**	**3.0600e-003**	**1.0000e-005**	**0.0000**	**3.2600e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging Generators	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 14

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging Generators	Pumps	1	8.00	84	0.74
Dredging Generators	Generator Sets	2	8.00	84	0.74
Dredging Generators	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Dredging Generators	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging Generators	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging Generators - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.0952	9.5423	11.1101	0.0197		0.5131	0.5131		0.5131	0.5131		1,869.1048	1,869.1048	0.0976		1,871.5441
Total	**1.0952**	**9.5423**	**11.1101**	**0.0197**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**0.5131**	**0.5131**		**1,869.1048**	**1,869.1048**	**0.0976**		**1,871.5441**

3.2 Dredging Generators - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.0952	9.5423	11.1101	0.0197		0.5131	0.5131		0.5131	0.5131	0.0000	1,869.1048	1,869.1048	0.0976		1,871.5441
Total	**1.0952**	**9.5423**	**11.1101**	**0.0197**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**0.5131**	**0.5131**	**0.0000**	**1,869.1048**	**1,869.1048**	**0.0976**		**1,871.5441**

3.2 Dredging Generators - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.2626	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003
Unmitigated	0.2626	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2160					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003
Total	**0.2626**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0600e-003**	**3.0600e-003**	**1.0000e-005**		**3.2600e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.2160					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0600e-003	3.0600e-003	1.0000e-005		3.2600e-003
Total	**0.2626**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0600e-003**	**3.0600e-003**	**1.0000e-005**		**3.2600e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Grading - 65,600 cubic yards of Phase 1 dredged material

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1 - Sacramento Valley Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	89.00
tblConstructionPhase	PhaseEndDate	3/19/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	10/19/2020	6/15/2021
tblGrading	MaterialImported	0.00	65,600.00
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	8,200.00	6,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.2473	50.1759	22.9755	0.0547	12.9909	2.1035	15.0945	6.7711	1.9355	8.7066	0.0000	5,391.4078	5,391.4078	1.5044	0.0000	5,429.0166
Maximum	**4.2473**	**50.1759**	**22.9755**	**0.0547**	**12.9909**	**2.1035**	**15.0945**	**6.7711**	**1.9355**	**8.7066**	**0.0000**	**5,391.4078**	**5,391.4078**	**1.5044**	**0.0000**	**5,429.0166**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.4884	29.4728	26.9012	0.0547	5.2276	1.0803	6.3078	2.6837	1.0665	3.7501	0.0000	5,391.4078	5,391.4078	1.5044	0.0000	5,429.0166
Maximum	**1.4884**	**29.4728**	**26.9012**	**0.0547**	**5.2276**	**1.0803**	**6.3078**	**2.6837**	**1.0665**	**3.7501**	**0.0000**	**5,391.4078**	**5,391.4078**	**1.5044**	**0.0000**	**5,429.0166**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**64.96**	**41.26**	**-17.09**	**0.00**	**59.76**	**48.64**	**58.21**	**60.37**	**44.90**	**56.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 1 (2021)	Grading	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 1 (2021)	Trenchers	1	8.00	78	0.50
Phase 1 (2021)	Forklifts	2	8.00	89	0.20
Phase 1 (2021)	Cranes	1	8.00	231	0.29
Phase 1 (2021)	Excavators	0	8.00	158	0.38
Phase 1 (2021)	Rubber Tired Dozers	2	8.00	247	0.40
Phase 1 (2021)	Graders	1	8.00	187	0.41
Phase 1 (2021)	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 1 (2021)	Scrapers	0	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 1 (2021)	9	30.00	0.00	6,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 1 (2021) - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.7269	0.0000	12.7269	6.7008	0.0000	6.7008			0.0000			0.0000
Off-Road	3.9743	42.3784	21.2881	0.0421		2.0954	2.0954		1.9278	1.9278		4,079.9116	4,079.9116	1.3195		4,112.8997
Total	**3.9743**	**42.3784**	**21.2881**	**0.0421**	**12.7269**	**2.0954**	**14.8223**	**6.7008**	**1.9278**	**8.6286**		**4,079.9116**	**4,079.9116**	**1.3195**		**4,112.8997**

3.2 Phase 1 (2021) - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1463	7.7281	0.7342	0.0101	0.0176	6.4300e-003	0.0241	4.9700e-003	6.1500e-003	0.0111		1,062.8606	1,062.8606	0.1779		1,067.3081
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1267	0.0695	0.9532	2.5000e-003	0.2464	1.6400e-003	0.2481	0.0654	1.5100e-003	0.0669		248.6356	248.6356	6.9300e-003		248.8088
Total	**0.2730**	**7.7975**	**1.6874**	**0.0126**	**0.2641**	**8.0700e-003**	**0.2722**	**0.0703**	**7.6600e-003**	**0.0780**		**1,311.4962**	**1,311.4962**	**0.1848**		**1,316.1168**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9635	0.0000	4.9635	2.6133	0.0000	2.6133			0.0000			0.0000
Off-Road	1.2154	21.6753	25.2137	0.0421		1.0722	1.0722		1.0588	1.0588	0.0000	4,079.9116	4,079.9116	1.3195		4,112.8997
Total	**1.2154**	**21.6753**	**25.2137**	**0.0421**	**4.9635**	**1.0722**	**6.0357**	**2.6133**	**1.0588**	**3.6721**	**0.0000**	**4,079.9116**	**4,079.9116**	**1.3195**		**4,112.8997**

3.2 Phase 1 (2021) - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1463	7.7281	0.7342	0.0101	0.0176	6.4300e-003	0.0241	4.9700e-003	6.1500e-003	0.0111		1,062.8606	1,062.8606	0.1779		1,067.3081
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1267	0.0695	0.9532	2.5000e-003	0.2464	1.6400e-003	0.2481	0.0654	1.5100e-003	0.0669		248.6356	248.6356	6.9300e-003		248.8088
Total	**0.2730**	**7.7975**	**1.6874**	**0.0126**	**0.2641**	**8.0700e-003**	**0.2722**	**0.0703**	**7.6600e-003**	**0.0780**		**1,311.4962**	**1,311.4962**	**0.1848**		**1,316.1168**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Unmitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 250,000 cubic yards of Phase 2 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2 - Sacramento Valley Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	250,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	31,250.00	25,000.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.0304	64.7147	23.6793	0.0831	13.4764	1.7584	15.2347	6.8512	1.6185	8.4697	0.0000	8,383.0633	8,383.0633	1.9906	0.0000	8,432.8282
Maximum	**4.0304**	**64.7147**	**23.6793**	**0.0831**	**13.4764**	**1.7584**	**15.2347**	**6.8512**	**1.6185**	**8.4697**	**0.0000**	**8,383.0633**	**8,383.0633**	**1.9906**	**0.0000**	**8,432.8282**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.8317	50.2717	28.7044	0.0831	5.4476	1.0678	6.5154	2.7235	1.0555	3.7791	0.0000	8,383.0633	8,383.0633	1.9906	0.0000	8,432.8282
Maximum	**1.8317**	**50.2717**	**28.7044**	**0.0831**	**5.4476**	**1.0678**	**6.5154**	**2.7235**	**1.0555**	**3.7791**	**0.0000**	**8,383.0633**	**8,383.0633**	**1.9906**	**0.0000**	**8,432.8282**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**54.55**	**22.32**	**-21.22**	**0.00**	**59.58**	**39.27**	**57.23**	**60.25**	**34.78**	**55.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	25,000.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.1619	0.0000	13.1619	6.7667	0.0000	6.7667			0.0000			0.0000
Off-Road	3.3826	35.8699	20.1604	0.0421		1.7351	1.7351		1.5963	1.5963		4,079.6690	4,079.6690	1.3195		4,112.6552
Total	**3.3826**	**35.8699**	**20.1604**	**0.0421**	**13.1619**	**1.7351**	**14.8971**	**6.7667**	**1.5963**	**8.3630**		**4,079.6690**	**4,079.6690**	**1.3195**		**4,112.6552**

3.2 Phase 2 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5298	28.7825	2.6445	0.0386	0.0680	0.0216	0.0896	0.0192	0.0207	0.0398		4,063.7447	4,063.7447	0.6650		4,080.3686
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1179	0.0623	0.8744	2.4100e-003	0.2464	1.6000e-003	0.2480	0.0654	1.4700e-003	0.0668		239.6496	239.6496	6.1900e-003		239.8044
Total	**0.6478**	**28.8448**	**3.5189**	**0.0410**	**0.3144**	**0.0232**	**0.3376**	**0.0845**	**0.0222**	**0.1067**		**4,303.3943**	**4,303.3943**	**0.6712**		**4,320.1730**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.1332	0.0000	5.1332	2.6390	0.0000	2.6390			0.0000			0.0000
Off-Road	1.1839	21.4269	25.1855	0.0421		1.0446	1.0446		1.0334	1.0334	0.0000	4,079.6690	4,079.6690	1.3195		4,112.6552
Total	**1.1839**	**21.4269**	**25.1855**	**0.0421**	**5.1332**	**1.0446**	**6.1777**	**2.6390**	**1.0334**	**3.6724**	**0.0000**	**4,079.6690**	**4,079.6690**	**1.3195**		**4,112.6552**

3.2 Phase 2 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5298	28.7825	2.6445	0.0386	0.0680	0.0216	0.0896	0.0192	0.0207	0.0398		4,063.7447	4,063.7447	0.6650		4,080.3686
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1179	0.0623	0.8744	2.4100e-003	0.2464	1.6000e-003	0.2480	0.0654	1.4700e-003	0.0668		239.6496	239.6496	6.1900e-003		239.8044
Total	**0.6478**	**28.8448**	**3.5189**	**0.0410**	**0.3144**	**0.0232**	**0.3376**	**0.0845**	**0.0222**	**0.1067**		**4,303.3943**	**4,303.3943**	**0.6712**		**4,320.1730**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Unmitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Preferred Project Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.00**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.03**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.01**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.13**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site. The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 329 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 250,000 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Material handling to occur during dredging season

Off-road Equipment - Assumed material handling equipment

Grading -

Trips and VMT -

Construction Off-road Equipment Mitigation - Mitigation Measure

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling - Sacramento Valley Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	5.00	89.00
tblConstructionPhase	PhaseEndDate	11/23/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.4969	14.8046	9.1302	0.0162	6.1700	0.7570	6.9269	3.3495	0.6964	4.0459	0.0000	1,578.3337	1,578.3337	0.4664	0.0000	1,589.9930
Maximum	**1.4969**	**14.8046**	**9.1302**	**0.0162**	**6.1700**	**0.7570**	**6.9269**	**3.3495**	**0.6964**	**4.0459**	**0.0000**	**1,578.3337**	**1,578.3337**	**0.4664**	**0.0000**	**1,589.9930**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.4370	7.5531	9.7867	0.0162	2.4965	0.3974	2.8939	1.3302	0.3973	1.7275	0.0000	1,578.3337	1,578.3337	0.4664	0.0000	1,589.9930
Maximum	**0.4370**	**7.5531**	**9.7867**	**0.0162**	**2.4965**	**0.3974**	**2.8939**	**1.3302**	**0.3973**	**1.7275**	**0.0000**	**1,578.3337**	**1,578.3337**	**0.4664**	**0.0000**	**1,589.9930**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**70.80**	**48.98**	**-7.19**	**0.00**	**59.54**	**47.50**	**58.22**	**60.29**	**42.95**	**57.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0938	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0938**	**0.0000**	**5.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**	**0.0000**	**1.1700e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0938	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0938**	**0.0000**	**5.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**	**0.0000**	**1.1700e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material Handling	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material Handling	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Material Handling	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material Handling	3	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Material Handling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	1.4209	14.7629	8.5583	0.0147		0.7560	0.7560		0.6955	0.6955		1,429.1523	1,429.1523	0.4622		1,440.7078
Total	**1.4209**	**14.7629**	**8.5583**	**0.0147**	**6.0221**	**0.7560**	**6.7781**	**3.3102**	**0.6955**	**4.0058**		**1,429.1523**	**1,429.1523**	**0.4622**		**1,440.7078**

3.2 Material Handling - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0760	0.0417	0.5719	1.5000e-003	0.1479	9.9000e-004	0.1489	0.0392	9.1000e-004	0.0401		149.1814	149.1814	4.1600e-003		149.2853
Total	**0.0760**	**0.0417**	**0.5719**	**1.5000e-003**	**0.1479**	**9.9000e-004**	**0.1489**	**0.0392**	**9.1000e-004**	**0.0401**		**149.1814**	**149.1814**	**4.1600e-003**		**149.2853**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.3486	0.0000	2.3486	1.2910	0.0000	1.2910			0.0000			0.0000
Off-Road	0.3610	7.5115	9.2147	0.0147		0.3964	0.3964		0.3964	0.3964	0.0000	1,429.1523	1,429.1523	0.4622		1,440.7078
Total	**0.3610**	**7.5115**	**9.2147**	**0.0147**	**2.3486**	**0.3964**	**2.7450**	**1.2910**	**0.3964**	**1.6874**	**0.0000**	**1,429.1523**	**1,429.1523**	**0.4622**		**1,440.7078**

3.2 Material Handling - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0760	0.0417	0.5719	1.5000e-003	0.1479	9.9000e-004	0.1489	0.0392	9.1000e-004	0.0401		149.1814	149.1814	4.1600e-003		149.2853
Total	**0.0760**	**0.0417**	**0.5719**	**1.5000e-003**	**0.1479**	**9.9000e-004**	**0.1489**	**0.0392**	**9.1000e-004**	**0.0401**		**149.1814**	**149.1814**	**4.1600e-003**		**149.2853**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0938	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Unmitigated	0.0938	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0771					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0938**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0771					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	0.0000	5.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.0900e-003	1.0900e-003	0.0000		1.1700e-003
Total	**0.0938**	**0.0000**	**5.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0900e-003**	**1.0900e-003**	**0.0000**		**1.1700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 2 Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.26**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.04**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.02**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.17**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site.

The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 416 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3

Sacramento Valley Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 315600 cubic yards of Alternative 3 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3 - Sacramento Valley Air Basin, Summer

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	315,600.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	39,450.00	31,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.1694	72.2672	24.3732	0.0933	13.6484	1.7640	15.4124	6.8796	1.6239	8.5035	0.0000	9,449.3899	9,449.3899	2.1651	0.0000	9,503.5169
Maximum	**4.1694**	**72.2672**	**24.3732**	**0.0933**	**13.6484**	**1.7640**	**15.4124**	**6.8796**	**1.6239**	**8.5035**	**0.0000**	**9,449.3899**	**9,449.3899**	**2.1651**	**0.0000**	**9,503.5169**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.9707	57.8242	29.3983	0.0933	5.5256	1.0734	6.5990	2.7377	1.0609	3.7986	0.0000	9,449.3899	9,449.3899	2.1651	0.0000	9,503.5169
Maximum	**1.9707**	**57.8242**	**29.3983**	**0.0933**	**5.5256**	**1.0734**	**6.5990**	**2.7377**	**1.0609**	**3.7986**	**0.0000**	**9,449.3899**	**9,449.3899**	**2.1651**	**0.0000**	**9,503.5169**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**52.73**	**19.99**	**-20.62**	**0.00**	**59.51**	**39.15**	**57.18**	**60.21**	**34.67**	**55.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**	**0.0000**	**0.0126**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	31,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.3161	0.0000	13.3161	6.7900	0.0000	6.7900			0.0000			0.0000
Off-Road	3.3826	35.8699	20.1604	0.0421		1.7351	1.7351		1.5963	1.5963		4,079.6690	4,079.6690	1.3195		4,112.6552
Total	**3.3826**	**35.8699**	**20.1604**	**0.0421**	**13.3161**	**1.7351**	**15.0512**	**6.7900**	**1.5963**	**8.3863**		**4,079.6690**	**4,079.6690**	**1.3195**		**4,112.6552**

3.2 Phase 2 - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6689	36.3351	3.3384	0.0487	0.0858	0.0273	0.1131	0.0242	0.0261	0.0503		5,130.0713	5,130.0713	0.8394		5,151.0573
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1179	0.0623	0.8744	2.4100e-003	0.2464	1.6000e-003	0.2480	0.0654	1.4700e-003	0.0668		239.6496	239.6496	6.1900e-003		239.8044
Total	**0.7868**	**36.3973**	**4.2128**	**0.0512**	**0.3323**	**0.0289**	**0.3612**	**0.0896**	**0.0276**	**0.1171**		**5,369.7209**	**5,369.7209**	**0.8456**		**5,390.8617**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.1933	0.0000	5.1933	2.6481	0.0000	2.6481			0.0000			0.0000
Off-Road	1.1839	21.4269	25.1855	0.0421		1.0446	1.0446		1.0334	1.0334	0.0000	4,079.6690	4,079.6690	1.3195		4,112.6552
Total	**1.1839**	**21.4269**	**25.1855**	**0.0421**	**5.1933**	**1.0446**	**6.2378**	**2.6481**	**1.0334**	**3.6815**	**0.0000**	**4,079.6690**	**4,079.6690**	**1.3195**		**4,112.6552**

3.2 Phase 2 - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6689	36.3351	3.3384	0.0487	0.0858	0.0273	0.1131	0.0242	0.0261	0.0503		5,130.0713	5,130.0713	0.8394		5,151.0573
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1179	0.0623	0.8744	2.4100e-003	0.2464	1.6000e-003	0.2480	0.0654	1.4700e-003	0.0668		239.6496	239.6496	6.1900e-003		239.8044
Total	**0.7868**	**36.3973**	**4.2128**	**0.0512**	**0.3323**	**0.0289**	**0.3612**	**0.0896**	**0.0276**	**0.1171**		**5,369.7209**	**5,369.7209**	**0.8456**		**5,390.8617**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Unmitigated	1.0129	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1792					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8332					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5100e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		0.0118	0.0118	3.0000e-005		0.0126
Total	**1.0129**	**5.0000e-005**	**5.5100e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**0.0118**	**0.0118**	**3.0000e-005**		**0.0126**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 3 Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.26**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.04**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.02**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.17**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site.

The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 416 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

Project Marine Vessels Emissions

Yuba City Boat Ramp Sediment Removal Project

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - ME Barge and Dredge (Drege Boat)	**NOx**	0.0029	**5.84**	**0.25**
	ROG	0.0001	**0.18**	**0.01**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0007	**1.46**	**0.06**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - ME Barge and Dredge (Potential Barge)	**NOx**	0.0029	**5.84**	**0.25**
	ROG	0.0001	**0.18**	**0.01**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0007	**1.46**	**0.06**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Project Marine Vessels Emissions

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Tow Boats	NOx	0.0069	13.78	0.60
	ROG	0.0011	2.22	0.10
	PM10	0.0003	0.54	0.02
	PM2.5	0.0003	0.50	0.02
	CO	0.0053	10.66	0.46
	SO2	0.0000	0.00	0.00

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Others (Rescue)	NOx	0.0004	0.84	0.04
	ROG	0.0001	0.16	0.01
	PM10	0.0000	0.04	0.00
	PM2.5	0.0000	0.04	0.00
	CO	0.0003	0.60	0.03
	SO2	0.0000	0.00	0.00

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Project Marine Vessels Emissions

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
CHC - AE Work Boat (Support)	NOx	0.0023	**4.54**	**0.20**
	ROG	0.0003	**0.64**	**0.03**
	PM10	0.0001	**0.16**	**0.01**
	PM2.5	0.0001	**0.14**	**0.01**
	CO	0.0017	**3.30**	**0.14**
	SO2	0.0000	**0.00**	**0.00**

[1] Anuual Pollutants are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Tons Annually[1]
Combined Total	NOx	0.0154	**30.84**	**1.34**
	ROG	0.0017	**3.38**	**0.15**
	PM10	0.0005	**1.06**	**0.05**
	PM2.5	0.0009	**1.80**	**0.08**
	CO	0.0087	**17.48**	**0.76**
	SO2	0.0000	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Replacement - Generators

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	14.00	Acre	14.00	609,840.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Dregding season = June 15 - October 15

Off-road Equipment - Dredging support equipment

Trips and VMT - No worker commutes modeled in this model

Yuba City Boat Ramp Sediment Replacement - Generators - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	89.00
tblConstructionPhase	PhaseEndDate	11/30/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0487	0.4246	0.4944	8.8000e-004	0.0000	0.0228	0.0228	0.0000	0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5537
Maximum	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5537**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0487	0.4246	0.4944	8.8000e-004	0.0000	0.0228	0.0228	0.0000	0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5536
Maximum	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5536**

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

Yuba City Boat Ramp Sediment Replacement - Generators - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-20-2021	7-19-2021	0.1330	0.1330
4	7-20-2021	9-30-2021	0.2773	0.2773
		Highest	0.2773	0.2773

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging Generators	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 14

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging Generators	Pumps	1	8.00	84	0.74
Dredging Generators	Generator Sets	2	8.00	84	0.74
Dredging Generators	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Dredging Generators	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging Generators	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging Generators - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0487	0.4246	0.4944	8.8000e-004		0.0228	0.0228		0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5537
Total	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5537**

Unmitigated Construction Off-Site

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

3.2 Dredging Generators - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0487	0.4246	0.4944	8.8000e-004		0.0228	0.0228		0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5536
Total	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5536**

Mitigated Construction Off-Site

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Unmitigated	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0394					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0394					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Grading - 65,600 cubic yards of Phase 1 dredged material

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	89.00
tblConstructionPhase	PhaseEndDate	3/19/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	10/19/2020	6/15/2021
tblGrading	MaterialImported	0.00	65,600.00
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	8,200.00	6,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1886	2.2279	1.0233	2.4000e-003	0.5777	0.0936	0.6713	0.3012	0.0862	0.3874	0.0000	214.5091	214.5091	0.0611	0.0000	216.0374
Maximum	**0.1886**	**2.2279**	**1.0233**	**2.4000e-003**	**0.5777**	**0.0936**	**0.6713**	**0.3012**	**0.0862**	**0.3874**	**0.0000**	**214.5091**	**214.5091**	**0.0611**	**0.0000**	**216.0374**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0659	1.3066	1.1980	2.4000e-003	0.2322	0.0481	0.2803	0.1193	0.0475	0.1668	0.0000	214.5089	214.5089	0.0611	0.0000	216.0372
Maximum	**0.0659**	**1.3066**	**1.1980**	**2.4000e-003**	**0.2322**	**0.0481**	**0.2803**	**0.1193**	**0.0475**	**0.1668**	**0.0000**	**214.5089**	**214.5089**	**0.0611**	**0.0000**	**216.0372**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**65.09**	**41.35**	**-17.07**	**0.00**	**59.81**	**48.62**	**58.25**	**60.39**	**44.88**	**56.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-19-2021	7-18-2021	0.6609	0.3760
4	7-19-2021	9-30-2021	1.4383	0.8183
		Highest	1.4383	0.8183

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 1 (2021)	Grading	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 1 (2021)	Trenchers	1	8.00	78	0.50
Phase 1 (2021)	Forklifts	2	8.00	89	0.20
Phase 1 (2021)	Cranes	1	8.00	231	0.29
Phase 1 (2021)	Excavators	0	8.00	158	0.38
Phase 1 (2021)	Rubber Tired Dozers	2	8.00	247	0.40
Phase 1 (2021)	Graders	1	8.00	187	0.41
Phase 1 (2021)	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 1 (2021)	Scrapers	0	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 1 (2021)	9	30.00	0.00	6,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 1 (2021) - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5664	0.0000	0.5664	0.2982	0.0000	0.2982	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1769	1.8858	0.9473	1.8700e-003		0.0933	0.0933		0.0858	0.0858	0.0000	164.7049	164.7049	0.0533	0.0000	166.0366
Total	**0.1769**	**1.8858**	**0.9473**	**1.8700e-003**	**0.5664**	**0.0933**	**0.6596**	**0.2982**	**0.0858**	**0.3840**	**0.0000**	**164.7049**	**164.7049**	**0.0533**	**0.0000**	**166.0366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.8800e-003	0.3387	0.0401	4.3000e-004	7.6000e-004	3.2000e-004	1.0900e-003	2.2000e-004	3.1000e-004	5.3000e-004	0.0000	40.7314	40.7314	7.6100e-003	0.0000	40.9218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8900e-003	3.4100e-003	0.0360	1.0000e-004	0.0105	7.0000e-005	0.0106	2.8000e-003	7.0000e-005	2.8700e-003	0.0000	9.0728	9.0728	2.5000e-004	0.0000	9.0790
Total	**0.0118**	**0.3421**	**0.0760**	**5.3000e-004**	**0.0113**	**3.9000e-004**	**0.0117**	**3.0200e-003**	**3.8000e-004**	**3.4000e-003**	**0.0000**	**49.8042**	**49.8042**	**7.8600e-003**	**0.0000**	**50.0008**

3.2 Phase 1 (2021) - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2209	0.0000	0.2209	0.1163	0.0000	0.1163	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0541	0.9646	1.1220	1.8700e-003		0.0477	0.0477		0.0471	0.0471	0.0000	164.7047	164.7047	0.0533	0.0000	166.0364
Total	**0.0541**	**0.9646**	**1.1220**	**1.8700e-003**	**0.2209**	**0.0477**	**0.2686**	**0.1163**	**0.0471**	**0.1634**	**0.0000**	**164.7047**	**164.7047**	**0.0533**	**0.0000**	**166.0364**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.8800e-003	0.3387	0.0401	4.3000e-004	7.6000e-004	3.2000e-004	1.0900e-003	2.2000e-004	3.1000e-004	5.3000e-004	0.0000	40.7314	40.7314	7.6100e-003	0.0000	40.9218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8900e-003	3.4100e-003	0.0360	1.0000e-004	0.0105	7.0000e-005	0.0106	2.8000e-003	7.0000e-005	2.8700e-003	0.0000	9.0728	9.0728	2.5000e-004	0.0000	9.0790
Total	**0.0118**	**0.3421**	**0.0760**	**5.3000e-004**	**0.0113**	**3.9000e-004**	**0.0117**	**3.0200e-003**	**3.8000e-004**	**3.4000e-003**	**0.0000**	**49.8042**	**49.8042**	**7.8600e-003**	**0.0000**	**50.0008**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 250,000 cubic yards of Phase 2 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	250,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	31,250.00	25,000.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1780	2.8286	1.0626	3.5600e-003	0.5925	0.0775	0.6700	0.3013	0.0713	0.3727	0.0000	325.4211	325.4211	0.0810	0.0000	327.4471
Maximum	**0.1780**	**2.8286**	**1.0626**	**3.5600e-003**	**0.5925**	**0.0775**	**0.6700**	**0.3013**	**0.0713**	**0.3727**	**0.0000**	**325.4211**	**325.4211**	**0.0810**	**0.0000**	**327.4471**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0812	2.1931	1.2837	3.5600e-003	0.2392	0.0471	0.2863	0.1197	0.0466	0.1663	0.0000	325.4209	325.4209	0.0810	0.0000	327.4469
Maximum	**0.0812**	**2.1931**	**1.2837**	**3.5600e-003**	**0.2392**	**0.0471**	**0.2863**	**0.1197**	**0.0466**	**0.1663**	**0.0000**	**325.4209**	**325.4209**	**0.0810**	**0.0000**	**327.4469**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**54.36**	**22.47**	**-20.81**	**0.00**	**59.63**	**39.20**	**57.27**	**60.27**	**34.72**	**55.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2 - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
7	4-19-2022	7-18-2022	0.8348	0.6327
8	7-19-2022	9-30-2022	1.8168	1.3770
		Highest	1.8168	1.3770

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	25,000.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5791	0.0000	0.5791	0.2977	0.0000	0.2977	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1488	1.5783	0.8871	1.8500e-003		0.0764	0.0764		0.0702	0.0702	0.0000	162.8446	162.8446	0.0527	0.0000	164.1613
Total	**0.1488**	**1.5783**	**0.8871**	**1.8500e-003**	**0.5791**	**0.0764**	**0.6555**	**0.2977**	**0.0702**	**0.3680**	**0.0000**	**162.8446**	**162.8446**	**0.0527**	**0.0000**	**164.1613**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0246	1.2473	0.1430	1.6100e-003	2.9000e-003	1.0900e-003	3.9900e-003	8.2000e-004	1.0400e-003	1.8600e-003	0.0000	153.9296	153.9296	0.0282	0.0000	154.6333
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0291**	**1.2503**	**0.1756**	**1.7100e-003**	**0.0133**	**1.1600e-003**	**0.0145**	**3.5900e-003**	**1.1000e-003**	**4.7000e-003**	**0.0000**	**162.5765**	**162.5765**	**0.0284**	**0.0000**	**163.2858**

3.2 Phase 2 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2259	0.0000	0.2259	0.1161	0.0000	0.1161	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.9428	1.1082	1.8500e-003		0.0460	0.0460		0.0455	0.0455	0.0000	162.8444	162.8444	0.0527	0.0000	164.1611
Total	**0.0521**	**0.9428**	**1.1082**	**1.8500e-003**	**0.2259**	**0.0460**	**0.2718**	**0.1161**	**0.0455**	**0.1616**	**0.0000**	**162.8444**	**162.8444**	**0.0527**	**0.0000**	**164.1611**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0246	1.2473	0.1430	1.6100e-003	2.9000e-003	1.0900e-003	3.9900e-003	8.2000e-004	1.0400e-003	1.8600e-003	0.0000	153.9296	153.9296	0.0282	0.0000	154.6333
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0291**	**1.2503**	**0.1756**	**1.7100e-003**	**0.0133**	**1.1600e-003**	**0.0145**	**3.5900e-003**	**1.1000e-003**	**4.7000e-003**	**0.0000**	**162.5765**	**162.5765**	**0.0284**	**0.0000**	**163.2858**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Preferred Project Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.00**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.03**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.01**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.13**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site. The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 329 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 250,000 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Material handling to occur during dredging season

Off-road Equipment - Assumed material handling equipment

Grading -

Trips and VMT -

Construction Off-road Equipment Mitigation - Mitigation Measure

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	5.00	89.00
tblConstructionPhase	PhaseEndDate	11/23/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0662	0.6590	0.4024	7.2000e-004	0.2743	0.0337	0.3080	0.1490	0.0310	0.1800	0.0000	63.1382	63.1382	0.0188	0.0000	63.6084
Maximum	**0.0662**	**0.6590**	**0.4024**	**7.2000e-004**	**0.2743**	**0.0337**	**0.3080**	**0.1490**	**0.0310**	**0.1800**	**0.0000**	**63.1382**	**63.1382**	**0.0188**	**0.0000**	**63.6084**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0190	0.3363	0.4316	7.2000e-004	0.1108	0.0177	0.1285	0.0591	0.0177	0.0768	0.0000	63.1381	63.1381	0.0188	0.0000	63.6083
Maximum	**0.0190**	**0.3363**	**0.4316**	**7.2000e-004**	**0.1108**	**0.0177**	**0.1285**	**0.0591**	**0.0177**	**0.0768**	**0.0000**	**63.1381**	**63.1381**	**0.0188**	**0.0000**	**63.6083**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**71.28**	**48.97**	**-7.26**	**0.00**	**59.59**	**47.52**	**58.27**	**60.31**	**42.95**	**57.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-20-2021	7-19-2021	0.2038	0.0999
4	7-20-2021	9-30-2021	0.4250	0.2083
		Highest	0.4250	0.2083

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material Handling	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material Handling	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Material Handling	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material Handling	3	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Material Handling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2680	0.0000	0.2680	0.1473	0.0000	0.1473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0632	0.6570	0.3808	6.6000e-004		0.0336	0.0336		0.0310	0.0310	0.0000	57.6945	57.6945	0.0187	0.0000	58.1610
Total	**0.0632**	**0.6570**	**0.3808**	**6.6000e-004**	**0.2680**	**0.0336**	**0.3016**	**0.1473**	**0.0310**	**0.1783**	**0.0000**	**57.6945**	**57.6945**	**0.0187**	**0.0000**	**58.1610**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	2.0500e-003	0.0216	6.0000e-005	6.3300e-003	4.0000e-005	6.3700e-003	1.6800e-003	4.0000e-005	1.7200e-003	0.0000	5.4437	5.4437	1.5000e-004	0.0000	5.4474
Total	**2.9300e-003**	**2.0500e-003**	**0.0216**	**6.0000e-005**	**6.3300e-003**	**4.0000e-005**	**6.3700e-003**	**1.6800e-003**	**4.0000e-005**	**1.7200e-003**	**0.0000**	**5.4437**	**5.4437**	**1.5000e-004**	**0.0000**	**5.4474**

3.2 Material Handling - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1045	0.0000	0.1045	0.0575	0.0000	0.0575	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0161	0.3343	0.4101	6.6000e-004		0.0176	0.0176		0.0176	0.0176	0.0000	57.6944	57.6944	0.0187	0.0000	58.1609
Total	**0.0161**	**0.3343**	**0.4101**	**6.6000e-004**	**0.1045**	**0.0176**	**0.1222**	**0.0575**	**0.0176**	**0.0751**	**0.0000**	**57.6944**	**57.6944**	**0.0187**	**0.0000**	**58.1609**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	2.0500e-003	0.0216	6.0000e-005	6.3300e-003	4.0000e-005	6.3700e-003	1.6800e-003	4.0000e-005	1.7200e-003	0.0000	5.4437	5.4437	1.5000e-004	0.0000	5.4474
Total	**2.9300e-003**	**2.0500e-003**	**0.0216**	**6.0000e-005**	**6.3300e-003**	**4.0000e-005**	**6.3700e-003**	**1.6800e-003**	**4.0000e-005**	**1.7200e-003**	**0.0000**	**5.4437**	**5.4437**	**1.5000e-004**	**0.0000**	**5.4474**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Unmitigated	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0141					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0141					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 2 Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.26**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.04**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.02**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.17**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site.

The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 416 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 315600 cubic yards of Alternative 3 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	315,600.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	39,450.00	31,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1844	3.1559	1.1001	3.9800e-003	0.6000	0.0778	0.6778	0.3026	0.0716	0.3742	0.0000	365.8122	365.8122	0.0884	0.0000	368.0228
Maximum	**0.1844**	**3.1559**	**1.1001**	**3.9800e-003**	**0.6000**	**0.0778**	**0.6778**	**0.3026**	**0.0716**	**0.3742**	**0.0000**	**365.8122**	**365.8122**	**0.0884**	**0.0000**	**368.0228**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0877	2.5204	1.3212	3.9800e-003	0.2426	0.0474	0.2900	0.1203	0.0468	0.1672	0.0000	365.8120	365.8120	0.0884	0.0000	368.0226
Maximum	**0.0877**	**2.5204**	**1.3212**	**3.9800e-003**	**0.2426**	**0.0474**	**0.2900**	**0.1203**	**0.0468**	**0.1672**	**0.0000**	**365.8120**	**365.8120**	**0.0884**	**0.0000**	**368.0226**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**52.45**	**20.14**	**-20.10**	**0.00**	**59.57**	**39.07**	**57.21**	**60.23**	**34.59**	**55.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3 - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
7	4-19-2022	7-18-2022	0.9282	0.7261
8	7-19-2022	9-30-2022	2.0201	1.5803
		Highest	2.0201	1.5803

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	31,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5859	0.0000	0.5859	0.2988	0.0000	0.2988	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1488	1.5783	0.8871	1.8500e-003		0.0764	0.0764		0.0702	0.0702	0.0000	162.8446	162.8446	0.0527	0.0000	164.1613
Total	**0.1488**	**1.5783**	**0.8871**	**1.8500e-003**	**0.5859**	**0.0764**	**0.6623**	**0.2988**	**0.0702**	**0.3690**	**0.0000**	**162.8446**	**162.8446**	**0.0527**	**0.0000**	**164.1613**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0311	1.5746	0.1805	2.0400e-003	3.6600e-003	1.3700e-003	5.0300e-003	1.0400e-003	1.3100e-003	2.3500e-003	0.0000	194.3207	194.3207	0.0355	0.0000	195.2091
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0356**	**1.5776**	**0.2131**	**2.1400e-003**	**0.0141**	**1.4400e-003**	**0.0155**	**3.8100e-003**	**1.3700e-003**	**5.1900e-003**	**0.0000**	**202.9676**	**202.9676**	**0.0358**	**0.0000**	**203.8616**

3.2 Phase 2 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2285	0.0000	0.2285	0.1165	0.0000	0.1165	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.9428	1.1082	1.8500e-003		0.0460	0.0460		0.0455	0.0455	0.0000	162.8444	162.8444	0.0527	0.0000	164.1611
Total	**0.0521**	**0.9428**	**1.1082**	**1.8500e-003**	**0.2285**	**0.0460**	**0.2745**	**0.1165**	**0.0455**	**0.1620**	**0.0000**	**162.8444**	**162.8444**	**0.0527**	**0.0000**	**164.1611**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0311	1.5746	0.1805	2.0400e-003	3.6600e-003	1.3700e-003	5.0300e-003	1.0400e-003	1.3100e-003	2.3500e-003	0.0000	194.3207	194.3207	0.0355	0.0000	195.2091
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0356**	**1.5776**	**0.2131**	**2.1400e-003**	**0.0141**	**1.4400e-003**	**0.0155**	**3.8100e-003**	**1.3700e-003**	**5.1900e-003**	**0.0000**	**202.9676**	**202.9676**	**0.0358**	**0.0000**	**203.8616**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 3 Haul Truck Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Tons Annually
T7 Single Construction Haul Trucks	1216	1140	**NOx**	4.502830	0.013770111	5491.14	**12.11**	**1.26**
			ROG	0.078800	0.001107292	97.08	**0.21**	**0.02**
			PM10	0.127070	6.65972E-06	154.52	**0.34**	**0.04**
			PM2.5	0.063529	0.000006375	77.26	**0.17**	**0.02**
			CO	0.591870	0.015713868	737.63	**1.63**	**0.17**
			SO2	0.016150	2.59813E-05	19.67	**0.04**	**0.00**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site.

The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 329 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

Particulate matter emissions account for tire wear and brake wear. All emission factors sourced from EMFAC2017

APPENDIX C

Air Quality and GHG Emissions

C1 Air Quality Emissions

C2 Greenhouse Gas Emissions

C3 Energy Details

Project Marine Vessels Greenhouse Gas Emissions

Yuba City Boat Ramp Sediment Removal Project

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
CHC - ME Barge and Dredge (Drege Boat)	**CO2e**	0.0559	**111.80**	**4.41**

[1] Anuual GHG Emissions are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
CHC - ME Barge and Dredge (Potential Barge)	**CO2e**	0.0559	**111.80**	**4.41**

[1] Anuual GHG Emissions are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
CHC - AE Tow Boats	**CO2e**	0.1127	**225.40**	**8.89**

[1] Anuual GHG Emissions are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Project Marine Vessels Greenhouse Gas Emissions

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
CHC - AE Others (Rescue)	**CO2e**	0.0052	**10.43**	**0.41**

[1] Anuual GHG Emissions are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

Marine Vessel	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
CHC - AE Work Boat (Support)	**CO2e**	0.0017	**3.30**	**0.13**

[1] Anuual GHG Emissions are based on 87 work days per year.
All emission factors sourced from OFFROAD 2017.

	Pollutant	Emission Rate (Tons/Day)	Total Pounds Daily	Total Metric Tons Annually[1]
Combined Total	**CO2e**	0.2314	**462.73**	**18.26**

Yuba City Boat Ramp Sediment Replacement - Generators

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	14.00	Acre	14.00	609,840.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Dregding season = June 15 - October 15

Off-road Equipment - Dredging support equipment

Trips and VMT - No worker commutes modeled in this model

Yuba City Boat Ramp Sediment Replacement - Generators - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	89.00
tblConstructionPhase	PhaseEndDate	11/30/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0487	0.4246	0.4944	8.8000e-004	0.0000	0.0228	0.0228	0.0000	0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5537
Maximum	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5537**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0487	0.4246	0.4944	8.8000e-004	0.0000	0.0228	0.0228	0.0000	0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5536
Maximum	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5536**

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

Yuba City Boat Ramp Sediment Replacement - Generators - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-20-2021	7-19-2021	0.1330	0.1330
4	7-20-2021	9-30-2021	0.2773	0.2773
		Highest	0.2773	0.2773

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging Generators	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 14

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging Generators	Pumps	1	8.00	84	0.74
Dredging Generators	Generator Sets	2	8.00	84	0.74
Dredging Generators	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Dredging Generators	Rubber Tired Dozers	0	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging Generators	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging Generators - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0487	0.4246	0.4944	8.8000e-004		0.0228	0.0228		0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5537
Total	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5537**

Unmitigated Construction Off-Site

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

3.2 Dredging Generators - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0487	0.4246	0.4944	8.8000e-004		0.0228	0.0228		0.0228	0.0228	0.0000	75.4552	75.4552	3.9400e-003	0.0000	75.5536
Total	**0.0487**	**0.4246**	**0.4944**	**8.8000e-004**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**0.0228**	**0.0228**	**0.0000**	**75.4552**	**75.4552**	**3.9400e-003**	**0.0000**	**75.5536**

Mitigated Construction Off-Site

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Unmitigated	0.0479	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0394					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.4800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0394					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.7000e-004
Total	**0.0479**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Grading - 65,600 cubic yards of Phase 1 dredged material

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment Phase 1 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	89.00
tblConstructionPhase	PhaseEndDate	3/19/2021	10/15/2021
tblConstructionPhase	PhaseStartDate	10/19/2020	6/15/2021
tblGrading	MaterialImported	0.00	65,600.00
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	8,200.00	6,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1886	2.2279	1.0233	2.4000e-003	0.5777	0.0936	0.6713	0.3012	0.0862	0.3874	0.0000	214.5091	214.5091	0.0611	0.0000	216.0374
Maximum	**0.1886**	**2.2279**	**1.0233**	**2.4000e-003**	**0.5777**	**0.0936**	**0.6713**	**0.3012**	**0.0862**	**0.3874**	**0.0000**	**214.5091**	**214.5091**	**0.0611**	**0.0000**	**216.0374**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0659	1.3066	1.1980	2.4000e-003	0.2322	0.0481	0.2803	0.1193	0.0475	0.1668	0.0000	214.5089	214.5089	0.0611	0.0000	216.0372
Maximum	**0.0659**	**1.3066**	**1.1980**	**2.4000e-003**	**0.2322**	**0.0481**	**0.2803**	**0.1193**	**0.0475**	**0.1668**	**0.0000**	**214.5089**	**214.5089**	**0.0611**	**0.0000**	**216.0372**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**65.09**	**41.35**	**-17.07**	**0.00**	**59.81**	**48.62**	**58.25**	**60.39**	**44.88**	**56.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-19-2021	7-18-2021	0.6609	0.3760
4	7-19-2021	9-30-2021	1.4383	0.8183
		Highest	1.4383	0.8183

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 1 (2021)	Grading	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 1 (2021)	Trenchers	1	8.00	78	0.50
Phase 1 (2021)	Forklifts	2	8.00	89	0.20
Phase 1 (2021)	Cranes	1	8.00	231	0.29
Phase 1 (2021)	Excavators	0	8.00	158	0.38
Phase 1 (2021)	Rubber Tired Dozers	2	8.00	247	0.40
Phase 1 (2021)	Graders	1	8.00	187	0.41
Phase 1 (2021)	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 1 (2021)	Scrapers	0	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 1 (2021)	9	30.00	0.00	6,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 1 (2021) - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5664	0.0000	0.5664	0.2982	0.0000	0.2982	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1769	1.8858	0.9473	1.8700e-003		0.0933	0.0933		0.0858	0.0858	0.0000	164.7049	164.7049	0.0533	0.0000	166.0366
Total	**0.1769**	**1.8858**	**0.9473**	**1.8700e-003**	**0.5664**	**0.0933**	**0.6596**	**0.2982**	**0.0858**	**0.3840**	**0.0000**	**164.7049**	**164.7049**	**0.0533**	**0.0000**	**166.0366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.8800e-003	0.3387	0.0401	4.3000e-004	7.6000e-004	3.2000e-004	1.0900e-003	2.2000e-004	3.1000e-004	5.3000e-004	0.0000	40.7314	40.7314	7.6100e-003	0.0000	40.9218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8900e-003	3.4100e-003	0.0360	1.0000e-004	0.0105	7.0000e-005	0.0106	2.8000e-003	7.0000e-005	2.8700e-003	0.0000	9.0728	9.0728	2.5000e-004	0.0000	9.0790
Total	**0.0118**	**0.3421**	**0.0760**	**5.3000e-004**	**0.0113**	**3.9000e-004**	**0.0117**	**3.0200e-003**	**3.8000e-004**	**3.4000e-003**	**0.0000**	**49.8042**	**49.8042**	**7.8600e-003**	**0.0000**	**50.0008**

3.2 Phase 1 (2021) - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2209	0.0000	0.2209	0.1163	0.0000	0.1163	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0541	0.9646	1.1220	1.8700e-003		0.0477	0.0477		0.0471	0.0471	0.0000	164.7047	164.7047	0.0533	0.0000	166.0364
Total	**0.0541**	**0.9646**	**1.1220**	**1.8700e-003**	**0.2209**	**0.0477**	**0.2686**	**0.1163**	**0.0471**	**0.1634**	**0.0000**	**164.7047**	**164.7047**	**0.0533**	**0.0000**	**166.0364**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.8800e-003	0.3387	0.0401	4.3000e-004	7.6000e-004	3.2000e-004	1.0900e-003	2.2000e-004	3.1000e-004	5.3000e-004	0.0000	40.7314	40.7314	7.6100e-003	0.0000	40.9218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8900e-003	3.4100e-003	0.0360	1.0000e-004	0.0105	7.0000e-005	0.0106	2.8000e-003	7.0000e-005	2.8700e-003	0.0000	9.0728	9.0728	2.5000e-004	0.0000	9.0790
Total	**0.0118**	**0.3421**	**0.0760**	**5.3000e-004**	**0.0113**	**3.9000e-004**	**0.0117**	**3.0200e-003**	**3.8000e-004**	**3.4000e-003**	**0.0000**	**49.8042**	**49.8042**	**7.8600e-003**	**0.0000**	**50.0008**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 250,000 cubic yards of Phase 2 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	250,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	31,250.00	25,000.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1780	2.8286	1.0626	3.5600e-003	0.5925	0.0775	0.6700	0.3013	0.0713	0.3727	0.0000	325.4211	325.4211	0.0810	0.0000	327.4471
Maximum	**0.1780**	**2.8286**	**1.0626**	**3.5600e-003**	**0.5925**	**0.0775**	**0.6700**	**0.3013**	**0.0713**	**0.3727**	**0.0000**	**325.4211**	**325.4211**	**0.0810**	**0.0000**	**327.4471**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0812	2.1931	1.2837	3.5600e-003	0.2392	0.0471	0.2863	0.1197	0.0466	0.1663	0.0000	325.4209	325.4209	0.0810	0.0000	327.4469
Maximum	**0.0812**	**2.1931**	**1.2837**	**3.5600e-003**	**0.2392**	**0.0471**	**0.2863**	**0.1197**	**0.0466**	**0.1663**	**0.0000**	**325.4209**	**325.4209**	**0.0810**	**0.0000**	**327.4469**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**54.36**	**22.47**	**-20.81**	**0.00**	**59.63**	**39.20**	**57.27**	**60.27**	**34.72**	**55.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Phase 2 - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
7	4-19-2022	7-18-2022	0.8348	0.6327
8	7-19-2022	9-30-2022	1.8168	1.3770
		Highest	1.8168	1.3770

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	25,000.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5791	0.0000	0.5791	0.2977	0.0000	0.2977	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1488	1.5783	0.8871	1.8500e-003		0.0764	0.0764		0.0702	0.0702	0.0000	162.8446	162.8446	0.0527	0.0000	164.1613
Total	**0.1488**	**1.5783**	**0.8871**	**1.8500e-003**	**0.5791**	**0.0764**	**0.6555**	**0.2977**	**0.0702**	**0.3680**	**0.0000**	**162.8446**	**162.8446**	**0.0527**	**0.0000**	**164.1613**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0246	1.2473	0.1430	1.6100e-003	2.9000e-003	1.0900e-003	3.9900e-003	8.2000e-004	1.0400e-003	1.8600e-003	0.0000	153.9296	153.9296	0.0282	0.0000	154.6333
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0291**	**1.2503**	**0.1756**	**1.7100e-003**	**0.0133**	**1.1600e-003**	**0.0145**	**3.5900e-003**	**1.1000e-003**	**4.7000e-003**	**0.0000**	**162.5765**	**162.5765**	**0.0284**	**0.0000**	**163.2858**

3.2 Phase 2 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2259	0.0000	0.2259	0.1161	0.0000	0.1161	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.9428	1.1082	1.8500e-003		0.0460	0.0460		0.0455	0.0455	0.0000	162.8444	162.8444	0.0527	0.0000	164.1611
Total	**0.0521**	**0.9428**	**1.1082**	**1.8500e-003**	**0.2259**	**0.0460**	**0.2718**	**0.1161**	**0.0455**	**0.1616**	**0.0000**	**162.8444**	**162.8444**	**0.0527**	**0.0000**	**164.1611**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0246	1.2473	0.1430	1.6100e-003	2.9000e-003	1.0900e-003	3.9900e-003	8.2000e-004	1.0400e-003	1.8600e-003	0.0000	153.9296	153.9296	0.0282	0.0000	154.6333
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0291**	**1.2503**	**0.1756**	**1.7100e-003**	**0.0133**	**1.1600e-003**	**0.0145**	**3.5900e-003**	**1.1000e-003**	**4.7000e-003**	**0.0000**	**162.5765**	**162.5765**	**0.0284**	**0.0000**	**163.2858**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Preferred Project Haul Truck Greenhouse Gas Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Metric Tons Annually[3]
			CO2	1709.4258	2.7500	2081796.82	**4592.64**	**343.50**
			CH4	0.0037	0.0001	4.51	**0.01**	**0.00**
T7 Single Construction Haul Trucks	1216	1140	**N2O**	0.2687	0.0004	327.23	**0.72**	**0.05**
			CO2e				**4816.68**	**360.49**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site. The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 329 days (assumed to span years 2022 & 2023). 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 250,000 cubic yards of dredged material.

All emission factors sourced from EMFAC2017.

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.00	Acre	5.00	217,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Material handling to occur during dredging season

Off-road Equipment - Assumed material handling equipment

Grading -

Trips and VMT -

Construction Off-road Equipment Mitigation - Mitigation Measure

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	5.00	89.00
tblConstructionPhase	PhaseEndDate	11/23/2020	10/15/2021
tblConstructionPhase	PhaseStartDate	11/17/2020	6/15/2021
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0662	0.6590	0.4024	7.2000e-004	0.2743	0.0337	0.3080	0.1490	0.0310	0.1800	0.0000	63.1382	63.1382	0.0188	0.0000	63.6084
Maximum	**0.0662**	**0.6590**	**0.4024**	**7.2000e-004**	**0.2743**	**0.0337**	**0.3080**	**0.1490**	**0.0310**	**0.1800**	**0.0000**	**63.1382**	**63.1382**	**0.0188**	**0.0000**	**63.6084**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0190	0.3363	0.4316	7.2000e-004	0.1108	0.0177	0.1285	0.0591	0.0177	0.0768	0.0000	63.1381	63.1381	0.0188	0.0000	63.6083
Maximum	**0.0190**	**0.3363**	**0.4316**	**7.2000e-004**	**0.1108**	**0.0177**	**0.1285**	**0.0591**	**0.0177**	**0.0768**	**0.0000**	**63.1381**	**63.1381**	**0.0188**	**0.0000**	**63.6083**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**71.28**	**48.97**	**-7.26**	**0.00**	**59.59**	**47.52**	**58.27**	**60.31**	**42.95**	**57.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Alternative 2 Material Handling - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	4-20-2021	7-19-2021	0.2038	0.0999
4	7-20-2021	9-30-2021	0.4250	0.2083
		Highest	0.4250	0.2083

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Material Handling	Site Preparation	6/15/2021	10/15/2021	5	89	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Material Handling	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Material Handling	Rubber Tired Dozers	1	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Material Handling	3	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Material Handling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2680	0.0000	0.2680	0.1473	0.0000	0.1473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0632	0.6570	0.3808	6.6000e-004		0.0336	0.0336		0.0310	0.0310	0.0000	57.6945	57.6945	0.0187	0.0000	58.1610
Total	**0.0632**	**0.6570**	**0.3808**	**6.6000e-004**	**0.2680**	**0.0336**	**0.3016**	**0.1473**	**0.0310**	**0.1783**	**0.0000**	**57.6945**	**57.6945**	**0.0187**	**0.0000**	**58.1610**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	2.0500e-003	0.0216	6.0000e-005	6.3300e-003	4.0000e-005	6.3700e-003	1.6800e-003	4.0000e-005	1.7200e-003	0.0000	5.4437	5.4437	1.5000e-004	0.0000	5.4474
Total	**2.9300e-003**	**2.0500e-003**	**0.0216**	**6.0000e-005**	**6.3300e-003**	**4.0000e-005**	**6.3700e-003**	**1.6800e-003**	**4.0000e-005**	**1.7200e-003**	**0.0000**	**5.4437**	**5.4437**	**1.5000e-004**	**0.0000**	**5.4474**

3.2 Material Handling - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1045	0.0000	0.1045	0.0575	0.0000	0.0575	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0161	0.3343	0.4101	6.6000e-004		0.0176	0.0176		0.0176	0.0176	0.0000	57.6944	57.6944	0.0187	0.0000	58.1609
Total	**0.0161**	**0.3343**	**0.4101**	**6.6000e-004**	**0.1045**	**0.0176**	**0.1222**	**0.0575**	**0.0176**	**0.0751**	**0.0000**	**57.6944**	**57.6944**	**0.0187**	**0.0000**	**58.1609**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	2.0500e-003	0.0216	6.0000e-005	6.3300e-003	4.0000e-005	6.3700e-003	1.6800e-003	4.0000e-005	1.7200e-003	0.0000	5.4437	5.4437	1.5000e-004	0.0000	5.4474
Total	**2.9300e-003**	**2.0500e-003**	**0.0216**	**6.0000e-005**	**6.3300e-003**	**4.0000e-005**	**6.3700e-003**	**1.6800e-003**	**4.0000e-005**	**1.7200e-003**	**0.0000**	**5.4437**	**5.4437**	**1.5000e-004**	**0.0000**	**5.4474**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Unmitigated	0.0171	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0141					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0141					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**0.0171**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 2 Haul Truck Greenhouse Gas Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Metric Tons Annually[3]
			CO2	1709.4258	2.7500	2081796.82	**4592.64**	**477.32**
			CH4	0.0037	0.0001	4.51	**0.01**	**0.00**
T7 Single Construction Haul Trucks	1216	1140	**N2O**	0.2687	0.0004	327.23	**0.72**	**0.08**
			CO2e				**4816.68**	**454.44**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site. The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 416 days (assumed to span years 2022 & 2023) 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

All emission factors sourced from EMFAC2017.

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3

Sacramento Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	54.00	Acre	54.00	2,352,240.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	65
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Marysville Wastewater Treatment Plant ponds

Construction Phase - Accounts for activity at Marysville WWTP

Off-road Equipment - Equipment per Table 3-1 of Project Description

Off-road Equipment - Equipment per Table 3-1 of the Project Description

Trips and VMT - Accounts for movement of dredged material around the Marysville WWTP

Grading - 315600 cubic yards of Alternative 3 dredged material

Construction Off-road Equipment Mitigation - Accounts for water truck onsite, per Project Description

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3 - Sacramento Valley Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	88.00
tblGrading	MaterialImported	0.00	315,600.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	HaulingTripNumber	39,450.00	31,560.00
tblTripsAndVMT	WorkerTripNumber	23.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1844	3.1559	1.1001	3.9800e-003	0.6000	0.0778	0.6778	0.3026	0.0716	0.3742	0.0000	365.8122	365.8122	0.0884	0.0000	368.0228
Maximum	**0.1844**	**3.1559**	**1.1001**	**3.9800e-003**	**0.6000**	**0.0778**	**0.6778**	**0.3026**	**0.0716**	**0.3742**	**0.0000**	**365.8122**	**365.8122**	**0.0884**	**0.0000**	**368.0228**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0877	2.5204	1.3212	3.9800e-003	0.2426	0.0474	0.2900	0.1203	0.0468	0.1672	0.0000	365.8120	365.8120	0.0884	0.0000	368.0226
Maximum	**0.0877**	**2.5204**	**1.3212**	**3.9800e-003**	**0.2426**	**0.0474**	**0.2900**	**0.1203**	**0.0468**	**0.1672**	**0.0000**	**365.8120**	**365.8120**	**0.0884**	**0.0000**	**368.0226**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**52.45**	**20.14**	**-20.10**	**0.00**	**59.57**	**39.07**	**57.21**	**60.23**	**34.59**	**55.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Yuba City Boat Ramp Sediment Removal Project Onshore Equipment - Alternative 3 - Sacramento Valley Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
7	4-19-2022	7-18-2022	0.9282	0.7261
8	7-19-2022	9-30-2022	2.0201	1.5803
		Highest	2.0201	1.5803

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Phase 2	Grading	6/15/2022	10/15/2022	5	88	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 54

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 2	Cranes	1	8.00	231	0.29
Phase 2	Excavators	0	8.00	158	0.38
Phase 2	Forklifts	2	8.00	89	0.20
Phase 2	Graders	1	8.00	187	0.41
Phase 2	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2	Scrapers	0	8.00	367	0.48
Phase 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2	Trenchers	1	8.00	78	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Phase 2	9	30.00	0.00	31,560.00	10.80	7.30	0.25	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Phase 2 - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5859	0.0000	0.5859	0.2988	0.0000	0.2988	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1488	1.5783	0.8871	1.8500e-003		0.0764	0.0764		0.0702	0.0702	0.0000	162.8446	162.8446	0.0527	0.0000	164.1613
Total	**0.1488**	**1.5783**	**0.8871**	**1.8500e-003**	**0.5859**	**0.0764**	**0.6623**	**0.2988**	**0.0702**	**0.3690**	**0.0000**	**162.8446**	**162.8446**	**0.0527**	**0.0000**	**164.1613**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0311	1.5746	0.1805	2.0400e-003	3.6600e-003	1.3700e-003	5.0300e-003	1.0400e-003	1.3100e-003	2.3500e-003	0.0000	194.3207	194.3207	0.0355	0.0000	195.2091
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0356**	**1.5776**	**0.2131**	**2.1400e-003**	**0.0141**	**1.4400e-003**	**0.0155**	**3.8100e-003**	**1.3700e-003**	**5.1900e-003**	**0.0000**	**202.9676**	**202.9676**	**0.0358**	**0.0000**	**203.8616**

3.2 Phase 2 - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2285	0.0000	0.2285	0.1165	0.0000	0.1165	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.9428	1.1082	1.8500e-003		0.0460	0.0460		0.0455	0.0455	0.0000	162.8444	162.8444	0.0527	0.0000	164.1611
Total	**0.0521**	**0.9428**	**1.1082**	**1.8500e-003**	**0.2285**	**0.0460**	**0.2745**	**0.1165**	**0.0455**	**0.1620**	**0.0000**	**162.8444**	**162.8444**	**0.0527**	**0.0000**	**164.1611**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0311	1.5746	0.1805	2.0400e-003	3.6600e-003	1.3700e-003	5.0300e-003	1.0400e-003	1.3100e-003	2.3500e-003	0.0000	194.3207	194.3207	0.0355	0.0000	195.2091
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5100e-003	3.0200e-003	0.0325	1.0000e-004	0.0104	7.0000e-005	0.0105	2.7700e-003	6.0000e-005	2.8400e-003	0.0000	8.6470	8.6470	2.2000e-004	0.0000	8.6525
Total	**0.0356**	**1.5776**	**0.2131**	**2.1400e-003**	**0.0141**	**1.4400e-003**	**0.0155**	**3.8100e-003**	**1.3700e-003**	**5.1900e-003**	**0.0000**	**202.9676**	**202.9676**	**0.0358**	**0.0000**	**203.8616**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.546645	0.035890	0.197836	0.113293	0.020769	0.005403	0.022328	0.047186	0.001633	0.001687	0.005655	0.000779	0.000896

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Unmitigated	0.1848	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0327					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1521					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.6000e-004	9.6000e-004	0.0000	0.0000	1.0300e-003
Total	**0.1848**	**0.0000**	**5.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.6000e-004**	**9.6000e-004**	**0.0000**	**0.0000**	**1.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alternative 3 Haul Truck Greenhouse Gas Emissions

Yuba City Boat Ramp Sediment Removal Project

Vehicle Class	Daily VMT[1]	Daily Idling[2] (minutes)	Pollutant	Emission Rate (Gram/Mile)	Emission Rate (Gram/Minute)	Total Grams Daily	Total Pounds Daily	Total Metric Tons Annually[3]
			CO2	1709.4258	2.7500	2081796.82	**4592.64**	**477.32**
			CH4	0.0037	0.0001	4.51	**0.01**	**0.00**
T7 Single Construction Haul Trucks	1216	1140	**N2O**	0.2687	0.0004	327.23	**0.72**	**0.08**
			CO2e				**4816.68**	**454.44**

[1] Daily VMT: Calculations factor the average distance from the Project to the Recology Ostrom Landfill (16 miles). As with the Preferred Project, 76 one-way haul truck trips are anticipated in order to remove dredge material and return to the site. The Project is expected to generate 76 one-way trips (38 round trip truck trips) daily for approximately 416 days (assumed to span years 2022 & 2023) 16 miles x 76 one-way haul trips = 1,216 miles traveled daily

[2]Daily Idling: Calculations assume 15 minutes of idling per daily haul truck trip. 76 one-way trips x 15 = 1,140 minutes daily

[3]Annual Emissions based on the amount of days anticipated to haul 315,600 cubic yards of dredged material.

All emission factors sourced from EMFAC2017.

APPENDIX C

Air Quality and GHG Emissions

- C1 Air Quality Emissions
- C2 Greenhouse Gas Emissions
- **C3 Energy Details**

Preferred Project
Total Gasoline Usage

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Preferred Project	**1092**	**1092000**	**10.15**	**107,586**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During Project Construction: 107,586

Sources:

[1]ECORP Consulting, 2020.

[2]Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1.* January 2016. http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf

Altenative 1
Gasoline Usage

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Alternative 1	**0**	**0**	**10.15**	**-**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During Project Construction: -

Sources:

[1]ECORP Consulting, 2020.

[2]Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1.* January 2016. http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf

Alternative 2
Gasoline Usage

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Alternative 2	**612**	**612000**	**10.15**	**60,296**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During Project Construction: 60,296

Sources:

[1]ECORP Consulting, 2020.

[2]Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1.* January 2016. http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf

Alternative 3
Gasoline Usage

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Alternative 3	**916**	**916000**	**10.15**	**90,246**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During Project Construction: 90,246

Sources:

[1]ECORP Consulting, 2020.

[2]Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1.* January 2016. http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf

Biological Resources Assessment

Yuba City Boat Ramp Sediment Removal Project

Sutter and Yuba Counties, California

August 21, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

1.0 INTRODUCTION 1
2.0 STUDY AREA 1
2.1 Study Area Location 1
2.2 Project Description 1
2.3 Disposal Options 5
2.3.1 Agricultural Soil 5
2.3.2 Landfill 5
2.3.3 City of Marysville Wastewater Ponds 5
2.4 Purpose of this Biological Resources Assessment 5
3.0 REGULATORY SETTING 6
3.1 Federal Regulations 6
3.1.1 Federal Endangered Species Act 6
3.1.2 Magnuson-Stevens Fishery Conservation and Management Act 8
3.1.3 Migratory Bird Treaty Act 8
3.1.4 Bald and Golden Eagle Protection Act 8
3.1.5 Federal Clean Water Act 9
3.1.6 Rivers and Harbors Act 9
3.2 State Regulations 10
3.2.1 California Fish and Game Code 10
3.2.2 Species of Special Concern 11
3.2.3 California Rare Plant Ranks 11
3.2.4 Porter-Cologne Water Quality Act 12
3.2.5 California Environmental Quality Act 13
3.3 Local Plans and Ordinances 14
3.3.1 Yuba City General Plan 14
3.3.2 City of Marysville General Plan 14
4.0 METHODS 15
4.1 Literature Review 15
4.2 Site Surveys 15
4.2.1 Reconnaissance Site Survey 15
4.2.2 Aquatic Resources Delineation Site Survey 16
4.3 Special-Status Species Considered for the Project 16
5.0 RESULTS 17
5.1 Site Characteristics and Land Use 17

5.2 Soils and Topography 17
5.3 Land Cover Types and Vegetation Communities 17
5.3.1 Riparian Woodland 17
5.4 Aquatic Resources 19
5.4.1 Wetlands 19
5.4.2 Other Waters/Non-Wetland Waters 24
5.5 Wildlife Observations 24
5.6 Evaluation of Species Identified in the Literature Search 24
5.6.1 Plants 37
5.6.2 Fish 39
5.6.3 Invertebrates 45
5.6.4 Reptiles 46
5.6.5 Birds 46
5.6.6 Mammals 52
5.7 Critical Habitat and Essential Fish Habitat 54
5.8 Riparian Habitats and Sensitive Natural Communities 54
5.9 Wildlife Movement/Corridors and Nursery Sites 54
6.0 IMPACT ANALYSIS 55
6.1 Special Status Species, Designated Critical Habitat and Essential Fish Habitat 55
6.1.1 Impacts to Special Status Plants 55
6.1.2 Impacts to Special Status Fish Species, Critical Habitat, and Essential Fish Habitat 55
6.1.3 Impacts to Northwestern Pond Turtles 56
6.1.4 Impacts to Valley Elderberry Longhorn Beetle 56
6.1.5 Impacts to Special Status Birds 56
6.1.6 Impacts to Special Status Mammals 57
6.2 Riparian Habitat and Sensitive Natural Communities 57
6.3 Aquatic Resources, Including Waters the U.S. and State 57
6.4 Wildlife Movement/Corridors 57
6.5 Local Policies, Ordinances, and Other Plans 58
7.0 RECOMMENDATIONS 58
7.1 General Recommendations 58
7.2 Special-Status Species 59
7.2.1 Plants 59
7.2.2 Fish Species, Critical Habitat, and Essential Fish Habitat 60

7.2.3 Northwestern Pond Turtle 60
7.2.4 Valley Elderberry Longhorn Beetle 61
7.2.5 Special-Status Birds and MBTA-Protected Birds (including nesting raptors) 61
7.2.6 Special-Status Mammals 62
7.3 Riparian and Sensitive Natural Communities 63
7.4 Waters of the U.S./State 63
7.5 Wildlife Movement Corridors 64
8.0 REFERENCES 65

LIST OF TABLES

Table 1. Aquatic Resources in the Study Area 19
Table 2. Special-Status Species Evaluated for the Study Area 24

LIST OF FIGURES

Figure 1. Yuba City Boat Ramp Location and Vicinity 2
Figure 2. Project Components 3
Figure 3. Potential Disposal Locations 4
Figure 4. Natural Resources Conservation Service Soil Types 18
Figure 5. Aquatic Resources Delineation 20
Figure 6. Elderberry Shrub Locations 47

LIST OF ATTACHMENTS

Attachment A – Special-Status Species Searches
Attachment B – Representative Site Photographs
Attachment C – Wildlife Observed Onsite

LIST OF ACRONYMS AND ABBREVIATIONS

Act	Rivers and Harbors Act
BA	Biological assessment
BCC	Birds of Conservation Concern
BMPs	Best management practices
BO	Biological opinion
BRA	Biological resources assessment
CBOC	California Burrowing Owl Consortium

LIST OF ACRONYMS AND ABBREVIATIONS

CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
DPS	Distinct population segment
EFH	Essential Fish Habitat
EPIC	Environmental Protection Information Center
ESA	Endangered Species Act
ESU	Evolutionarily significant unit
HCP	Habitat conservation plan
MBTA	Migratory Bird Treaty Act
MSL	Mean sea level
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
Project	Yuba City Boat Ramp Sediment Removal Project
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
Section 404 Permit	Section 404 of the federal CWA
SL	Standard length
SSC	Species of Special Concern
Study Area	±124.06-acre Yuba City Boat Ramp Study Area
TRBL	Tricolored blackbird
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley elderberry longhorn beetle
WBWG	Western Bat Working Group

1.0 INTRODUCTION

On behalf of the Sutter Butte Flood Control Agency (Proponent) ECORP Consulting, Inc. has conducted a biological resources assessment (BRA) for the Yuba City Boat Ramp Sediment Removal Project (Project) located in Sutter and Yuba counties, California. The purpose of the assessment was to collect information on the biological resources present or with the potential to occur in the Project Study Area, assess potential biological impacts related to Project activities, and identify potential mitigation measures to inform and support the Project's California Environmental Quality Act (CEQA) documentation for biological resources.

2.0 STUDY AREA

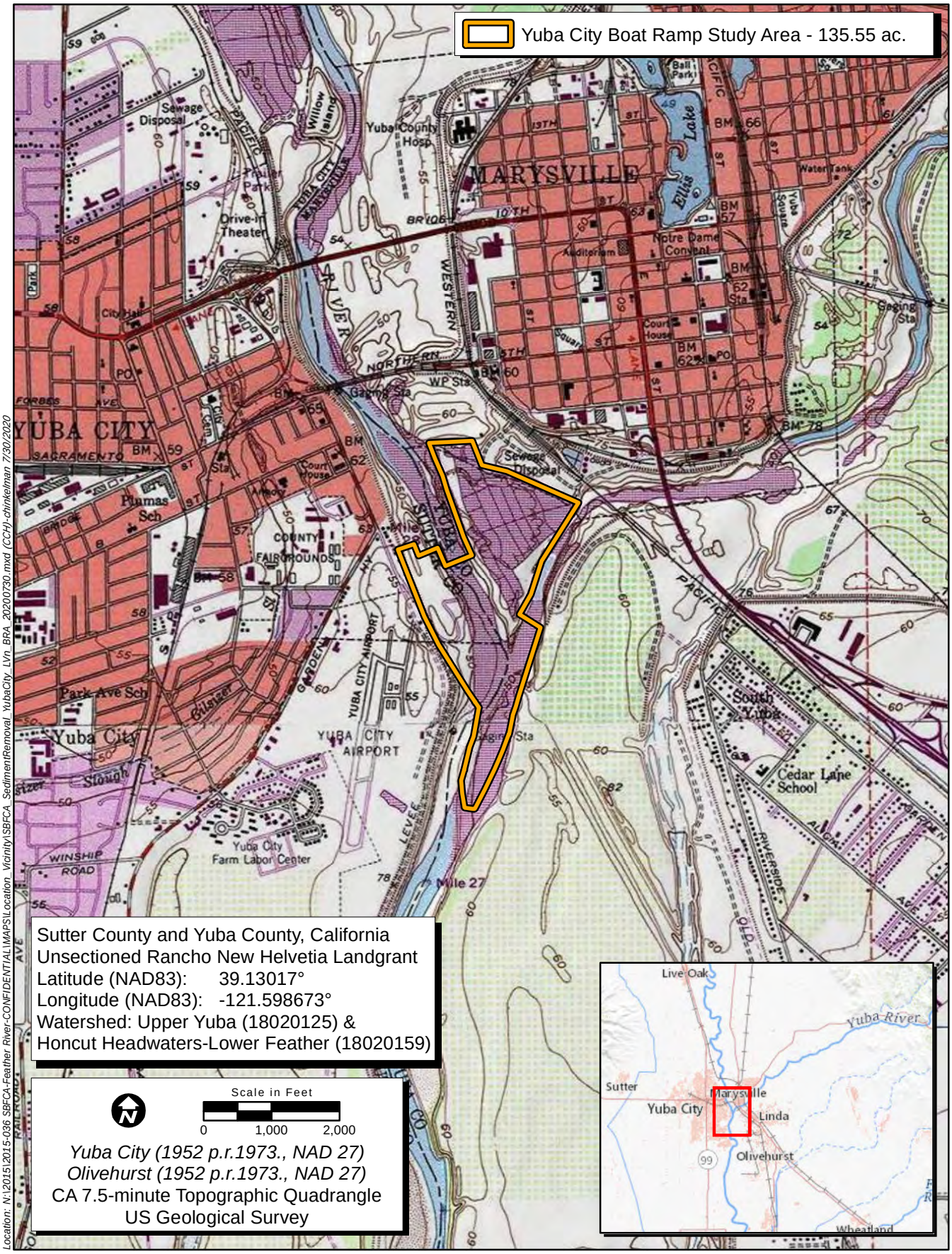
2.1 Study Area Location

The ±135.55-acre Yuba City Boat Ramp Study Area (Study Area) is located at the confluence of the Feather and Yuba rivers in the cities of Yuba City and Marysville, California in Sutter and Yuba counties, respectively (Figure 1. *Yuba City Boat Ramp Location and Vicinity*). The Study Area corresponds the unsectioned Rancho New Helvetia Landgrant (Mount Diablo Base and Meridian) of the "Olivehurst, California" and "Yuba City, California" 7.5-minute Topographic Quadrangles (U.S. Geological Survey [USGS] 1952, photorevised 1973 and 1952b, photorevised 1973, respectively). The approximate center of the Study Area is located at 39.13017° and -121.598673° within the Honcut Headwaters – Lower Feather Watershed (Hydrologic Unit Code #18020159, Natural Resources Conservation Service [NRCS] et al. 2016).

For the purposes of this report, the Study Area includes (1) the Yuba City Boat Ramp facility and adjacent lands, including the RV Park to the north, (2) the area of proposed dredging and potential future dredging within the Feather and Yuba rivers, and (3) the City of Marysville's old wastewater ponds (wastewater ponds), where dredged spoils may be dewatered and/or disposed (Figure 2. *Project Components*).

2.2 Project Description

The Project involves dredging to remove sediment that has accumulated at the confluence of the Yuba and Feather rivers, exacerbated by the Oroville Dam Spillway incident of 2017. The dredging operation would be staged from the existing Yuba City Boat Ramp and adjacent lands (Figure 2). Dredging would initially remove approximately 65,600 cubic yards of sediment within an approximate 14.41-acre dredging area (Figure 2). Dredging beyond the initial 65,600 cubic yards may be conducted within the 14.40-acre future dredging area if funding is available. Dredged spoils would be dewatered on lands adjacent to the boat ramp or at the wastewater ponds (Figure 2). Once dewatered, spoils would be disposed at the wastewater ponds, the Recology Ostrom Road Landfill, or on agricultural fields (location to be determined) (Figure 3. *Potential Disposal Locations*).



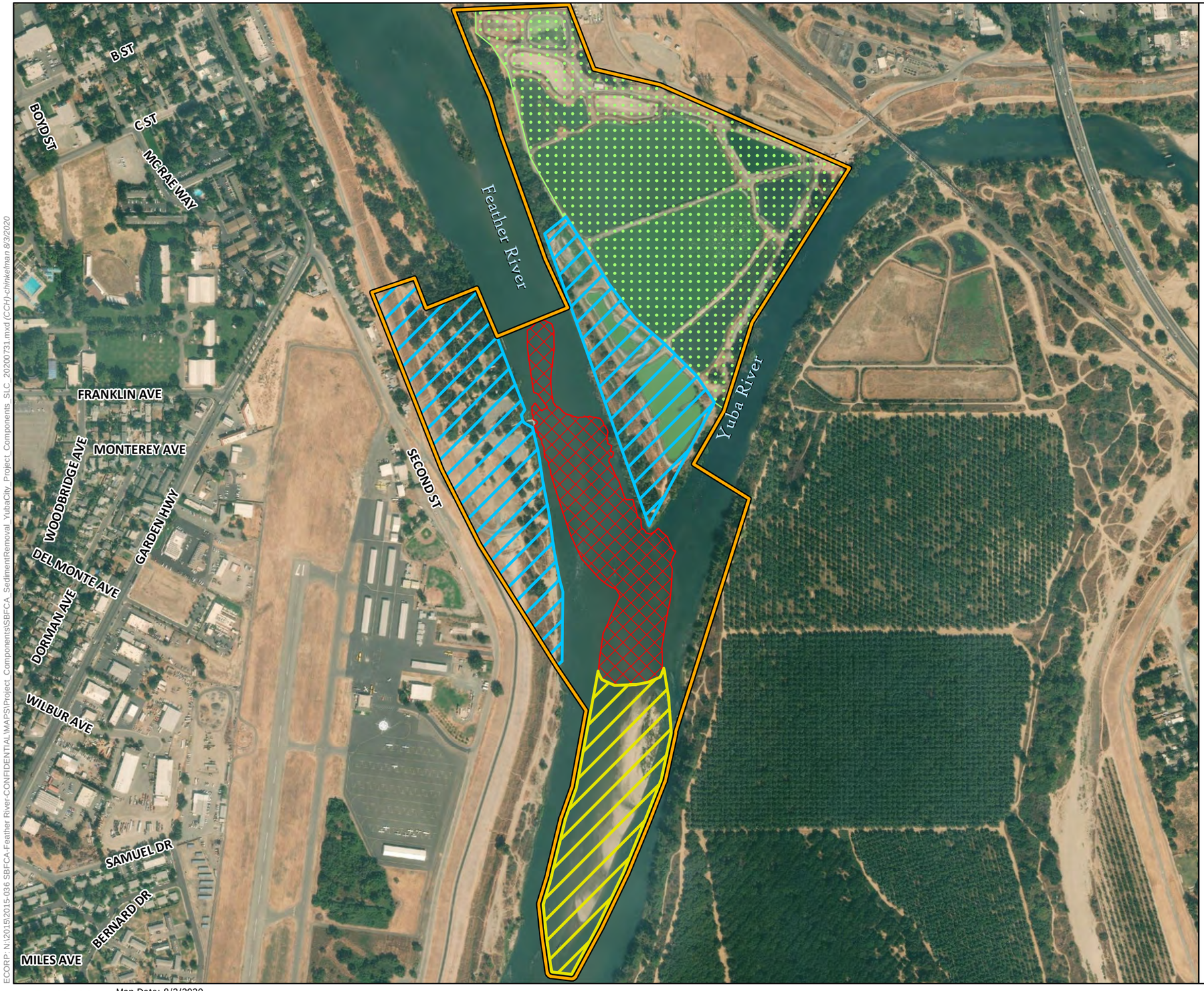
Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Yuba City Boat Ramp Location and Vicinity

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

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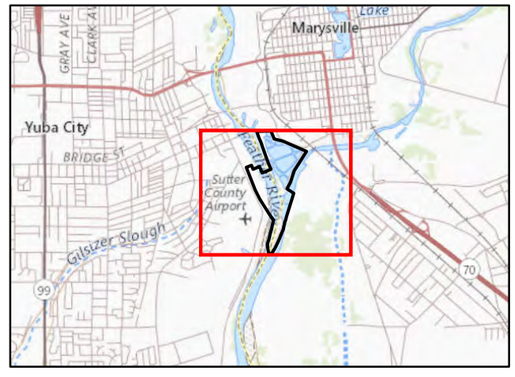
Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



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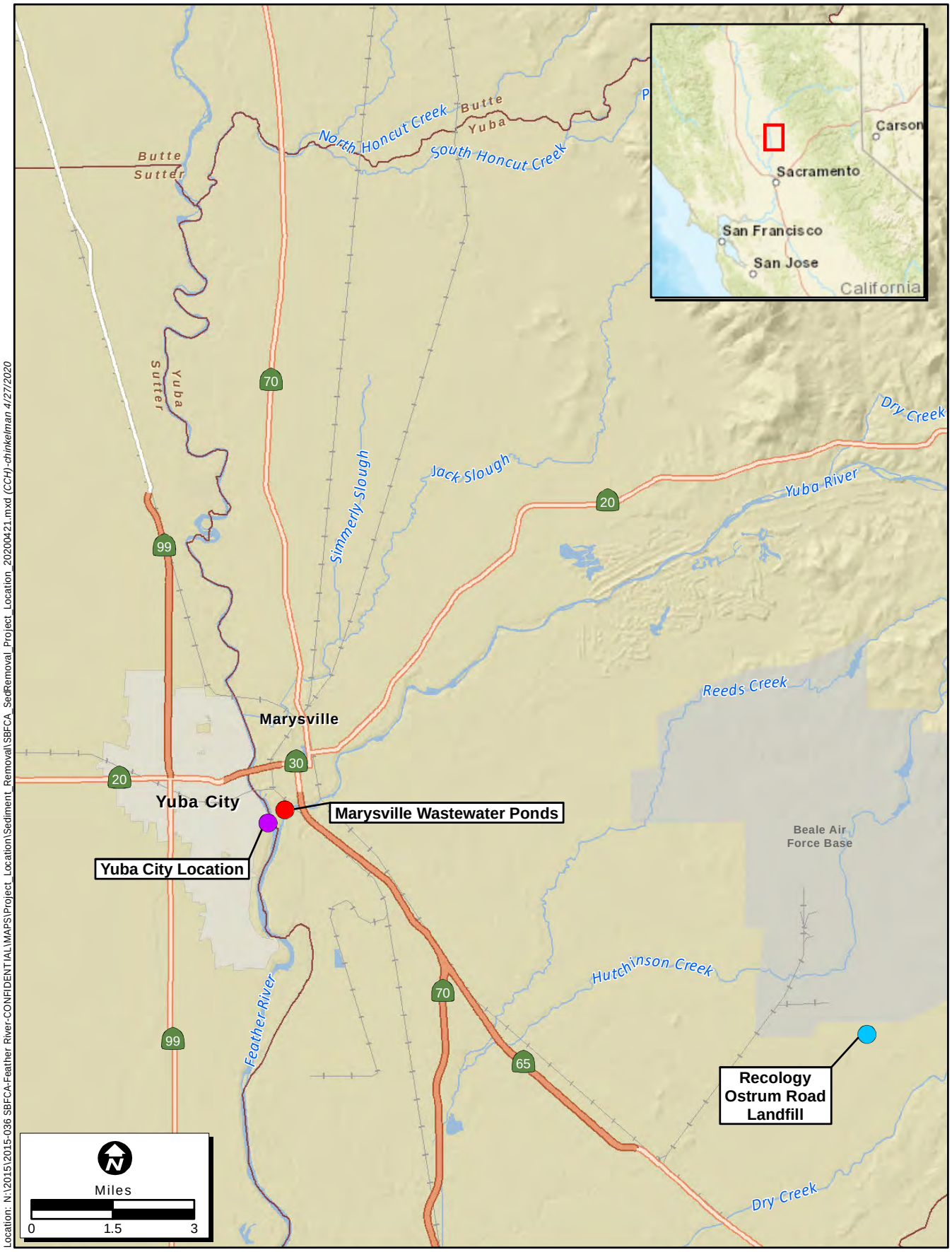
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Scale in Feet
0 560

Figure 2. Project Components

2015-036.10 Yuba City Boat Ramp Sediment Removal Project



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Map Date: 4/27/2020

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 3. Potential Disposal Locations

Yuba City Boat Ramp Sediment Removal Project

Dredging would involve hydraulic or mechanical mining. Hydraulic mining would consist of a barge using suction to remove sediment from the river bottom and pumping the material to a location on the east or west side of the river, where it would be dewatered, and hauled by truck to a disposal site(s). Mechanical dredging would involve equipment such as an excavator with a bucket removing the sediment from shore and/or a barge, transporting the material to the dewatering area, then to the disposal site(s).

2.3 Disposal Options

Potential sediment disposal options include soil for farmlands, county landfills, and placement in the wastewater ponds. Brief descriptions of each disposal option are provided below (Figure 3).

2.3.1 Agricultural Soil

When dredged material is free of contaminants, nuisance weeds, and has the proper balance of nutrients, it has similar characteristics as productive agricultural soils and can be beneficial for increasing crop production when incorporated or mixed with native soils. This option will depend on the identification of available agricultural lands.

2.3.2 Landfill

The nearest landfill to the site is the Recology Ostrom Road Landfill located at 5900 Ostrom Road in Wheatland, California (Figure 3). This landfill is approximately 17 miles by road from the Project and has a maximum daily throughput of 3,000 tons, which is sufficient to accommodate the Project. This landfill is the only one in the general area of the Yuba City Boat Ramp permitted to accept contaminated soils.

2.3.3 City of Marysville Wastewater Ponds

The City has recently modified its wastewater collection and treatment system to connect to the Linda County Water District Regional Wastewater Treatment Facility for treatment and discharge. As such, the City's existing percolation/evaporation ponds (herein referred to as wastewater ponds) are no longer needed, and the City intends to formally close and restore the abandoned facility. Under this option, the dredge material would be used in reclamation of the ponds. The wastewater ponds are in the Study Area on the east side of the Feather River and north of the Yuba River (Figure 3). This option is currently being discussed with the City to determine its viability.

2.4 Purpose of this Biological Resources Assessment

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

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

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California ESA;
- meet the definitions of endangered or rare under Section 15380 of CEQA Guidelines;
- are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- are birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- plants listed by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4);
- are plants listed as rare under the California Native Plant Protection Act (NPPA, California Fish and Game Code, § 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, §§ 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

Only species that fall into one of the above listed groups were considered for this assessment. Other species without special status that are sometimes found in database or literature searches were not included within this analysis.

3.0 REGULATORY SETTING

3.1 Federal Regulations

3.1.1 Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the USFWS and the National Marine Fisheries Service (NMFS). Section 9 of ESA prohibits the taking of listed wildlife, where take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued

existence of the species. Section 10 of ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

Section 7

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

Section 10

When no discretionary action is being taken by a federal agency but a project may result in the take of listed species, an incidental take permit under Section 10 of the ESA is necessary. The purpose of the incidental take permit is to authorize the take of federally listed species that may result from an otherwise lawful activity, not to authorize the activities themselves. In order to obtain an incidental take permit under Section 10, an application must be submitted that includes an HCP. In some instances, applicants, USFWS, and/or NMFS may determine that an HCP is necessary or prudent, even if a discretionary federal action will occur. The purpose of the HCP planning process associated with the permit application is to ensure that adequate minimization and mitigation for impacts to listed species and/or their habitat will occur.

Critical Habitat

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

- Space for individual and population growth and for normal behavior;

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

3.1.2 Magnuson-Stevens Fishery Conservation and Management Act

The 1996 Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 USC 1801), requires federal agencies to consult with NMFS whenever a proposed action has a potential to adversely affect Essential Fish Habitat (EFH). Although states are not required to consult with NMFS, NMFS is required to develop EFH conservation recommendations for any state agency activities with the potential to affect EFH. EFH is defined as "…those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" and includes the necessary habitat for managed fish to complete their life cycles and contribute to a sustainable fishery and healthy ecosystem. Although the concept of EFH is similar to the ESA definition of Critical Habitat, measures recommended by NMFS or a regional fisheries management council to protect EFH are advisory, rather than prescriptive (NMFS 1998). National Marine Fisheries Service (NMFS). 1998. Essential fish habitat: new marine fish habitat conservation mandate for federal agencies. EFH Federal Agency Primer 12/98. Northeast Region, Gloucester, MA.

3.1.3 Migratory Bird Treaty Act

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

3.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22]. USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

3.1.5 Federal Clean Water Act

The purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the U.S." without a permit from the U.S. Army Corps of Engineers (USACE). "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to, the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines" (33 CFR § 328.2(f)). In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect wetlands (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board.

3.1.6 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 (Act) requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable Waters of the U.S. Structures or work outside the limits defined for navigable Waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the U.S., and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. The alteration of a USACE federally authorized civil works project requires a permit pursuant to Section 14 of the Act, as amended and codified in 33 USC 408. Projects with minimal impacts require approval by the USACE Sacramento District Construction Operations Group; however projects with more substantial impacts may require USACE Headquarters review. Coordination with the Central Valley Flood Protection Board, who serve as the Non-Federal Sponsor, is required as a part of the process of obtaining a Section 408 permit.

3.2 State Regulations

3.2.1 California Fish and Game Code

California Endangered Species Act

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

Fully Protected Species

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

Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code §§ 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in

accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA.

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

3.2.2 Species of Special Concern

SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under ESA, the California ESA or the California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role;
- The species is listed as federally (but not state) threatened or endangered, or meets the state definition of threatened or endangered but has not formally been listed;
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status;
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for state threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, state-threatened, or endangered species are considered "significant" under CEQA.

3.2.3 California Rare Plant Ranks

The CNPS maintains the *Inventory of Rare and Endangered Plants of California* (CNPS 2020), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere

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

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

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

Factors such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection (CNPS 2020). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines § 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

3.2.4 Porter-Cologne Water Quality Act

The Regional Water Quality Control Board (RWQCB) implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

3.2.5 California Environmental Quality Act

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

CEQA Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant and are particularly relevant to SSC. Generally, impacts to rare, threatened, or endangered species are considered significant, requiring thorough analysis in a CEQA document and often requiring mitigation to avoid or minimize potential impacts. Assessment of "impact significance" to populations of non-listed species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

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

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional or state HCP.

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

3.3 Local Plans and Ordinances

3.3.1 Yuba City General Plan

Chapter 8: Environmental Conservation of the *Yuba City General Plan Policy Document* includes several goals and policies related to the protection of biological resources, water quality, and air quality. Additionally, Chapter 8 includes several goals and policies related to open space for the preservation of natural resources and wildlife habitats along the Feather River (Yuba City 2004).

The goals and policies emphasize protecting and enhancing the natural habitat features of the Feather River and protecting special-status species, in accordance with state regulatory requirements. They also:

- require new construction to utilize best management practices (BMPs) such as site preparation, grading, and foundation designs for erosion control to prevent sediment runoff into waterways, specifically the Feather River;
- require assessments of biological resources prior to approval of any development within 300 feet of any creeks, sensitive habitat areas, or areas of potential sensitive status species;
- require preservation of oak trees and other native trees that are of a significant size by requiring site designs to incorporate these trees to the maximum extent feasible;
- require a buffer zone along the river in which no grading or construction activities will occur, except as needed for shoreline uses such as boat docks; and
- protect waterways by prohibiting the dumping of debris and refuse in and near waterways and storm drains. (Yuba City 2004).

3.3.2 City of Marysville General Plan

The Open Space, Conservation and Recreation Element of the *City of Marysville General Plan Document* includes several goals and policies related to the protection of natural resources including wildlife habitats, fisheries and adjacent waterways, as well as air quality (City of Marysville 1985).

The goals and policies emphasize conservation of natural resources from encroachment or development, protection against uses in the floodplain that would pose danger to the public, and prevention of

contamination of waterways, water recharge areas and areas with a high water table (City of Marysville 1985).

Chapter 18 of the Marysville Municipal Code regulates tree removal on open space land uses.

4.0 METHODS

4.1 Literature Review

The following resources were reviewed to determine the special-status species that have been documented within or in the vicinity of the Study Area. Results of the species searches are included as Attachment A.

- CDFW CNDDB data for the "Yuba City, California" 7.5-minute quadrangles as well as the nine surrounding USGS quadrangles (CDFW 2020);
- USFWS Information, Planning, and Consultation System Resource Report List for the Study Area (USFWS 2020a);
- CNPS' electronic Inventory of Rare and Endangered Plants of California was queried for the "Yuba City, California" 7.5-minute quadrangles and the nine surrounding quadrangles (CNPS 2020).

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the Study Areas from the following sources:

- The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004 (California Department of Fish and Game [CDFG] 2005);
- California Bird Species of Special Concern (Shuford and Gardali 2008);
- Amphibian and Reptile Species of Special Concern in California (Thompson, Wright, and Shaffer 2016);
- Mammalian Species of Special Concern in California (Williams 1986);
- California's Wildlife, Volumes I-III (Zeiner, et al. 1988, 1990a, 1990b);
- A Guide to Wildlife Habitats of California (Mayer and Laudenslayer Jr., eds. 1988);
- USFWS Online Critical Habitat Mapper (USFWS 2020b); and
- NRCS Web Soil Survey (NRCS 2020a).

4.2 Site Surveys

4.2.1 Reconnaissance Site Survey

ECORP Biologists Keith Kwan and Gabrielle Attisani conducted the site reconnaissance visit April 8, 2020. The Study Area was systematically surveyed on foot using an ESO Arrow Global Positioning System unit

with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the Study Area with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and the following biological resource information was collected:

- Potential aquatic resources
- Vegetation communities
- Plant and animal species directly observed
- Animal evidence (e.g., scat, tracks)
- Existing active raptor nest locations
- Burrows and any other special habitat features
- Representative Study Area photographs (Attachment B)

4.2.2 Aquatic Resources Delineation Site Survey

An aquatic resources delineation of the Study Area was conducted on April 8, 2020 by ECORP biologist Keith Kwan. The delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation* Manual*: Arid West Region* (Arid West Region Supplement) (USACE 2008).

4.3 Special-Status Species Considered for the Project

Based on species occurrence information from the literature review and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Study Area was generated. Only special-status species as defined in Section 1.3 were included in this analysis. Each of these species' potential to occur within the Study Ares was assessed based on the following criteria:

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

5.0 RESULTS

5.1 Site Characteristics and Land Use

The Study Area includes the confluence and adjacent portions of the Feather and Yuba rivers, the Yuba City Boat Ramp (operated by Sutter County) and surrounding lands on the west bank of the Feather River, the City of Marysville wastewater ponds between the Feather and Yuba rivers, and a narrow area of shoreline on the eastern bank of the Feather and Yuba rivers. The developed portions of the boat ramp include a paved roadway, parking areas, the boat ramp, and the Feather River RV Park. The undeveloped areas around the boat ramp include riverbank habitat, ruderal weedy roadside habitats, and unimproved areas of compacted dirt that are used for overflow parking and/or fishing access. The wastewater ponds portion of the Study Area includes constructed/excavated ponds of varying shapes and sizes and a narrow corridor of riparian habitat along the Feather and Yuba rivers.

5.2 Soils and Topography

According to the Web Soil Survey (NRCS 2020a), five soil units, or types, have been mapped within the Study Area (Figure 4. *Natural Resources Conservation Service Soil Units*):

- 117 – Columbia fine sandy loam, 0 to 2 percent slopes, MLRA 17.
- 118 – Columbia fine sandy loam, channeled, 0 to 2 percent slopes.
- 127 – Conejo-Urban land complex, 0 percent slopes MLRA 17.
- 138 – Columbia fine sandy loam, 0 to 1 percent slopes, occasionally flooded.
- 163 – Holillipah loamy sand, 0 to 1 percent slopes, frequently flooded.

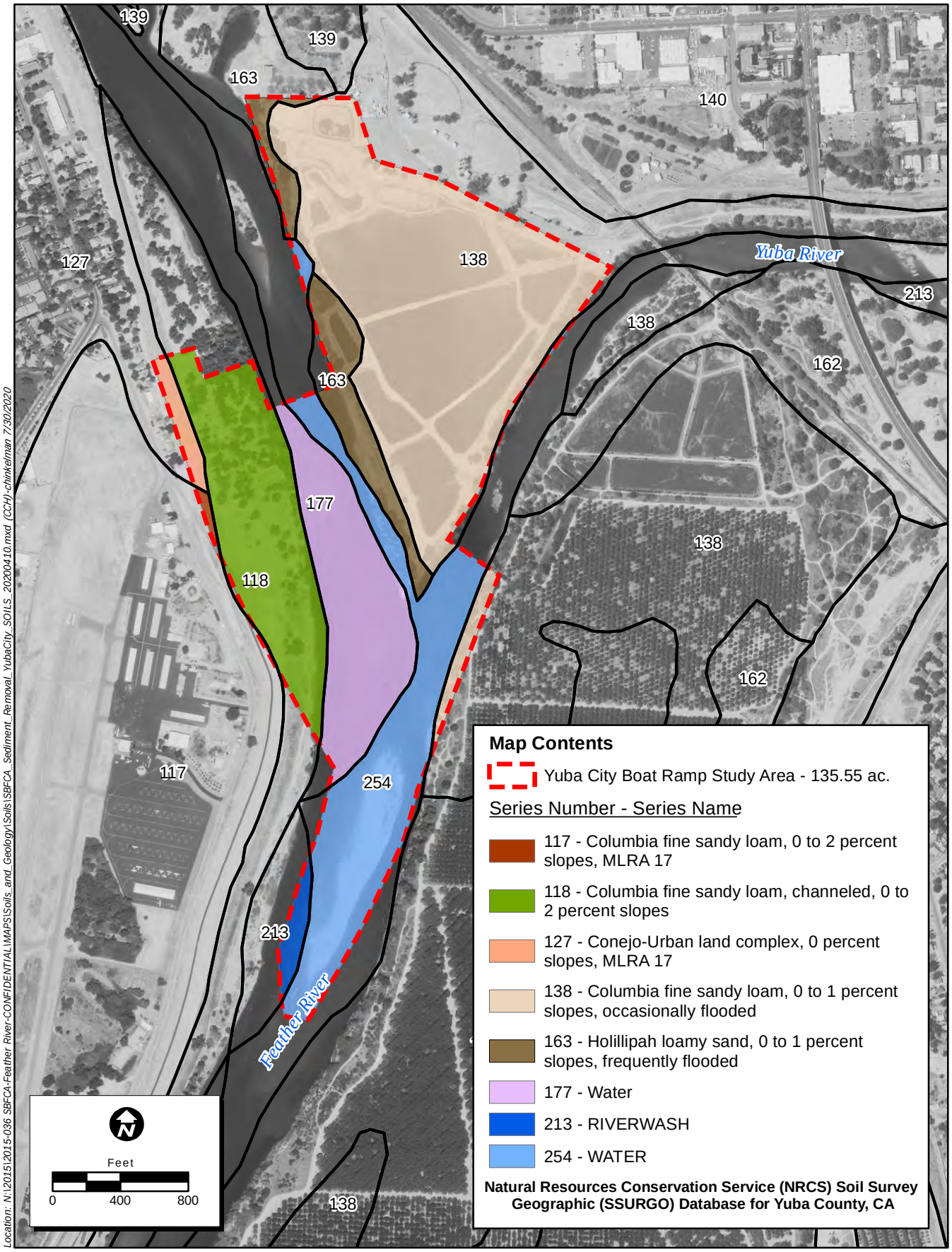
All of these soil units contain hydric components and are considered hydric except 127-Conejo-Urban land complex (NRCS 2020b).

5.3 Land Cover Types and Vegetation Communities

Land cover types or vegetation communities found within the Study Area included riparian woodland, ruderal, paved/developed, and constructed wastewater ponds. Descriptions of the land cover types and vegetation communities present within the Study Area are provided below.

5.3.1 Riparian Woodland

The riparian woodland community is found along the riverbanks. The riparian woodland vegetation is a relatively narrow corridor of mature trees with varying densities of understory cover, depending on levels of human use. Dominant trees include Fremont's cottonwood (*Populus fremontii*), Goodding's black willow (*Salix gooddingii*), and Valley oak (*Quercus lobata*), with scattered box elder (*Acer negundo*), tree-of-heaven (*Ailanthus altissima*), California black walnut (*Juglans hindsii*), black locust (*Robinia pseudoacacia*), and sandbar willow (*Salix exigua*). Understory vegetation was dense in scattered locations and included



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Soils_and_Geology\Soils\SBFCA_Sediment_Removal_YubaCity_SOILS_20200410.mxd (CCH)-chinkelman 7/30/2020

Map Date: 7/30/2020
Photo Source: NAIP (2018)

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Figure 4. Natural Resources Conservation Service Soils Units

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

Himalayan blackberry (*Rubus armeniacus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), tree tobacco (*Nicotiana glauca*), mugwort (*Artemisia douglasiana*), cow parsnip (*Heracleum maximum*), and common bedstraw (*Galium aparine*).

Ruderal/Disturbed

The ruderal community was found along roadsides, levees, wastewater pond edges, and other areas heavily impacted by human presence. These areas are characterized by the presence of nonnative weedy plants such as cheeseweed (*Malva parviflora*), barley (*Hordeum murinum*), cut-leaved geranium (*Geranium dissectum*), yellow star-thistle (*Centaurea solstitialis*), and wild oats (*Avena* sp.).

Paved/Developed

Paved, developed portions of the Study Area are characterized by existing paved roads and parking areas, compacted dirt/gravel parking areas, and pedestrian paths to the Feather River. The majority of the dirt/gravel roads and paths are unvegetated.

Wastewater Treatment Ponds

The wastewater ponds are manmade ponds surrounded by gravel and dirt-surfaced access roads. The ponds are no longer in use and hydrology is limited to seasonal rainfall.

5.4 Aquatic Resources

A total of 85.898 acres of aquatic resources have been mapped within the Study Area (Table 1). A discussion of the aquatic resources is presented below, and the aquatic resources delineation maps for the Study Area are presented on Figure 5. *Aquatic Resources Delineation*.

Table 1. Aquatic Resources in the Study Area

Type	Acreage[1]
Wetlands	
None	0.000
Other Waters/Non-Wetland Waters	
Wastewater Ponds	37.126
Feather/Yuba Rivers	48.772
Total	**85.898**

[1]Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

5.4.1 Wetlands

There are no wetlands within the Study Area.



Figure 5.
Aquatic Resources Delineation
(Sheet 1 of 5)

Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.
- Reference Coordinates

Aquatic Resources Delineation[1]*

Non-wetland Aquatic Resources

- Feather River/Yuba River OHWM
- Wastewater Pond

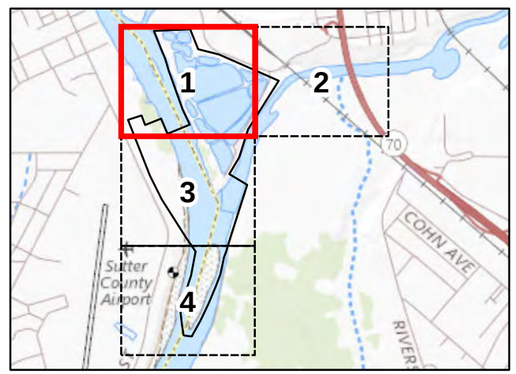
Non-wetland Aquatic Resources	Total (acres)
Feather River/Yuba River OHWM	48.772
Wastewater Pond	37.126
Total (acres)	**85.898**

Sample Points	Type	Latitude	Longitude
1	Upland Point	39.129143	-121.59767
2	Waters Point	39.128288	-121.597873
3	Upland Point	39.128297	-121.597865
4	Waters Point	39.130043	-121.600265
5	Upland Point	39.130051	-121.600296

[1] *Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.*

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

Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Yuba City Boat Ramp Sediment Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 7/31/2020

ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\SBFCA_SedimentRemoval_YubaCity_ARD_20200731.mxd(CCH) -chinkelman 7/31/2020



Figure 5.
Aquatic Resources Delineation
(Sheet 2 of 4)

Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.
- Reference Coordinates
- Aquatic Resources Delineation[1]*

Non-wetland Aquatic Resources

- Feather River/Yuba River OHWM
- Wastewater Pond

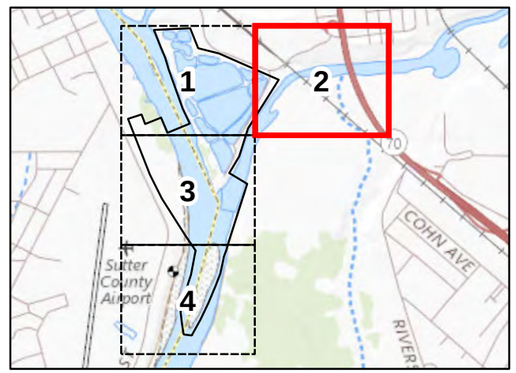
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Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Yuba City Boat Ramp Sediment Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 7/31/2020

ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Jurisdictional_Delineation\USACE_Delineation\Sediment_Removal\SBFCA_SedimentRemoval_YubaCity_ARD_20200731.mxd(CCH) -chinkelman 7/31/2020



Figure 5. Aquatic Resources Delineation (Sheet 3 of 4)

Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.
- Reference Coordinates

Feature Type

- Upland Point
- Waters Point

Aquatic Resources Delineation[1]*

Non-wetland Aquatic Resources

- Feather River/Yuba River OHWM
- Wastewater Pond

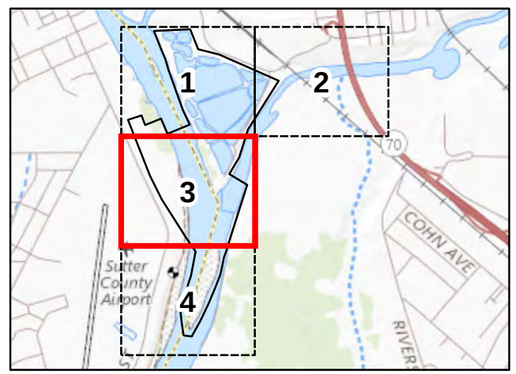
Non-wetland Aquatic Resources	Total (acres)
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* *The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Yuba City Boat Ramp Sediment Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

Map Date: 7/31/2020



Figure 5.
Aquatic Resources Delineation
(Sheet 4 of 4)

Map Features

Yuba City Boat Ramp Study Area - 135.55 ac.

Reference Coordinates

Aquatic Resources Delineation[1]*

Non-wetland Aquatic Resources

Feather River/Yuba River OHWM

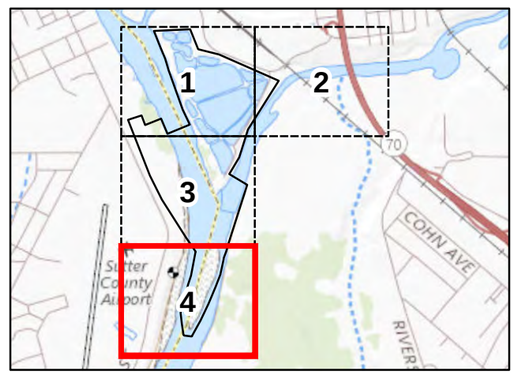
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** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Yuba City Boat Ramp Sediment Removal Project

Scale in Feet
0 200

Photo Source: NAIP (2018)
Boundary Source: PBI/ECORP
Delineator(s): K. Kwan
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet

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5.4.2 Other Waters/Non-Wetland Waters

River (Feather and Yuba Rivers)

The Feather and Yuba rivers are perennial and exhibit bed and bank. Flows and water levels of these rivers are regulated at dams upstream. Feather River is a navigable water as defined under the CWA.

Wastewater Ponds

The wastewater ponds are located in the city of Marysville north of the confluence of the Feather and Yuba rivers. The wastewater ponds are constructed/excavated ponds located between access roads and levees. Some ponds are vegetated with upland and emergent wetland vegetation, while others are unvegetated. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA, are typically not Waters of the U.S. The USACE will make the final determination on the jurisdictional status of the wastewater ponds.

5.5 Wildlife Observations

The Study Area supports a variety of common wildlife species. A detailed list of wildlife species observed in the vicinity of the Study Area during the site visit is included as Attachment C.

5.6 Evaluation of Species Identified in the Literature Search

A list of all of the special-status plant and wildlife species identified in the literature search as potentially occurring within the Study Areas is provided in Table 2. This table includes the listing status for each species, a brief habitat description, and a determination on the potential to occur in or near the Study Area. Following the table is a brief description of each species with potential to occur.

Several species and sensitive habitat types that came up in the database and literature searches have been formally delisted, are tracked by the CNDDB but possess no special status, or are identified as sensitive habitats but not located within the Study Area. These species and habitat types were not included in Table 2 and are not discussed further in this report.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Plants						
Depauperate milk-vetch *(Astragalus pauperculus)*			4.3	Vernally mesic areas on volcanic soils within chaparral, cismontane woodland, and valley and foothill grassland habitats (197'- 3,986').	March-June	Absent. No suitable habitat within Study Area.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Ferris' milk-vetch *(Astragalus tener* var.*ferrisiae)*			1B.1	Vernally mesic meadows and seeps and in sub-alkaline flats within valley and foothill grasslands (7'–246').	April–May	Absent. No suitable habitat within Study Area.
Mexican mosquito fern *(Azolla microphylla)*			4.2	Marshes and swamps, ponds or slow-moving bodies of water (98'–328').	August	Low potential. Marginally suitable habitat within the Study Area.
Valley brodiaea (*Brodiaea rosea* ssp.*vallicola*)			4.2	Old alluvial terraces with silty, sandy, or gravelly loam within vernal pools and swales in valley and foothill grassland (33'–1,100').	April–May	Absent. No suitable habitat within Study Area.
Sierra foothills brodiaea *(Brodiaea sierrae)*			4.3	Usually found on serpentinite or gabbroic soils within chaparral or cismontane woodland (164'–3,215').	May–August	Absent. No suitable habitat within Study Area.
Red-stemmed cryptantha *(Cryptantha rostellata)*			4.2	Often roadsides and gravelly, volcanic openings within cismontane woodland and valley and foothill grassland (131' – 2,624 ').	April-June	Absent. No suitable habitat within Study Area.
Recurved larkspur *(Delphinium recurvatum)*			1B.2	Alkaline soils in chenopod scrub, cismontane woodland, and valley and foothill grasslands (10'–2,592').	March–June	Absent. No suitable habitat within Study Area.
Dwarf downingia *(Downingia pusilla)*			2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species appears to have an affinity for slight disturbance (i.e., scraped depressions, ditches) (Baldwin et al. 2012, CDFW 2018) (3'–1,460').	March–May	Low potential. Marginally suitable habitat within the Study Area.
Shield-bracted monkeyflower *(Erythranthe glaucescens)*			4.3	Serpentinite seeps and sometimes streambanks within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (197' – 4,068').	February-August	Low potential to occur. Marginally suitable habitat within Study Area.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*			1B.2	Marshes and freshwater swamps. Often in riprap on sides of levees (0'–394').	June–September	Low potential to occur. Marginally suitable habitat within Study Area.
Ahart's dwarf rush *(Juncus leiospermus* var. *ahartii)*			1B.2	Mesic areas in valley and foothill grassland. Species has an affinity for slight disturbance such as farmed fields (USFWS 2005) (98'–751').	March–May	Low potential to occur. Marginally suitable habitat within Study Area.
Red Bluff dwarf rush *(Juncus leiospermus* var. *leiospermus)*			1B.1	Vernally mesic areas in chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools (115'–4,101').	March–June	Absent. No suitable habitat within Study Area.
Legenere *(Legenere limosa)*			1B.1	Various seasonally inundated areas including wetlands, wetland swales, marshes, vernal pools, artificial ponds, and floodplains of intermittent drainages (USFWS 2005) (3'–2,887').	April–June	Low potential to occur. Marginally suitable habitat within Study Area.
Veiny monardella *(Monardella venosa)*			1B.1	Heavy clay soils in cismontane woodland and valley and foothill grasslands (197'–1,345').	May–July	Absent. No suitable habitat within Study Area.
Baker's navarretia *(Navarretia leucocephala* ssp. *bakeri)*			1B.1	Vernal pools and mesic areas within cismontane woodlands, lower montane coniferous forests, meadows and seeps, and valley and foothill grasslands (16'–5,709').	April–July	Absent. No suitable habitat within Study Area.
Adobe navarretia *(Navarretia nigelliformis* ssp. *nigelliformis)*			4.2	Clay and sometimes serpentinite soils in vernally mesic valley and foothill grasslands and sometimes in vernal pools (328'–3,281).	April–June	Absent. No suitable habitat within Study Area.
Ahart's paronychia (*Paronychia ahartii*)			1B.1	Cismontane woodland, valley and foothill grassland, and vernal pools (98'–1673').	February-June	Absent. No suitable habitat within Study Area.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Hartweg's Golden Sunburst *(Pseudobahia bahiifolia)*	FE	CE	1B.1	Clay, often acidic soils in cismontane woodland, valley and foothill grasslands (49'–492').	March–April	Absent. No suitable habitat within Study Area.
Sanford's arrowhead *(Sagittaria sanfordii)*			1B.2	Shallow marshes and freshwater swamps (0'–2,133').	May–October	Low potential to occur. Marginally suitable habitat within Study Area.
Wright's trichocoronis *(Trichocoronis wrightii* var. *wrightii)*			2B.1	Alkaline soils in meadows and seeps, marshes and swamps, riparian forest, and vernal pools (16'–1,427').	May–September	Absent. No suitable habitat within Study Area.
Invertebrates						
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT			Elderberry shrubs (host plant for this species).	Any season	Potential to occur. Several elderberry shrubs are present in the Study Area.
Conservancy fairy shrimp (*Branchinecta conservatio)*	FE			Vernal pools/wetlands.	November-April	Absent. No suitable habitat within Study Area.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT			Vernal pools/wetlands.	November - April	Absent. No suitable habitat within Study Area.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE			Vernal pools/wetlands.	November - April	Absent. No suitable habitat within Study Area.
Fish						
Delta smelt (*Hypomesus transpacificus*)	FT	CE		Sacramento-San Joaquin delta.	N/A	Absent. Outside the known range for this species.
Pacific lamprey (*Lampetra tridentata*)			SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
River lamprey (*Lampetra ayresi*)			SSC	Anadromous; undammed streams rivers, streams, and creeks with gravel spawning substrates.	N/A	Present [2]
Sacramento hitch (*Lavinia exilicauda*)			SSC	Low-velocity habitats of warm water rivers and lakes.	N/A	Present [2]

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Sacramento splittail (*Pogonichthys macrolepidotus*)			SSC	Estuarine environments, rivers, sloughs, and alkaline lakes.	N/A	Low potential to occur. Historically present prior to substantial hydrologic alterations.
Hardhead (*Mylopharodon conocephalus*)			SSC	Relatively undisturbed streams at low to mid elevations in the Sacramento-San Joaquin and Russian River drainages. In the San Joaquin River, scattered populations found in tributary streams, but only rarely in the valley reaches of the San Joaquin River.	N/A	Present [2]
Chinook salmon (Central Valley fall-run/late fall-run ESU) (*Oncorhynchus tshawytscha*)	SC		SSC	Anadromous; undammed cold-water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]
Chinook salmon (Central Valley spring-run ESU)	FT	CT		Anadromous; undammed cold-water rivers and streams having riffles with large gravel substrates and relatively deep pools.	N/A	Present [2]
Steelhead (Central Valley DPS) (*Oncorhynchus mykiss*)	FT			Anadromous; undammed cold-water rivers and streams having riffles with gravel substrates and relatively deep pools.	N/A	Present [2]
Green Sturgeon (Southern DPS) (*Acipenser medirostris*)	FT			Anadromous; undammed cold-water rivers having relatively deep pools with large substrates.	N/A	Low potential to occur. There is little past or current evidence of occurrence or spawning in the Feather/Yuba Rivers.
Riffle sculpin (*Cottus gulosus*)			SSC	Riffles or pools of cold headwater streams having coarse substrates and adequate cover.	N/A	Present [2]

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Amphibians						
California red-legged frog (*Rana draytonii*)	FT		SSC	Lowlands or foothills at waters with dense shrubby or emergent riparian vegetation. Adults must have aestivation habitat to endure summer dry down.	May 1 - November 1	Absent. Outside the known range of this species.
Western spadefoot (*Spea hammondii*)			SSC	California endemic species of vernal pools, swales, wetlands and adjacent grasslands throughout the Central Valley.	March-May	Absent. No suitable habitat within the Study Area.
Reptiles						
Northwestern pond turtle (*Actinemys marmorata*)			SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	April-September	Potential to occur. Suitable habitat present within the Study Area.
Giant garter snake (*Thamnophis gigas*)	FT	CT		Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range.	April - October	Absent. No suitable habitat due to lack of vegetation and slow-moving water at the boat ramp and lack of perennial water at the wastewater ponds.
Birds						
Clark's grebe (*Aechmophorus clarkii*)			BCC	Winters on salt or brackish bays, estuaries, sheltered sea coasts, freshwater lakes, and rivers. Breeds on freshwater to brackish marshes, lakes, reservoirs and ponds, with a preference for large stretches of open water fringed with emergent vegetation.	June-August (breeding)	Absent. There is no emergent vegetation along riverbanks; irregular flows and water levels reduce potential for nesting.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	CE	BCC	Breeds in California, Arizona, Utah, Colorado, and Wyoming. In California, they nest along the upper Sacramento River and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other known nesting locations include Feather River (Butte, Yuba, Sutter counties), Prado Flood Control Basin (San Bernardino and Riverside County), Amargosa River and Owens Valley (Inyo County), Santa Clara River (Los Angeles County), Mojave River and Colorado River (San Bernardino County). Nests in riparian woodland. Winters in South America.	June 15- August 15	Absent. The degraded riparian habitat along the riverbanks are too narrow to support potential nesting habitat.
Rufous hummingbird (*Selasphorus rufus*)			BCC	Breeds in British Columbia and Alaska (does not breed in California). Winters in coastal Southern California south into Mexico. Common migrant during March-April in Sierra Nevada foothills and June-August in Lower Conifer to Alpine zone of Sierra Nevada. Nesting habitat includes secondary succession communities and openings, mature forests, parks and residential area.	April-July	Absent. This species does not nest in the region.
California black rail (*Laterallus jamaicensis coturniculus*)		CT	BCC, CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer, El Dorado counties)	March-September (breeding)	Absent. No suitable nesting habitat within the Study Area.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Greater sandhill crane (*Antigone canadensis tabida*)		CT	CFP	Breeds in NE California, Nevada, Oregon, Washington, and BC, Canada; winters from CA to Florida. In winter, they forage in burned grasslands, pastures, and feed on waste grain in a variety of agricultural settings (corn, wheat, milo, rice, oats, and barley), tilled fields, recently planted fields, alfalfa fields, row crops and burned rice fields.	March-August (breeding); September-March (wintering)	Absent. No suitable wintering habitat within the Study Area.
Long-billed curlew (*Numenius americanus*)			BCC	Breeds east of the Cascades in Washington, Oregon, northeastern California (Siskiyou, Modoc, Lassen counties), east-central California (Inyo County), through Great Basin region into Great Plains. Winters in California, Texas, and Louisiana. Wintering habitat includes tidal mudflats and estuaries, wet pastures, sandy beaches, salt marsh, managed wetlands, evaporation ponds, sewage ponds, and grasslands.	September-March (wintering)	Low potential to occur. This species does not nest in the region; the wastewater ponds onsite support marginal wintering habitat.
Marbled godwit (*Limosa fedoa*)			BCC	Nests in Montana, North and South Dakota, Minnesota, into Canada. Winter range along Pacific Coast from British Columbia south to Central America, with small numbers wintering in interior California. Wintering habitat includes coastal mudflats, meadows, estuaries, sandy beaches, sandflats, and salt ponds.	August-April (Migrant/Wintering in CA)	Low potential to occur. This species does not nest in the region and is uncommon in the Central Valley during migration.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Short-billed dowitcher (*Limnodromus griseus*)			BCC	Nests in Canada, southern Alaska; winters in coastal California south to South America; wintering habitat includes coastal mudflats and brackish lagoons	wintering/migrant period: late-August-May	Low potential to occur. This species does not nest in the region and is uncommon in the Central Valley during migration.
White-tailed kite (*Elanus leucurus*)			CFP	Nesting occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats.	March-August	Potential to occur. Nesting habitat present within the Study Area.
Golden eagle (*Aquila chrysaetos*)			BCC, CFP	Nesting habitat includes mountainous canyon land, rimrock terrain of open desert and grasslands, riparian, oak woodland/ savannah, and chaparral. Nesting occurs on cliff ledges, river banks, trees, and human-made structures (e.g., windmills, platforms, and transmission towers). Breeding occurs throughout California, except the immediate coast, Central Valley floor, Salton Sea region, and the Colorado River region, where they can be found during Winter.	Nest (February-August); winter CV (October-February)	Absent. No suitable nesting or foraging habitat within the Study Area.
Bald eagle (*Haliaeetus leucocephalus*)	Delisted	CE	CFP, BCC	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g. rivers, lakes), wetlands, flooded agricultural fields, open grasslands.	February – September (nesting); October-March (wintering)	Low potential to occur. The Study Area contains marginal nesting habitat; however, human presence throughout the Study Area reduces potential of nesting.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Swainson's hawk (*Buteo swainsoni*)		CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures.	March-August	Potential to occur. Suitable nesting habitat within the Study Area.
Burrowing owl (*Athene cunicularia*)			BCC, SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds.	February-August	Potential to occur. Suitable nesting habitat within the Study Area.
Nuttall's woodpecker (*Dryobates nuttallii*)			BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands.	April-July	Potential to occur. Suitable nesting habitat within the Study Area.
Least Bell's vireo (*Vireo bellii pusillus*)	FE	CE	BCC	In California, breeding range includes Ventura, Los Angeles, Riverside, Orange, San Diego, and San Bernardino counties, and rarely Stanislaus and Santa Clara counties Nesting habitat includes dense, low shrubby vegetation in riparian areas, brushy fields, young second-growth woodland, scrub oak, coastal chaparral and mesquite brushland. Winters in southern Baja California Sur.	April 1-July 31	Absent. Extirpated from the region.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Yellow-billed magpie (*Pica nuttallii*)			BCC	Endemic to California; found in the Central Valley and coast range south of San Francisco Bay and north of Los Angeles County; nesting habitat includes oak savannah with large in large expanses of open ground; also found in urban parklike settings.	April-June	Potential to occur. Suitable nesting habitat within the Study Area.
Bank swallow (*Riparia riparia*)		CT		Nests colonially along coasts, rivers, streams, lakes, reservoirs, and wetlands in vertical banks, cliffs, and bluffs in alluvial, friable soils. May also nest in sand, gravel quarries and road cuts. In California, breeding range includes northern and central California.	May-July	Potential to occur. Suitable nesting habitat within the Study Area.
Oak titmouse (*Baeolophus inornatus*)			BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree).	March-July	Potential to occur. Suitable nesting habitat within the Study Area.
Wrentit (*Chamaea fasciata*)			BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens.	March-August	Potential to occur. Suitable nesting habitat within the Study Area.
Song sparrow "Modesto" (*Melospiza melodia heermanni*)			BCC, SSC	Resident in central and southwest California, including Central Valley; nests in marsh, scrub habitat.	April-June	Potential to occur. Suitable nesting habitat within the Study Area.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
San Clemente spotted towhee (*Pipilo maculatus clementae*)			BCC, SSC	Resident on Santa Catalina and Santa Rosa Islands; extirpated on San Clemente Island, California. Breeds in dense, broadleaf shrubby brush, thickets, and tangles in chaparral, oak woodland, island woodland, and Bishop pine forest.	Year round resident; breeding season is April-July	Absent. This subspecies does not occur in the region.
Tricolored blackbird (*Agelaius tricolor*)		CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta Cos south to San Bernardino, Riverside and San Diego counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields.	March-August	Low potential to occur. The wastewater grounds and ruderal upland areas around the boat ramp represent foraging habitat. There is no potential nesting habitat present within the Study Area.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)			BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego County.	March-July	Absent. This subspecies does not occur in the region.
Mammals						
Ringtail (*Bassariscus astutus*)			Fully Protected	Occur in riparian areas, preferably those with rocky outcrops. Nest in rock or tree cavities.	February-May	Low potential to occur. Trees with cavities in riparian areas provide habitat.

Table 2. Special-Status Species Evaluated for the Study Area

Common Name (*Scientific Name*)	Status			Habitat Description	Survey Period	Potential To Occur Onsite
	ESA	CESA	Other			
Pallid bat (*Antrozous pallidus*)			SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g. basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (WBWG 2017).	April-September	Potential to occur. Suitable roosting habitat within the Study Area.
Townsend's big-eared bat (*Corynorhinus townsendii*)			SSC	Caves, mines, buildings, rock crevices, trees.	April-September	Potential to occur. Suitable roosting habitat within the Study Area.
Western red bat (*Lasiurus blossevillii*)			SSC	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2017).	April-September	Potential to occur. Suitable roosting habitat within the Study Area.

Status Codes NOTE:

FESA Federal Endangered Species Act
CESA California Endangered Species Act
FE FESA listed, Endangered.
FT FESA listed, Threatened.
BCC USFWS Bird of Conservation Concern).
CT CESA- or NPPA-listed, Threatened.
CE CESA or NPPA listed, Endangered.
CFP California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, §5 050-reptiles/amphibians).
SSC CDFW Species of Special Concern (CDFW, updated July 2017).
1B CRPR/Rare or Endangered in California and elsewhere.
2B Plants rare, threatened, or endangered in California but more common elsewhere.
4 CRPR/Plants of Limited Distribution – A Watch List.
0.1 Threat Rank/Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 Threat Rank/Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 Threat Rank/Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)
Delisted Formally Delisted (delisted species are monitored for 5 years).

[2] Source: San Joaquin River Restoration Program 2014.

5.6.1 Plants

A total of 20 special-status plant species were identified as having the potential to occur within Study Areas based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, 13 species were determined to not have potential to occur within the Study Area due to the absence of suitable habitat or the Study Area was outside the elevational range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining seven species that have the potential to occur within the Study Area are presented below.

Mexican mosquito fern

Mexican mosquito fern (*Azolla microphylla)* is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual/perennial that occurs in marshes and swamps (e.g., ponds and slow-moving water) (CNPS 2020). Mexican mosquito fern blooms in August and is known to occur at elevations ranging from 98 to 328 feet above MSL (CNPS 2020). The current range for Mexican mosquito fern in California includes Butte, Colusa, Glenn, Inyo, Kern, Lake, Modoc, Nevada, Plumas, San Bernardino, Santa Clara, San Diego, and Tulare counties (CNPS 2020).

While there are no CNDDB documented occurrences of Mexican mosquito fern within five miles of the Study Area (CDFW 2020), the wastewater ponds within the Study Area provides marginally suitable habitat for this species. Mexican mosquito fern has potential to occur onsite.

Dwarf downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas in valley and foothill grasslands (CNPS 2020). Dwarf downingia also appears to have an affinity for slight disturbance since it has been found in manmade features such as tire ruts, scraped depressions, stock ponds, and roadside ditches (Baldwin et al. 2012, CDFW 2020). This species blooms from March through May and is known to occur at elevations ranging from 3 to 1,460 feet above MSL (CNPS 2020). The current range of this species in California includes Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2020).

While there are no CNDDB documented occurrences of dwarf downingia within five miles of the Study Area (CDFW 2020), the wastewater ponds and surrounding disturbed areas within the Study Area provides marginally suitable habitat for this species. Dwarf downingia has potential to occur onsite.

Shield-bracted monkeyflower

Shield-bracted monkeyflower (*Erythranthe glaucescens*) is not listed as pursuant to either the federal or California ESAs but is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in serpentine seeps and sometimes streambanks of chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (CNPS 2020). Shield-bracted monkeyflower blooms from February through August and is known to occur at elevations ranging from 196 to 4,069 feet above

mean sea level (MSL, CNPS 2020). The current range of this species includes Butte, Colusa, Lake, Nevada, Shasta, and Tehama counties (CNPS 2020).

While there are no CNDDB documented occurrences of shield-bracted monkeyflower within five miles of the Study Area (CDFW 2020), the riverbanks within the Study Area provides marginally suitable habitat for this species. Shield-bracted monkeyflower has low potential to occur onsite.

Woolly rose-mallow

Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a rhizomatous, herbaceous perennial that occurs in marshes and freshwater swamps, and often in riprap on sides of levees (CNPS 2020). Rose-mallow blooms from June through September and is known to occur at elevations ranging from sea level to 394 feet above MSL (CNPS 2020). Rose-mallow is endemic to California; the current range of this species in California includes Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties (CNPS 2020)

While there are no CNDDB documented occurrences of wooly rose-mallow within five miles of the Study Area (CDFW 2020), the wastewater ponds within the Study Area provides suitable habitat for this species. Wooly rose-mallow has potential to occur onsite.

Ahart's dwarf rush

Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in mesic areas in valley and foothill grasslands (CNPS 2020). This species also appears to have an affinity for slight disturbance since it has been found on farmed fields and gopher turnings (USFWS 2005). Ahart's dwarf rush blooms from March through May and is known to occur at elevations ranging from 98 to 751 feet above MSL (CNPS 2020; USFWS 2005). Ahart's dwarf rush is endemic to California; the current range of this species includes Butte, Calaveras, Placer, Sacramento, Tehama, and Yuba counties (CNPS 2020).

While there are no CNDDB documented occurrences of Ahart's dwarf rush within five miles of the Study Area (CDFW 2020), the wastewater ponds and surrounding disturbed areas within the Study Area provides suitable habitat for this species. Ahart's dwarf rush has potential to occur onsite.

Legenere

Legenere (*Legenere limosa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species (CNPS 2020). This species is an herbaceous annual that occurs in a variety of seasonally inundated environments including wetlands, wetland swales, marshes, vernal pools, artificial ponds, and floodplains of intermittent drainages (USFWS 2005). Legenere blooms from April through June and is known to occur at elevations ranging from three to 2,887 feet above MSL (CNPS 2020). Legenere is endemic to California; the current range of this species includes Alameda, Lake, Monterey, Napa, Placer, Sacramento, Santa Clara, San Joaquin, Shasta, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties; is believed to be extirpated from Stanislaus County (CNPS 2020).

While there are no CNDDB documented occurrences of Legenere within five miles of the Study Area (CDFW 2020), the wastewater ponds within the Study Area provides marginally suitable habitat for this species. Legenere has potential to occur onsite.

Sanford's arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is not listed pursuant to the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial rhizomatous herb that occurs in shallow, freshwater marshes and swamps (CNPS 2020). Sanford's arrowhead blooms from May through October, and is known to occur at elevations ranging from sea level to 2,133 feet above MSL (CNPS 2020). Sanford's arrowhead is endemic to California; the current range of this species includes Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, San Joaquin, Shasta, Solano, Tehama, Tulare, Ventura, and Yuba counties; it is believed to be extirpated from both Orange and Ventura counties (CNPS 2020).

While there are no CNDDB documented occurrences of Legenere within five miles of the Study Area (CDFW 2020), the wastewater ponds within the Study Area provides marginally suitable habitat for this species. Sanford's arrowhead has potential to occur onsite.

5.6.2 Fish

The lower Feather River and Yuba River in the Study Area provides migration, spawning, and rearing habitat for a diverse assemblage of native and nonnative fish species, including both resident and anadromous (i.e., ocean migrating) species. At least 31 fish species, including 13 native and 18 nonnative species, have been documented in the lower Feather River in the Study Area (Seesholtz et al. 2004). A total of 10 special-status fish species were identified as having the potential to occur within Study Areas based on the literature review (Table 2). Nine of these species were determined to have some potential to occur in the Study Area. These species are described below.

Chinook Salmon

Two separate evolutionarily significant units (ESUs) of Chinook salmon occur in the study area: (1) Central Valley spring-run ESU, and (2) Central Valley fall-run ESU. Each of these ESUs is discussed below.

Central Valley Spring-run ESU Chinook Salmon

The Central Valley spring-run ESU Chinook salmon (spring-run ESU) was listed as a threatened species under the ESA on September 16, 1999 (50 CFR 50394) and under the California ESA in February 1999. The 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. Annual estimates of spring-run ESU escapement for the Feather River basin ranged from approximately 146 (1967) to 8,662 (2003) and was last estimated to be 2,110 in 2018 (GrandTab 2019).

The majority of spring-run Chinook salmon enters freshwater to spawn as three-year-old fish (Fisher 1994). Upstream migrations of adult spring-run Chinook salmon begin in late January and continue

through September (CDFG 1998; NMFS 2014). These sexually immature fish hold in deep, cold freshwater pools of rivers to mature for several months prior to spawning (Moyle 2002) and generally enter their natal streams from mid-February through July (CDFG 1998). Spawning typically occurs from mid-August to early October, with peak spawning occurring in September (Moyle 2002). Embryo survival is dependent upon water temperatures between five to 13 degrees Celsius (°C) and high dissolved-oxygen saturation (Moyle 2002). Embryos hatch in approximately 40-60 days, depending on water temperature, and remain in gravel as alevins for four to six weeks before emerging as fry from November through March (Moyle 2002). Juveniles typically reside in freshwater for 12-16 months and emigrate as yearlings from October through March, with peak emigration occurring from November to December (NMFS 2014).

The lower Feather and lower Yuba rivers both support populations of Central Valley spring-run ESU Chinook salmon. Therefore, this ESU has potential to occur in the Study Area during the adult immigration and juvenile emigration periods.

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

The Central Valley fall-run ESU, a federal Species of Concern and California SSC, is currently the only run of Chinook salmon occurring naturally in the San Joaquin River basin and is the largest run in the Sacramento River basin. Annual estimates of fall-run escapement for the Feather River basin ranged from approximately 6,126 fish in 1990 to 203,515 fish in 2001 and was last estimated at 73,150 fish in 2018 (GrandTab 2019).

Adult fall-run Chinook salmon migrate into the San Joaquin and Sacramento river systems from September through January, with peak immigration occurring in October and November (Moyle 2002). Spawning typically occurs from October through December, and fry typically begin to emerge in late December and January. Fall-run Chinook salmon may emigrate as post-emergent fry, juveniles, or as smolts after rearing in their natal streams for up to six months.

The lower Feather and lower Yuba rivers both support populations of Central Valley fall-run ESU Chinook salmon. Therefore, this ESU has potential to occur in the Study Area during the adult immigration and juvenile emigration periods.

California Central Valley DPS Steelhead

California Central Valley DPS steelhead, the anadromous form of rainbow trout, were listed as threatened under the ESA on March 19, 1998 (63 FR 13347). This DPS includes steelhead populations in the Sacramento River and San Joaquin River, inclusive and downstream of the Merced River. The listing was updated to include Coleman National Fish Hatchery and Feather River Hatchery steelhead populations on January 5, 2006 (71 Federal Register [FR] 834).

Adult steelhead, typically averaging 600 to 800 mm in length (Moyle et al. 1989), generally leave the ocean and begin upstream migration through the Delta to spawning reaches in the upper Sacramento and San Joaquin rivers and tributaries from August through March (McEwan 2001), with peak immigration occurring in January and February (Moyle 2002). Spawning generally occurs from January through April (McEwan and Jackson 1996). Redds are typically dug by female fish in water depths of 10 to 150 cm and

where water velocities over redds range from 20 to 155 cm/sec (Moyle 2002). Juvenile steelhead rear in their natal streams for one to three years prior to emigrating from the river. Emigration of one- to three-year old, sub-adult primarily occurs from January through June (Snider and Titus 1996). Unlike Chinook salmon, steelhead are iteroparous (i.e., able to spawn repeatedly) and may spawn for up to four consecutive years before dying; however, it is rare for steelhead to spawn more than twice and the majority of repeat spawners are females (Busby et al. 1996). Although one-time spawners comprise the majority, Shapovalov and Taft (1954) report that repeat spawners are relatively numerous (i.e., 17.2 percent) in California streams. Thus, kelts (post-spawning adults) may be present in the in the study area shortly after spawning (i.e., January through mid-April).

The lower Feather and lower Yuba rivers both support populations of California Central Valley DPS steelhead. Therefore, the DPS has the potential to occur in the Study Area during the adult and juvenile migration periods.

Green Sturgeon

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).

Although little is known about the spawning habits of green sturgeon in the Sacramento-San Joaquin system, spawning times are thought to be similar to those documented for the Klamath River (Emmett et al. 1991). There are three general phases in green sturgeon life history: 1) freshwater stage (<three years old), 2) coastal migrants (three to 13 years old for females; three to nine years old for males); and 3) adults (>13 years old for females, >nine years old for males) (Environmental Protection Information Center [EPIC] et al. 2001). Adults typically migrate into fresh water beginning in late February; spawning occurs from March to July, with peak activity from April to June (Moyle et al. 2015). Emigration typically occurs after a period of over-summering followed by out-migration in the fall/winter period coinciding with increases in flow.

Based on information from catches of green sturgeon eggs, larvae, and juveniles, and additional data derived from monitoring studies of white sturgeon, it appears that green sturgeon in the Sacramento River spawn from above Hamilton City to above Red Bluff Diversion Dam, maybe as far upstream as Keswick Dam (CDFG 2002). Juvenile green sturgeon are believed to reside in freshwater habitats from one to three years, before emigrating to the Delta under winter high-flow events. However, the timing of emigration is unknown (EPIC et al. 2001). Following emigration from the upper Sacramento River, juvenile green sturgeon are widely distributed throughout the Delta (Radtke 1966).

Although adult green sturgeon have been documented occasionally in the Feather River, the numbers are low, sporadic, and there is limited evidence of historic or current spawning (Moser et al. 2016). However, green sturgeon eggs were collected in the Feather River in June 2011 (Seesholtz et al. 2015), indicating potentially successful spawning in this system. Adult sDPS green sturgeon have also been observed in the lower Yuba River downstream of Daguerre Point Dam (the upstream limit for critical habitat in the lower Yuba River and presumed to be a barrier to green sturgeon migration) in 2011, 2016, and 2017 (Cramer Fish Sciences 2011; CDFW 2018; CDFW 2019). In a study using submersible mats to collect fish eggs, CDFW (2018) collected approximately 270 green sturgeon eggs in the lower Yuba River in June 2017 and a single juvenile green sturgeon in August 2019 (CDFW 2019), indicating successful green sturgeon spawning in the lower Yuba River. Based on this information, there is a low potential for green sturgeon to occur in the Study Area.

Pacific Lamprey

Pacific lamprey (*Lampetra tridentata*) is not listed pursuant to either the federal or California ESAs; however, it is designated by CDFW as an SSC due to declining abundance throughout its range in California (Moyle et al. 2015). The reason for this decline is believed to be a secondary effect of the reduction in abundance of anadromous salmonids, the primary prey of Pacific lamprey.

Lampreys are eel-like, jawless fishes with a cartilaginous skeleton and disc-shaped, sucker-like mouths. Pacific lamprey are predatory and anadromous, although landlocked (i.e., potamodromous) populations exist in some inland water bodies. The adult predatory, ocean-residing stage typically lasts three to four years and these fish rarely stray far from the mouths of their natal streams (Moyle 2002). Adult fish ranging from 30-76 cm total length typically move upstream to spawning streams from March to late June (Moyle 2002). After males and females excavate a redd, the female attaches to the substrate and releases 20,200 to 200,000 eggs that are fertilized by males. The majority of adult fish die following spawning, although a small proportion may survive to spawn the following year at a larger size. The fertilized eggs hatch after approximately 19 days at 15°C (Moyle 2002). The larval ammocoetes remain in the gravel for a short period before emerging and being swept downstream, where they burrow into soft sediments and filter organic material from the substrates. Following a five-- to seven-year residence period in freshwater, the ammocoetes undergo metamorphosis to an adult, predatory stage that is tolerant of saltwater and subsequently migrate downstream under high winter flows to the ocean.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

River Lamprey

The river lamprey is a California SSC. The abundance of this species in California is believed to be declining, primarily due to degradation and fragmentation of suitable spawning and rearing habitats and declines in salmonid prey species (Moyle et al. 2015).

The river lamprey is relatively small (averaging 17 cm) 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. It may have its greatest abundance in the Sacramento–San Joaquin River system, although it is not commonly observed in large numbers (Moyle et al. 2015). 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. 2015). 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).

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Sacramento Hitch

Sacramento hitch (*Lavinia exilicauda*) is not listed pursuant to either the federal or California ESAs; however, it is designated by CDFW as an SSC due to long-term declines in abundance and distribution (Moyle et al. 2015). Major factors that may threaten the abundance and distribution of Sacramento hitch include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species (Moyle et al. 2015).

Sacramento hitch are relatively large (i.e., up to 35 cm standard length [SL]), deep-bodies cyprinids that occur in warm low-elevation water bodies, including clear streams, turbid sloughs, lakes, and reservoirs (Moyle 2002). They have wide environmental tolerances, capable of withstanding short-term temperatures of nearly 38°C and salinities as high as nine parts per thousand (Moyle 2002). Sacramento hitch are omnivorous, feeding on zooplankton, filamentous algae, and aquatic and terrestrial insects (Moyle et al. 2015). Females typically mature in years two or three, while males mature in years one, two, or three. Spawning typically occurs in riffles of streams and in sloughs after spring rains increase flows and temperatures reach 14-18°C (Moyle 2002). Sacramento hitch are broadcast spawners that occur in groups with vigorous splashing. A spawning female releases 9,000 to 63,000 eggs into the water column, which are fertilized by one to five males immediately after their release. Fertilized eggs swell to approximately four times their initial size after settling into the substrate. Larvae hatch in three to seven days at 15-22°C and become free-swimming within three to four days (Moyle et al. 2015).

This species has been documented in the Feather River near the study area (Seesholtz et al. 2004) and, thus, is considered present.

Sacramento Splittail

Sacramento splittail (*Pogonichthys macrolepidotus*) is not listed pursuant to either the federal or California ESAs; however, it was previously listed as a threatened species by the USFWS in 1999 and was subsequently delisted in 2003 in light of new information regarding the biology and status of the species (Moyle et al. 2004). It is currently designated by CDFW as an SSC due to declining abundance and

distribution. Major factors that may threaten the abundance and distribution of Sacramento splittail include major dams, water quality degradation associated with agricultural activities, alteration of the Sacramento-San Joaquin River Estuary, and invasive species (Moyle et al. 2015).

Sacramento splittail relatively large (i.e., 40 cm SL) and long-lived (i.e., seven-10 years) warm water fish typically found at water temperatures ranging from 5-24°C (Moyle 2002). When acclimated to elevated temperatures, splittail can tolerate temperatures up to 33°C (Moyle 2002). Adult splittail typically reach sexual maturity in their second year. Upon reaching maturity, adult splittail migrate upstream from November through February (Moyle 2002). Adults spawn on floodplains or flooded edge habitats in March and April at water temperatures between 14-19°F (Moyle 2002) and then move back downstream. Eggs acquire adhesive properties following exposure to water and adhere to vegetation or other benthic substrates. Fertilized eggs generally hatch in three to five days and larvae begin feeding on plankton soon thereafter. Juvenile splittail inhabit shallow, low-velocity habitats with abundant vegetation as they migrate downstream to the Delta. Emigration through the lower Sacramento River occurs from February through August, with peak emigration occurring from March through June (Moyle 2002). Splittail are benthic foragers that feed primarily on aquatic invertebrates, although detritus may make up a substantial proportion of their diet (Moyle et al. 2015).

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Hardhead

Hardhead (*Mylopharodon conocephalus*) is not listed pursuant to either the federal or California ESAs; however, it is designated by CDFW as an SSC due to declining numbers and small, isolated populations (Moyle et al. 2015). Primary threats to the species include dams and diversions, water quality degradation associated with agricultural activities, and invasive species (Moyle et al. 2015).

Hardhead occur in relatively undisturbed clear and cool (i.e., up to 20°C maximum summer temperature) low- to mid-elevation streams below approximately 1,500 meters (Moyle et al. 2015). Hardhead are primarily bottom-feeding fish that forage on aquatic invertebrates and aquatic vegetation, but will also prey on drifting invertebrates, plankton, and algae and terrestrial insects (Moyle et al. 2015). Hardhead reach maturity at age two and spawn primarily in April and May (Moyle 2002). Adult fish migrate into smaller tributary streams and aggregate in pools, returning to their home pools in larger rivers after spawning. Females produce over 20,000 eggs, which are deposited in sand or gravel substrates in riffles, runs, or heads of pools (Moyle 2002). After hatching, larval fish are believed to remain in near-shore areas with dense cover, gradually moving downstream and into deeper habitats with increased growth.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

Riffle Sculpin

Riffle sculpin (*Cottus gulosus)* is not listed pursuant to either the federal or California ESAs; however, it is designated by CDFW as an SSC. The primary threats to riffle sculpin include increasing isolation between

populations, thereby increasing vulnerability to local extirpation, and habitat changes that may reduce flows or increase water temperatures (Moyle et al. 2015).

Riffle sculpin are common in many clear and cold (i.e., maximum temperature <26°C) perennial streams predominated by riffle habitats with rock or gravel substrates and relatively high dissolved oxygen concentrations (Moyle 2002). They are benthic dwellers that typically co-occur with rainbow trout, but occupy different microhabitats and, therefore, interactions between the two species are not common. Riffle sculpin are opportunistic feeders that prey upon benthic macroinvertebrates, amphipods, and other small fish. Riffle sculpin typically have a four-year life span and reach sexual maturity at the end of their second year. Spawning typically occurs from late February through April in nests on the underside of rocks in riffles, or in cavities of submerged logs (Moyle 2002). Embryos hatch in 11-24 days at temperatures of 10-15°C, and adult males guard the embryos and fry during this period.

This species has been documented in the Feather River near the Study Area (Seesholtz et al. 2004) and, thus, is considered present.

5.6.3 Invertebrates

A total of four special-status invertebrate species were identified as having the potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, all but one was determined to be absent due to lack of suitable habitat: valley elderberry longhorn beetle (*Desmocerus californicus dimorphus,* VELB). A brief description of this species is presented below.

Valley Elderberry Longhorn Beetle

The VELB is listed as threatened pursuant to the federal ESA (USFWS 1980). The VELB is completely dependent on its larval host plant, elderberry (*Sambucus* sp.), which occurs in riparian and other woodland and scrub communities (USFWS 1999, 2017). Elderberry plants located within the range of the beetle, with one or more stems measuring 1.0 inch or greater in diameter at ground level are considered to be habitat for the species (USFWS 1999). The adult flight season extends from late March through July (USFWS 2017). During that time the adults feed on foliage and perhaps flowers, mate, and females lay eggs on living elderberry plants (Barr 1991). The first instar larvae bore into live elderberry stems, where they develop for one to two years feeding on the pith. The fifth instar larvae create exit holes in the stems and then plug the holes and remain in the stems through pupation (Talley et al. 2007). The VELB occurs in metapopulations throughout the Central Valley (Collinge et. al 2001 as cited in USFWS 2017). These metapopulations (subpopulations) occur throughout contiguous riparian habitat, which shift temporarily and spatially based on changing environmental conditions. This temporal and spatial shifting of the metapopulations results in a patchy and ever-changing distribution of the species. Research indicates that dense elderberry shrub clumps in healthy riparian habitat is the primary habitat for the VELB (USFWS 2017). The beetle's current distribution extends from Shasta County in the north to Fresno County in the south and includes everything from the valley floor up into the lower foothills (USFWS 2017). The vast

majority of VELB occurrences have been recorded below 500 feet (152 meters), however, rare occurrences have been recorded up to approximately 3,000 feet (USFWS 1999; USFWS 2017).

There are two documented CNDDB occurrences of this species located within five miles of the Study Area (CDFW 2020). Numerous elderberry shrubs were mapped in the Study Area (Figure 6. *Elderberry Shrub Locations*). VELB has potential to occur within the Study Area.

5.6.4 Reptiles

A total of two special-status reptile species were identified as having the potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, one reptile was identified to have potential to occur in the Study Area as described below.

Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata*) is not listed pursuant to either the federal or California ESAs; however, it is designated as a CDFW SSC. Northwestern pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow-moving streams (Jennings and Hayes 1994). This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter (Jennings and Hayes 1994). Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops is optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles and hatchlings require shallow edgewater with relatively dense submergent or short emergent vegetation in which to forage. Northwestern pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August (Jennings and Hayes 1994). Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions (Jennings and Hayes 1994). The majority of nesting sites are located within 650 feet (200 meters) of aquatic sites; however, nests have been documented as far as 1,310 feet (400 meters) from aquatic habitat.

There are no CNDDB occurrences of this species located within five miles of the Study Area (CDFW 2020). There is limited potential for this species to occur in the Study Area primarily as a movement corridor. The ongoing disturbance at the boat ramp and lack of persistent hydrology in the wastewater ponds limit the presence of suitable habitat for this species within the Study Area.

5.6.5 Birds

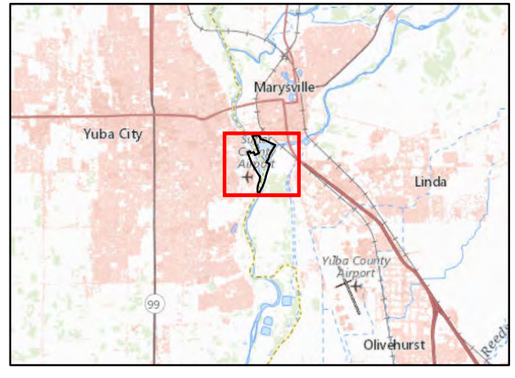
A total of 23 special-status bird species were identified as having the potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, nine species were determined to be absent due to lack of suitable habitat or because the Study Area is outside the elevational range for the species. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining 14 species that have the potential to occur within the Study Areas are presented below.

Figure 6.
Elderberry Shrub Locations

Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.
- Elderberry Shrub Locations (34)

Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Feather River Sediment Removal and Invasive Species Removal Project

Scale in Feet
0 600

Map Date: 8/4/2020

ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\SSS_Survey_and_Mapping\Elderberry\SBFCA_SedimentRemoval_Elderberry_20200804.mxd (CCH) chinkelman 8/4/2020

Long-billed curlew

The long-billed curlew (*Numenius americanus*) is not listed in accordance with either the California or federal ESAs, but is designated as a BCC by the USFWS and a CDFW "watch list" species. The breeding range of this species includes the Great Plains, Great Basin and intermontane valleys of the western U.S. and southwestern Canada (Dugger and Dugger 2020). In the U.S., their wintering range includes California, Louisiana, and Texas. Winter foraging habitat includes rice fields (flooded and unflooded), managed wetlands, evaporation ponds, sewage ponds, and grasslands (Dugger and Dugger 2020).

There are no CNDDB occurrences of this species located within five miles of the Study Area (CDFW 2020). Long-billed curlew do not nest in the Study Area region but may occasionally forage within grassland communities (or wetlands, agricultural fields) during winter. Therefore, this species has low potential to occur in the Study Area.

Marbled godwit

The marbled godwit (*Limosa fedoa*) is not listed in accordance with either the California or federal ESAs, but is designated as a BCC by the USFWS. Marbled godwits breed in the northern grassland of the U.S. (from Montana and the Dakotas to Minnesota) and southern Canada. Marbled godwits do not breed in California but can be found overwintering in coastal mudflats adjoining savannahs and meadows, estuaries, sandy beaches, sandflats, and salt ponds (Gratto-Trevor 2020).

There are no CNDDB occurrences of this species located within five miles of the Study Area (CDFW 2020). There is low potential for this species to occur in the Study Area during winter.

Short-billed dowitcher

The short-billed dowitcher (*Limnodromus griseus*) is not listed in accordance with either the California or federal ESAs, but is designated as a BCC by the USFWS. Short-billed dowitchers breed in muskegs of taiga to subarctic tundra in southeastern Alaska and northern Canada (Jehl et al. 2020). In California, short-billed dowitchers overwinter along the Pacific Coast from Humboldt County to southern California in coastal mudflats and brackish lagoons (Jehl et al 2020).

There are no CNDDB occurrences of this species located within five miles of the Study Area (CDFW 2020). There is low potential for this species to occur in the Study Area during winter.

White-tailed kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either the California or federal ESAs; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 2020). In northern California, white-tailed kite nesting occurs from March through early August, with nesting activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (Dunk 2020).

There is one CNDDB occurrence of this species within five miles of the Study Area (CDFW 2020). While the riparian woodlands along the river provide suitable nesting habitat for this species, the ongoing disturbance associated with the boat ramp and maintenance of the wastewater ponds limits the potential for this species to nest in the Study Area.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) has been delisted under the federal ESA but remains listed as Endangered under the California ESA. It is fully protected pursuant to the California Fish and Game Code Section 3511 and the federal Bald and Golden Eagle Protection Act. It is a Bureau of Land Management sensitive species, a U. S. Forest Service (USFS) sensitive species, and is considered a USFWS BCC. Bald eagles breed at lower elevations in the northern Sierra Nevada and North Coast ranges. Bald eagles breed in forested areas adjacent to large waterbodies (Buehler 2020). Tree species used for nesting is quite variable and includes conifers (dominant where available), oaks, hickories, cottonwoods and aspens (Buehler 2020). Nest trees are generally the largest tree available in a suitable area (Buehler 2020). Breeding activity occurs during late-February through September, with peaks in activity from March to June.

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). While the riparian woodlands along the river may provide suitable nesting habitat for this species, the ongoing disturbance associated with the boat ramp and maintenance of the wastewater ponds limits the potential for this species to nest in the Study Area.

Swainson's hawk

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to the California ESA. This species nests in North America (Canada, western U.S., and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2020). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

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

There are several CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). While the riparian woodlands along the river provide suitable nesting habitat for this species, the ongoing

disturbance associated with the boat ramp and maintenance of the wastewater ponds limits the potential for this species to nest in the Study Area.

Burrowing owl

The burrowing owl (*Athene cunicularia*) is not listed pursuant to either the California or federal ESAs; however, it is designated as a BCC by the USFWS and an SSC by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Poulin et al. 2020). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel but may also use manmade structures such as concrete culverts or pipes; concrete, asphalt, or wood debris piles; or openings beneath concrete or asphalt pavement (CDFG 2012). The breeding season typically occurs between February 1 and August 31 (California Burrowing Owl Consortium [CBOC] 1993; CDFG 2012).

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present in ruderal vegetation around the wastewater ponds. Therefore, there is potential for this species to occur in the Study Area.

Nuttall's woodpecker

The Nuttall's woodpecker (*Dryobates nuttallii*) is not listed and protected under either state or federal ESAs but is considered a USFWS BCC. They are resident from Siskiyou County south to Baja California. Nuttall's woodpeckers nest in tree cavities primarily within oak woodlands, but also can be found in riparian woodlands (Lowther et al. 2020). Breeding occurs during April through July.

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Yellow-billed magpie

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either the California or federal ESAs but is considered a USFWS BCC. This endemic species is a yearlong resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late-January to mid-February, which may take up to six to eight weeks to complete, with eggs laid during April-May, and fledging during May-June (Koenig and Reynolds 2020). The young leave the nest at about 30 days after hatching (Koenig and Reynolds 2020). Yellow-billed magpies are highly susceptible to West Nile Virus, which may have been the cause of death to thousands of magpies during 2004-2006 (Koenig and Reynolds 2020).

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Bank swallow

Bank swallow (*Riparia riparia*) is listed as a threatened species and protected pursuant to the California ESA but has no federal special status. The subspecies that breeds in North America can also be found breeding in Eurasia, the Mediterranean region and winters in Central and South American and Africa (Garrison and Turner 2020). This species occurs on ocean coasts, along rivers and creeks, lakes, reservoirs, and wetlands where exposed banks are utilized for nesting (Garrison and Turner 2020). Most colonies within California are located in the extreme northern portion of the state with scattered populations along the north coast, Central Valley, Mono Basin, and Crowley Lake (Mono County) (Small 1994). Burrows are typically excavated within banks which have friable soils and nesting occurs during May through July.

There are several CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Oak titmouse

Oak titmouse (*Baeolophus inornatus*) are not listed and protected under either state or federal ESAs, but are considered a USFWS BCC. Oak titmouse breeding range includes southwestern Oregon south through California's Coast, Transverse and Peninsular ranges, western foothills of the Sierra Nevada, into Baja California; they are absent from the humid northwestern coastal region and the San Joaquin Valley (Cicero et al. 2020). They are found in dry oak or oak-pine woodlands but may also use scrub oaks or other brush near woodlands (Cicero et al. 2020). Nesting occurs during March through July.

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Wrentit

The wrentit (*Chamaea fasciata*) is not listed in accordance with either the California or federal ESAs but is designated as a BCC by the USFWS. Wrentit are a sedentary resident along the west coast of North America from the Columbia River south to Baja California (Geupel and Ballard 2020). Wrentit are found in coastal sage scrub, northern coastal scrub, and coastal hard and montane chaparral and breed in the dense understory of Valley oak riparian, Douglas-fir and redwood forests, early-successional forests, riparian scrub, coyote bush and blackberry thickets, suburban parks and larger gardens (Geupel and Ballard 2020). Nesting occurs during March through August.

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Song sparrow "Modesto" Population

The song sparrow (*Melospiza melodia*) is considered one of the most polytypic songbirds in North America (Miller 1956 as cited in Arcese et al.2020). The subspecies *Melospiza melodia heermanni* includes as synonyms *M. m. mailliardi* (the "Modesto song sparrow") and *M. m. cooperi* (Arcese et al. 2020). The "Modesto song sparrow" is not listed and protected pursuant to either the California or federal ESAs but is considered a CDFW SSC. The subspecies *M. m. heermanni* can be found in central and southwestern

California to northwestern Baja California (Arcese et al. 2020). Song sparrows in this group may have slight morphological differences but they are genetically indistinguishable. The "Modesto song sparrow" occurs in the Central Valley from Colusa County south to Stanislaus County, and east of the Suisun Marshes (Grinnell and Miller 1944). Nesting habitat includes riparian thickets and freshwater marsh communities, with nesting occurring from April through June.

There is one, non-site-specific and outdated CNDDB occurrence of this species within five miles of the Study Area (CDFW 2020). Suitable nesting habitat is present; therefore, there is potential for this species to occur in the Study Area.

Tricolored blackbird

The tricolored blackbird (TRBL, *Agelaius tricolor*) was granted emergency listing for protection under the California ESA in December 2014, but the listing status was not renewed in June 2015. After an extensive status review, the California Fish and Game Commission listed TRBL as a threatened species in 2018. In addition, it is currently considered a USFWS BCC and a CDFW SSC. This colonial nesting species is distributed widely throughout the Central Valley, Coast Range, and into Oregon, Washington, Nevada, and Baja California (Beedy et al. 2020). TRBLs nest in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or level of human disturbance. TRBL nesting habitat includes emergent marsh, riparian woodland/scrub, blackberry thickets, densely vegetated agricultural and idle fields (e.g., wheat, triticale, safflower, fava bean fields, thistle, mustard, cane, and fiddleneck), usually with some nearby standing water or ground saturation (Beedy et al. 2020). They feed mainly on grasshoppers during the breeding season but may also forage upon a variety of other insects, grains, and seeds in open grasslands, wetlands, feedlots, dairies, and agricultural fields (Beedy et al. 2020). The nesting season is generally from March through August.

There are several CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). There is no nesting habitat in the Study Area and marginal foraging habitat. There is low potential for this species to occur in the Study Area.

5.6.6 Mammals

A total of four special-status mamma; species were identified as having the potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, all four mammal species were determined to have potential to occur in the Study Area as described below.

Ringtail

Ringtail (*Bassariscus astutus*) is not listed pursuant to the federal or California ESAs but is designated as Fully Protected in California by CDFW. This is a smallish, somewhat cat-like procyonid, related to the widespread raccoon (*Procyon lotor*) and neotropical white-nosed coati (*Nasua narica*). Ringtails are mesocarnivores of riparian areas, especially those with abundant rocky outcrops, in low- to middle elevation drainages in blue oak woodlands, foothill pine/oak forests, chaparral, ponderosa pine

woodlands, black oak woodlands, riparian deciduous forests, and mixed coniferous forest (Verner and Boss 1980). Highly nocturnal, ringtails consume small rodents, snakes, birds and their eggs, invertebrates, and some fruits, nuts, and carrion (Zeiner et al. 1990b). There is potential for this species to occur in the Study Area.

Pallid bat

The pallid bat (*Antrozous pallidus*) is not listed pursuant to either the California or federal ESAs; however, this species is considered an SSC by CDFW. The pallid bat is a large, light-colored bat with long, prominent ears and pink, brown, or grey wing and tail membranes. This species ranges throughout North America from the interior of British Columbia, south to Mexico, and east to Texas. The pallid bat inhabits low elevation (below 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forest (above 7,000 feet). This species roosts alone or in groups in the crevices of rocky outcrops and cliffs, caves, mines, trees, and in various human structures such as bridges and barns. Pallid bats are feeding generalists that glean a variety of arthropod prey from surfaces as well as capturing insects on the wing. Foraging occurs over grasslands, oak savannahs, ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. This species is not thought to migrate long distances between summer and winter sites (Western Bat Working Group [WBWG] 2017).

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Nevertheless, the Project site buildings and trees provide potential roost sites and this species has potential to occur in the Study Area.

Townsend's big eared bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered an SSC by CDFW. Townsend's big-eared bat is a fairly large bat with prominent bilateral nose lumps and large "rabbit-like" ears. This species occurs throughout the west and ranges from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains. This species has been reported from a wide variety of habitat types and elevations from sea level to 10,827 feet. Habitats include coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Its distribution is strongly associated with the availability of caves and cave-like roosting habitat including abandoned mines, buildings, bridges, rock crevices, and hollow trees. Townsend's big-eared bat primarily forages on moths. Foraging habitat is generally edge habitats along streams adjacent to and within a variety of wooded habitats. This species often travels long distances when foraging and large home ranges have been documented in California (WBWG 2017).

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Nevertheless, the Project site buildings and trees provide potential roost sites and this species has potential to occur in the Study Area.

Western Red Bat

The western red bat (*Lasiurus blossevillii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered an SSC by CDFW. The western red bat is easily distinguished from other western bat species by its distinctive red coloration. This species is broadly distributed; its range extends from southern British Columbia in Canada through Argentina and Chile in South America and including much of the western U.S. This solitary species day roosts primarily in the foliage of trees or shrubs in edge habitats bordering streams or open fields, in orchards, and occasionally urban areas. They may be associated with intact riparian habitat, especially with willows, cottonwoods, and sycamores. This species may occasionally use caves for roosting as well. They feed on a variety of insects, and generally begin to forage one to two hours after sunset. This species is considered highly migratory; the timing of migration and the summer ranges of males and females may be different. Winter behavior of this species is poorly understood (WBWG 2017).

There are no CNDDB occurrences of this species within five miles of the Study Area (CDFW 2020). Nevertheless, the Project site riparian trees provide potential roost sites and this species has potential to occur in the Study Area.

5.7 Critical Habitat and Essential Fish Habitat

The Study Area is designated Critical Habitat for the following federally listed species.

- Central Valley spring-run ESU Chinook salmon,
- Central Valley DPS steelhead, and
- Southern DPS North American green sturgeon (USFWS 2020b).

The Study Area is EFH for Pacific Coast salmon (i.e., Chinook salmon, including Central Valley spring-run and fall-run ESUs).

5.8 Riparian Habitats and Sensitive Natural Communities

As described above, the riparian habitat in the Study Area is a relatively narrow corridor of mature trees with varying densities of understory cover, depending on levels of human use. Two sensitive natural communities were identified as having potential to occur within the Study Area based on the literature review (CDFW 2020). These included Great Valley Mixed Riparian Forest and Great Valley Cottonwood Riparian Forest. Based on the site visit, the mixed riparian woodlands present within the Study Area are likely too narrow and limited in extent to be representative of Great Valley Mixed Riparian Forest or Great Valley Cottonwood Riparian Forest.

5.9 Wildlife Movement/Corridors and Nursery Sites

The Feather and Yuba rivers provide an important aquatic and terrestrial wildlife movement corridor. The rivers are both important migratory habitat for a diversity of native and nonnative fish species, including both resident and anadromous (i.e., ocean migrating) species. Adjacent riparian woodlands and open

spaces, though limited in extent, support riparian wildlife and wildlife movements through the upland portions of the Study Area.

For the purposes of this analysis, nursery sites include but are not limited to concentrations of nest or den sites such as heron rookeries or bat maternity roosts. This data is available through CDFW's BIOS database or as occurrence records in the CNDDB and is supplemented with the results of the field reconnaissance. No nursery sites have been documented within the Study Area (CDFW 2020) and none were observed during the site reconnaissance.

6.0 IMPACT ANALYSIS

This section specifically addresses the questions raised by the CEQA - Appendix G Environmental Checklist Form, IV. Biological Resources. This section also identifies the appropriate recommendations to reduce potential impacts of the actions to less than significant. The recommendations are described in detail in Section 7.0.

6.1 Special Status Species, Designated Critical Habitat and Essential Fish Habitat

Would the Project result in effects, either directly or through habitat modifications, to species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

The Project would result in temporary construction related impacts to the upland and aquatic resources that provide habitat for special-status species within the Study Area. Potential impacts to upland habitats include temporary disturbance associated with staging, dewatering, and disposal of dredged spoils. The Project would result in temporary impacts to aquatic habitat from dredging operations within the Feather and Yuba rivers. As such, the Project would potentially have a substantial adverse effect, either directly or through habitat modifications, on special-status species identified by CDFW, USFWS, and NMFS and on Critical Habitat and EFH as identified by NMFS. Impacts by species or habitat group are summarized below.

6.1.1 Impacts to Special Status Plants

There is no habitat for federally or State-listed plant species in the Study Area and there is low potential for seven special status plant species to occur. Upland staging and dewatering areas would generate a temporary disturbance, but would not result in permanent habitat modifications. Implementation of Recommendations BIO1 and PLANT1 described in Section 7.0 would avoid or minimize potential effects to special status plants.

6.1.2 Impacts to Special Status Fish Species, Critical Habitat, and Essential Fish Habitat

Nine special status fish species, including three federally threatened species, have potential to occur in the Study Area. Direct impacts to special status fish species could occur as a result of dredging operations

through noise, scraping bottom substrates and causing downstream turbidity. Implementation of the recommendation FISH1 outlined in Section 7.0 would minimize the effects of the Project on listed and special status fish species.

The Study Area includes designated Critical Habitat for three federally threatened fish species: Chinook salmon, steelhead, and green sturgeon and is EFH for Chinook salmon. Dredging operations would temporarily disturb designated critical habitat and EFH by scraping bottom substrates and causing turbidity downstream. These temporary effects would not affect the integrity of the physical and biological factors contributing to the critical habitat designation or result in permanent impacts or loss of EFH. Implementation of the recommendation FISH1 outlined in Section 7.0 would avoid or minimize the potential effects on designated critical habitat and EFH.

6.1.3 Impacts to Northwestern Pond Turtles

Northwestern pond turtles may occur in the upland and river portions of the Study Area. The upland areas have low potential to support this species due to the nature of the soils (which are not conducive to nest building) and the extent of public use. Implementation of BIO1 and NPT1 outlined in Section 7.0 is expected to avoid or minimize potential effects to this species in upland portions of the Study Area. In aquatic habitat, this species may inadvertently be captured by dredging equipment most likely resulting in direct mortality. More likely, noise and disturbance associated with setting up the dredging operation and installing BMPs for water quality would deter and displace turtles from the work area. This could increase or decrease susceptibility to predation, particularly for hatchlings, depending on how predators behave in response to the dredging operation. Overall, the effects are expected to be temporary and minimized by the implementation of Recommendations BIO1 and FISH1 outlined in Section 7.0.

6.1.4 Impacts to Valley Elderberry Longhorn Beetle

There are numerous elderberry shrubs, the host species for VELB, in the Study Area. Because the shrubs occur in riparian habitat, they are suitable habitat for VELB and potentially occupied habitat (USFWS 2017). The Applicant would avoid direct impacts (removal) of elderberry shrubs and implementation of the recommendations BIO1 and VELB1 outlined in Section 7.0 to minimize the potential for direct effects on VELB.

6.1.5 Impacts to Special Status Birds

Three State-listed bird species have the potential to occur in the Study Area and there is potential for 11 additional special status bird species in the Study Area. Upland staging and dewatering areas would generate a temporary disturbance that would likely displace nesting birds from the Study Area for the duration of construction but would not result in permanent habitat modifications. If special status birds initiate nesting prior to the start of construction, direct effects would largely be avoided by implementation of the recommendation BIRD1, outlined in Section 7.0. This recommendation requires preconstruction surveys and establishment of buffers and monitoring at nest sites until young of the year have fledged.

6.1.6 Impacts to Special Status Mammals

There are four special-status mammals with potential to occur in the Study Area. The Project would not remove upland vegetation, including trees and is therefore not expected to result in adverse effects of habitat modification for special status mammals. Implementation of recommendations MAM1 outlined in Section 7.0 would further reduce the potential for effects to special status mammals.

6.2 Riparian Habitat and Sensitive Natural Communities

Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

The Study Area supports riparian woodland habitat along the Feather and Yuba rivers. Construction staging and dewatering dredged spoils would occur in upland, developed or disturbed areas of the Study Area. No vegetation clearing or tree removal within riparian habitats is expected to be required; therefore, the Project would not result in permanent adverse effects to riparian habitats. Implementation of recommendation BIO1 described in Section 7.0 would further reduce the potential for temporary impacts to riparian habitats. There are no Sensitive Natural Communities as defined by CDFW within the Study Area. Therefore, no impacts would occur.

6.3 Aquatic Resources, Including Waters the U.S. and State

Would the Project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The Project would have no direct impact on federally protected wetlands; however, the Feather and Yuba rivers are considered Waters of the U.S. and the Feather River is designated as a Section 10 Navigable Water. Project implementation would temporarily disturb Waters of the U.S. through proposed dredging of the Feather and Yuba rivers. Recommendations to reduce impacts to Waters of the U.S. are provided in Section 7.0.

6.4 Wildlife Movement/Corridors

Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The Feather and Yuba rivers are important migratory corridors for native fish. Project dredging activities have the potential to interfere with natural movements of resident and migratory fish species. Implementation of Recommendations BIO1 and FISH1 described in Section 7.0 are expected to avoid and minimize potential effects.

The forested uplands and open space lands within the Study Area provide some limited migratory opportunities for wildlife. Establishment of the staging areas, dewatering the dredged spoils, and operation of equipment is likely to temporarily disturb and displace most wildlife from the Study Area. Some wildlife such as birds or nocturnal species are likely to continue to use the habitats opportunistically for the duration of construction. Once construction is complete, wildlife movements are expected to resume.

As discussed in Section 5.9, the Study Area does not include a known nursery sites and no evidence of a wildlife nursery site was observed during the field reconnaissance. Therefore, the Project is not expected to impact wildlife nursery sites. Potential impacts to individual nesting birds would be reduced by implementation of recommendation BIRD1 described in Section 7.2.

6.5 Local Policies, Ordinances, and Other Plans

Does the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Project does not anticipate requiring removal of trees or other upland vegetation. The Project does not conflict with a local policy or ordinance protecting biological resources, including tree ordinances. The Applicant would coordinate with the local jurisdiction to secure the necessary variance, permit, or approval if a conflict is identified.

Does the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Study Area is not covered by any local, regional, or State conservation plan. Therefore, the Project would not conflict with a local, regional, or State conservation plan.

7.0 RECOMMENDATIONS

This section summarizes recommended measures to avoid, minimize, or compensate for potential impacts to biological resources from the proposed Project.

7.1 General Recommendations

The following general measure is recommended:

BIO1 – The project will implement erosion control measures and BMPs to reduce the potential for sediment or pollutants at the Project site. Measures may include:

- Erosion control measures will be placed between Waters of the U.S., and the outer edge of the staging and dewatering areas, within an area identified with highly visible markers (e.g., construction fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification and erosion control measures will be properly maintained until construction is completed and the soils have been stabilized.

- Fiber rolls used for erosion control will be certified by the California Department of Food and Agriculture as weed free.
- Seed mixtures applied for erosion control will not contain California Invasive Plant Council designated invasive species (http://cal-ipc.org/) and will be composed of native species appropriate for the site.
- Trash generated onsite will be promptly and properly removed from the site.
- Any fueling in the upland portion of the Study Area will use appropriate secondary containment techniques to prevent spills.
- A qualified biologist will conduct a mandatory Worker Environmental Awareness Program for all contractors, work crews, and any onsite personnel on the potential for special status species to occur on the Project site. The training will provide an overview of habitat and characteristics of the species, the need to avoid certain areas, and the possible penalties for non-compliance.
- A qualified biologist/biological monitor will be onsite during daily construction activities to ensure compliance with the anticipated terms and conditions of the Project regulatory permits and CEQA compliance document. If appropriate, the approved biologist will train an individual to act as the onsite construction monitor for periods when there is a low risk of effect to special status species.

7.2 Special-Status Species

Recommendations to minimize impacts to special status species or habitats are summarized below by species group.

7.2.1 Plants

There is low potential for seven special-status plants to occur within the Study Area. Upland staging and dewatering areas would generate a temporary disturbance but would not result in permanent habitat modifications. Implementation of recommendation BIO1 would minimize the potential for impacts to plants associated with upland work areas. If the Project requires ground disturbance (i.e., grading or earthwork) in suitable habitat for the special-status plants, the following measure is recommended:

PLANT 1 - Preconstruction floristic surveys shall be conducted for any areas of proposed ground disturbance (i.e., grading or earth work) in the Study Area with the potential to support special-status plants. The area of ground disturbance and a 25-foot buffer would be surveyed by a qualified botanist during the appropriate blooming period prior to the start of Project activity. If no special status plants are found during the preconstruction surveys, no further measures are necessary. If surveys identify any special-status plants, the Applicant shall identify them with flagging and avoid them with a 25-foot no-disturbance buffer during Project activities. If this

avoidance is not feasible, the Applicant shall consult with CDFW to determine whether alternative avoidance measures that are equally protective are possible.

7.2.2 Fish Species, Critical Habitat, and Essential Fish Habitat

The Study Area supports listed and special status fish species, designated critical habitat, and EFH. Therefore, the following measure is recommended:

FISH1 – To avoid and minimize potential adverse effects to listed and special status fish species, designated critical habitat, and EFH implement the following:

- Implement dredging operations during a limited work window (likely June 15 through October 15) to avoid the most sensitive life stages of ESA-listed anadromous fish species;
- Deploy measures, as practicable, to reduce sediment resuspension such as a turbidity curtain, if feasible, given the flow volume and velocity in the Study Area;
- Employ a fish biologist to be onsite as needed to monitor dredging activities and check the exit end of the suction pipe and spoils (i.e., sediment and vegetation);
- If/where mechanical dredging is used, attempt to exclude fish and other aquatic organisms from the area using block nets, to the extent feasible for the Study Area.
- Through the Rivers and Harbors Act Section 10 Minor Impact Letter of Permission, request the USACE initiate ESA Section 7 Consultation with NMFS on the project effects to ESA-listed anadromous fish species, designated critical habitat, and EFH.
- Consult with CDFW and if necessary, secure an Incidental Take Permit 2081, pursuant to Section 2080 of the California Fish and Game Code.

7.2.3 Northwestern Pond Turtle

Northwestern pond turtles may occur incidentally within the river portion of the Study Area. Implementation of recommendations BIO1 and FISH1 would avoid and/or minimize potential adverse effects to northwestern pond turtles. Additionally, prior to establishment of construction staging and dewatering areas, the following measure is recommended:

NPT1 – Conduct a pre-construction northwestern pond turtle survey in the construction staging and dewatering areas 48 hours prior to construction activities. Any northwestern pond turtle individuals discovered in the Project work area immediately prior to or during Project activities shall be allowed to move out of the work area of their own volition. If this is not feasible, they shall be captured by a qualified wildlife biologist and relocated out of harm's way to the nearest suitable habitat at least 100 feet from the Project work area where they were found.

7.2.4 Valley Elderberry Longhorn Beetle

The Project is not expected to require removal of elderberry shrubs. Nevertheless, construction activities would likely occur within 165 feet of elderberry shrubs, which could result in effects to shrubs or VELB flight patterns. In addition to measure BIO1, the following measure is recommended:

VELB1 – To avoid and minimize potential adverse effects to VELB, implement the following:

- Through the Rivers and Harbors Act Section 10 Minor Impact Letter of Permission, request the USACE initiate ESA Section 7 Consultation with USFWS, if necessary, on the project effects to ESA-listed VELB
- The area surrounding avoided elderberry shrubs shall be fenced and/or flagged as close to construction limits as possible. Recognizing that the Project may require staging/and or dewatering activities within 165 feet of some shrubs, the shrubs shall be protected during construction by establishing and maintaining a high-visibility fence as far from the drip line of each elderberry shrub as feasible.
- As much as feasible, all activities that could occur within 165 feet of an elderberry shrub will be conducted outside of the flight season of VELB (March - July).
- Herbicides will not be used within the drip line of any elderberry shrubs. Insecticides will not be used within 100 feet of an elderberry shrub and will be applied using a backpack sprayer or similar direct application method.
- The potential effects of dust on VELB will be minimized by applying water during construction activities or by presoaking work areas that will occur within 100 feet of any potential elderberry shrub habitat.

7.2.5 Special-Status Birds and MBTA-Protected Birds (including nesting raptors)

To ensure Project implementation would not disturb nesting birds, the following measure is recommended:

BIRD1 – To protect nesting birds, no Project activity shall begin from February 1 through August 31 unless the following surveys are completed by a qualified wildlife biologist. Separate surveys and avoidance requirements are listed below for all nesting birds, raptors, including bald eagle, burrowing owl, and Swainson's hawk.

- All Nesting Birds - Within 14 days prior to construction (or less if recommended by CDFW), survey for nesting activity of birds within each Project work area and a 100-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

- Raptors (including bald eagle) – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 500-foot radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Burrowing owl – A qualified wildlife biologist shall survey for burrowing owl within the Project work area and a 250-foot radius of the Project work area, within 14 days prior to starting Project activities. Surveys shall be conducted at appropriate times (dawn or dusk) to maximize detection. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
- Swainson's hawk – Within 14 days prior to construction, survey for nesting activity of birds of prey within each Project work area and a 0.25-mile radius. If any active nests are observed, these nests shall be designated a sensitive area and protected by an avoidance buffer established in coordination with CDFW until the breeding season has ended or until a qualified biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

Four special-status birds identified as potentially occurring are migrants and/or wintering species. These are marbled godwit, long-billed curlew, short-billed dowitcher, and TRBL. These species do not nest in this region or nesting habitat does not occur in the Survey Area. Therefore, no surveys for wintering and/or migrant or foraging species are recommended.

7.2.6 Special-Status Mammals

There is potential for four special-status mammals to occur within the Study Area. Upland staging and dewatering areas would generate a temporary disturbance but would not result in permanent habitat modifications. Implementation of BIO1 and the following measure is recommended would minimize the potential for impacts to mammals from upland work areas. If the Project requires removal of trees or buildings, the following additional measures are recommended:

MAM1 – Within 14 days of construction, a qualified biologist will survey all trees proposed for removal to determine their potential to provide suitable ringtail nest sites (e.g., trees with cavities). If potential nest trees are found, an avoidance area would be fenced and/or flagged around the tree as close to construction limits as possible.

MAM2 – Within 14 days of construction , a qualified biologist will survey for all suitable roosting habitat (e.g., manmade structures, trees) proposed for removal. If suitable roosting habitat is identified, a qualified biologist will conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If roosting bats are found, consultation

with CDFW prior to initiation of construction activities may be required. If bats are not found during the preconstruction surveys, no further measures are necessary.

7.3 Riparian and Sensitive Natural Communities

There are no sensitive natural communities in the Study Area. Riparian habitat is protected under the California Fish and Game Code. The Project does not expect to require vegetation clearing. Nevertheless, to minimize the potential for impacts to riparian habitat, the following measure is recommended:

RIP1 – The river channels will be accessed via areas where no permanent impacts to riparian vegetation will be required.

RIP2 – A Streambed Alteration Agreement (SAA), pursuant to Section 1602 of the California Fish and Game Code, must be obtained for any activity that will impact the Feather and Yuba rivers and riparian habitats. Minimization measures will be developed during consultation with CDFW as part of the SAA agreement process to ensure protections for affected fish and wildlife resources.

7.4 Waters of the U.S./State

The Project site supports Waters of the U.S. including the Feather and Yuba rivers. In addition to BIO1 , FISH1, and RIP2, the following measure is recommended:

WTR1 – To avoid or minimize anticipated short-term adverse effects to Waters of the U.S. implement the following measures:

- If backwater from dewatered dredged spoils has potential to discharge to wetlands or Waters of the U.S. then a Nationwide Permit 16 (Backwater) under Section 404 of the federal CWA must be obtained from USACE. The impacts from such actions are expected to be temporary and solely associated with the dewatering activities. Therefore, no net loss of aquatic resources is likely to occur as a result of the Project and no mitigation is required.
- Authorization to dredge the Feather and Yuba Rivers under Section 10 of the Rivers and Harbor Act must be obtained from the USACE. To facilitate such authorization, an application for a Minor Impact Letter of Permission for the Project will be prepared and submitted to USACE.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by RWQCB, must be obtained for Section 404 permit actions.
- A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB must be obtained for impacts to waters of the State.

7.5 Wildlife Movement Corridors

Implementation of recommendations BIO1, RIP1, and FISH1 are expected to avoid or minimize potential short-term effects on wildlife and aquatic movement corridors.

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LIST OF ATTACHMENTS

Attachment A – Special-Status Species Searches

Attachment B – Representative Site Photographs

Attachment C – Wildlife Observed Onsite

ATTACHMENT A

Special-Status Species Searches

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Yuba City (3912125) OR Gridley (3912136) OR Honcut (3912135) OR Loma Rica (3912134) OR Sutter (3912126) OR Browns Valley (3912124) OR Gilsizer Slough (3912116) OR Olivehurst (3912115) OR Wheatland (3912114))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Antigone canadensis tabida greater sandhill crane	ABNMK01014	None	Threatened	G5T4	S2	FP
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S3	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Juncus leiospermus var. ahartii Ahart's dwarf rush	PMJUN011L1	None	None	G2T1	S1	1B.2
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Monardella venosa veiny monardella	PDLAM18082	None	None	G1	S1	1B.1
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Oncorhynchus tshawytscha pop. 6 chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	
Paronychia ahartii Ahart's paronychia	PDCAR0L0V0	None	None	G3	S3	1B.1
Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G1	S1	1B.1
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	

Record Count: 40

CNPS California Native Plant Society

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

20 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3912136, 3912135, 3912134, 3912126, 3912125, 3912124, 3912116 3912115 and 3912114;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual / perennial herb	Aug	4.2	S4	G5
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	4.2	S3	G5T3
Brodiaea sierrae	Sierra foothills brodiaea	Themidaceae	perennial bulbiferous herb	May-Aug	4.3	S3	G3
Cryptantha rostellata	red-stemmed cryptantha	Boraginaceae	annual herb	Apr-Jun	4.2	S3	G4
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Erythranthe glaucescens	shield-bracted monkeyflower	Phrymaceae	annual herb	Feb-Aug(Sep)	4.3	S3S4	G3G4
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	1B.2	S1	G2T1
Juncus leiospermus var. leiospermus	Red Bluff dwarf rush	Juncaceae	annual herb	Mar-Jun	1B.1	S2	G2T2
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1	S2	G2
Monardella venosa	veiny monardella	Lamiaceae	annual herb	May,Jul	1B.1	S1	G1
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
Paronychia ahartii	Ahart's paronychia	Caryophyllaceae	annual herb	Feb-Jun	1B.1	S3	G3

Pseudobahia bahiifolia	Hartweg's golden sunburst	Asteraceae	annual herb	Mar-Apr	1B.1	S2	G2
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3

Suggested Citation

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

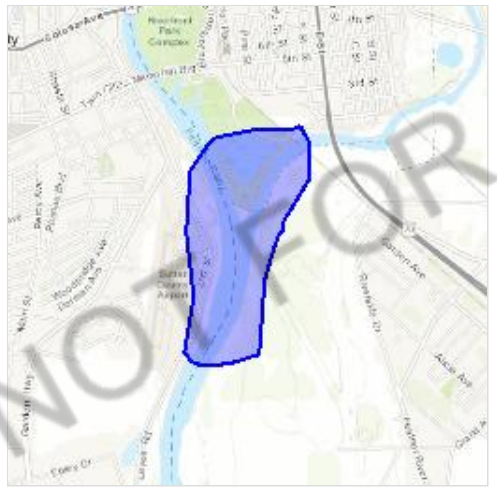
This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Sutter and Yuba counties, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

NOT FOR CONSULTATION

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

Yellow-billed Cuckoo Coccyzus americanus There is **proposed** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered

NOT FOR CONSULTATION

Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Hartweg's Golden Sunburst Pseudobahia bahiifolia No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1704	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Long-billed Curlew Numenius americanus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

NOT FOR CONSULTATION

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

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Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

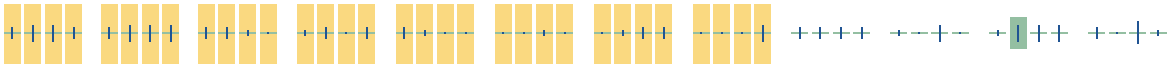
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



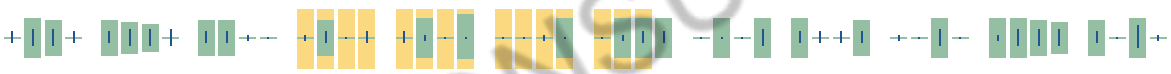
Long-billed Curlew
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



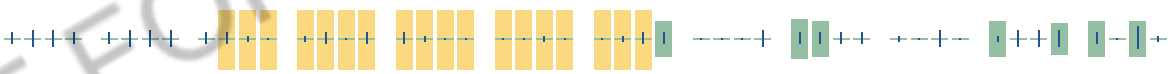
Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Oak Titmouse
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



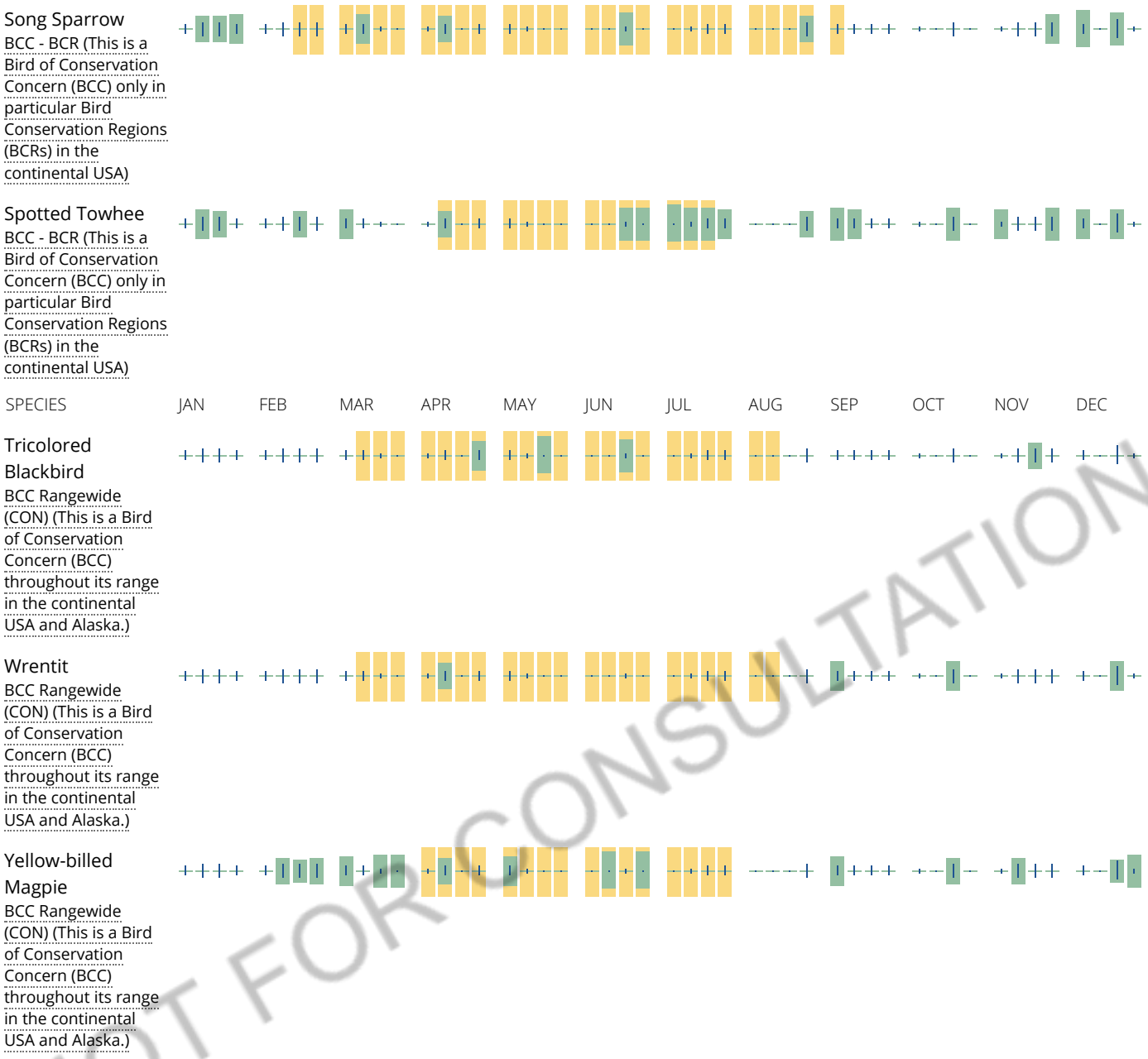
Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project

intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

Palustrine

RIVERINE

Riverine

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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ATTACHMENT B

Representative Site Photographs



Photo 1. Wastewater Pond at the Disposal Site, view west, 04/08/2020.



Photo 4. Wastewater Pond at the Disposal Site, view northwest, 04/08/2020.



Photo 5. View of the Yuba City Boat Launch and River bank from the Disposal Site, view south 04/08/2020.



Photo 7. View of the western bank of the Feather River from the top of the confluence, view northwest. 04/08/2020



Photo 8. View of the eastern bank of the Yuba River from the tip of the confluence, view northeast. 04/08/2020.



Photo 9. View of the east bank of the Feather River from the Yuba City Boat Launch, view northeast 04/08/2020.



Photo 12. View of the eastern and western banks of the Feather River from the Yuba City Boat Launch. View north. 04/08/2020.



Photo 13. View of the west bank of the Feather River from the Yuba City Boat Launch, view south 04/08/2020.

ATTACHMENT C

Wildlife Observed Onsite

List of Wildlife Observed at the Yuba City Boat Ramp Project Site

Common Name	Scientific Name
Birds	
Canada Goose	*Branta canadensis*
Wood Duck	*Aix sponsa*
Eurasian Collared Dove	*Streptopelia decaocto*
Anna's Hummingbird	*Calypte anna*
Greater Yellowlegs	*Tringa melanoleuca*
Great Blue Heron	*Ardea herodias*
Turkey Vulture	*Cathartes aura*
Osprey	*Pandion haliaetus*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Great Horned Owl	*Bubo virginianus*
Nuttall's Woodpecker	*Dryobates nuttallii*
Northern Flicker	*Colaptes auratus*
American Kestrel	*Falco sparverius*
Black Phoebe	*Sayornis nigricans*
California Scrub-Jay	*Aphelocoma californica*
Tree Swallow	*Tachycineta bicolor*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Cliff Swallow	*Petrochelidon pyrrhonota*
Bushtit	*Psaltriparus minimus*
White-breasted Nuthatch	*Sitta carolinensis*
House Wren	*Troglodytes aedon*
Ruby-crowned Kinglet	*Regulus calendula*
Western Bluebird	*Sialia mexicana*
American Robin	*Turdus migratorius*
Northern Mockingbird	*Mimus polyglottos*
European Starling	*Sturnus vulgaris*
House Sparrow	*Passer domesticus*
House Finch	*Haemorhous mexicanus*
Lesser Goldfinch	*Spinus psaltria*
White-crowned Sparrow	*Zonotrichia leucophrys*
Lincoln's Sparrow	*Melospiza lincolnii*
California Towhee	*Melozone crissalis*
Spotted Towhee	*Pipilo maculatus*
Bullock's Oriole	*Icterus bullockii*
Brown-headed Cowbird	*Molothrus ater*

Common Name	Scientific Name
Orange-crowned Warbler	*Leiothlypis celata*
Yellow-rumped Warbler	*Setophaga coronata*
Mammals	
Eastern fox squirrel	*Sciurus niger*
mule deer	*Odocoileus hemionus*

APPENDIX D

Biological Resources Documentation

D1 Biological Resources Assessment, Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

D2 Information for the U.S. Fish and Wildlife Service

D3 Biological Assessment for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

Information to Support Section 7 Consultation with U.S. Fish and Wildlife Service

Yuba City Boat Ramp Sediment Removal Project

Sutter and Yuba Counties, California

(U.S. Army Corps of Engineers SPK No. Pending)

Prepared for

Sutter Butte Flood Control Agency

November 3, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

1.0 PROJECT LOCATION 1
2.0 PURPOSE AND NEED 1
3.0 PROJECT DESCRIPTION/PROPOSED ACTION 1
4.0 FEDERALLY LISTED OR PROPOSED SPECIES POTENTIALLY IMPACTED BY THE PROPOSED PROJECT 1
4.1 Valley Elderberry Longhorn Beetle 4
4.2 Status of Valley Elderberry Longhorn Beetle within the Project Area 5
4.2.1 Site Characteristics and Land Use 5
4.2.2 Land Cover Types and Vegetation Communities 5
4.2.3 Valley Elderberry Longhorn Beetle Habitat 6
5.0 EFFECTS OF THE ACTION 6
5.1 Definitions 6
5.2 Effects of Proposed Actions 8
6.0 PROPOSED CONSERVATION MEASURES 8
7.0 PROPOSED EFFECTS DETERMINATION 9
7.1 Definitions 9
7.2 Effects Determination 9
8.0 CONCLUSION 9
9.0 REFERENCES 10

LIST OF FIGURES

Figure 1. Yuba City Boat Ramp Location and Vicinity 2
Figure 2. Project Components 3
Figure 3. Elderberry Shrub Locations 7

LIST OF ACRONYMS AND ABBREVIATIONS

2017 VELB Framework	2017 Framework for Assessing Impacts to Valley Elderberry Longhorn Beetle
BRA	Biological Resources Assessment
CDFW	California Department of Fish and Wildlife
cy	Cubic yards
Project	Yuba City Boat Ramp Sediment Removal Project
NRCS	Natural Resources Conservation Service
USEPA	U.S. Environmental Protection Agency

LIST OF ACRONYMS AND ABBREVIATIONS

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley elderberry longhorn beetle
WEAP	Worker Education Awareness Program

1.0 PROJECT LOCATION

The Yuba City Boat Ramp Sediment Removal Project (Project) is located at the confluence of the Feather and Yuba rivers in the cities of Yuba City, California and Marysville, California in Sutter and Yuba counties, respectively (Figure 1. *Yuba City Boat Ramp Location and Vicinity*). This corresponds to the unsectioned Rancho New Helvetia Landgrant lands within the "Olivehurst, California" and "Yuba City, California" 7.5-minute quadrangles (U.S. Geological Survey [USGS] 1952a, photorevised 1973 and 1952b, photorevised 1973, respectively). The approximate center of the Project is 39.1308° latitude, -121.598639° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code #18020159; Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016)

2.0 PURPOSE AND NEED

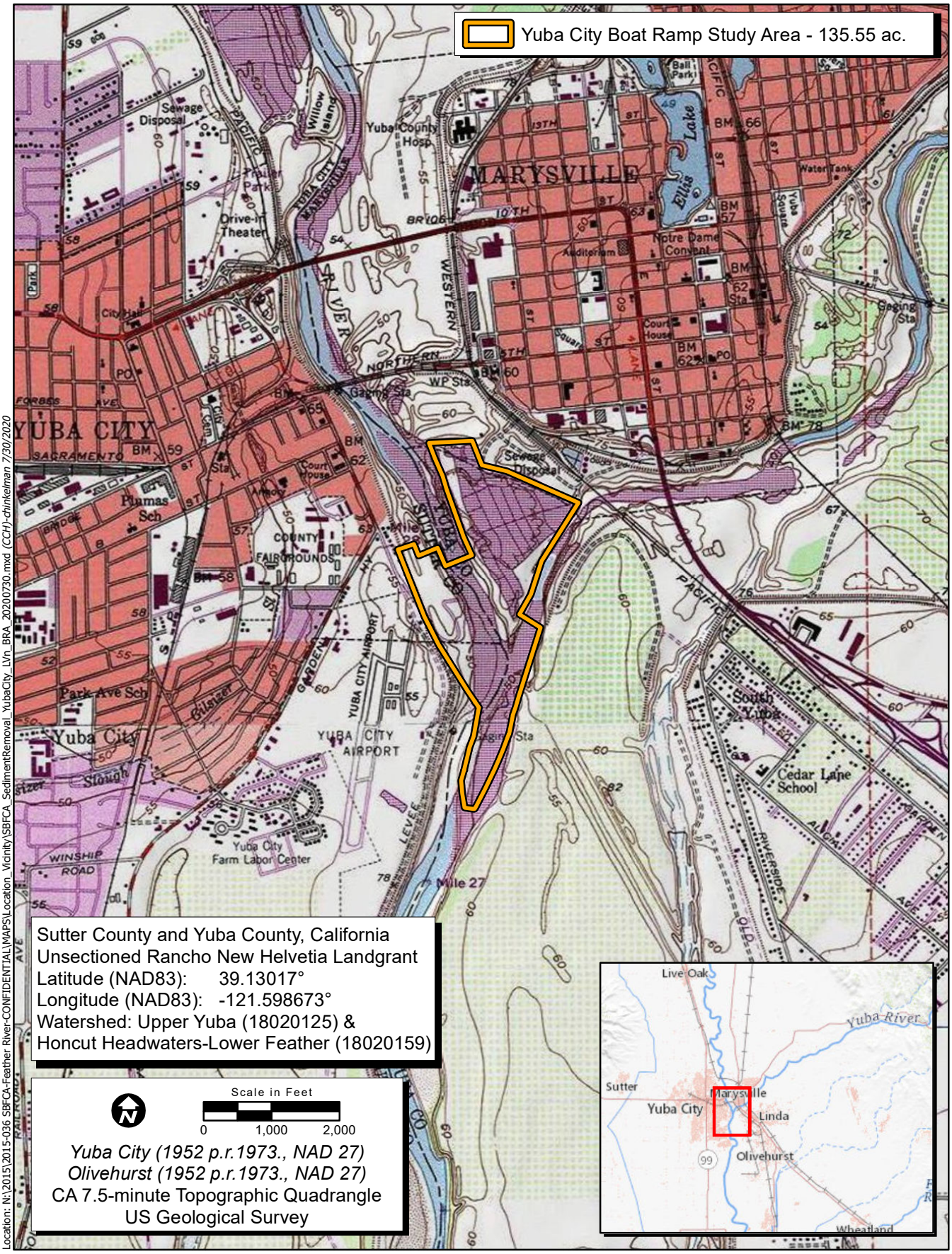
The Project is needed to remove sediment that has accumulated at the Yuba City Boat Ramp and the confluence of the Yuba and Feather rivers, exacerbated by the Oroville Dam Spillway incident of 2017. This has hampered recreational users and public safety as it has affected emergency vessel launching capabilities at the boat ramp. The Project received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River as part of restoration, protection, and development of river parkways in accordance with the California River Parkways Grant Program. Restoring river access and fish passage conditions at the Project will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) bring commerce to local restaurants, hotels, and other businesses.

3.0 PROJECT DESCRIPTION/PROPOSED ACTION

The Project consists of maintenance dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 2. *Project Components*). Approximately 315,600 cubic yards (cy) of dredged material would be removed within an approximately 28-acre area and may occur over two phases. Phase 1 includes the removal of approximately 65,600 cy of dredged material within an approximately 14.41-acre Dredging Area as part of restoration, protection, and development of river parkways in accordance with the California River Parkways Grant Program. Phase 2 includes an additional approximately 250,000 cy within an approximately 14.40-acre Future Dredging Area immediately downstream to further restore fish passage and improve conveyance at the confluence of the Yuba and Feather rivers to be funded by other sources. The timing of Phase 2 will depend on availability of funding and may occur concurrently with Phase 1.

4.0 FEDERALLY LISTED OR PROPOSED SPECIES POTENTIALLY IMPACTED BY THE PROPOSED PROJECT

ECORP prepared a Biological Resources Assessment (BRA) for the Project, which included a review of federally listed species with potential to occur within the Project (ECORP 2020). The U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Consultation System Resource Report List for the Project Area (USFWS 2020) was queried to determine federally listed species under the jurisdiction of USFWS with potential to occur in the Project Area. These species include:



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Location_Vicinity\SBFCA_SedimentRemoval_YubaCity_LVn_BRA_20200730.mxd (CCH)-dhinkelman 7/30/2020

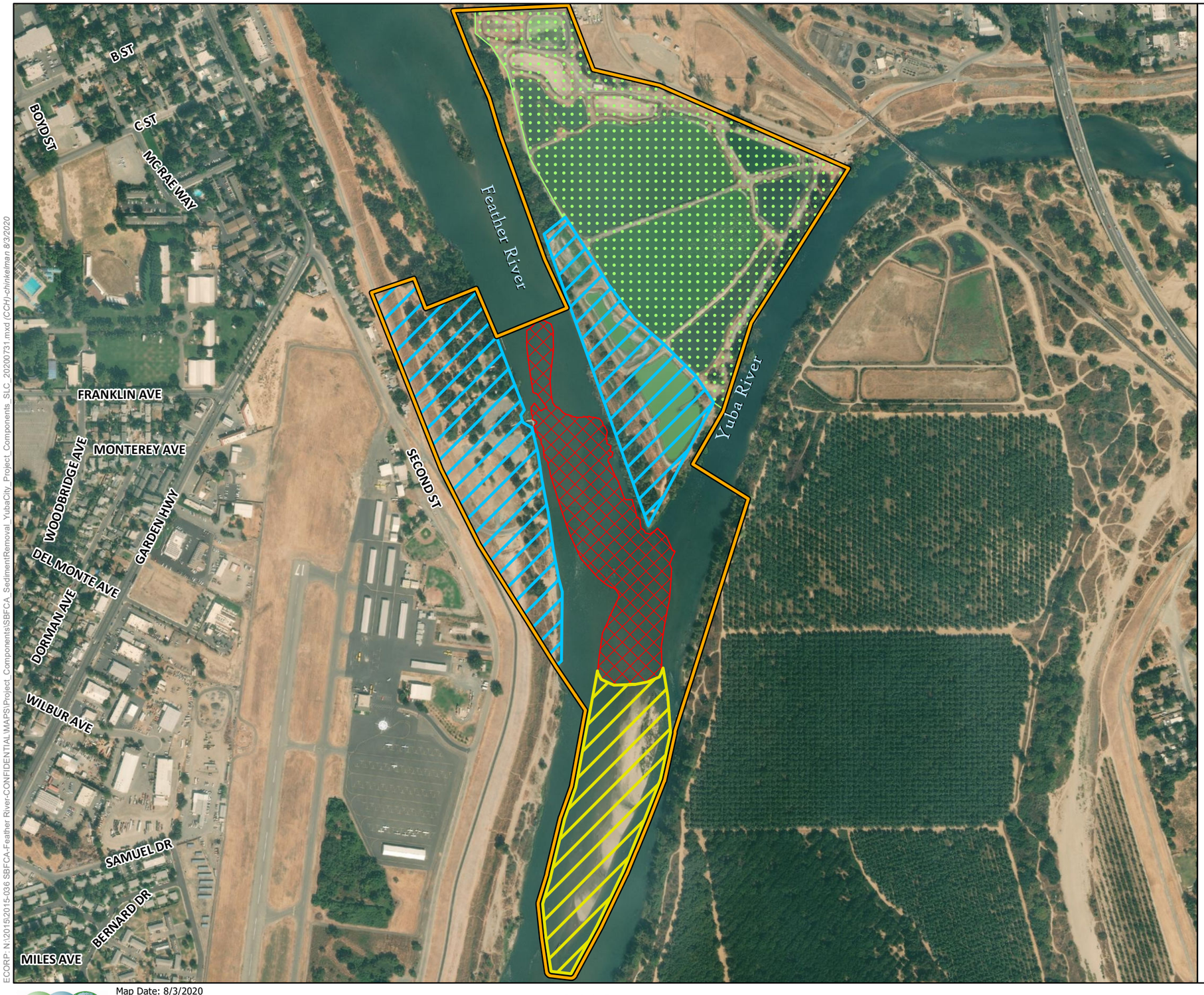
Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Yuba City Boat Ramp Location and Vicinity

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

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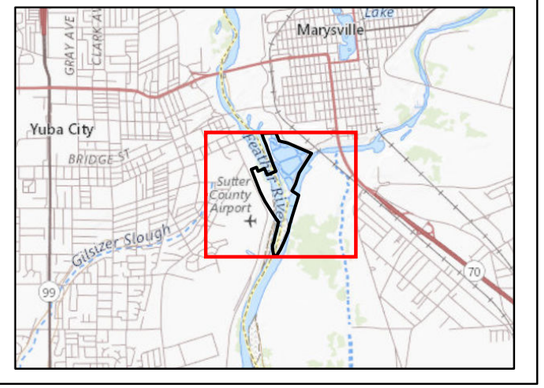
Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



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Map Date: 8/3/2020

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Scale in Feet
0 560

Figure 2. Project Components

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

- Hartweg's golden sunburst (*Pseudobahia bahiifolia*);
- Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*);
- Conservancy fairy shrimp (*Branchinecta conservatio*);
- Vernal pool fairy shrimp (*Branchinecta lynchi*);
- Vernal pool tadpole shrimp (*Lepidurus packardi*);
- California red-legged frog (*Rana draytonii*);
- Giant garter snake (*Thamnophis gigas*);
- Delta smelt (*Hypomesus transpacificus*); and
- Yellow-billed cuckoo (*Coccyzus americanus*).

As part of the BRA, ECORP Biologists Keith Kwan and Gabrielle Attisani conducted a site reconnaissance visit on April 8, 2020. The Project Area was systematically surveyed on foot using an ESO Arrow Global Positioning System unit with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. The BRA concluded that VELB was the only federally listed species under USFWS jurisdiction with potential to occur within the Project. The remaining eight species listed above were determined to be absent from the Project due to lack of suitable habitat and/or the Project is outside of the species known range (ECORP 2020).

4.1 Valley Elderberry Longhorn Beetle

VELB is listed as threatened pursuant to the federal Endangered Species Act (USFWS 1980). The historic range of this beetle is limited to moist, Valley oak woodlands along margins of rivers and streams in the lower Sacramento and lower San Joaquin valleys (USFWS 1984). At the time of its listing, the beetle was known from less than 10 localities in Merced, Sacramento, and Yolo counties (USFWS 1980). The VELB is completely dependent on its larval host plant, elderberry, which occurs in riparian and other woodland and scrub communities (USFWS 1999, 2017). Elderberry plants located within the range of the beetle, with one or more stems measuring 1.0 inch or greater in diameter at ground level are considered to be habitat for the species (USFWS 1999). The adult flight season extends from late March through July (USFWS 2017). During that time the adults feed on foliage and perhaps flowers, mate, and females lay eggs on living elderberry plants (Barr 1991). The first instar larvae bore into live elderberry stems, where they develop for one to two years feeding on the pith. The fifth instar larvae create exit holes in the stems and then plug the holes and remain in the stems through pupation (Talley et al. 2007).

The VELB occurs in metapopulations throughout the Central Valley (Collinge et al. 2001 as cited in USFWS 2017). These metapopulations (subpopulations) occur throughout contiguous riparian habitat that shift temporarily and spatially based on changing environmental conditions. This temporal and spatial shifting of the metapopulations results in a patchy and ever-changing distribution of the species. Research indicates that dense elderberry shrub clumps in healthy riparian habitat is the primary habitat for the VELB (USFWS 2017). The beetle's current distribution extends from Shasta County in the north to Fresno County in the south and includes everything from the valley floor up into the lower foothills (USFWS 2017). The

vast majority of VELB occurrences have been recorded below 500 feet (152 meters); however, rare occurrences have been recorded up to approximately 3,000 feet (USFWS 1999, 2017).

The largest threat to VELB is the loss of riparian habitat through agricultural conversion and urban development (USFWS 2006). Habitat loss is also attributable to extensive flood control activities such as the construction and maintenance of levees. However, protection of existing habitat and creation of new habitat have increased the prevalence of the VELB in the Central Valley (USFWS 2006). The *Valley Elderberry Longhorn Beetle Recovery Plan* was established by USFWS in 1984 (USFWS 1984). A five-year review by the USFWS concluded that the increased number of sightings and the reduction of threats warrant that VELB be delisted (USFWS 2006); therefore, delisting was proposed in 2012 (USFWS 2012). However, after further review the USFWS concluded that the scientific information and analysis relied upon in its 2012 proposal was not strong enough to support the decision to delist the species (USFWS 2014).

4.2 Status of Valley Elderberry Longhorn Beetle within the Project Area

4.2.1 Site Characteristics and Land Use

The Project Area includes the confluence and adjacent portions of the Feather and Yuba rivers, the Yuba City Boat Ramp (operated by Sutter County) and surrounding lands on the west bank of the Feather River, the City of Marysville wastewater ponds between the Feather and Yuba rivers, and a narrow area of shoreline on the eastern bank of the Feather and Yuba rivers. The developed portions of the boat ramp include a paved roadway, parking areas, the boat ramp, and the Feather River RV Park. The undeveloped areas around the boat ramp include riverbank habitat, ruderal weedy roadside habitats, and unimproved areas of compacted dirt that are used for overflow parking and/or fishing access. The wastewater ponds portion of the Project Area includes constructed/excavated ponds of varying shapes and sizes and a narrow corridor of riparian habitat along the Feather and Yuba rivers.

4.2.2 Land Cover Types and Vegetation Communities

Land cover types or vegetation communities found within the Project Area include riparian woodland, ruderal, paved/developed, and constructed wastewater ponds.

Riparian Woodland

The riparian woodland community is found along the riverbanks. The riparian woodland vegetation is a relatively narrow corridor of mature trees with varying densities of understory cover, depending on levels of human use. Dominant trees include Fremont's cottonwood (*Populus fremontii*), Goodding's black willow (*Salix gooddingii*), and Valley oak (*Quercus lobata*), with scattered box elder (*Acer negundo*), tree-of-heaven (*Ailanthus altissima*), California black walnut (*Juglans hindsii*), black locust (*Robinia pseudoacacia*), and sandbar willow (*Salix exigua*). Understory vegetation was dense in scattered locations and included Himalayan blackberry (*Rubus armeniacus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), tree tobacco (*Nicotiana glauca*), mugwort (*Artemisia douglasiana*), cow parsnip (*Heracleum maximum*), and common bedstraw (*Galium aparine*).

Ruderal/Disturbed

The ruderal community was found along roadsides, levees, wastewater pond edges, and other areas heavily impacted by human presence. These areas are characterized by the presence of nonnative weedy plants such as cheeseweed (*Malva parviflora*), barley (*Hordeum murinum*), cut-leaved geranium (*Geranium dissectum*), yellow star-thistle (*Centaurea solstitialis*), and wild oats (*Avena* sp.). Blue elderberry shrubs are present along the wastewater pond edges and in ruderal areas adjacent to the boat ramp facility.

Paved/Developed

Paved, developed portions of the Project Area are characterized by existing paved roads and parking areas, compacted dirt/gravel parking areas, and pedestrian paths to the Feather River. The majority of the dirt/gravel roads and paths are unvegetated.

Wastewater Treatment Ponds

The wastewater ponds are manmade ponds surrounded by gravel and dirt-surfaced access roads. The ponds are no longer in use and hydrology is limited to seasonal rainfall.

4.2.3 Valley Elderberry Longhorn Beetle Habitat

VELB habitat within the Project Area was assessed using the *2017 Framework for Assessing Impacts to Valley Elderberry Longhorn Beetle* (2017 VELB Framework) (USFWS 2017). A total of 35 elderberry shrubs were documented within the Project Area during the April 2020 site visit (Figure 3. *Elderberry Shrub Locations*). The majority of the shrubs are located within the riparian woodland adjacent to the Feather and Yuba rivers. A few shrubs are located adjacent to the Yuba City Boat Ramp and several shrubs are located along berms and roads with the inactive Marysville Wastewater Treatment Plant wastewater ponds (Figure 3).

There are two documented California Natural Diversity Database occurrences of VELB located within five miles of the Project, including one adjacent to the Project on the east bank of the Yuba River (California Department of Fish and Wildlife [CDFW] 2020). Per the 2017 VELB Framework (USFWS 2017), elderberry shrubs occurring within riparian habitat are considered suitable habitat and likely occupied by VELB. Because the majority of the elderberry shrubs occurring within the Project Area are within the riparian woodland adjacent to the Feather and Yuba rivers, these shrubs are considered suitable VELB habitat and likely occupied. Shrubs within 800 meters (2,526 feet) of riparian habitat and/or a known VELB occurrence may also be suitable habitat and be occupied by VELB (USFWS 2017). Therefore, it is assumed that all shrubs within the Project Area provide suitable habitat and may be occupied by VELB.

5.0 EFFECTS OF THE ACTION

5.1 Definitions

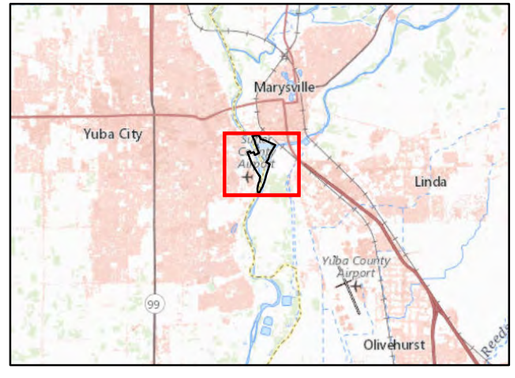
Definitions of types of effects are provided by USFWS (1998) and are described below:

Figure 3.
Elderberry Shrub Locations

Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.
- Elderberry Shrub Locations (34)

Sources: ESRI, USGS, Maxar (2018)



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2015-036.10 Feather River Sediment Removal and Invasive Species Removal Project

Scale in Feet
0 600

Map Date: 8/4/2020

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Direct effects are defined as the direct or immediate effects of a Proposed Action on a species or its habitat. Direct effects may result from the action and may include the effects of interrelated and interdependent actions.

Indirect effects are caused by or result from the Proposed Action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the area directly affected by the action.

An interrelated action is an activity that is part of the Proposed Action and depends on the Proposed Action for its justification.

An interdependent action is an activity that has no independent utility apart from the action under consultation.

Cumulative effects consist of the effects of future State, local, and private actions not involving a federal action that are reasonably certain to occur within the action area under consideration.

5.2 Effects of Proposed Actions

The Project will not require the removal elderberry shrubs. While all elderberry shrubs will be avoided, construction activities such as construction access, equipment staging, and dewatering will be required within 165 feet of elderberry shrubs. Per the 2017 VELB Framework (USFWS 2017), elderberry shrubs within 50 meters (165 feet) of Project activities could result in adverse effects to VELB. Construction access, equipment staging, and/or dewatering of sediment could result in adverse effects to VELB as these activities are likely to occur within 165 feet of the 35 elderberry shrubs present within the Project Area.

All potential effects to VELB associated with the Project Area anticipated to be limited to impacts during Project implementation. No indirect, interrelated, or interdependent effects are anticipated. The Project is not expected to contribute to long-term cumulative effects on the species since the impacts are limited to short-term, construction-related impacts and would not extend beyond the duration of the Project.

6.0 PROPOSED CONSERVATION MEASURES

In accordance with the 2017 VELB Framework, the following conservation measures are proposed to minimize indirect impacts to VELB during construction activities.

- **Conservation Measure 1:** A qualified biologist will conduct a Worker Education Awareness Program (WEAP) training for all contractors and work crews that will be onsite during Project construction. The WEAP training will include the status of VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance.
- **Conservation Measure 2:** Avoided elderberry shrubs within the Project Area will be protected during construction by establishing and maintaining a high-visibility fence as far from the drip line of each elderberry shrub as feasible. The area surrounding avoided elderberry shrubs will be fenced and/or flagged. If Project activities must encroach within the drip line of a shrub, additional protection such a k-rails or other protective fencing will be required.

- **Conservation Measure 3:** A qualified biologist will monitor work at Project-appropriate intervals to assure that all conservation measures are being implemented. The biologist will inspect elderberry shrub fencing weekly. The biologist will monitor all construction activities that occur within 20 feet of avoided elderberry shrubs.
- **Conservation Measure 4:** Herbicides will not be used within the drip line of any elderberry shrubs. Insecticides will not be used within 100 feet of an elderberry shrub and will be applied using a backpack sprayer or similar direct application method.
- **Conservation Measure 5:** The potential effects of dust on VELB will be minimized by applying water during construction activities or by presoaking work areas that will occur within 100 feet of any elderberry shrub.

7.0 PROPOSED EFFECTS DETERMINATION

7.1 Definitions

Definitions of effects determinations are provided by USFWS (1998) and are described below:

No effect: There will be no impacts, positive or negative, to listed or proposed resources.

May affect, but not likely to adversely affect: All effects are beneficial, insignificant, or discountable.

May affect, and is likely to adversely affect: Listed resources are likely to be negatively impacted by the action or its environmental consequences.

7.2 Effects Determination

The proposed Project would not require the removal of any VELB habitat (elderberry shrubs). Construction activities such as construction access, equipment staging, and/or dewatering of sediment will occur within 165 feet of elderberry shrubs, which may result in adverse effects to VELB during Project implementation. Implementation of the proposed conservation measures provided in Section 6.0 as part of the Project will reduce potential adverse effects to VELB. Therefore, ECORP anticipates that the Project may affect, but is not likely to adversely affect, VELB.

8.0 CONCLUSION

A total of 35 elderberry shrubs are located within the Project Area. No elderberry shrubs will be removed by the Project; however, the Project may result in adverse effects to VELB associated with Project activities occurring within 165 feet of elderberry shrubs. Conservation measures will be implemented to minimize potential adverse effects to VELB. Therefore, ECORP anticipates the Project **may affect, but is not likely to adversely affect,** VELB.

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APPENDIX D

Biological Resources Documentation

D1 Biological Resources Assessment, Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

D2 Information for the U.S. Fish and Wildlife Service

D3 Biological Assessment for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

APPENDIX D

Biological Resources Documentation

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Biological Assessment

Yuba City Boat Ramp Sediment Removal Project

Sutter and Yuba Counties, California

(U.S. Army Corps of Engineers SPK No. Pending)

Prepared for:

Sutter Butte Flood Control Agency

December 7, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

1.0 INTRODUCTION 1
1.1 Purpose of the Biological Assessment 1
1.2 Responsible Parties 2
2.0 CONSULTATION HISTORY 2
3.0 DESCRIPTION OF THE PROPOSED ACTION 3
3.1 Project Location 3
3.2 Definition of the Action Area 5
3.3 Proposed Action 5
3.3.1 Dredging Operations 5
3.3.2 Dewatering Operations 8
3.3.3 Dredged Material Characteristics 9
3.3.4 Project Timing and Sequence 11
3.3.5 Avoidance and Minimization Measures Included During Construction 11
3.4 Interdependent and Interrelated Actions 12
4.0 STATUS OF LISTED FISH SPECIES, CRITICAL HABITAT, AND ESSENTIAL FISH HABITAT 12
4.1 Central Valley Spring-run Chinook Salmon 13
4.1.1 Status 13
4.1.2 Life History and Timing of Presence in the Action Area 13
4.1.3 Critical Habitat 14
4.2 Central Valley Distinct Population Segment Steelhead 15
4.2.1 Status 15
4.2.2 Life History and Timing of Presence in the Action Area 16
4.2.3 Critical Habitat 16
4.3 Green Sturgeon 17
4.3.1 Status 17
4.3.2 Life History and Timing of Presence in the Action Area 18
4.3.3 Critical Habitat 19
4.4 Pacific Coast Salmon – Essential Fish Habitat 20
5.0 ENVIRONMENTAL BASELINE OF THE ACTION AREA 20
5.1 Riparian Conditions and Surrounding Land Use 20
5.2 Hydrology and Temperature of the Lower Feather River 21
5.3 Aquatic Habitat in the Action Area 22
5.4 Fish Assemblage of the Lower Feather and Yuba Rivers 23
5.5 Water and Sediment Quality in the Action Area 23

6.0 EFFECTS OF THE PROPOSED ACTION 24
6.1 Assessment Approach 24
6.1.1 Direct Injury or Lethality from Construction-related Activities 24
6.1.2 Water Quality Effects 25
6.1.3 Habitat Effects 25
6.2 Effects Assessment 25
6.2.1 Effect 1: Direct Injury or Lethality 25
6.2.2 Effect 2: Water Quality Effects 27
6.2.3 Effect 3: Habitat Effects 28
7.0 CUMULATIVE EFFECTS 29
8.0 CONCLUSION AND DETERMINATION 30
8.1 Central Valley Spring-Run Evolutionarily Significant Unit Chinook Salmon 30
8.2 Critical Habitat for Spring-Run Evolutionarily Significant Unit Chinook Salmon 30
8.3 Central Valley Distinct Population Segment Steelhead 30
8.4 Critical Habitat for Central Valley Distinct Population Segment Steelhead 30
8.5 Southern Distinct Population Segment North American Green Sturgeon 30
8.6 Critical Habitat for Southern Distinct Population Segment North American Green Sturgeon 31
8.7 Essential Fish Habitat 31
9.0 REFERENCES CITED 32

LIST OF TABLES

Table 1. Construction Equipment List 9
Table 2. Listing History for ESA-Listed Anadromous Fishes Occurring in the Feather River 13
Table 3. Monthly Flows for the Period January 1, 2000 through October 4, 2020 at the Feather River Gridley (GRL) and Yuba River Marysville (MRY) Monitoring Stations and for the period February 27, 2011 through October 20, 2020 at the Feather River at Boyd's Landing Monitoring Station 21
Table 4. Monthly Temperature for the Period March 5, 2013 through October 4, 2020 at the Feather River at OWA Boundary Station and for the Period September 4, 2019 through October 4, 2020 at the Yuba River YR7 station 22

LIST OF FIGURES

Figure 1. Project Location and Vicinity 4
Figure 2. Project Components 6
Figure 3. Disposal Locations 10

LIST OF ATTACHMENTS

Attachment A – Representative Site Photographs

Attachment B – Dredging Depths

Attachment C – Yuba City Boat Ramp Sediment Removal Project 1 Staging and Dewatering Area

Attachment D – Soil Screening Data

Attachment E – Sampling Plan

Attachment F - Water Quality Monitoring Plan

LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
BA	Biological Assessment
BMPs	Best management practices
CCV	California Central Valley
CDEC	California Data Exchange Center
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
cfs	Cubic feet per second
cm	Centimeter
CTM	Critical thermal maximum
CV	Central Valley
CVFPB	Central Valley Flood Protection Board
CWA	Clean Water Act
cy	Cubic yards
Delta	Sacramento-San Joaquin Delta
DPS	Distinct Population Segment
EFH	Essential fish habitat
EPIC	Environmental Protection Information Center
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
°F	Fahrenheit
FERC	Federal Energy Regulatory Commission
FOW	Feather River OWA Boundary Station
FR	Federal Register
FRFH	Feather River Fish Hatchery
HAPC	Habitat Area of Particular Concern
HDPE	High-density polyethylene
HU	Hydrologic Unit
HUC	Hydrologic Unit Code
Mg	Milligrams
kg	kilogram
mm	Millimeters
MSA	Magnuson-Stevens Fishery Conservation and Management Act

LIST OF ACRONYMS AND ABBREVIATIONS

NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
PCE	Primary constituent elements
Project	Yuba City Boat Ramp Sediment Removal Project
RWQCB	Regional Water Quality Control Board
SBFCA	Sutter Butte Flood Control Agency
sDPS	Southern DPS
SWRCB	State Water Resources Control Board
TL	Total length
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WWTP	Wastewater treatment plant
YCWA	Yuba County Water Agency

1.0 INTRODUCTION

The Sutter Butte Flood Control Agency (SBFCA) is proposing to conduct the Yuba City Boat Ramp Sediment Removal Project (Project) at the confluence of the Feather and Yuba rivers in the cities of Yuba City and Marysville, California in Sutter and Yuba counties, respectively. The purpose of the Project is to remove sediment that has accumulated at the Yuba City Boat Ramp and the confluence of the Yuba and Feather rivers, exacerbated by the Oroville Dam Spillway incident of 2017. This has hampered recreational users and public safety as it has affected emergency vessel launching capabilities at the boat ramp. The Project has received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River as part of restoration, protection, and development of river parkways in accordance with the California River Parkways Grant Program. Restoring river access and fish passage conditions at the Project will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) bring commerce to local restaurants, hotels, and other businesses.

The Project would be implemented in the lower Feather River in Sutter and Yuba counties and, therefore, has a potential to affect anadromous fish listed as threatened or endangered under the federal Endangered Species Act (ESA; 16 U.S. Code [USC]1536(c)), designated Critical Habitat for these ESA-listed fishes, and essential fish habitat (EFH) under the 1996 Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267).

1.1 Purpose of the Biological Assessment

The purpose of this biological assessment (BA) is to evaluate the potential effects of the Project on anadromous fishes under the jurisdiction of the National Marine Fisheries Service (NMFS) that are listed as endangered or threatened under the ESA, designated Critical Habitat for these species, and EFH for Pacific coast salmon. This BA is prepared in accordance with the legal requirements set forth under Section 7 of the ESA, and follows the standards established in National Environmental Policy Act and ESA guidelines of the NMFS. Specifically, this BA will evaluate the potential impacts of the Project on the following ESA-listed fishes, Critical Habitat, and EFH:

- Central Valley (CV) spring-run evolutionarily significant unit (ESU) Chinook salmon (*Oncorhynchus tshawytscha*);
- California CV (CCV) distinct population segment (DPS) steelhead (*O. mykiss*);
- Southern DPS (sDPS) North American green sturgeon (*Acipenser medirostris*);
- Critical habitat for CV spring-run ESU Chinook salmon;
- Critical habitat for CCV DPS steelhead;
- Critical habitat for sDPS green sturgeon; and
- EFH for Pacific coast salmon.

1.2 Responsible Parties

The action agency for the proposed action is the U.S. Army Corps of Engineers (USACE). The contact person for the USACE is:

Mr. Jesse Stovall
Jesse.T.Stovall@usace.army.mil
Project Manager
California Regulatory Branch
U.S. Army Corps of Engineers
Sacramento District HQ Office
1325 J. Street
Sacramento, California 95814-2922
Phone: (916) 557-7506

SBFCA is the Responsible Party for approval and implementation of the proposed action. The contact person is:

Mr. Michael W. Bessette, PE
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m.bessette@sutterbutteflood.org
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P.O. Box M
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Phone: (530) 755-9859

The Project Agent is ECORP Consulting, Inc. The contact person is:

Ms. Emily Mecke
Staff Biologist/Project Manager
emecke@ecorpconsulting.com
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Rocklin, California 95677
Phone: (916) 782-9100

2.0 CONSULTATION HISTORY

The following consultation-related meetings or correspondence for the proposed action has occurred to date.

A pre-application meeting was held on May 7, 2020. Attendees included the following:

- USACE: Lisa Gibson and Melissa France
- Central Valley Regional Water Quality Control Board (RWQCB): Stephanie Tadlock

- U.S. Fish and Wildlife Service (USFWS): Jennifer Hobbs
- U.S. Environmental Protection Agency (USEPA): Joe Morgan
- NMFS: Neal Macintosh
- SBFCA: Michael Bessette (Applicant)
- PBI: Chris Fritz (Project Manager on behalf of SBFCA)
- ECORP: Bjorn Gregersen, Emily Mecke, Lisa Westwood, Dave Thomas (SBFCA's Environmental Consultant)

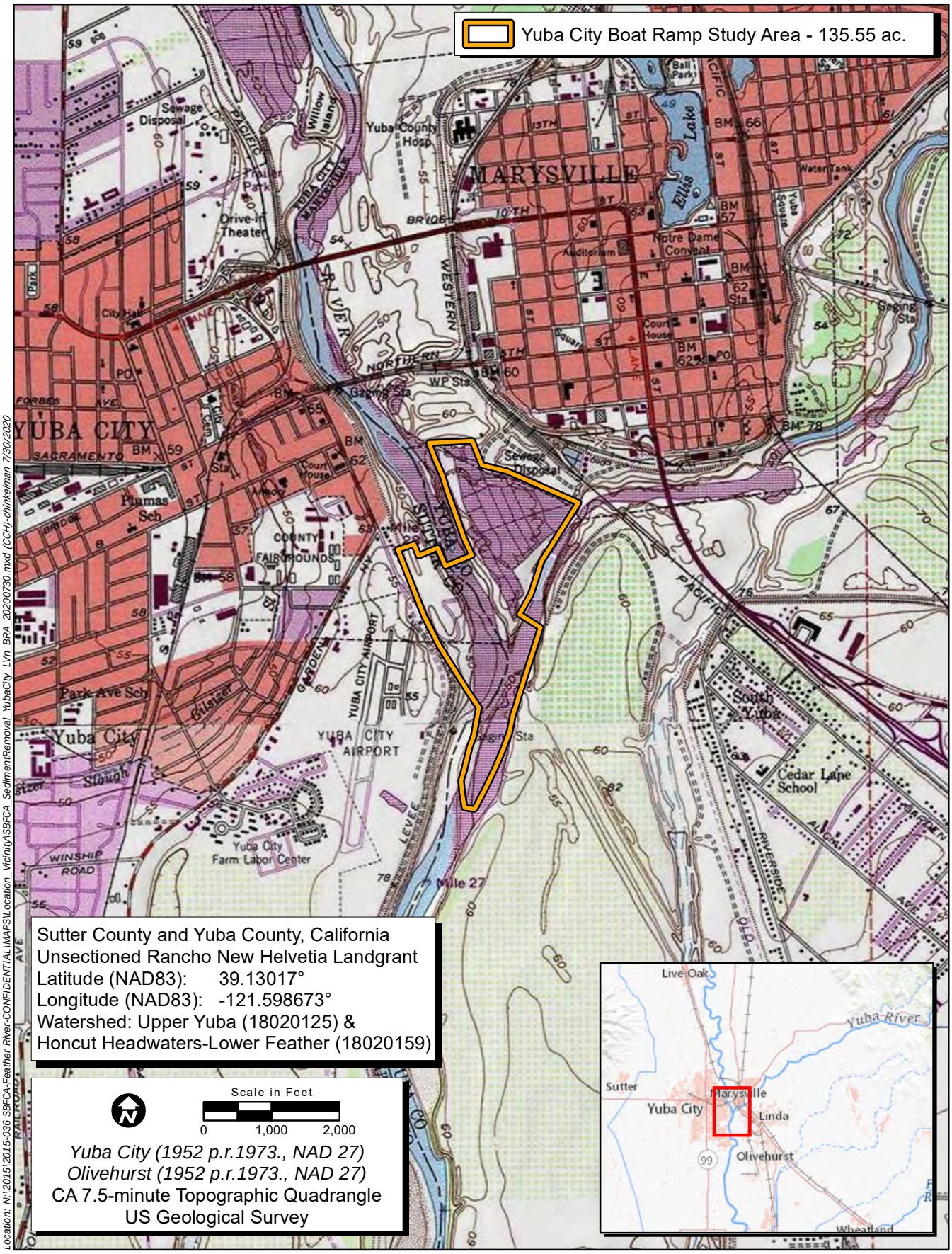
The project proposed at the time of the pre-application meeting was entitled the "Feather River Sediment and Invasive Species Removal Project" and included dredging of sediment and invasive species removal at the Live Oak Boat Ramp on the Yuba River in addition to the proposed dredging at the Yuba City Boat Ramp. During the pre-application meeting, it was determined that the two locations should be permitted separately. Discussion points for the Yuba City Boat Ramp location (proposed Project) included the following:

- **USACE:** Dredging in the river does not require a federal Clean Water Act (CWA) Section 404 permit; however, the disposal location must be known and may require a permit if discharge of the dredged material is within Waters of the U.S. The USACE indicated that the Marysville Wastewater Treatment Plant (WWTP) wastewater ponds have previously been determined non-USACE jurisdictional.
- The Yuba City Boat Ramp location is within a USACE Navigable Water, and thus dredging will require a USACE permit under Section 10 of the Rivers and Harbors Act. It was also indicated that the Project may require a Section 408 permission and the Applicant should coordinate with the Central Valley Flood Protection Board (CVFPB). The Applicant is currently working with the CVFPB to make this determination.
- **RWQCB:** Suction dredging is not regulated under CWA Section 401 and may require a National Pollutant Discharge Permit from the State Water Resources Control Board (SWRCB). The SWRCB currently has a draft General Order for Suction Dredging activities. Subsequently, it has been determined that the Project does not qualify for coverage under the order due to the location and nature of the dredging activities.
- **NMFS:** The Project would likely require formal consultation and a Biological Opinion.

3.0 DESCRIPTION OF THE PROPOSED ACTION

3.1 Project Location

The 135.55-acre Project is located at the confluence of the Feather and Yuba rivers in the cities of Yuba City, California and Marysville, California in Sutter and Yuba counties, respectively (Figure 1. *Yuba City Boat Ramp Location and Vicinity*). This corresponds to the unsectioned Rancho New Helvetia Landgrant lands



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Location_Vicinity\SBFCA_SedimentRemoval_YubaCity_LVn_BRA_20200730.mxd (CCH)-chinkelman 7/30/2020

Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Yuba City Boat Ramp Location and Vicinity

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

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within the "Olivehurst, California" and "Yuba City, California" 7.5-minute quadrangles (U.S. Geological Survey [USGS] 1952a, photorevised 1973 and 1952b, photorevised 1973, respectively).

The approximate center of the Project is 39.1307° latitude, -121.598673° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code [HUC] #18020159; Natural Resources Conservation Service [NRCS], et al. 2016).

3.2 Definition of the Action Area

The Action Area is defined as all areas directly or indirectly affected by the proposed action. For the purpose of addressing potential direct and indirect effects of the proposed action on ESA-listed fish species and their designated Critical Habitat, the Action Area includes the lower Feather River within the boundary of the proposed dredging activity (Figure 2. *Project Components*), including the riverbed and banks of the Feather River within the footprint of the proposed dredging activity up to the ordinary high water mark. Resuspension of sediments and associated increased turbidity levels resulting from removal of benthic sediments may adversely affect fish within the Action Area. In addition, discharge of decanted return water from sediment dewatering may affect water quality downstream of the point(s) of discharge within the Feather or Yuba rivers. As such, the Action Area also encompasses the entire width of the Feather River and Yuba River channels to a distance of 500 feet downstream of the dredging area boundary and downstream of any points of return water discharge, in which elevated levels of turbidity, suspended sediment load, or disturbance may occur during dredging of sediments and removal of invasive vegetation.

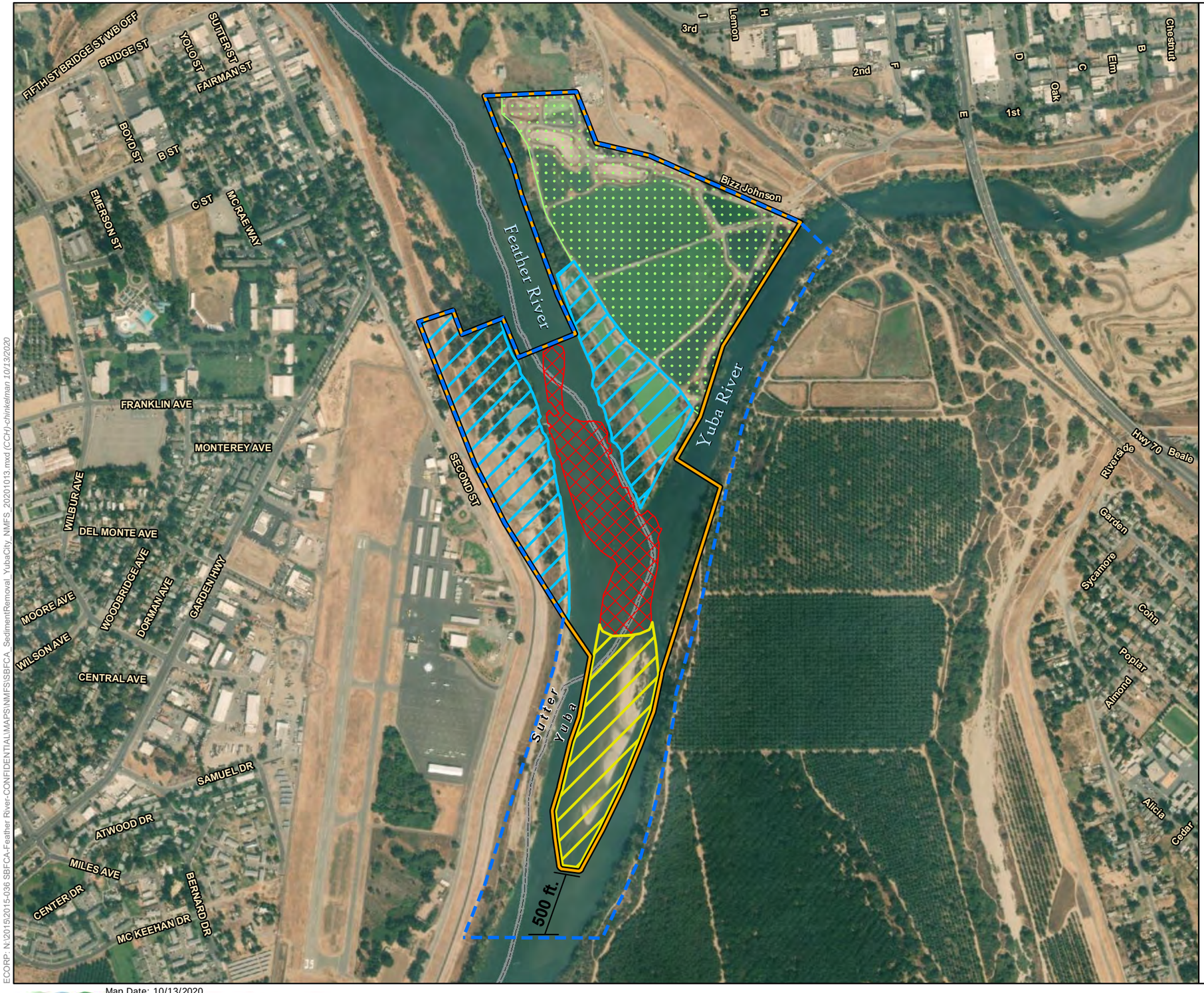
3.3 Proposed Action

The proposed action consists of maintenance dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 2). Approximately 315,600 cubic yards (cy) of dredged material would be removed within an approximately 28-acre area and may occur over two phases. Phase 1 includes the removal of approximately 65,600 cy of dredged material within an ±14.41-acre Dredging Area as part of restoration, protection, and development of river parkways in accordance with the California River Parkways Grant Program. Phase 2 includes an additional approximately 250,000 cy within an ±14.40-acre Future Dredging Area immediately downstream to further restore fish passage and improve conveyance at the confluence of the Yuba and Feather rivers to be funded by other sources. The timing of Phase 2 will depend on availability of funding and may occur concurrently with Phase 1.

Representative site photographs are provided in Attachment A.

3.3.1 Dredging Operations

Two potential dredging methods are being evaluated for the Project: hydraulic dredging and mechanical dredging, depending upon the results of the hydrographic and geophysical surveys of the area proposed to be dredged. Hydraulic dredging involves a barge with suction to remove sediment from the river bottom and pumping the material to shore. Mechanical dredging involves a barge with equipment to excavate the sediment from the river bottom, storage of the dredged material on a transport barge, and subsequent transfer of the material from the transport barge to shore.



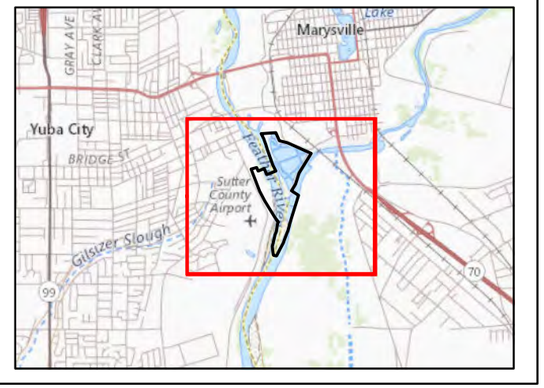
Map Features

- NMFS Action Area
- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



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Map Date: 10/13/2020

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Scale in Feet
0 700

Figure 2. Project Components

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

It is assumed that use of each method at some point during dredging operations may be necessary. Each method that would be employed is described in more detail below.

Hydraulic Dredging Methods

Hydraulic dredging would be performed likely using the hydraulic pipeline cutterhead dredge (or cutterhead dredge), the most commonly used, versatile, and efficient dredging vessel (USACE 2015). A cutterhead dredge is equipped with a rotating cutter apparatus surrounding the intake end of a suction pipe, where it can efficiently dig and pump all types of alluvial materials and compacted deposits (USACE 2015). This dredge also has the capability of pumping dredged material long distances to upland placement areas as a slurry (USACE 2015). Slurries of 10- to 20-percent solids (by dry weight) are typical, depending upon the material being dredged, dredging depth, horsepower of dredge pumps, and pumping distance to the placement area (USACE 2015). If no other data are available, a pipeline discharge concentration of 13 percent by dry weight should be used for preliminary design purposes (USACE 2015). Pipeline discharge velocity, under routine working conditions, ranges from 15 to 20 feet per second (USACE 2015).

The cutterhead dredge is generally equipped with two stern spuds (i.e., long stakes) used to hold the dredge in working position and to advance the dredge into the cut or excavating area (USACE 2015). During operation, the cutterhead dredge swings from side to side, alternately using the port and starboard spuds as a pivot (USACE 2015).

Cables attached to swing anchors on each side of the dredge control lateral movement (USACE 2015). Swing anchors are set out and repositioned by anchor-handling derrick barges or, in areas where water depth precludes derrick barge passage, anchor booms (fastened to the dredge hull) have been used to set the anchors (USACE 2015). For this Project, use of anchor booms is likely.

Dredged material is either transported directly to shore via a discharge pipeline (e.g., a floating or submerged discharge pipeline), or transported to and from a transportation barge if necessary. Conventional cutterhead dredges are not self-propelled and require mobilization using towboats in order to move between dredging locations (USACE 2015); however, others are self-propelled.

Typical equipment for hydraulic dredging includes cutterhead dredge vessel, transportation barge, derrick barge, and towboats. Use of a submerged high-density polyethylene (HDPE) discharge pipeline may also be required.

Mechanical Dredging Methods

Should it become necessary, mechanical dredging would be used. There are primarily two types of mechanical bucket dredges: the clamshell (or grab) bucket dredge, commonly called a bucket dredge, and the backhoe dredge (USACE 2015). The bucket dredge is so named because it uses a bucket to excavate the material to be dredged (USACE 2015). Different types of buckets can fulfill various types of dredging requirements. The buckets used include the clamshell, orange-peel, and dragline types and can usually be quickly changed to suit the operational requirements (USACE 2015). The vessel can be positioned and moved within a limited area using anchors and/or spuds. When the spuds are up, the bucket itself can be used to reposition the dredge by "grabbing" the bottom in the direction of desired translation and pulling

the dredge that way by taking in wire rope (USACE 2015). The barge is normally equipped with two spuds forward (in the front of the barge) and one spud at the aft end of the barge (USACE 2015). The latter is a kicking spud for advancing the dredge. Alternatively, the barge can be held in place by anchors, which are attached to winches on the dredge hull and can be placed by an attendant towboat or by a crane boom (USACE 2015).

Excavated dredged material is then placed on a transportation barge or hopper dredge (vessel with a sediment container or "hopper") that is then towed to the placement area. Material may be unloaded using a gravity dump method or by hydraulic unloader usually consisting of a barge-mounted submersible pump that pumps the dredged material via a discharge pipe to shore (USACE 2015). This operation may involve adding additional water to the dredged material in the barge to allow it to be entrained and pumped through the pipeline (USACE 2015).

Mechanical dredges are also not typically self-propelled and require the use of towboats. Typical equipment for mechanical dredging includes bucket dredge vessel, transportation barge, and towboats. Use of a submerged HDPE discharge pipeline may also be required for mechanical dredging operations.

Pre-Dredging Surveys

A Hydrographic Survey and Geophysical Survey will be performed prior to dredging to determine the presence of debris and/or larger boulders/rocks that may require the use of mechanical dredging in addition to hydraulic dredging for removal. For the 14.41-acre Dredging Area, existing depths of the rivers, proposed dredging depth, and proposed post-dredging depths are depicted in Attachment B. This level of detail has not yet been determined for the Future Dredging Area and can be provided once complete.

3.3.2 Dewatering Operations

Dredged material will be placed on land within empty wastewater ponds at the Marysville WWTP via a discharge pipeline or via mechanical equipment. The existing wastewater ponds serve as existing confined basins within which water would be decanted from the dredged material and evaporative drying of the dredged material would take place. Progressive surface trenching will be used to mechanically manipulate the dredged material to speed evaporative drying. Settling basins will also be used to clean water drained from sediment before it is discharged back into the Feather or Yuba rivers. A conceptual schematic of the proposed dewatering within the Marysville WWTP wastewater ponds is provided in Attachment C.

Phase 2 dredged material would be dewatered in the Marysville WWTP North Ponds as well, if funding is received in time for use of the Marysville WWTP site. If Phase 2 dredged material cannot be dewatered at the Marysville WWTP, dredged material would be placed into fractionation tanks or other temporary dewatering basins staged at the Yuba City Boat Ramp facility, either via a discharge pipeline or mechanical equipment, where water would be decanted from the dredged material. Fractionation tanks would be manifolded together in series and decanted water would be routed to a filtration system, stored, and tested. It is anticipated that filtered water would then be disposed of either to land or disposed of back into the Feather River.

Dredged Material Disposal Operations

Once the dredged material is determined to meet acceptable water content by the City of Marysville, it will be provided to the City of Marysville for their use in final grading/closure of the northernmost wastewater ponds (North Ponds) at the Marysville WWTP (Figure 2).

SBFCA's preferred option is to dispose of all of the dredged material at the Marysville WWTP. If all or portions of the sediment are not able to be disposed of at the Marysville WWTP, the sediment will be hauled to Recology's Ostrom Road Landfill (Figure 3. *Disposal Locations*).

Construction Equipment and Staging

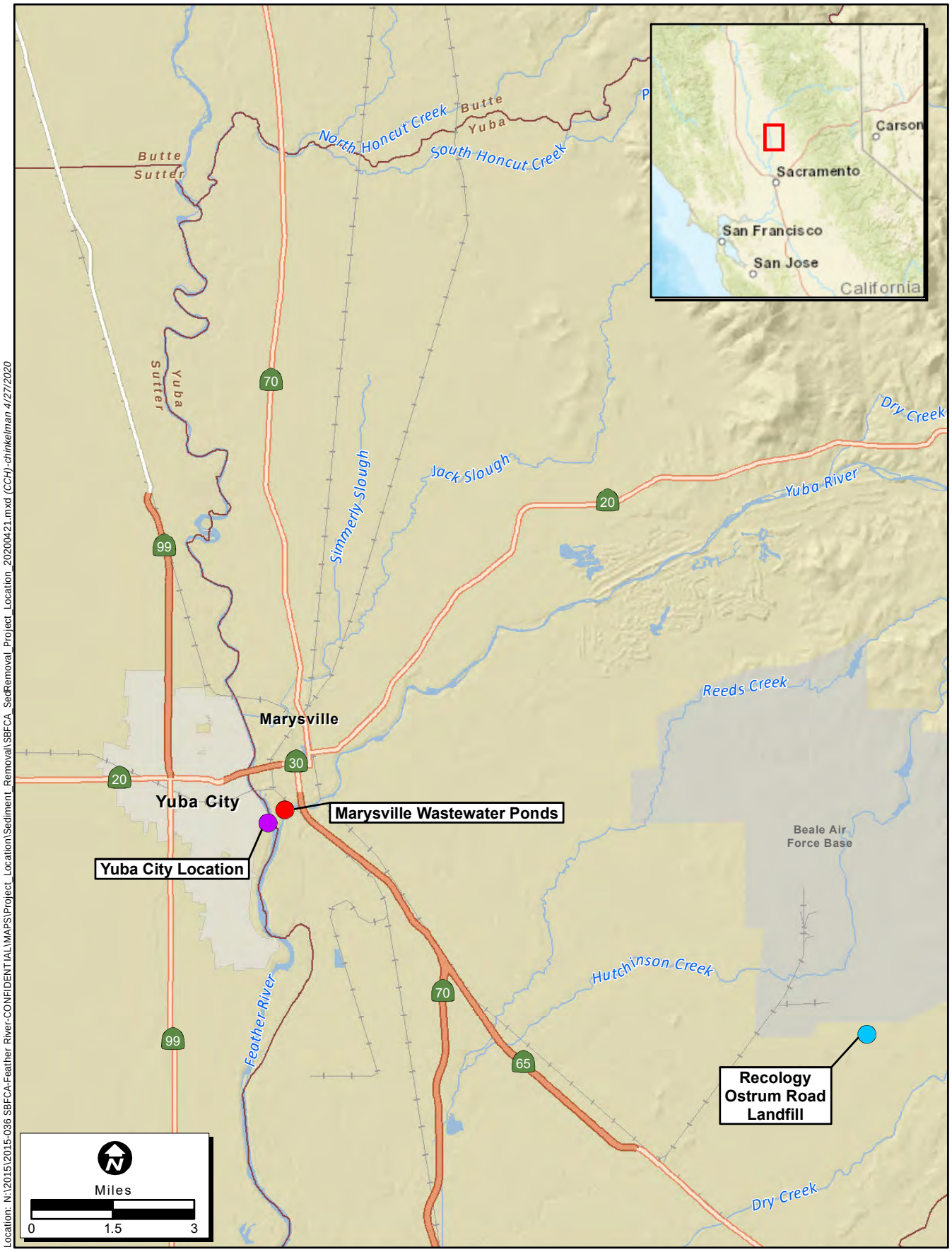
Onshore equipment and dredging equipment and vessels may vary depending upon site conditions during construction. However, Table 1 provides a list of anticipated equipment and vessels for the Project. Several support trailers would be required at the Yuba City Boat Ramp facility. Designated equipment storage and staging areas would be established at the Yuba City Boat Ramp facility and/or Marysville WWTP, in addition to the Marysville WWTP (Figure 2). It is assumed that all vessels will enter and exit the river via the Yuba City boat ramp.

Table 1. Construction Equipment List
Onshore Equipment
Crane (1)
Forklifts (2)
Rubber tired rotary trencher (1)
Rubber tired dozers (2)
Tractors/loaders/backhoes (2)
Grader (1)
Water trucks (1)
Dredging Vessels and Equipment
Dredge vessel (mechanical or hydraulic)
Transport barge
Towboats (2)
Support Vessels and Equipment
Swift water rescue boat
Support boat for environmental monitoring
Light plants (with 11 hp prime and 13 hp backup generators) (10)

3.3.3 Dredged Material Characteristics

Sediment Sampling of Dredged Material

Preliminary sediment sampling and analysis of the area proposed for dredging indicate that the dredged material will qualify as inert waste material and would not be considered hazardous pursuant to Title 22 of the California Code of Regulations (Blackburn 2020).



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Project_Location\Sediment_Removal\SBFCA_SedRemoval_Project_Location_20200421.mxd (CCH)-chinkelman 4/27/2020

Map Date: 4/27/2020

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 3. Disposal Locations

Yuba City Boat Ramp Sediment Removal Project

In late April 2020, three sediment grab samples at the surface (within the approximate top 12 inches) were collected from the proposed dredge area and analyzed for total petroleum hydrocarbons (Method 8015), semi-volatile organic compounds (Method 8270), organochlorine pesticides (Method 8081), and metals (Method 6010/Mercury with Method 7471). Other physical parameters were also measured. All analytes were non-detects, with the exception of barium (42-60 milligrams [mg]/kilogram [kg] total), chromium (17-22 mg/kg total), cobalt (6.6-7.7 mg/kg total), copper (6.3-7.3 mg/kg), nickel (31-41 mg/kg total), vanadium (19-21 mg/kg total), and zinc (15-18 mg/kg total) (concentrations are reported as total concentrations rather than dissolved concentrations). These metals concentrations, however, are below federal and State (Title 22) criteria for hazardous waste. The results of the preliminary sampling are provided in Attachment D.

Additional sampling will be required to fully characterize the dredged material prior to disposal. A proposed Sampling Plan is provided in Attachment E.

3.3.4 Project Timing and Sequence

Dredging operations and dewatering activities are proposed to be limited to between June 15 and October 15 to align with work windows to avoid impacts to special-status fish species. The remainder of the construction period would be dedicated to pre-construction surveys, mobilization and demobilization activities, and completion of the transfer of dewatered dredged material to the City of Marysville for their use in decommissioning of the WWTP.

Completion of Phase 1 of the proposed Project is anticipated to occur in one season, in 2021. Completion of Phase 2 of the proposed Project could occur in 2021 but is likely to conclude in 2022/2023 due to the timing of funding for this Phase and the number of truck trips associated with disposal of the dredged material. It is assumed that nighttime operations may be required for the Project.

3.3.5 Avoidance and Minimization Measures Included During Construction

The following measures will be implemented during construction:

- All in-water work will be limited to the time period between June 15 and October 15 (in-water work window) when ESA-listed anadromous fishes are least likely to be present in the Action Area within the lower Feather and Yuba rivers.
- Deploy a turbidity curtain, if feasible given the flow volume and velocity in the Project Area, to reduce sediment resuspension.
- If/where mechanical dredging is used, attempt to exclude fish from the area using block nets, to the extent feasible.
- Employ a fish biologist to be onsite as needed to monitor dredging activities and check the exit end of the suction pipe and spoils (i.e., sediment and vegetation).
- Erosion control measures will be placed between Waters of the U.S. and the outer edge of the staging and dewatering areas, within an area identified with highly visible markers (e.g.,

construction fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification and erosion control measures will be properly maintained until construction is completed and the soils have been stabilized.

- Any fueling in the upland portion of the Project Area will use appropriate secondary containment techniques to prevent spills.
- A qualified biologist will conduct a mandatory Worker Environmental Awareness Program for all contractors, work crews, and any onsite personnel on the potential for special-status species to occur on the Project site. The training will provide an overview of habitat and characteristics of the species, the need to avoid certain areas, and the possible penalties for non-compliance.
- A qualified biologist/biological monitor will be onsite during daily construction activities to ensure compliance with the anticipated terms and conditions of the Project regulatory permits and California Environmental Quality Act compliance document. If appropriate, the approved biologist will train an individual to act as the onsite construction monitor for periods when there is a low risk of effect to special-status species.
- The proposed action would comply with all terms and conditions of the regulatory permits including: Section 404 Permit from the USACE, Section 401 water quality certification from the Central Valley RWQCB, Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW), and, if necessary, an Incidental Take Permit 2081 from CDFW, pursuant to Section 2080 of the California Fish and Game Code.
- A qualified biologist/biological monitor will be onsite during daily construction activities to conduct water quality monitoring within the Feather River upstream and downstream of the construction area. A comprehensive water quality monitoring plan is being drafted and is provided in Attachment F.

3.4 Interdependent and Interrelated Actions

Interdependent actions are defined as those actions having no independent utility apart from the proposed action. Interrelated actions are those actions that are part of a larger action and depend on the larger action for their justification. There are no interdependent or interrelated actions identified for the proposed action.

4.0 STATUS OF LISTED FISH SPECIES, CRITICAL HABITAT, AND ESSENTIAL FISH HABITAT

The lower Feather River and lower Yuba River in the vicinity of the Action Area is used seasonally by anadromous fishes designated as threatened under the ESA. These include CV spring-run ESU Chinook salmon, CCV steelhead, and sDPS green sturgeon. The ESA listing history for these species is provided in Table 2.

Table 2. Listing History for ESA-Listed Anadromous Fishes Occurring in the Feather River

Fish Species	ESU or DPS	Original Federal Register (FR) Listing	Current Final Listing Status	Critical Habitat Designation
Chinook Salmon (*Oncorhynchus tshawytscha*)	CV spring-run ESU	9/16/1999 64 FR 50394 Threatened	6/28/2005 70 FR 37160 Threatened	9/2/2005 70 FR 52488
Steelhead (*O. mykiss*)	CCV DPS	3/19/1998 63 FR 13347 Threatened	1/5/2006 71 FR 834 Threatened	9/2/2005 70 FR 52488
North American green sturgeon (*Acipenser medirostris*)	sDPS	4/7/2006 71 FR 17757 Threatened	6/2/2010 75 FR 30714 Threatened	10/9/2009 74 FR 52300

All adult and juvenile anadromous fishes occurring seasonally in the Feather and Yuba river systems pass through the lower river, and thus may occur in the Action Area during their adult spawning migrations, juvenile emigration periods, and adult emigration periods for iteroparous (i.e., repeat spawning) anadromous fish species, which includes steelhead and green sturgeon. The lower Feather and Yuba rivers in the Action Area lacks the necessary habitat conditions (e.g., gravel substrates, appropriate stream flow and depth conditions) required for spawning and egg incubation by anadromous salmonids and green sturgeon. Consequently, the anadromous fishes assessed in this BA do not use the lower Feather or Yuba rivers in the Action Area for spawning or egg incubation. Rather, the lower Feather and Yuba rivers in the Action Area are used by these species as migrations corridor to and from spawning and rearing habitats in the upper reaches of these rivers.

4.1 Central Valley Spring-run Chinook Salmon

4.1.1 Status

CV ESU spring-run Chinook salmon were listed as threatened under the ESA on September 16, 1999 (50 Code of Federal Regulations [CFR] 50394) and reaffirmed on June 28, 2005. 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. 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 (California Department of Fish and Game [CDFG] 1998). The CV ESU includes all spawning populations in the Sacramento River and its tributaries, including the Feather River, and one artificial propagation program, the Feather River Fish Hatchery (FRFH) spring-run Chinook program.

4.1.2 Life History and Timing of Presence in the Action Area

Spring-run Chinook salmon begin their migrations into the Sacramento River from March through September (Reynolds et al. 1990), but peak abundance of immigrating adults in the Sacramento-San Joaquin Delta (Delta) and lower Sacramento River occurs from April through June. Adult spring-run Chinook salmon migrate into natal streams (i.e., the upper Sacramento River and tributaries), where they

hold in deep water habitats downstream of spawning grounds during the summer months until their eggs fully develop and become ready for spawning. This is the primary characteristic distinguishing spring-run from the other runs of Chinook salmon. Spring-run Chinook salmon spawn primarily upstream of the Red Bluff Diversion Dam, and in the aforementioned tributaries. Spawning occurs during mid-August through early October (Reynolds et al. 1990). A small portion of an annual year-class may emigrate as post-emergent fry (<45 millimeters [mm] total length [TL]) and reside in the Delta undergoing smoltification, a physiological process preparing them for saltwater entry. However, most are believed to rear in the upper river and tributaries during the winter and spring, emigrating as juveniles (>45mm TL; not having undergone smoltification) or smolts (silver-colored fingerlings having undergone smoltification). The timing of juvenile emigration from the spawning and rearing reaches varies among the tributaries of origin, and can occur from November through June, during which period juvenile spring-run Chinook salmon may occur in the Action Area.

The life history timing of steelhead in the lower Yuba and lower Feather rivers are assumed to be similar. Adult spring-run Chinook salmon migrate through the Action Area and into the lower Yuba River from March through July and hold in deep pools, including the Daguerre Point Dam plunge pool and the Narrows Reach downstream of Englebright Dam during the summer months (CDFG 1991). Monitoring of fish passage through the fish ladders at Daguerre Point Dam indicated that an average of 1,589 adult spring-run Chinook salmon migrated past the dam during the three-year monitoring period of 2010-12. An estimated 22.9 percent of the fish were adipose-clipped (i.e., marked to differentiate hatchery from wild origin) fish of hatchery origin (i.e., Feather River Fish Hatchery strays). Chinook salmon spawning occurs from early or mid-September into November (Yuba County Water Agency [YCWA] 2013a). Redd (spawning nest) surveys indicate that the majority (≥74 percent) of all Chinook salmon redds were established between Daguerre Point Dam and Englebright Dam (YCWA 2012).

4.1.3 Critical Habitat

Critical habitat for CV ESU spring-run Chinook salmon was designated September 2, 2005 (50 CFR 52488) and includes the following 12 hydrologic units (HUs):

1. Tehama (HU 5504),
2. Whitmore (HU 5507),
3. Redding (HU 5508),
4. Eastern Tehama (HU 5509),
5. Sacramento Delta (HU 5510),
6. Valley Putah-Cache (HU 5511),
7. Marysville (HU 5515),
8. Yuba River (HU 5517),

9. Valley-American (HU 5519),

10. Colusa (5520),

11. Butte Creek (HU 5521), and

12. Shasta Bally (HU 5524).

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 Action Area lies within the designated Critical Habitat for this ESU.

NMFS regulations require the agency to focus on primary constituent elements (PCE) in defining the physical and biological features that are essential for conservation of listed species. The PCEs for Critical Habitat for CV spring-run ESU in the Action Area include the following:

- Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover, such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

4.2 Central Valley Distinct Population Segment Steelhead

4.2.1 Status

The CV DPS steelhead was listed as threatened under the ESA on March 19, 1998 (63 FR 13347) and reaffirmed on January 5, 2006 (71 FR 834). This DPS includes all naturally spawned populations of steelhead occurring in the Sacramento and San Joaquin rivers and their tributaries, but excludes steelhead from San Francisco Bay, San Pablo Bay, and tributaries to these bays (63 FR 13347). Steelhead derived from the Coleman National Fish Hatchery and FRFH are considered part of the CV DPS.

Steelhead were historically widely distributed throughout the Central Valley, but populations have decreased substantially since the 1850s, although they were less abundant in the San Joaquin River system compared to the Sacramento River system, which currently supports the majority of CV steelhead production (McEwan 2001).

Extirpation from much of its historical range is a major factor in the decline of this DPS. In the Central Valley, approximately 95 percent of the historical spawning habitat for this DPS is inaccessible due to the presence of manmade impassible barriers (McEwan 2001). Other factors identified for declining steelhead populations include a reduction in the proportion of wild fish comprising the spawning run, interactions

with hatchery-derived fish, reduced habitat quantity and quality, a lack of ongoing population assessments, and commercial and sport fishing harvest (NMFS 2009).

4.2.2 Life History and Timing of Presence in the Action Area

Adult steelhead averaging 600 to 800 mm in length (Moyle 2002) leave the ocean and begin upstream migration through the Delta to spawning reaches in the upper Sacramento and San Joaquin rivers and tributaries, typically from August through March (McEwan 2001), with peak immigration occurring in January and February (Moyle 2002). Spawning generally occurs from January through April (McEwan and Jackson 1996). Redds are typically dug by female fish in water depths of 10 to 150 centimeters (cm) and where water velocities range from 20 to 155 cm per second (Moyle 2002). Juvenile steelhead rear in their natal streams for one to three years prior to emigrating from the river. Emigration of one- to three-year-old, subadult fish occurs primarily from January through June (Snider and Titus 1996). Unlike Chinook salmon, steelhead are iteroparous (i.e., able to spawn repeatedly) and may spawn for up to four consecutive years before dying; however, it is rare for steelhead to spawn more than twice and the majority of repeat spawners are females (Busby et al. 1996). Although one-time spawners comprise the majority, Shapolov and Taft (1954) report that repeat spawners are relatively numerous (i.e., 17.2 percent) in California streams.

Like most salmonids, steelhead will actively seek out preferable temperatures and avoid unsuitable temperatures when possible, a process known as behavioral thermoregulation (Keefer et al. 2009). Published acute thermal tolerances for American River steelhead range from a critical thermal maximum (CTM) of 81.9 degrees Fahrenheit (°F) for fish acclimated to 51.8°F to a CTM of 85.3°F for fish acclimated to 66.2°F (McCullough 1999). Sublethal thermal effects include reduced growth and/or maturation rates, increased vulnerability to predation, and an increased risk of disease. A study of juvenile steelhead growth rates indicate that growth rates were greatest at 61.5°F (depending on food ration), declined rapidly above 61.5°F, but were still positive at 72.5°F, the highest experimental temperature used in the study (Wurtsbaugh and Davis 1977).

The life history timing of steelhead in the lower Yuba and lower Feather rivers are assumed to be similar. Adult steelhead migrate into the lower Yuba River from August through March (YCWA 2013a). Monitoring of fish passage through the fish ladders at Daguerre Point Dam indicated that estimated 43 percent of all steelhead moving upstream were of hatchery origin (as indicated by adipose fin clips) in 2010/2011 and 63 percent in 2011/2012 (YCWA 2013a). Spawning generally occurs from January through April (YCWA 2013b) and embryo incubation lasts from January through May. Juvenile steelhead rear in their natal streams for one to three years prior to emigrating. Kelts (post-spawning adults) may be present in the in the Action Area during their return to the ocean shortly after spawning (i.e., January through mid-April).

4.2.3 Critical Habitat

Critical Habitat for CV DPS steelhead was designated September 2, 2005 (70 CFR 52488) and includes 21 HUs and 2,308 miles of stream in the Central Valley and 254 square miles of estuarine habitat in the San Francisco-San Pablo-Suisun Bay complex (70 FR 52488, September 2, 2005). The Action Area is located within the Upper Yuba (HUC 18020125) and Honcut Headwaters – Lower Feather (HUC 1820159)

watersheds, two of the 21 HUCs composing the designated Critical Habitat for CV DPS steelhead, and thus is within the Critical Habitat for this DPS.

The PCEs for CV DPS steelhead in the Action Area include the following:

- Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival; and
- Freshwater rearing sites with sufficient water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. These features are essential to conservation because, without them, juveniles cannot access and use the areas needed to forage, grow, and develop behaviors (e.g., predator avoidance, competition) that help ensure their survival.

4.3 Green Sturgeon

4.3.1 Status

The sDPS of North American green sturgeon was proposed for listing as threatened under the ESA on April 7, 2006 (71 FR 17757) and the Final Rule, which established take prohibitions for the sDPS, was promulgated on June 2, 2010 (75 FR 30714).

The green sturgeon is the least understood of all 25 sturgeon species occurring worldwide and there are currently no reliable estimates of abundance for the overall population. However, collections of green sturgeon at federal and State pumping facilities indicate that abundance of the sDPS has been declining in recent decades. A reduction in spawning habitat availability is considered the primary threat to the sDPS. The draft recovery plan (NMFS 2010) identifies the following habitat modifications in the Delta as the primary factors contributing to reductions in abundance of the sDPS:

1. Removal of gravel and deposition of mercury associated with hydraulic gold mining;
2. Conversion of tidal and seasonal marshlands to agricultural fields;
3. A reduction in riparian vegetation and channel complexity associated with construction of levees;
4. Alterations of river flow and temperature regimes;
5. Altered hydrology and entrainment of green sturgeon larvae/juveniles associated with in-water diversions; and
6. Modification of trophic relationships resulting from widespread introductions of nonnative species.

The only known current spawning locations in the Central Valley for the sDPS is in the Sacramento River system (i.e., Sacramento River below Keswick Dam, Feather River, and Yuba River below Daguerre Point Dam).

4.3.2 Life History and Timing of Presence in the Action Area

The three general phases in green sturgeon life history consist of:

1. freshwater stage (< three years old),
2. coastal migrants (three to 13 years old for females; three to nine years old for males), and
3. adults (13 years old for females, more >nine years old for males) (Environmental Protection Information Center [EPIC] 2001).

Green sturgeon may live to an age of 60 to 70 years and females reach sexual maturity at 16 to 20 years of age, while males reach sexual maturity as early as 14 years of age (Van Eenennaam et al. 2006). Upon reaching maturity, spawning occurs every three to five years throughout their lives (Moyle 2002).

Adult green sturgeon move into estuaries and lower reaches of rivers to feed between mid-February and early May (NMFS 2010). Adults captured in the Delta feed off benthic invertebrates including shrimp, mollusks, amphipods, and small fish (Moyle et al. 1992 as cited by NMFS 2015). Tagging studies indicate that migration of adult green sturgeon to upstream spawning reaches and downstream emigrations is rapid, typically occurring over the course of a few weeks (Heublein et al. 2008). Spawning occurs from April through early July in deep (>three meters), cool (50 to 63.7°F), and turbulent rivers (Van Eenennaam et al. 2005; Poytress et al. 2010, 2011) over substrates ranging from clean sand to bedrock, but typically dominated by cobbles (Moyle 2002).

Fecundity of adult female green sturgeon ranges from 60,000 to 140,000 eggs (Moyle 2002). During spawning, eggs are broadcast by female fish and fertilized externally by male fish. The adhesive eggs settle to the river bottom, where they adhere to substrates. Excessive silt depositions in the spawning substrates may reduce egg survival by preventing the eggs from attaching to each other and/or to coarser substrates. Based on their similarity to white sturgeon (*A. transmontanus*), eggs are believed to hatch within approximately 200 hours at 55°F, (Emmett et al. 1991; Moyle 2002). Young-of-the-year fish grow quickly and have a relatively short residence time in riverine environments (Van Eenennaam et al. 2006) before they emigrate downstream toward the Delta/Estuary, feeding primarily on opossum shrimp (*Neomysis mercedis*) and Corophium amphipods (Radtke 1966 as cited in Moyle 2002). Delta residence may range from one to four years before green sturgeon migrate as subadults to the ocean (NMFS 2010).

Following spawning, adult green sturgeon may hold for several months in deep pools or near spawning sites, followed by downstream migration to overwintering and rearing locations as flows increase in the fall months (NMFS 2010) and temperature decrease. Data from the California Fish Tracking Database (2015) indicate that ocean re-entry occurs primarily from November through January.

Known spawning locations for sDPS green sturgeon in the Central Valley include the Sacramento River downstream of Keswick Dam, in the Feather River near the Thermalito Bay outlet (Seesholtz et al. 2015),

and in the lower Yuba River downstream of Daguerre Point Dam (CDFW 2018, 2019). Adult green sturgeon have been observed in the plunge pool below Daguerre Point Dam in May 2011 (CDFW 2018; Cramer Fish Sciences 2011), in July 2016 (CDFW 2018), and in June-August 2017 (CDFW 2018), May-June 2018 (CDFW 2018), and April-August 2019 (CDFW 2019). In a study to determine green sturgeon spawning in the lower Yuba River below Daguerre Point Dam, approximately 270 green sturgeon eggs were collected on egg mats placed in the pool benthos in June 2018 (CDFW 2018) and one young-of-the-year green sturgeon was captured downstream of the dam in August 2019 (CDFW 2019), thereby indicating successful green sturgeon spawning in the lower Yuba River.

Juvenile green sturgeon are believed to reside in freshwater habitats from one to four years, before emigrating to the Delta under winter high-flow events; however, the timing and duration of juvenile emigration to the Delta is unknown (Poytress et al. 2011; EPIC 2001). Kynard et al. (2005) suggested that juvenile sturgeon move downstream to over-wintering and rearing habitats in the fall months when temperatures decreased to less than 50°F. As such, juvenile green sturgeon may occur in the Action Area from April through September.

4.3.3 Critical Habitat

Freshwater Critical Habitat for sDPS green sturgeon was designated by NMFS on October 9, 2009, (74 FR 52300) and 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 legal boundary of the Delta. The Critical Habitat designation consists of approximately 320 miles of freshwater river habitat, 897 miles of estuarine habitat, 11,421 miles of marine habitat, 487 miles of habitat in the Delta, and 135 miles of habitat within the Yolo and Sutter bypasses. The Action Area is located within the mainstem of the lower Feather and Yuba rivers and, therefore, is within the Critical Habitat designation for sDPS green sturgeon.

PCEs identified for sDPS green sturgeon in freshwater riverine systems include the following:

- Food resources - Abundant prey items for larval, juvenile, subadult, and adult life stages.
- Water flow - A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate of change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages.
- Water quality - Water quality, including temperature, salinity, dissolved oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
- Migratory corridor - A migratory pathway necessary for the safe and timely passage of sDPS fish within riverine habitats and between riverine and estuarine habitats (e.g., an unobstructed river or dammed river that still allows for safe and timely passage).
- Depth - Deep (≥five meters) holding pools for both upstream and downstream holding of adult or subadult fish, with adequate water quality and flow to maintain the physiological needs of the holding adult or subadult fish.

- Sediment quality - Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

4.4 Pacific Coast Salmon – Essential Fish Habitat

Section 305(b) of the 1996 MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on proposed actions that may adversely affect EFH. The objective of the EFH assessment is to determine whether or not the proposed action "may adversely affect" designated EFH for relevant commercially, federally managed fisheries species within the proposed Action Area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH from the proposed action. The Action Area is within designated EFH for Pacific Coast salmon, which includes the CV fall-run, late fall-run, and spring-run ESUs of Chinook salmon.

5.0 ENVIRONMENTAL BASELINE OF THE ACTION AREA

5.1 Riparian Conditions and Surrounding Land Use

The lower Feather River and lower Yuba River in the Action Area is bounded by a relatively narrow corridor of riparian woodland and unimproved areas around the boat ramp. Land cover types or vegetation communities found within the Action Area include riparian woodland, ruderal, paved/developed, and constructed wastewater ponds. Riparian habitat in the Action Area has been heavily modified by human activity, including restriction of the channel within levees and widespread conversion of surrounding lands to agricultural (e.g., orchards) and urban land uses since the early nineteenth century.

The riparian woodland community is found along the riverbanks. Riparian woodland vegetation is a relatively narrow corridor of mature trees with varying densities of understory cover, depending on levels of human use. Dominant trees include Fremont's cottonwood (*Populus fremontii*), Goodding's black willow (*Salix gooddingii*), and Valley oak (*Quercus lobata*), with scattered box elder (*Acer negundo*), tree-of-heaven (*Ailanthus altissima*), California black walnut (*Juglans hindsii*), black locust (*Robinia pseudoacacia*), and sandbar willow (*Salix exigua*). Understory vegetation is dense in scattered locations and includes Himalayan blackberry (*Rubus armeniacus*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), tree tobacco (*Nicotiana glauca*), mugwort (*Artemisia douglasiana*), cow parsnip (*Heracleum maximum*), and common bedstraw (*Galium aparine*).

The ruderal community occurs along roadsides, levees, wastewater pond edges, and other areas heavily impacted by human presence. These areas are characterized by the presence of nonnative weedy plants such as cheeseweed (*Malva parviflora*), barley (*Hordeum murinum*), cut-leaved geranium (*Geranium dissectum*), yellow star-thistle (*Centaurea solstitialis*), and wild oats (*Avena* sp.).

Paved, developed portions of the Study Area are characterized by existing paved roads and parking areas, compacted dirt/gravel parking areas, and pedestrian paths to the Feather River. The majority of the dirt/gravel roads and paths are unvegetated. The ponds are no longer in use and hydrology is limited to seasonal rainfall. The wastewater ponds are located in the city of Marysville north of the confluence of the

Feather and Yuba rivers. The wastewater ponds are constructed/excavated ponds located between access roads and levees. Some ponds are vegetated with upland and emergent wetland vegetation, while others are unvegetated.

5.2 Hydrology and Temperature of the Lower Feather River

The Feather and Yuba rivers in the Action Area are perennial and are affected by numerous factors, including seasonal precipitation and snowmelt, runoff, dam releases, and diversions. The hydrologic regime has been substantially altered by dams and diversions throughout these watersheds. Feather River flows and stage are regulated by releases from Oroville Dam, approximately 43 miles upstream of the Action Area, while lower Yuba River flows and stage are regulated by releases from Englebright Dam, approximately 24 miles upstream of the Action Area.

Hourly data from the California Data Exchange Center's (CDEC's) Gridley station, located approximately 23 miles upstream of the Action Area, indicate that flows are highly variable in the lower Feather River, ranging overall from 368 cubic feet per second (cfs) on April 15, 2015 to 111,963 cfs on February 14, 2017 (Table 3). Monthly averages over the past 20 years ranged from 1,880 cfs in November to 5,120 cfs in July (Table 3). Yuba River flows measured at the CDEC's Marysville station, located approximately six miles upstream of the Action Area, during the same period are also variable and ranged from 21 cfs on April 11, 2003 to 51,721 cfs on April 24, 2001, with monthly averages ranging from 551 cfs in November to 2,961 cfs in March (Table 3). Feather River flows at the CDEC Boyd's Landing station, located approximately 12 miles downstream of the Action Area and the Feather-Yuba confluence are only available dating back to February 27, 2011. Flows during this period ranged from 2,368 cfs on November 8, 2018 to 111,130 cfs on February 11, 2017, with monthly averages ranging from 3,577 cfs in November to 14,540 cfs in February (Table 3).

Table 3. Monthly Flows for the Period January 1, 2000 through October 4, 2020 at the Feather River Gridley (GRL) and Yuba River Marysville (MRY) Monitoring Stations and for the period February 27, 2011 through October 20, 2020 at the Feather River at Boyd's Landing Monitoring Station.

Month	Feather River at GRL (cfs) [1]			Yuba River at MRY (cfs) [2]			Feather River at FSB (cfs) [3]		
	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
January	624	83,515	2,912	675	42,894	1,580	2,573	86,876	8,115
February	644	111,963	4,879	701	33,989	2,729	2,600	111,130	14,540
March	409	44,599	4,842	449	33,031	2,961	2,514	71,353	12,750
April	368	37,717	5,059	21	51,721	2,281	2,393	57,788	13,517
May	409	30,338	3,638	306	8,343	2,253	2,470	50,190	8,823
June	869	12,542	3,689	42	36,534	1,491	2,529	19,312	6,698
July	583	30,622	5,120	276	2,003	1,373	2,464	13,826	6,169
August	663	10,075	4,576	463	2,408	1,344	2,600	9,772	6,302
September	695	8,771	3,872	417	1,189	627	2,536	8,909	5,943
October	727	7,579	2,448	404	943	575	2,600	8,615	4,363
November	655	2,870	1,880	69	788	551	2,368	12,754	3,577
December	634	78,198	2,413	374	9,225	1,201	2,486	31,935	5,836

Source: (1) CDEC's Gridley monitoring station; (2) CDEC's Feather River at Boyd's Landing station; (3) CDEC's Yuba River at Marysville station.

Hourly temperature data from the CDEC's Feather River at OWA Boundary station (FOW), located approximately 13 miles upstream of the Action Area, indicate that river temperatures are, on a monthly average basis, suitable for supporting anadromous salmonids in the lower Feather River, ranging overall from 37.7°F in March to 73.6°F in June (Table 4). Monthly averages for the FOW station ranged from 49.4°F in January to 66.6°F in July (Table 4). Monthly temperatures for the lower Yuba River at CDEC's Yuba River Above Highway 70 monitoring station (YR7) during the period September 4, 2019 through October 4, 2020 ranged from 41.0°F in January to 81.7°F in August, with monthly averages ranging from 49.3°F in January to 66.0°F in June (Table 4).

Table 4. Monthly Temperature for the Period March 5, 2013 through October 4, 2020 at the Feather River at OWA Boundary Station and for the Period September 4, 2019 through October 4, 2020 at the Yuba River YR7 station.

Month	Feather River at FOW (°F) [1]			Yuba River at YR7 (°F) [2]		
	Minimum	Maximum	Average	Minimum	Maximum	Average
January	45.7	53.9	49.4	41.0	53.2	49.3
February	45.5	56.5	50.8	45.9	56.1	51.0
March	37.7	74.7	54.5	48.4	59.9	53.6
April	48.1	67.9	57.1	50.5	67.1	57.7
May	52.8	70.0	60.8	48.2	71.6	61.9
June	57.6	73.6	64.9	59.4	73.6	66.0
July	62.0	73.0	66.6	59.0	70.3	64.6
August	59.5	69.6	64.8	56.1	81.7	62.3
September	55.7	67.5	61.1	56.7	69.6	62.8
October	51.4	64.6	58.2	50.9	65.1	59.0
November	48.0	59.1	54.0	48.2	57.2	53.2
December	45.4	56.0	49.9	46.6	53.4	50.3

Source: (1) CDEC's FOW Boundary monitoring station; (2) CDEC's Yuba River Above Highway 70 monitoring station.

5.3 Aquatic Habitat in the Action Area

Aquatic habitat in the lower Feather and Yuba rivers within the Action Area is currently characterized as relatively wide (approximately 200 to 450 feet) and consist primarily of deep runs and glides with large deposits of fine sediments along the banks, at river bends, and in the Feather River immediately downstream of the Yuba River confluence. Benthic substrates in the Action Area are dominated by fine sediments (i.e., sand and silt). The river channels are moderately sinuous in the Action Area.

Aquatic habitat in the Action Area is relatively homogeneous and lacks in-channel complexity and habitat diversity required by anadromous fishes habitat for spawning, egg incubation, and larval development. As such, the lower Feather and Yuba rivers in the Action Area primarily serve as migration corridors for adult and juvenile anadromous fishes moving to and from natal spawning and rearing reaches in the accessible upstream reaches of the lower Feather River downstream of Oroville Dam and the lower Yuba River downstream of Englebright Dam. Cover for migrating anadromous fish in the Action Area is provided by a limited abundance of large woody debris, downed trees, and some undercut banks. Passage of anadromous fishes through the Action Area is likely rapid, due to the paucity of suitable holding or rearing habitat throughout the lower reaches of the Feather and Yuba rivers.

5.4 Fish Assemblage of the Lower Feather and Yuba Rivers

The FRFH was construction by the California Department of Water Resources in the mid-1960s to mitigate for losses of habitat for Chinook salmon and steelhead upstream of Oroville Dam and is now operated by CDFW. The FRFH consists of the Fish Barrier Dam, fish ladder, holding tanks, hatchery buildings, and raceways. The FRFH rears and releases CV spring-run Chinook salmon, CV fall-run Chinook salmon, and CCV steelhead, and is the only hatchery in the Central Valley that produces CV spring-run Chinook salmon. Annual production of the FRFH is approximately eight million fall-run Chinook salmon, five million spring-run Chinook salmon, and 400,000 steelhead (Federal Energy Regulatory Commission [FERC] 2018).

The resident fish community of the lower Feather and Yuba rivers in the Action Area is comprised of native and nonnative fish species, many of which are piscivorous. Seesholtz and Cavallo (2004) conducted a study of juvenile fishes in the lower Feather River between 1998 and 2001 and identified a total of 31 species of fish in the lower Feather River near Live Oak. Chinook salmon were by far the most abundant, totaling over 99 percent of all fish collected in the study. Other native fish collected included Pacific lamprey (*Entosphenus tridentata*), steelhead/rainbow trout, Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), prickly sculpin (*Cottus asper*), hardhead (*Mylopharodon conocephalus*), riffle sculpin (*Cottus gulosus*), river lamprey (*Lampetra ayersi*), tule perch (*Hysterocarpus traskii*), splittail (*Pogonichthys macrolepidotus*), and Sacramento hitch (*Lavinia exilicauda*). Nonnative predatory fish collected at this location were somewhat abundant and included largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), bluegill (*Lepomis macrochirus*), warmouth (*Lepomis gulosus*), green sunfish (*Lepomis cyanellus*), and brown bullhead (*Ameiurus nebulosus*).

In a summary of studies characterizing the fish assemblage of the lower Yuba River, the YCWA (2011) identified prickly and riffle sculpin, Sacramento sucker, speckled dace (*Rhinichthys osculus*), and Sacramento pikeminnow as the most abundant fish species occurring in the lowest 11-mile stretch of the Yuba River. Other species included steelhead/rainbow trout, Chinook salmon, American shad (*Alosa sapidissima*), tule perch, Pacific lamprey, hardhead, green sunfish, western mosquitofish (*Gambusia affinis*), redear sunfish (*Lepomis microlophus*), and smallmouth bass.

5.5 Water and Sediment Quality in the Action Area

Water quality of the lower Feather River has been adversely affected by many factors, including agricultural runoff, stormwater discharges, urban runoff, diversions, and dam releases. The lower Feather River, from the Oroville Dam to the confluence of the Sacramento River, including the Action Area, is on the Category 5 303(d) list of impaired water bodies for chlorpyrifos, Group A pesticides, mercury, polychlorinated biphenyls , and other unknown toxicity (USEPA 2020). Group A Pesticides include one or more of the following compounds: dieldrin, endrin, alpha-chlordane, gammachlordane, cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor, and heptachlor epoxide. The Lower Yuba River is on the Category 5 303(d) list for copper and mercury (USEPA 2020). A Category 5 list contains water bodies that have listed pollutants that still require the development of a total maximum daily load.

During normal operations of Oroville Dam and Englebright Dam, turbidity levels in the lower Feather and Yuba rivers downstream of these dams are generally low (i.e., <10 Nephelometric Turbidity Units) because most fine sediments settle out in the reservoirs behind these dams prior to downstream release. However,

turbidity levels may increase downstream these dams due to sediment inputs from storm runoff and numerous tributaries (FERC 2018). The initial failure of the main Oroville Dam spillway and associated erosion of the emergency spillway in 2017 contributed a substantial increase in fine sediment and turbidity in the lower Feather River.

6.0 EFFECTS OF THE PROPOSED ACTION

This section considers the direct and indirect effects of the proposed action, together with the effects of interrelated or interdependent actions. The applicable standard for determining that a proposed action is not likely to adversely affect listed species, Critical Habitat, or EFH is that all of the effects of the action are anticipated to be discountable, insignificant, or beneficial. Discountable effects are those effects that are highly unlikely to occur. Insignificant effects are those effects of which the size and magnitude would not result in take. Beneficial effects are contemporaneous positive effects having no adverse effects to the species or Critical Habitat.

The components of the proposed action with the potential to adversely affect federally listed fish species, Critical Habitat, and EFH include short-term, construction-related effects and alteration of Critical Habitat and EFH. The potential short-term, construction-related effects include the potential for direct injury or lethality resulting from primrose removal and sediment dredging, and increased turbidity and suspended sediment associated with primrose removal and sediment dredging. Effects of the proposed action on Critical Habitat and EFH include the potential removal or alteration of near-shore vegetation and localized alteration of aquatic habitat.

6.1 Assessment Approach

The proposed action will utilize large machinery to dredge the accumulated sediment, which may have direct and indirect effects on ESA-listed anadromous fish, including injury, lethality, changes in water quality that may affect fish and fish migrations, and long-term changes in habitat of the lower Feather and Yuba rivers. Accordingly, the proposed action was assessed to determine the potential for direct injury or lethality associated with construction-related activities, water quality effects associated with construction-related activities, and long-term effects on habitat alteration resulting from the proposed action.

6.1.1 Direct Injury or Lethality from Construction-related Activities

The potential for direct injury or lethality to ESA-listed anadromous fishes resulting from dredging was assessed qualitatively by examining:

1. the timing and duration of construction-related actions and best management practices (BMPs);
2. the likelihood of occurrence of ESA-listed anadromous fishes during construction-related activities; and
3. the behavioral reactions of ESA-listed anadromous fishes when encountering in-water disturbances.

6.1.2 Water Quality Effects

The potential for elevated sediment loads, turbidity, and contaminants associated with dredging was assessed qualitatively by examining:

1. the timing and duration of construction-related actions and BMPs;
2. the likelihood of occurrence of ESA-listed anadromous fishes during construction-related activities;
3. the behavioral reactions of ESA-listed anadromous fishes when encountering plumes of elevated suspended sediments or turbidity; and
4. the potential concentrations of sediments in the water column resulting from construction-related activities.

6.1.3 Habitat Effects

The potential long-term effects of the proposed action on riparian and aquatic habitat were evaluated qualitatively by examining:

1. the nature and magnitude of alterations of aquatic habitats, including any specific effects on PCEs for designated Critical Habitat and EFH;
2. measures incorporated into the Project design to minimize effects on riparian and aquatic habitat; and
3. the potential for alterations of the riparian habitat to adversely affect shading near-shore cover of the lower Feather River within the Action Area.

6.2 Effects Assessment

6.2.1 Effect 1: Direct Injury or Lethality

Dredging of accumulated sediments within the Action Area of the Feather River would be conducted using large machinery with the potential to entrain, injure, or kill ESA-listed fishes, specifically hydraulic and mechanical dredging equipment such as a digging bucket, flat-cut bucket excavator, or cutterhead suction intake. Fish could potentially be physically injured or killed if they come into direct contact with the mechanical dredging equipment. Juvenile green sturgeon emigrating downstream through the Action Area may be entrained, injured, or killed if they come into close contact with the cutterhead suction intake. Depending on the exact timing of implementation of the proposed action, adult CV spring-run Chinook salmon and CCV steelhead may be present in the Action Area. In years that successful spawning occurs in the Feather and/or Yuba rivers, adult or juvenile sDPS green sturgeon may also be present in the Action Area. However, implementation of the conservation measures for the proposed action are expected to minimize the likelihood of direct injury or lethality to ESA-listed anadromous fishes.

Sediment dredging would occur in a summer period (June 15 to October 15) during which time no juvenile ESA-listed salmonids are expected to be present and little immigration of adult CV spring-run Chinook salmon or CCV steelhead occurs through the Action Area. Although dredging activities are anticipated to occur during both daylight and nighttime hours, the periods of dredging would be discontinuous throughout this period and would, therefore, leave daily periods during which fish could pass undisturbed through the Action Area. At any given time, the disturbance would be confined to a small footprint around the area being dredged, leaving the majority of the channel unaffected or minimally affected by construction activities. Furthermore, the presence of the turbidity curtain around the dredging area coupled with noise and activity associated with the dredging activity would likely cause these fish to avoid the immediate construction area by moving downstream a safe distance away from the construction area or by holding upstream of the construction activity until dredging is temporarily suspended and, therefore, unlikely to be directly injured or killed. In a meta-analysis of dredging effects on fish, Wenger et al. (2017) concluded that entrainment of mobile juvenile and adult fish had low mortality rates and that the likelihood of entrainment and mortality was greatest for demersal (i.e., bottom-dwelling) fish and other fish species with low mobility and/or ability to avoid the suction intake, rather than pelagic (i.e., occurring in the water column) and mobile fish, such as adult salmonids. Furthermore, any avoidance of the Action Area by migrating fish would be short term (i.e., several hours) and would occur during a summer period in which ESA-listed adult salmonids are unlikely to be present in the Action Area.

Adult or juvenile green sturgeon may occur in the Action Area at this time during their downstream emigration to the Delta. However, because green sturgeon occur primarily in deeper water, the potential for green sturgeon to move through the shallower water where accumulated sediment is being actively dredged is expected to be low. Furthermore, as discussed above, the presence of the turbidity curtain around the dredging area coupled with noise and activity associated with the dredging activity would likely cause these fish to avoid the immediate construction area by moving downstream a safe distance away from the construction area or by holding upstream of the construction activity until a break in dredging activities. As such, the potential for any green sturgeon to occur in the footprint of the dredging and subject to direct injury or lethality is very low.

Given the relatively small footprint of the active dredging area, the short time frame required to complete the work, the low likelihood that any ESA-listed anadromous fishes would be present during dredging activities, the presence of the turbidity curtain, attempts to exclude fish from the area around the active dredging, and the ability of anadromous fishes to avoid the immediate area around the mechanical or hydraulic dredging equipment, should they be present during dredging, the potential for direct injury or death of ESA-listed anadromous fishes resulting from hydraulic or mechanical sediment dredging is expected to be discountable. A small, but unknown number of ESA-listed adult CV spring-run Chinook salmon, CCV steelhead, and/or adult or juvenile sDPS green sturgeon may be adversely affected by construction-related activities associated with the proposed action.

6.2.2 Effect 2: Water Quality Effects

Substrate material in the lower Feather and Yuba rivers within the Action Area is comprised largely of fine sediments. Removal of accumulated sediments has the potential to disturb the substrate material, thereby creating a plume of elevated sediments, increased turbidity levels, and increased concentrations of sediment-bound pollutants in the water column in the immediate vicinity and downstream of the work area. The physiology of fish exposed to elevated suspended sediment loads or turbidity may be adversely affected through such physical mechanisms as gill trauma, alteration of osmoregulation, alteration of blood sugar levels, and behavioral responses (e.g., avoidance, decreased foraging success) (Bash et al. 2001).

Dewatering operations in tanks or basins, return of decanted water back to the Feather or Yuba rivers, could also adversely affect surface water quality in the Feather and Yuba rivers. The decanted return water is expected to have lower turbidity and concentrations of any pollutants than the Feather or Yuba rivers. However, sediments may become suspended causing a localized increase in turbidity around the point(s) of discharge into these rivers.

As noted in the *Sediment Sampling of Dredged Material* section, analyses of sediment grab samples collected in April 2020, in the proposed dredging area detected the presence of barium (42-60 mg/kg total), chromium (17-22 mg/kg total), cobalt (6.6-7.7 mg/kg total), copper (6.3-7.3 mg/kg), nickel (31-41 mg/kg total), vanadium (19-21 mg/kg total), and zinc (15-18 mg/kg total) in concentrations below federal and State (Title 22) criteria for hazardous waste and below screening levels for impacts on aquatic life (Attachment D). All other total petroleum hydrocarbons, semi-volatile organic compounds, organochlorine pesticides, and metals were non-detectable in these samples. As such, resuspension of sediments during dredging is not anticipated to create a plume of pollutants in concentrations that would be hazardous to ESA-listed fishes moving through the lower Feather or Yuba rivers in the Action Area. Furthermore, all equipment refueling and maintenance would occur in an upland area at a sufficient distance to preclude any construction-related hazardous materials from entering the Feather or Yuba rivers and refueling in the upland portion of the Action Area will use appropriate secondary containment techniques to prevent spills.

While use of a clamshell or bucket for mechanical dredging may result in a relatively high degree of spill, use of the cutterhead suction dredge is considered one of the most efficient methods of dredging in terms of sediment re-suspension and associated turbidity increases. Any increases in turbidity associated with sediment dredging would be relatively small, localized to within a short distance of the work area, confined to a relatively small area with the turbidity curtain during in-water work, and temporary. Use of the cutterhead dredge will likely result in elevated turbidity within a few meters of the intake; however, use of a bucket with mechanical dredging has a potential for much larger releases of sediments, resulting in a greater potential for a plume of suspended sediments downstream. The extent of the plume of elevated suspended sediments and/or turbidity would be minimized, to the extent feasible, by deploying a turbidity curtain downstream of the dredging operation. The turbidity curtain would be limited to the portion of the channel immediately downstream of the footprint of the active dredging activity, thereby leaving the majority of the river width unaffected by the plume.

Given the relatively small volume of sediment expected to be resuspended during sediment removal during cutterhead dredging, the plume is anticipated to be confined to within approximately 100 feet downstream of the dredging activity, while the plume resulting from mechanical dredging may extend further downstream (e.g., 500 feet). In both cases, the plume of elevated suspended sediments will be minimized, to the extent feasible, by the use of a turbidity curtain and will likely settle out to background turbidity and suspended sediment concentrations within a short period (i.e., hours). As such, any ESA-listed anadromous fishes passing through the lower Feather or Yuba rivers would be able to effectively avoid the plume immediately downstream of the dredging activity and, therefore, their migrations would not be blocked or substantially delayed. Moreover, the dredging activity would occur during the June 15 through October 15 construction window, during which time ESA-listed anadromous salmonids are unlikely to be present in the Action Area. Although there is a small likelihood that adult CV spring-run Chinook salmon or early-run CCV steelhead may be present during dredging (depending on the actual timing), these fish would be expected to move through the deeper portion of the channel away from dredging activity and outside the turbidity curtain. Therefore, any adult immigrating salmonids would likely avoid exposure to adverse Project-related increases in turbidity.

In some years, juvenile green sturgeon may be present in the Action Area during dredging, should successful spawning occur in the upper reaches of the Feather and/or Yuba rivers. However, the number of fish moving downstream through the Action Area during the dredging period is expected to be low and green sturgeon would be expected to move through the Action Area in the deeper channel a safe distance from the active dredging activity in shallow water where sediment has accumulated. Furthermore, the presence of the turbidity curtain coupled with construction noise associated with the dredging would likely cause these fish to avoid the immediate dredging area and plume of elevated turbidity downstream of the construction area. For these reasons, the potential water quality effects associated with removal of primrose and accumulated sediment are expected to be insignificant and thus would not result in take of ESA-listed fishes or cause adverse effects on Critical Habitat or EFH. A small but unknown number of ESA-listed adult CV spring-run Chinook salmon, CCV steelhead, and/or adult or juvenile sDPS green sturgeon may be adversely affected by elevated suspended sediments and turbidity within the Action Area.

6.2.3 Effect 3: Habitat Effects

Long-term habitat changes will occur in the lower Feather River, extending from just upstream to just downstream of the Yuba River confluence, as a result of the sediment removal. The portion of the lower Feather River within the Action Area serves as a seasonal (i.e., primarily fall-winter) migratory corridor for ESA-listed anadromous salmonids and green sturgeon. PCEs of Critical Habitat for anadromous salmon and steelhead include freshwater migration and freshwater rearing, while PCEs for green sturgeon include food resources, water flow, water quality, migratory corridor depth, and sediment quality. The potential effects of the proposed action on EFH for Pacific Coast salmon include short-term effects associated with construction. Section 3 of the MSA defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC Section 1802), and includes aquatic areas and their associated physical, chemical, and biological habitat features necessary to support the entire life cycle of the species. In the lower Feather River within the Action Area, EFH is primarily a migration corridor for Chinook salmon migrating to/from spawning and rearing habitats in the upper reaches. As such,

effects on EFH in the Action Area would occur if the proposed action blocked or delayed migrations or reduced food availability.

In addition, the Pacific Fishery Management Council has identified Habitat Areas of Particular Concern (HAPC), which are defined as discrete subsets of EFH that provide important ecological functions and/or are rare, particularly vulnerable to degradation, ecologically important, or located in an environmentally stressed area. HAPCs identified for Pacific Coast salmon include:

- complex channels and floodplain habitats,
- thermal refugia,
- spawning habitat, and
- estuaries.

As discussed above, the lower Feather River in the Action Area is used by Chinook salmon as a migration corridor between the Delta's estuarine habitat and upstream spawning reaches and, therefore, is not identified as a HAPC.

As noted in the Project description, construction-related activities associated with the proposed action will only affect in-water habitat and will not disturb riparian habitats. The long-term effects on habitat for ESA-listed anadromous fishes in the lower Feather River are limited to a localized reduction of accumulated sediment immediately upstream and downstream of the Yuba River confluence. This will result in an incremental and localized improvement in migration conditions for ESA-listed fishes by returning the Feather River channel to a more natural condition, and reducing the overall fine sediment load. For these reasons, the long-term habitat effects of the proposed action are expected to be beneficial and thus would not result in take of ESA-listed fishes or cause adverse effects on Critical Habitat or EFH.

7.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the Action Area of this BA. Future federal actions unrelated to the proposed action are not included because they require separate consultation with NMFS, USFWS, and/or other agencies.

Other projects with the potential to contribute to cumulative or indirect effects on fisheries that may encompass the Action Area include growth-inducing plans (e.g., county general plans, specific plans), flood risk management plans (e.g., Central Valley Flood Protection Plan), and other Sacramento River and Delta management and restoration plans (e.g., California WaterFix, South Delta Improvements Program, California State Water Project, California EcoRestore). While the combined effects of these actions may result in a significant cumulative effect on fisheries, each of these actions have, or will, undergo a separate environmental review and consultation with NMFS and/or USFWS and thus are expected to be mitigated to a less-than-significant cumulative effect. The proposed action is limited in size, would occur during the time period when ESA-listed anadromous fish are least likely to be present, and would comply with all permit terms and conditions to maintain water quality during construction. The long-term effects of the proposed action are anticipated to have an overall beneficial effect on EFH and Critical Habitat for ESA-listed anadromous fishes by providing a localized and incremental reduction in sediment load and

primrose abundance in the lower Feather River. Therefore, it is not expected to contribute to significant cumulative effects in the Action Area.

8.0 CONCLUSION AND DETERMINATION

Based on the findings presented in this BA, the effects of the proposed action would be insignificant, discountable, or beneficial. As such, the proposed action will have the following effects on CV spring-run ESU Chinook salmon and designated Critical Habitat for this ESU, CV DPS steelhead, and designated Critical Habitat for this DPS, sDPS of North American green sturgeon and designated Critical Habitat for this sDPS, and EFH.

8.1 Central Valley Spring-Run Evolutionarily Significant Unit Chinook Salmon

Findings from this BA indicate that implementation of the proposed action would affect, but is not expected to adversely affect, the CV spring-run ESU Chinook salmon population or its long-term viability because the short-term impacts would be localized, occur during a period when this ESU is least likely to occur in the Action Area, and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to this ESU.

8.2 Critical Habitat for Spring-Run Evolutionarily Significant Unit Chinook Salmon

The proposed Project lies within the area designated as Critical Habitat for CV spring-run ESU Chinook salmon. However, implementation of the proposed action would not adversely affect designated Critical Habitat because the short-term impacts would be localized and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to Critical Habitat for this ESU.

8.3 Central Valley Distinct Population Segment Steelhead

Findings from this BA indicate that implementation of the proposed action would affect, but is not expected to adversely affect, the CV DPS steelhead population or its long-term viability because the short-term impacts would be localized, occur during a period when this DPS is least likely to occur in the Action Area, and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to this DPS.

8.4 Critical Habitat for Central Valley Distinct Population Segment Steelhead

The proposed Project lies within the area designated as Critical Habitat for CV DPS steelhead. However, implementation of the proposed action would not adversely affect designated Critical Habitat because the short-term impacts would be localized and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to Critical Habitat for this DPS.

8.5 Southern Distinct Population Segment North American Green Sturgeon

Findings from this BA indicate that implementation of the proposed action would affect, but is not expected to adversely affect, the sDPS of North American green sturgeon population or its long-term viability because the short-term impacts would be localized, occur during a period when this DPS is least

likely to occur in the Action Area, and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to this DPS.

8.6 Critical Habitat for Southern Distinct Population Segment North American Green Sturgeon

The proposed Project lies within the area designated as Critical Habitat for sDPS North American green sturgeon. However, implementation of the proposed action would not adversely affect designated Critical Habitat because the short-term impacts would be localized and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to Critical Habitat for this DPS.

8.7 Essential Fish Habitat

Implementation of the proposed action would affect, but would not adversely affect EFH within or outside the Action Area because the short-term impacts would be localized and minimized by implementation of conservation measures, while the long-term impacts would be beneficial to EFH.

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LIST OF ATTACHMENTS

Attachment A – Representative Site Photographs

Attachment B – Dredging Depths

Attachment C – Yuba City Boat Ramp Sediment Removal Project 1 Staging and Dewatering Area

Attachment D – Soil Screening Data

Attachment E – Sampling Plan

Attachment F - Water Quality Monitoring Plan

ATTACHMENT A

Representative Site Photographs (April 8, 2020)



Photo 1. Wastewater Pond at the Disposal Site, view west, 04/08/2020.



Photo 4. Wastewater Pond at the Disposal Site, view northwest, 04/08/2020.



Photo 5. View of the Yuba City Boat Launch and River bank from the Disposal Site, view south 04/08/2020.



Photo 7. View of the western bank of the Feather River from the top of the confluence, view northwest. 04/08/2020



Photo 8. View of the eastern bank of the Yuba River from the tip of the confluence, view northeast. 04/08/2020.



Photo 9. View of the east bank of the Feather River from the Yuba City Boat Launch, view northeast 04/08/2020.



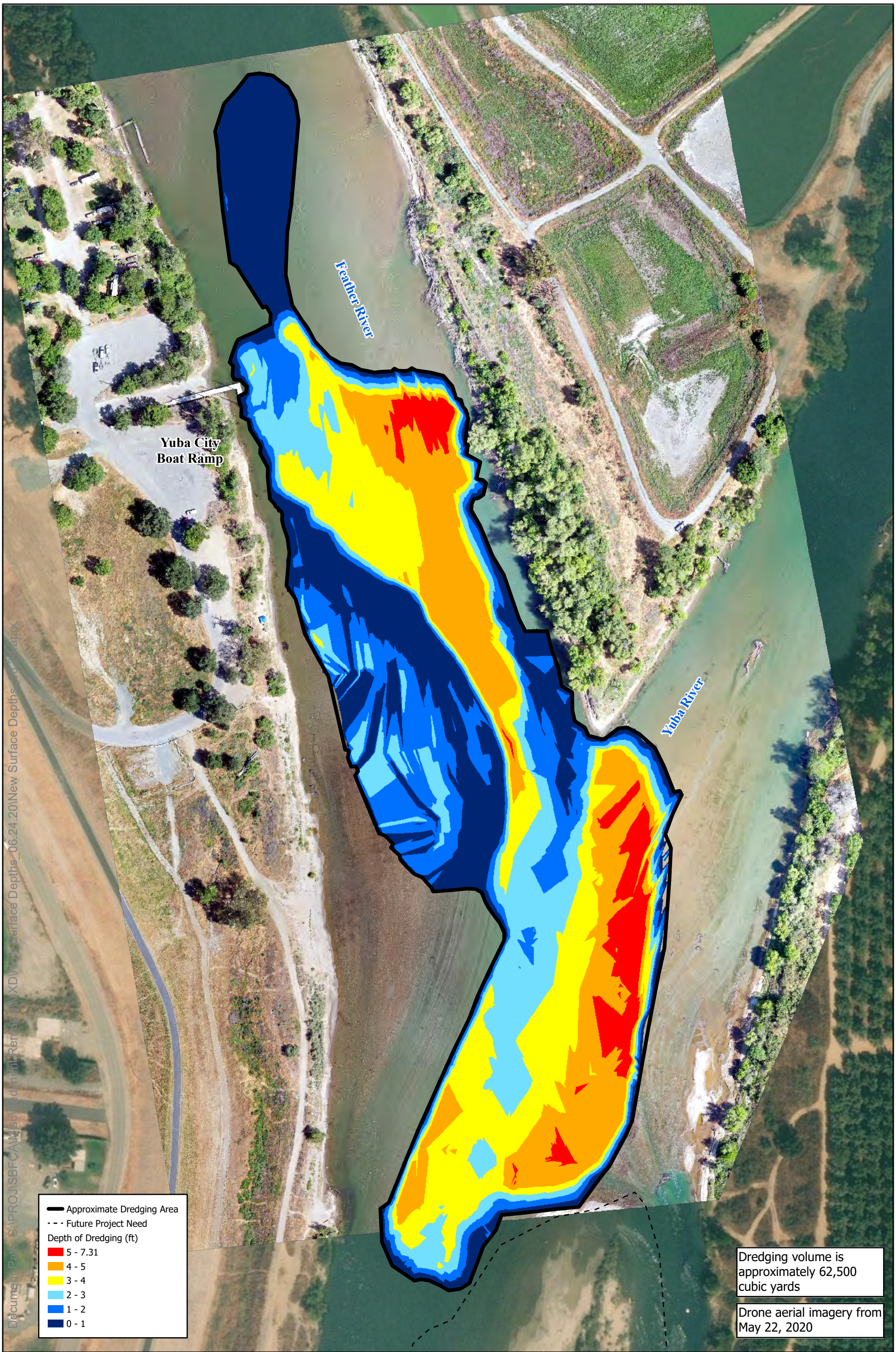
Photo 12. View of the eastern and western banks of the Feather River from the Yuba City Boat Launch. View north. 04/08/2020.



Photo 13. View of the west bank of the Feather River from the Yuba City Boat Launch, view south 04/08/2020.

ATTACHMENT B

Dredging Depths



PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

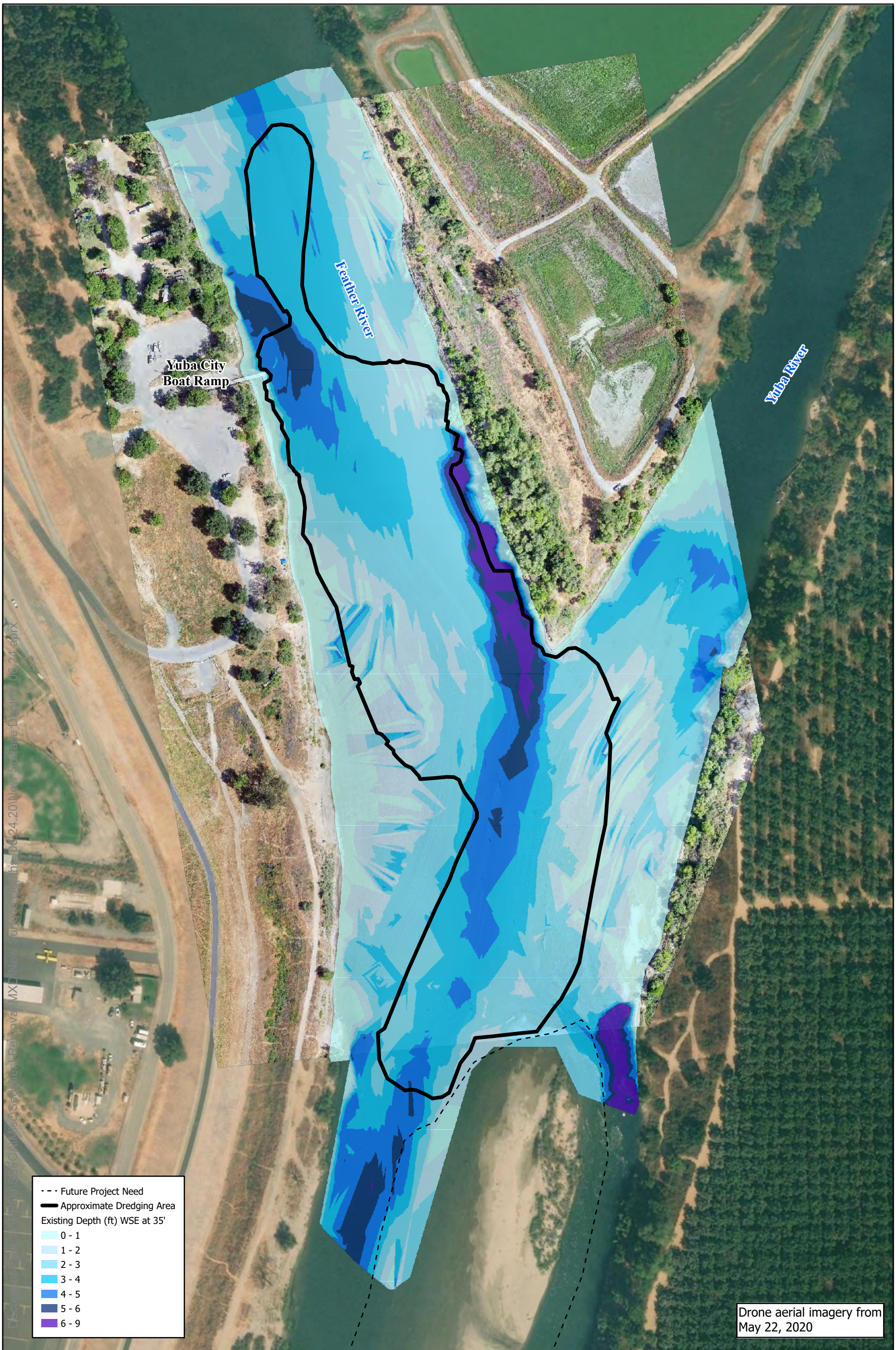
80 Blue Ravine Rd., Suite 280
Folsom, CA 95630
Phone: (916) 608-2212

SUTTER BUTTE FLOOD CONTROL AGENCY

Yuba City Boat Ramp - Dredging Depths

FIGURE

2



PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 Blue Ravine Rd., Suite 280
Folsom, CA 95630
Phone: (916) 608-2212

N

0 150 300 Feet

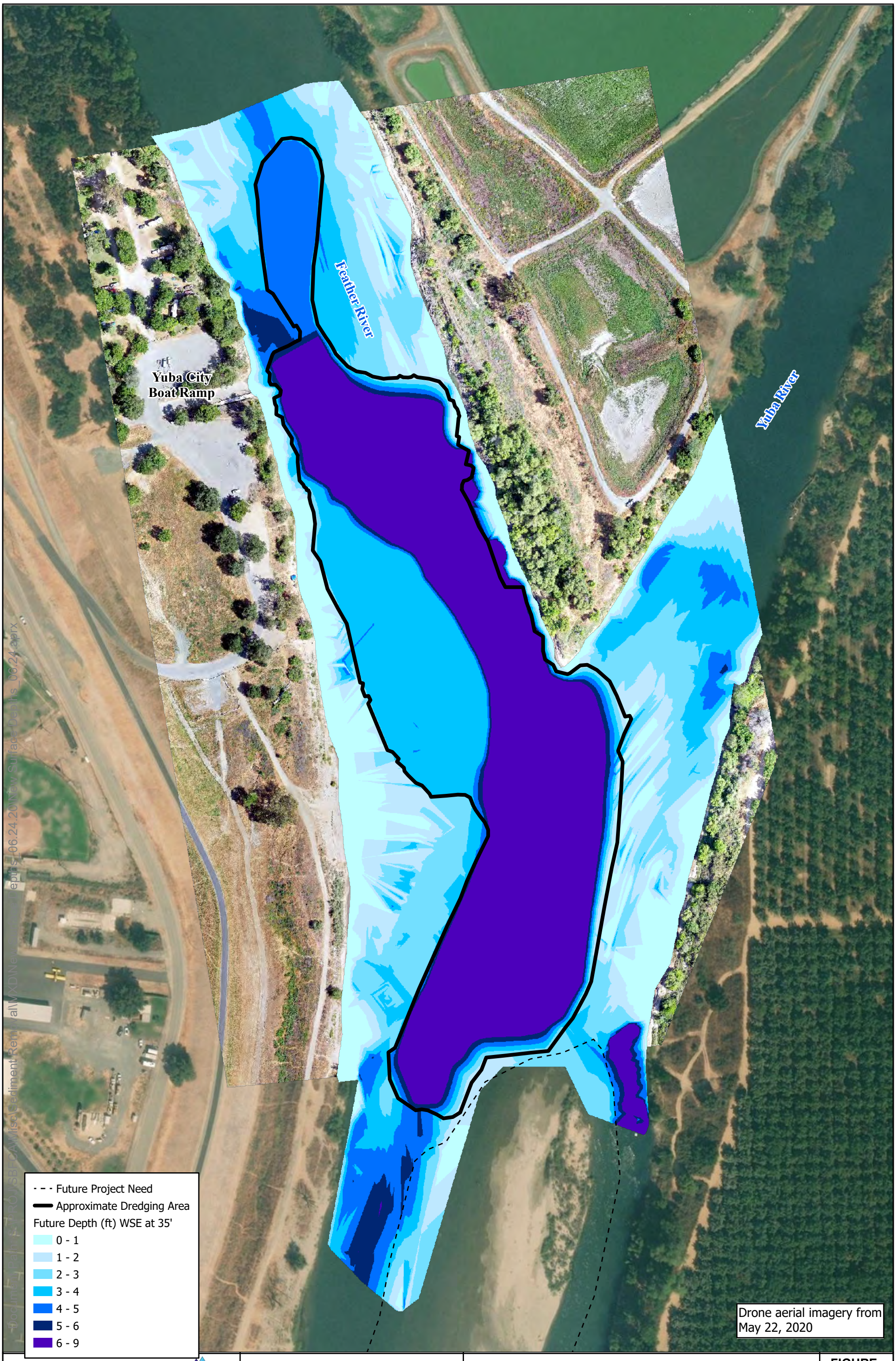
July 2020

SUTTER BUTTE FLOOD CONTROL AGENCY

Yuba City Boat Ramp - Existing Conditions Depth (WSE = 35')

FIGURE

3



PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 Blue Ravine Rd., Suite 280
Folsom, CA 95630
Phone: (916) 608-2212

N

0 150 300 Feet

July 2020

SUTTER BUTTE FLOOD CONTROL AGENCY

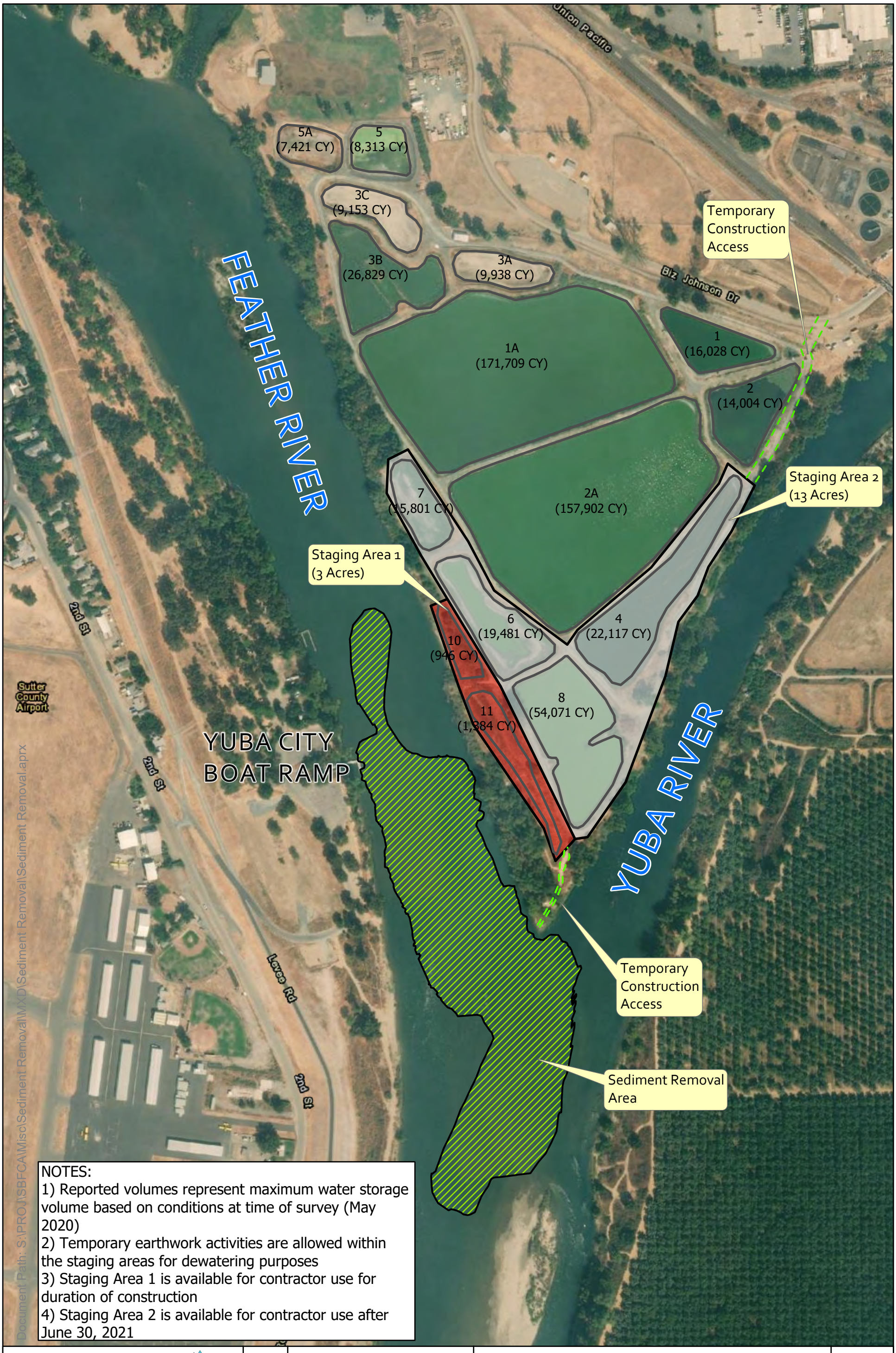
Yuba City Boat Ramp - Future Conditions Depth (WSE = 35')

FIGURE

4

ATTACHMENT C

Yuba City Boat Ramp Sediment Removal Project 1 Staging and Dewatering Area



NOTES:
1) Reported volumes represent maximum water storage volume based on conditions at time of survey (May 2020)
2) Temporary earthwork activities are allowed within the staging areas for dewatering purposes
3) Staging Area 1 is available for contractor use for duration of construction
4) Staging Area 2 is available for contractor use after June 30, 2021

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 Blue Ravine Rd., Suite 280
Folsom, CA 95630
Phone: (916) 608-2212

N

0 200 400 Feet

September 2020

Yuba City Boat Ramp Sediment Removal Project
Staging and Dewatering Area

FIGURE
1

ATTACHMENT D

Soil Screening Data

West Sacramento Office:
2491 Boatman Ave
West Sacramento, CA 95691
(916) 375-8706

BLACKBURN
CONSULTING

Auburn (530) 887-1494
Fresno (559) 438-8411

Blackburn File No. 3825.X
May 21, 2020

Mr. Chris Fritz
Peterson Brustad, Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: **SOIL SCREENING DATA REPORT**
Feather River Sediment Removal Project
Live Oak Boat Launch and Yuba City Boat Launch
Sutter County, California

Dear Mr. Fritz,

Blackburn Consulting (Blackburn) prepared this Soil Screening Data Report (Data Report) for the Feather River Sediment Removal Project (Project) in Sutter County, California. Blackburn prepared this Data Report in accordance with our proposal dated April 6, 2020. This Data Report is a preliminary assessment and intended for planning purposes. Additional sampling and testing are necessary to comply with US Army Corps of Engineers (USACE) standards and provide adequate data for design-level project documents. This Data Report contains Project Description, Soil Sample Collection and Test Results, and Conclusions.

PROJECT DESCRIPTION

Peterson Brustad, Inc. (PBI) requested Blackburn perform soil classification and environmental testing on accumulated sediment for proposed dredging activities at the Live Oak Boat Launch and the Yuba City Boat Launch in Sutter County, California (Figure 1). The USACE and other regulatory bodies require testing of water way sediments prior to dredging activities. PBI requested Blackburn "pre-profile" the proposed dredged material for general soil characteristics before a more rigorous sampling and testing plan is implemented prior to dredging activities.

SOIL SAMPLE COLLECTION AND TEST RESULTS

Sample Locations and Depths

Blackburn collected samples of the sediment soil for testing on May 5, 2020. Blackburn collected two samples from the Live Oak Boat Launch and three samples from the Yuba City Boat Launch at the approximate locations presented on Figure 2. We collected samples for environmental tests at

approximately 12" below the sediment surface. We collected samples for soil classification tests from the upper 12" of sediment.

Soil Sample Collection Methodology

Blackburn collected soil samples with a hand auger where the sediment surface was above the water elevation. We collected samples below the water surface at the Yuba City Boat Launch by hand-driving an open-ended, small-diameter PVC pipe into the sediment . Appendix C contains photos of the general sample locations.

Blackburn transferred the samples for environmental tests into laboratory-supplied 4-ounce glass jars. The sample jars were labeled and placed in a chilled cooler for transport to Sunstar Laboratories, a California certified analytical laboratory, under continuous chain-of-custody documentation. Blackburn cleaned the sampling equipment with an Alconox wash solution and a distilled water rinse between each sample. The samples were submitted to SunStar Laboratories of Lake Forest, California for the following tests:

- Total Petroleum Hydrocarbon (TPH) as gasoline/diesel/motor oil by EPA Method 8015.
- Semi Volatile Organics (SVOC) by EPA Method 8270C.
- Organochlorine Pesticides (OCP) by EPA Method 8081A.
- Cam-17 Metals by EPA Methods 6010B and 7471A (mercury).

We placed soil samples for classification tests in plastic bags and delivered them to our West Sacramento Laboratory for soil classification testing. We performed the following classification tests:

- 200 Wash in accordance with ASTM D1140.
- Particle Size Analysis in accordance with ASTM D6913.
- Atterberg Limits in accordance with ASTM D4318

Environmental Test Results

Reported detection levels and environmental test results are presented in Tables 1-4 and discussed below. Applicable screening levels from the US EPA Regional Screening Levels (RSLs) are included in the tables for comparison. Appendix A presents Sunstar's analytical test result report and chain-of-custody documentation.

Total Petroleum Hydrocarbons (TPHs), Table 1: TPH as Motor Oil (MORO) was detected in both samples at the Live Oak Boat Launch. Detected concentrations were below RSLs for residential land use. TPH as Gasoline (GRO) and Diesel (DRO) was not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Semi-Volatile Organic Compounds (SVOCs), Table 2: SVOCs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Organochlorine Pesticides (OCPs), Table 3: OCPs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Cam -17 Metals, Table 4: Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the soil samples at concentrations below the RSLs for residential land use. All other metals were not detected at concentrations equal to or greater than laboratory reporting limits.

Soil Classification Test Results

We collected five soil samples of the sediment at the boat launch facilities for classification tests; two at the Live Oak Boat Launch and three at the Yuba City Boat Launch. Our test results are shown in the following tables.

Soil Classification Test Results - Gradation					
Sample ID	**Soil Classification**	**Sieve Opening Size – Percent Finer**			
		½ -Inch	**No. 4**	**No. 40**	**No. 200**
Live Oak-1 0-12”	Poorly-graded SAND with SILT (SP-SM)	100	100	98.0	10.6
Live Oak-2 0-12”	SILTY SAND (SM)	NA	NA	NA	44.7
Yuba City-1 0-12”	Poorly-graded SAND (SP)	100	99.8	26.5	0.4
Yuba City-2 0-12”	Poorly-graded SAND (SP)	100	96.0	29.7	0.1
Yuba City-3 0-12”	Poorly-graded SAND (SP)	100	100	27.6	0.1

Soil Classification Test Results – Atterberg Limits			
Sample ID	**Soil Classification USCS**	**Liquid Limit**	**Plasticity Index**
Live Oak-2 0-12”	SILTY SAND (SM)	33	1

Appendix B contains the soil classification laboratory test results.

CONCLUSIONS

This Data Report provides preliminary information about the accumulated sediment at the Yuba City and Live Oak boat launch facilities prior to the development and implementation of a more detailed sampling and testing program required before any dredging activities. The preliminary tests indicate that the sediment tested at both facilities meets EPA RSLs for unrestricted land use, however, additional testing is required to determine project-wide conditions and compliance with USACE standards.

Our classification tests indicate that the sediment samples tested from the Yuba City Boat Launch are all non-plastic poorly graded sand (SP). The sediment samples we tested from the Live Oak Boat Launch classify as non-plastic poorly-graded sand with silt (SP-SM) and silty sand (SM).

Thank you for including Blackburn on your project team. Please let us know if you have any questions or need more information.

Sincerely,

BLACKBURN CONSULTING

Prepared by:

Luke Morrell, E.I.T.
Environmental Engineer

Reviewed by:

Laura Long
Environmental Project Manager



Robert Lokteff, P.E., G.E.
Principal Geotechnical Engineer

Attachments:
Figure 1: Vicinity Map
Figures 2a-2b: Site Map
Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals
Appendix A: Sunstar Laboratory Reports
Appendix B: Soil Classification Laboratory Test Results
Appendix C: Photo Report

SOIL SCREENING DATA REPORT

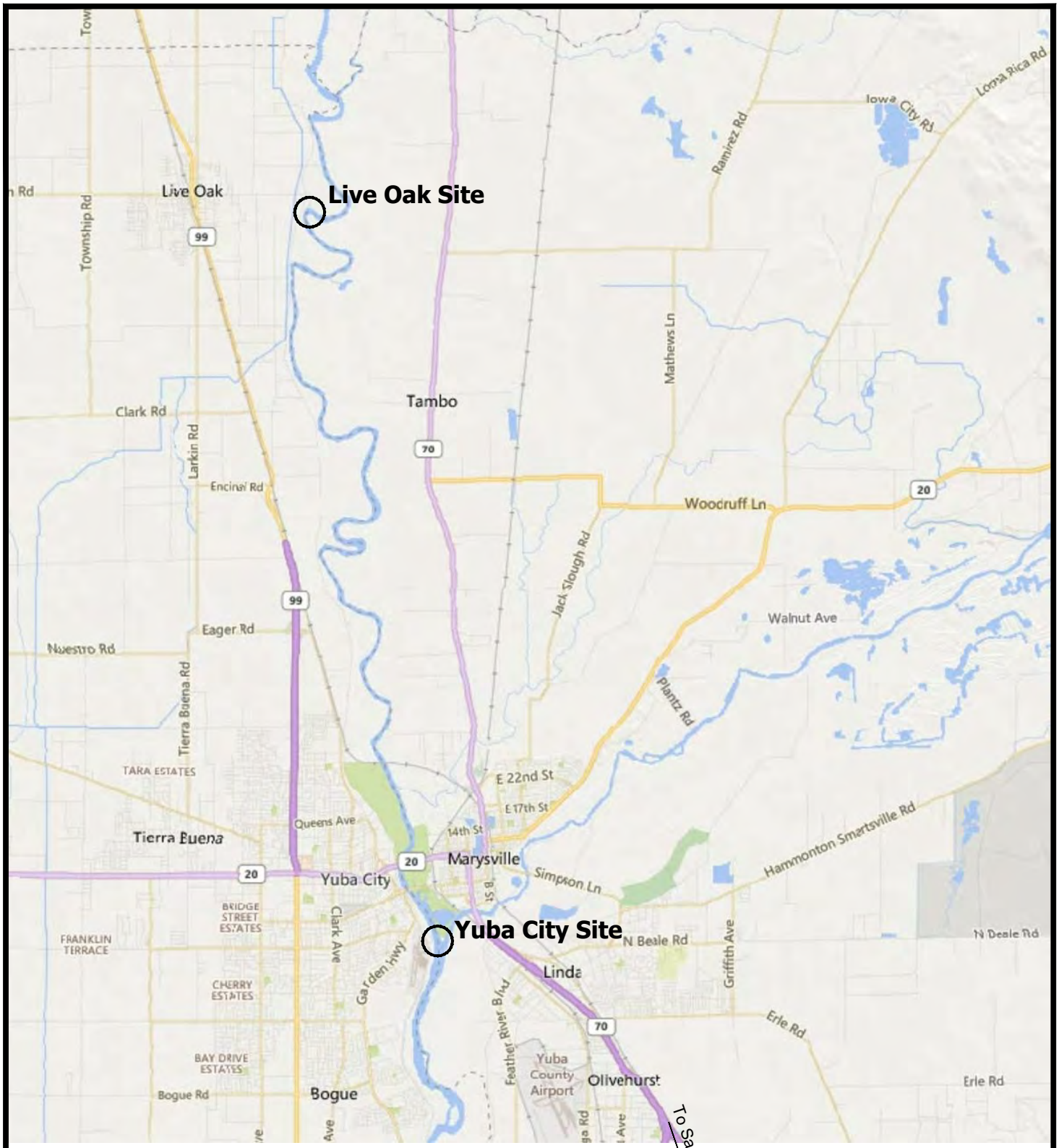
FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

FIGURES

Figure 1: Vicinity Map
Figures 2a-2b: Site Map



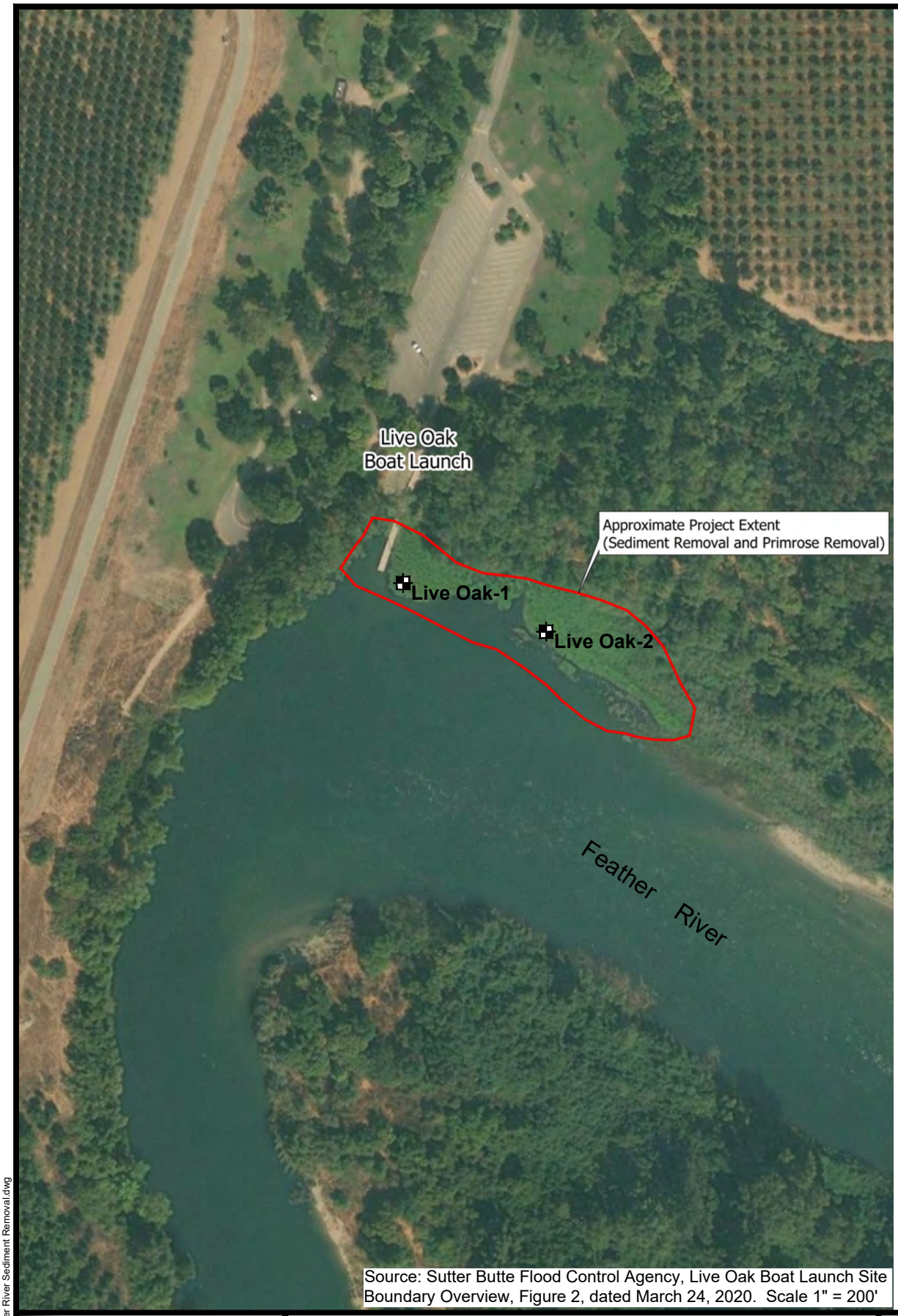
BLACKBURN CONSULTING

VICINITY MAP

Feather River Sediment Removal Project
Live Oak and Yuba City Boat Launches
Butte & Sutter Counties, California

File No. 3825.x
May 2020
Figure 1

5/11/2020 3825.x Fig1 Feather River Sediment Removal.dwg



Source: Sutter Butte Flood Control Agency, Live Oak Boat Launch Site Boundary Overview, Figure 2, dated March 24, 2020. Scale 1" = 200'

N

SCALE 1"= 200'

LEGEND

Approximate Sample Location

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

Live Oak Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2A

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg



Source: Sutter Butte Flood Control Agency, Feather River Sediment Removal Project Site Specific Map, Figure 2, dated October 2019. Scale 1" = 400'

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

Yuba City Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2B

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

TABLES

Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals

West Sacramento Office:
2491 Boatman Ave., Sacramento, CA 95691
(916) 375-8706

BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 1 Extractable Petroleum Hydrocarbons (TPHs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS (mg/kg)

Sample Date	Sample ID:	TPH (Extractable Petroleum Hydrocarbons) (mg/kg)		
		EPA Method 8015B		
		Gasoline (C6-C12)	Diesel Fuel (C13-C28)	Motor Oil (C29-C40)
5/5/2020	Live Oak-1 12"	ND	ND	**22**
	Live Oak-2 12"	ND	ND	**17**
	Yuba City-1 12"	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND
Reporting Limit**		10	10	10
EPA RSLs	Residential	82	96	2,500

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2A Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	Aniline	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	1-Methylnaphthalene	3-Nitroaniline	4-Methylphenol	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	1.0	1.0	1.0	1.0	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	0.3	1.0	1.0	0.3	1.0	0.3	0.3
EPA RSLs	Residential	7.8	1,800	95	---	2.6	6,300	7.8	190	1,300	130	1.7	0.36	4,100	340	190	3,200	630	---	9.9	---	---	5.1	---	6,300	2.7	---

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2B Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		4-Nitroaniline	4-Nitrophenol	2,3,5,6-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Carbazole	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	N-Nitrosodiphenylamine	N-Nitrosodimethylamine	Nitrobenzene	Pentachlorophenol	Phenol
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	0.3	1.0	0.3	0.3	0.3	0.3	1.0	1.0	1.0
EPA RSLs	**Residential**	27	---	---	1,900	6,300	6,300	0.1	3,100	39	290		6,300	630	66	51,000	---	0.19	1.2	1.8	1.8	570	110	0.002	5.1	1.0	19,000

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2C Semi-Volatile Organic Compounds (SVOCs) PAHs

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																	
		EPA Method 8270C																	
		Pyridine	Azobenzene	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a] anthracene	Benzo[a] pyrene	Benzo[b] fluoranthene	Benzo (g,h,i) perylene	Benzo[k] fluor anthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno [1,2,3-cd] pyrene	Naphthalene	Phenanthrene	Pyrene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPA RSLs	**Residential**	5.8	5.6	3,300	---	17,000	1.1	0.11	1.1	---	11	110	0.028	2,400	2,300	1.1	2.0	---	1,800

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit
** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 3a Organochlorine Pesticides (OCPs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Organochlorine Pesticides (OCPs) by EPA Method 8081A (mg/kg)																				
		4,4'-DDE	4,4'-DDT	4,4'-DDD	alpha-BHC	alpha-Chlordane	Aldrin	beta-BHC	Chlordane (Technical)	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin Ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.020
EPA RSLs	Residential	1.9	2.0	1.9	0.039	0.086	0.44	0.3	0.44	---	0.034	470	470	---	19	---	---	0.57	0.44	0.13	0.07	320	0.49

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram

- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019

- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 4 Cam-17 Metals

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	CAM-17 Metals (mg/kg)																
		EPA Method 6010B																EPA Method 7471A
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
5/5/2020	Live Oak-1 12"	ND	ND	**39**	ND	ND	**23**	**8.6**	**14**	**3.5**	ND	**35**	ND	ND	ND	**27**	**21**	ND
	Live Oak-2 12"	ND	ND	**41**	ND	ND	**29**	**8.8**	**12**	ND	ND	**42**	ND	ND	ND	**27**	**22**	ND
	Yuba City-1 12"	ND	ND	**60**	ND	ND	**22**	**7.7**	**7.1**	ND	ND	**41**	ND	ND	ND	**20**	**18**	ND
	Yuba City-2 12"	ND	ND	**49**	ND	ND	**17**	**6.6**	**6.3**	ND	ND	**31**	ND	ND	ND	**19**	**15**	ND
	Yuba City-3 12"	ND	ND	**42**	ND	ND	**22**	**6.8**	**7.3**	ND	ND	**37**	ND	ND	ND	**21**	**17**	ND
Reporting Limit**		3.0	5.0	1.0	1.0	2.0	2.0	2.0	1.0	3.0	5.0	2.0	5.0	2.0	2.0	5.0	1.0	0.1
EPA RSLs	**Residential**	31	0.11	15,000	16	71	36,000	23	3,100	80	390	820	390	390	0.78	390	23,000	1

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX A

Sunstar Laboratory Reports

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

13 May 2020

Luke Morrell
Blackburn Consulting-West Sac.
2491 Boatman Ave.
West Sacramento, CA 95691

RE: Feather River Sediment Removal

Enclosed are the results of analyses for samples received by the laboratory on 05/06/20 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Mike Jaroudi
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
YubaCity-3 12"	T202211-01	Soil	05/05/20 09:10	05/06/20 09:40
YubaCity-2 12"	T202211-02	Soil	05/05/20 09:30	05/06/20 09:40
YubaCity-1 12"	T202211-03	Soil	05/05/20 09:50	05/06/20 09:40
LiveOAk-1 12"	T202211-04	Soil	05/05/20 11:25	05/06/20 09:40
LiveOAk-2 12"	T202211-05	Soil	05/05/20 12:00	05/06/20 09:40

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Mike Jaroudi, Project Manager

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

DETECTIONS SUMMARY

Sample ID: YubaCity-3 12" **Laboratory ID:** T202211-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**42**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.8**	2.0	mg/kg	EPA 6010b	
Copper	**7.3**	1.0	mg/kg	EPA 6010b	
Nickel	**37**	2.0	mg/kg	EPA 6010b	
Vanadium	**21**	5.0	mg/kg	EPA 6010b	
Zinc	**17**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-2 12" **Laboratory ID:** T202211-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**49**	1.0	mg/kg	EPA 6010b	
Chromium	**17**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.6**	2.0	mg/kg	EPA 6010b	
Copper	**6.3**	1.0	mg/kg	EPA 6010b	
Nickel	**31**	2.0	mg/kg	EPA 6010b	
Vanadium	**19**	5.0	mg/kg	EPA 6010b	
Zinc	**15**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-1 12" **Laboratory ID:** T202211-03

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**60**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**7.7**	2.0	mg/kg	EPA 6010b	
Copper	**7.1**	1.0	mg/kg	EPA 6010b	
Nickel	**41**	2.0	mg/kg	EPA 6010b	
Vanadium	**20**	5.0	mg/kg	EPA 6010b	
Zinc	**18**	1.0	mg/kg	EPA 6010b	

SunStar Laboratories, Inc.



Mike Jaroudi, Project Manager

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Providing Quality Analytical Services Nationwide

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Sample ID: LiveOAk-1 12" **Laboratory ID:** T202211-04

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**22**	10	mg/kg	EPA 8015B	
Barium	**39**	1.0	mg/kg	EPA 6010b	
Chromium	**23**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.6**	2.0	mg/kg	EPA 6010b	
Copper	**14**	1.0	mg/kg	EPA 6010b	
Lead	**3.5**	3.0	mg/kg	EPA 6010b	
Nickel	**35**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**21**	1.0	mg/kg	EPA 6010b	

Sample ID: LiveOAk-2 12" **Laboratory ID:** T202211-05

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**17**	10	mg/kg	EPA 8015B	
Barium	**41**	1.0	mg/kg	EPA 6010b	
Chromium	**29**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.8**	2.0	mg/kg	EPA 6010b	
Copper	**12**	1.0	mg/kg	EPA 6010b	
Nickel	**42**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*91.7 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**42**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**22**	2.0	"	"	"	"	"	"	
Cobalt	**6.8**	2.0	"	"	"	"	"	"	
Copper	**7.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**37**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**21**	5.0	"	"	"	"	"	"	
Zinc	**17**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*108 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*108 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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T202211-01 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*43.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*63.1 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*75.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*67.8 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*52.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*56.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*92.4 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**49**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**17**	2.0	"	"	"	"	"	"	
Cobalt	**6.6**	2.0	"	"	"	"	"	"	
Copper	**6.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**31**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**19**	5.0	"	"	"	"	"	"	
Zinc	**15**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.9 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*92.6 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*66.2 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*72.6 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*95.5 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*79.5 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*73.3 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*85.5 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*96.2 %*		*65-135*	"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	05/08/20	"	
Arsenic	ND	5.0	"	"	"	"	05/08/20	"	
Barium	**60**	1.0	"	"	"	"	05/08/20	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**22**	2.0	"	"	"	"	05/08/20	"	
Cobalt	**7.7**	2.0	"	"	"	"	05/08/20	"	
Copper	**7.1**	1.0	"	"	"	"	05/08/20	"	
Lead	ND	3.0	"	"	"	"	05/08/20	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**41**	2.0	"	"	"	"	05/08/20	"	
Selenium	ND	5.0	"	"	"	"	05/08/20	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**20**	5.0	"	"	"	"	05/08/20	"	
Zinc	**18**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

SunStar Laboratories, Inc.



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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*96.8 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*94.0 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*46.6 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*71.2 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*65.0 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*97.3 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*66.8 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**22**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.1 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**39**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**23**	2.0	"	"	"	"	"	"	
Cobalt	**8.6**	2.0	"	"	"	"	"	"	
Copper	**14**	1.0	"	"	"	"	"	"	
Lead	**3.5**	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**35**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**21**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*98.4 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*99.4 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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Mike Jaroudi, Project Manager

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*66.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*68.5 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*47.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*70.7 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.9 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*73.7 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**17**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*95.2 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**41**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**29**	2.0	"	"	"	"	"	"	
Cobalt	**8.8**	2.0	"	"	"	"	"	"	
Copper	**12**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**42**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.5 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*93.7 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*50.0 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*77.4 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*66.2 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*82.9 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*79.7 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*74.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050726 - EPA 3550B GC										
Blank (0050726-BLK1)				Prepared & Analyzed: 05/07/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*96.7*		*"*	*99.0*		*97.6*	*65-135*			
LCS (0050726-BS1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	470	10	mg/kg	495		94.5	75-125			
Surrogate: p-Terphenyl	*100*		*"*	*99.0*		*101*	*65-135*			
LCS Dup (0050726-BSD1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	460	10	mg/kg	495		92.2	75-125	2.38	20	
Surrogate: p-Terphenyl	*101*		*"*	*99.0*		*102*	*65-135*			

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Blank (0050634-BLK1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							J
LCS (0050634-BS1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	94.3	5.0	mg/kg	100		94.3	75-125			
Barium	96.9	1.0	"	100		96.9	75-125			
Cadmium	96.8	2.0	"	100		96.8	75-125			
Chromium	97.5	2.0	"	100		97.5	75-125			
Lead	95.1	3.0	"	100		95.1	75-125			
Matrix Spike (0050634-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	58.6	5.0	mg/kg	91.7	2.00	61.7	75-125			QM-05
Barium	155	1.0	"	91.7	89.9	70.7	75-125			QM-05
Cadmium	59.5	2.0	"	91.7	ND	64.8	75-125			QM-05
Chromium	66.9	2.0	"	91.7	7.52	64.7	75-125			QM-05
Lead	55.2	3.0	"	91.7	1.55	58.4	75-125			QM-05

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Matrix Spike Dup (0050634-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	62.6	5.0	mg/kg	100	2.00	60.6	75-125	6.61	20	QM-05
Barium	171	1.0	"	100	89.9	81.2	75-125	10.0	20	QM-05
Cadmium	61.3	2.0	"	100	ND	61.3	75-125	2.98	20	QM-05
Chromium	70.5	2.0	"	100	7.52	63.0	75-125	5.17	20	QM-05
Lead	60.7	3.0	"	100	1.55	59.1	75-125	9.51	20	QM-05

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050633 - EPA 7471A Soil										
Blank (0050633-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	ND	0.10	mg/kg							
LCS (0050633-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.378	0.10	mg/kg	0.391		96.7	80-120			
Matrix Spike (0050633-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.415	0.10	mg/kg	0.417	ND	99.6	75-125			
Matrix Spike Dup (0050633-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.431	0.10	mg/kg	0.417	ND	104	75-125	3.89	20	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
Blank (0050637-BLK1)				Prepared: 05/08/20 Analyzed: 05/11/20						
alpha-BHC	ND	5.0	ug/kg							
gamma-BHC (Lindane)	ND	5.0	"							
beta-BHC	ND	5.0	"							
delta-BHC	ND	5.0	"							
Heptachlor	ND	5.0	"							
Aldrin	ND	5.0	"							
Heptachlor epoxide	ND	5.0	"							
gamma-Chlordane	ND	5.0	"							
alpha-Chlordane	ND	5.0	"							
Endosulfan I	ND	5.0	"							
4,4´-DDE	ND	5.0	"							
Dieldrin	ND	5.0	"							
Endrin	ND	5.0	"							
4,4´-DDD	ND	5.0	"							
Endosulfan II	ND	5.0	"							
4,4´-DDT	ND	5.0	"							
Endrin aldehyde	ND	5.0	"							
Endosulfan sulfate	ND	5.0	"							
Methoxychlor	ND	5.0	"							
Endrin ketone	ND	5.0	"							
Toxaphene	ND	20	"							
Surrogate: Tetrachloro-meta-xylene	*9.37*		*"*	*10.0*		*93.7*	*35-140*			
Surrogate: Decachlorobiphenyl	*8.97*		*"*	*10.0*		*89.7*	*35-140*			
LCS (0050637-BS1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	37.9	5.0	ug/kg	40.0		94.8	40-120			
Heptachlor	39.7	5.0	"	40.0		99.2	40-120			
Aldrin	28.7	5.0	"	40.0		71.8	40-120			
Dieldrin	39.2	5.0	"	40.0		98.0	40-120			
Endrin	38.4	5.0	"	40.0		95.9	40-120			
4,4´-DDT	37.8	5.0	"	40.0		94.6	33-147			
Surrogate: Tetrachloro-meta-xylene	*9.65*		*"*	*10.0*		*96.5*	*35-140*			
Surrogate: Decachlorobiphenyl	*9.30*		*"*	*10.0*		*93.0*	*35-140*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
LCS Dup (0050637-BSD1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	44.0	5.0	ug/kg	40.0		110	40-120	14.9	30	
Heptachlor	46.6	5.0	"	40.0		117	40-120	16.1	30	
Aldrin	33.8	5.0	"	40.0		84.4	40-120	16.2	30	
Dieldrin	45.5	5.0	"	40.0		114	40-120	14.8	30	
Endrin	45.0	5.0	"	40.0		113	40-120	16.0	30	
4,4´-DDT	40.6	5.0	"	40.0		102	33-147	7.11	30	
Surrogate: Tetrachloro-meta-xylene	*11.1*		*"*	*10.0*		*111*	*35-140*			
Surrogate: Decachlorobiphenyl	*10.4*		*"*	*10.0*		*104*	*35-140*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Carbazole	ND	300	ug/kg							
Aniline	ND	300	"							
Phenol	ND	1000	"							
2-Chlorophenol	ND	1000	"							
1,4-Dichlorobenzene	ND	300	"							
N-Nitrosodi-n-propylamine	ND	300	"							
1,2,4-Trichlorobenzene	ND	300	"							
4-Chloro-3-methylphenol	ND	1000	"							
2-Methylnaphthalene	ND	300	"							
1-Methylnaphthalene	ND	300	"							
Acenaphthene	ND	300	"							
4-Nitrophenol	ND	1000	"							
2,4-Dinitrotoluene	ND	300	"							
Pentachlorophenol	ND	1000	"							
Pyrene	ND	300	"							
Acenaphthylene	ND	300	"							
Anthracene	ND	300	"							
Benzo (a) anthracene	ND	300	"							
Benzo (b) fluoranthene	ND	300	"							
Benzo (k) fluoranthene	ND	300	"							
Benzo (g,h,i) perylene	ND	1000	"							
Benzo (a) pyrene	ND	300	"							
Benzyl alcohol	ND	300	"							
Bis(2-chloroethoxy)methane	ND	300	"							
Bis(2-chloroethyl)ether	ND	300	"							
Bis(2-chloroisopropyl)ether	ND	300	"							
Bis(2-ethylhexyl)phthalate	ND	300	"							
4-Bromophenyl phenyl ether	ND	300	"							
Butyl benzyl phthalate	ND	300	"							
4-Chloroaniline	ND	300	"							
2-Chloronaphthalene	ND	300	"							
4-Chlorophenyl phenyl ether	ND	300	"							
Chrysene	ND	300	"							
Dibenz (a,h) anthracene	ND	300	"							
Dibenzofuran	ND	300	"							
Di-n-butyl phthalate	ND	300	"							

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
1,2-Dichlorobenzene	ND	300	ug/kg							
1,3-Dichlorobenzene	ND	300	"							
2,4-Dichlorophenol	ND	1000	"							
Diethyl phthalate	ND	300	"							
2,4-Dimethylphenol	ND	1000	"							
Dimethyl phthalate	ND	300	"							
4,6-Dinitro-2-methylphenol	ND	1000	"							
2,4-Dinitrophenol	ND	1000	"							
2,6-Dinitrotoluene	ND	1000	"							
Di-n-octyl phthalate	ND	300	"							
Fluoranthene	ND	300	"							
Fluorene	ND	300	"							
Hexachlorobenzene	ND	1500	"							
Hexachlorobutadiene	ND	300	"							
Hexachlorocyclopentadiene	ND	1000	"							
Hexachloroethane	ND	300	"							
Indeno (1,2,3-cd) pyrene	ND	300	"							
Isophorone	ND	300	"							
2-Methylphenol	ND	1000	"							
4-Methylphenol	ND	1000	"							
Naphthalene	ND	300	"							
2-Nitroaniline	ND	300	"							
3-Nitroaniline	ND	300	"							
4-Nitroaniline	ND	300	"							
Nitrobenzene	ND	1000	"							
2-Nitrophenol	ND	1000	"							
N-Nitrosodimethylamine	ND	300	"							
N-Nitrosodiphenylamine	ND	300	"							
2,3,5,6-Tetrachlorophenol	ND	300	"							
2,3,4,6-Tetrachlorophenol	ND	300	"							
Phenanthrene	ND	300	"							
Azobenzene	ND	300	"							
2,4,5-Trichlorophenol	ND	1000	"							
Pyridine	ND	300	"							
2,4,6-Trichlorophenol	ND	1000	"							

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: 2-Fluorophenol	*1610*		*ug/kg*	*3260*		*49.6*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3260*		*63.6*	*24-113*			
Surrogate: Nitrobenzene-d5	*2580*		*"*	*3260*		*79.3*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*2230*		*"*	*3260*		*68.3*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2310*		*"*	*3260*		*71.0*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2670*		*"*	*3260*		*82.0*	*29.1-130*			
LCS (0050636-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2170	1000	ug/kg	3320		65.3	34-114			
2-Chlorophenol	2120	1000	"	3320		63.9	34-114			
1,4-Dichlorobenzene	2070	300	"	3320		62.4	34-114			
N-Nitrosodi-n-propylamine	1990	300	"	3320		59.8	30-110			
1,2,4-Trichlorobenzene	2260	300	"	3320		67.9	39-119			
4-Chloro-3-methylphenol	2600	1000	"	3320		78.3	50-130			
Acenaphthene	2350	300	"	3320		70.7	34-114			
Pentachlorophenol	3090	1000	"	3320		93.0	50-130			
Pyrene	1840	300	"	3320		55.5	33.7-123			
Surrogate: 2-Fluorophenol	*1680*		*"*	*3320*		*50.5*	*15-121*			
Surrogate: Phenol-d6	*2140*		*"*	*3320*		*64.3*	*24-113*			
Surrogate: Nitrobenzene-d5	*2050*		*"*	*3320*		*61.6*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1750*		*"*	*3320*		*52.5*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2620*		*"*	*3320*		*78.9*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2800*		*"*	*3320*		*84.2*	*29.1-130*			
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2110	1000	ug/kg	3250		65.0	34-114	2.73	42	
2-Chlorophenol	2200	1000	"	3250		67.7	34-114	3.47	40	
1,4-Dichlorobenzene	2060	300	"	3250		63.6	34-114	0.489	28	
N-Nitrosodi-n-propylamine	2350	300	"	3250		72.3	30-110	16.7	38	
1,2,4-Trichlorobenzene	2220	300	"	3250		68.4	39-119	1.62	28	
4-Chloro-3-methylphenol	2620	1000	"	3250		80.6	50-130	0.633	42	
Acenaphthene	2450	300	"	3250		75.4	34-114	4.04	31	
Pentachlorophenol	3180	1000	"	3250		98.0	50-130	2.86	50	
Pyrene	1830	300	"	3250		56.4	33.7-123	0.762	31	
Surrogate: 2-Fluorophenol	*1840*		*"*	*3250*		*56.8*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3250*		*63.6*	*24-113*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: Nitrobenzene-d5	*2630*		*ug/kg*	*3250*		*81.2*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1940*		*"*	*3250*		*59.6*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*3510*		*"*	*3250*		*108*	*18.1-105*			*S-GC*
Surrogate: Terphenyl-dl4	*2760*		*"*	*3250*		*84.9*	*29.1-130*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Notes and Definitions

S-GC	Surrogate recovery outside of established control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
J	Detected but below the Standard Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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SunStar Laboratories

25712 Commercentre Drive, Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Blackburn Consulting
Address: 2491 Boatman Ave West Sac, CA
Phone: 916-375-8706 Fax:
Project Manager: Luke Morrell / Laura Long

Date: 5/5/20 Page: 1 Of 1
Project Name: Feather River Sediment Removal
Collector: LDM Client Project #: 3825.X
Batch #: T202211 EDF #:

Laboratory ID #	Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270 SVOCs	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals (cont'd)	6020 ICP-MS Metals	7471A Mercury	8081 OCPs			Comments/Preservative	Total # of containers
01	Yuba City-3 12"	5/5/20	9:10	Jar	Soil				X				X	X		X	X				1
02	Yuba City-2 12"		9:30						X				X	X		X	X				1
03	Yuba City-1 12"		9:50						X				X	X		X	X				1
04	Live Oak-1 12"		11:25						X				X	X		X	X				1
05	Live Oak-2 12"		12:00						X				X	X		X	X				1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	5/5/20 1315	[signature]	5/5/20 1315
[signature]	5/6/20 9:40	[signature]	5/6/20 9:40

Total # of containers: 5
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold: 3.4

Turn around time: STD

Notes

Sample disposal Instructions: Disposal @ $2.00 each ___ Return to client ___ Pickup ___

COC 18142

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SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T202211

Client Name: BLACKBURN Project: FEATHER RIVER SEDIMENT

Delivered by: ☐ Client ☐ SunStar Courier ☒ GSO ☐ FedEx ☐ Other

If Courier, Received by: _____ Date/Time Courier Received: _____

Lab Received by: BRIAN Date/Time Lab Received: 5/6/20 940

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due : 6/27/20

Temperature:	Cooler #1 2.2	°C +/- the CF (+ 1.2°C)	= 3.4	°C corrected temperature
Temperature:	Cooler #2	°C +/- the CF (+ 1.2°C)	=	°C corrected temperature
Temperature:	Cooler #3	°C +/- the CF (+ 1.2°C)	=	°C corrected temperature

Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☒ **Yes** ☐ **No**
If NO:		
Samples received on ice?	☐ Yes	☐ **No → Complete Non-Conformance Sheet**
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ **No → Complete Non-Conformance Sheet**

Custody seals intact on cooler/sample	☒ Yes	☐ No*	☐ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: BC 5/6/20

Comments:

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

WORK ORDER

T202211

Client:	**Blackburn Consulting-West Sac.**	**Project Manager:**	**Mike Jaroudi**
Project:	**Feather River Sediment Removal**	**Project Number:**	**3825.x**

Report To:
Blackburn Consulting-West Sac.
Luke Morrell
2491 Boatman Ave.
West Sacramento, CA 95691

Date Due:	05/13/20 17:00 (5 day TAT)		
Received By:	Brian Charon	Date Received:	05/06/20 09:40
Logged In By:	Brian Charon	Date Logged In:	05/06/20 09:58

Samples Received at: **3.4°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirı	No		

Analysis	Due	TAT	Expires	Comments
T202211-01 YubaCity-3 12'' [Soil] Sampled 05/05/20 09:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:10	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:10	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:10	
8270C	05/13/20 15:00	5	05/19/20 09:10	
T202211-02 YubaCity-2 12'' [Soil] Sampled 05/05/20 09:30 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:30	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:30	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:30	
8270C	05/13/20 15:00	5	05/19/20 09:30	
T202211-03 YubaCity-1 12'' [Soil] Sampled 05/05/20 09:50 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:50	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:50	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:50	
8270C	05/13/20 15:00	5	05/19/20 09:50	

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202211

Client: **Blackburn Consulting-West Sac.** **Project Manager:** **Mike Jaroudi**

Project: **Feather River Sediment Removal** **Project Number:** **3825.x**

Analysis	Due	TAT	Expires	Comments
T202211-04 LiveOAk-1 12'' [Soil] Sampled 05/05/20 11:25 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 11:25	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 11:25	
8081 Pesticides	05/13/20 15:00	5	05/19/20 11:25	
8270C	05/13/20 15:00	5	05/19/20 11:25	
T202211-05 LiveOAk-2 12'' [Soil] Sampled 05/05/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 12:00	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 12:00	
8081 Pesticides	05/13/20 15:00	5	05/19/20 12:00	
8270C	05/13/20 15:00	5	05/19/20 12:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By Date

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

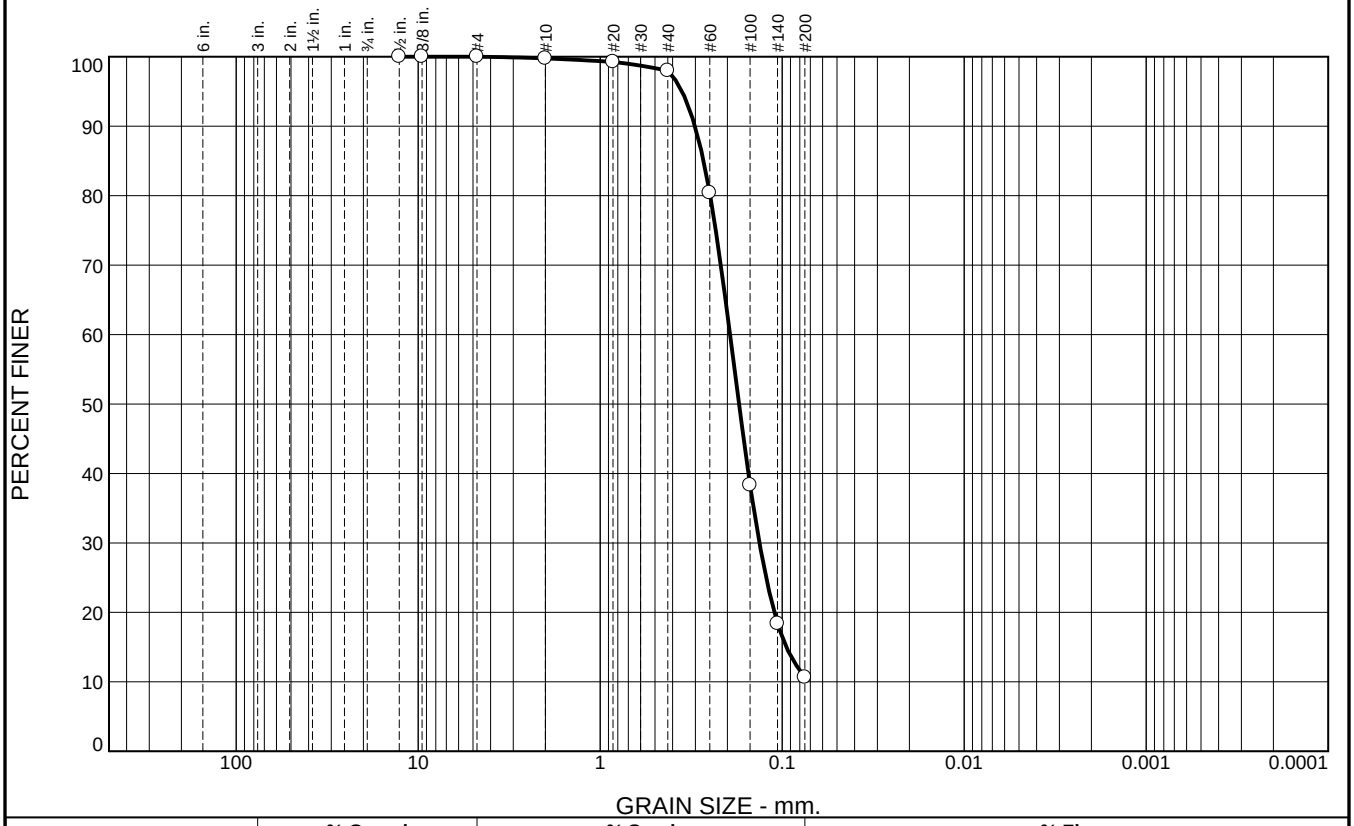
Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX B

Soil Classification Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	87.4	10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	98.0		
#60	80.4		
#100	38.3		
#140	18.4		
#200	10.6		

* (no specification provided)

Material Description

Poorly-graded SAND with SILT, mottled dark gray & brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3013 D_{85}= 0.2703 D_{60}= 0.1933
D_{50}= 0.1726 D_{30}= 0.1334 D_{15}= 0.0949
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 1 **Date:**

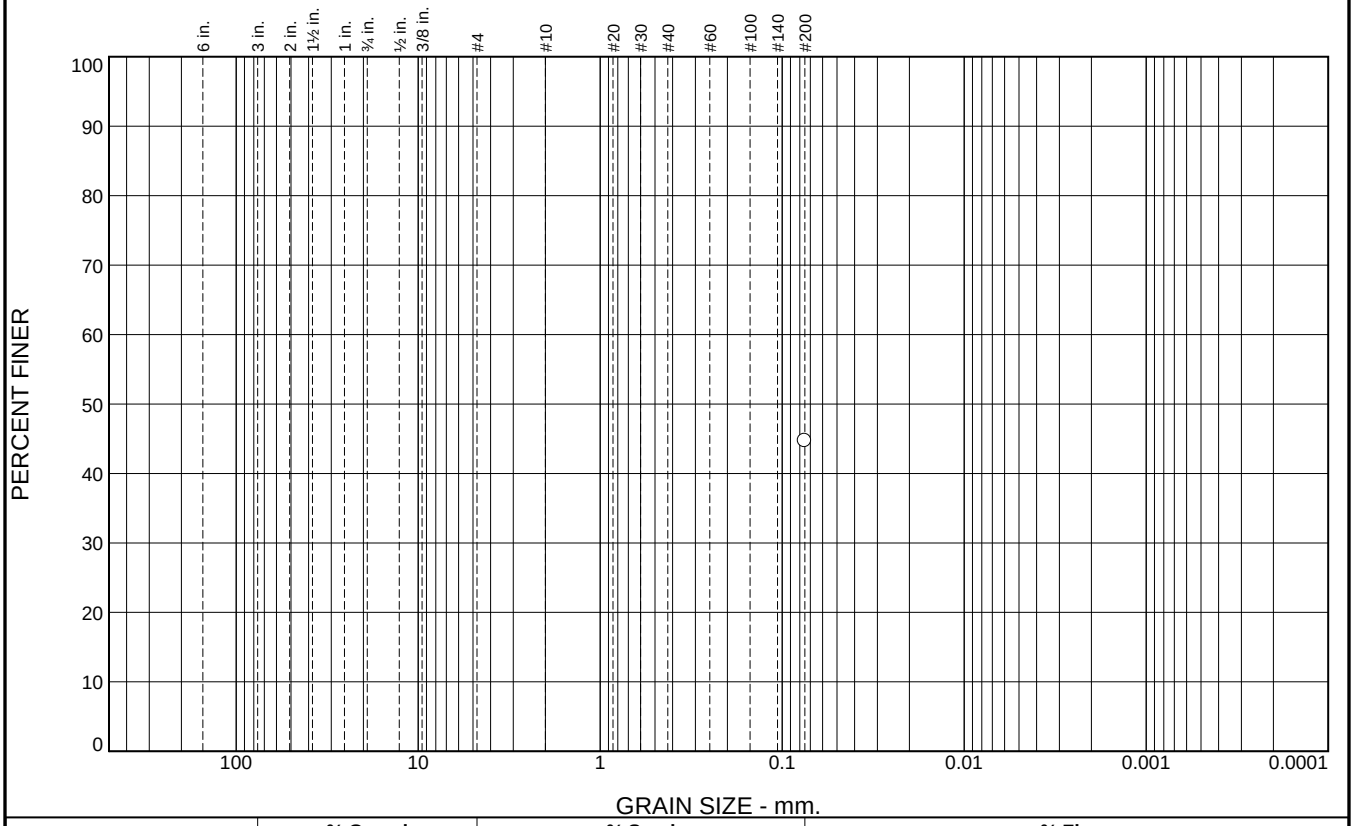
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						44.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	44.7		

* (no specification provided)

Material Description

SILTY SAND, dark brown

Atterberg Limits

PL= 32 LL= 33 PI= 1

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 2 **Date:**

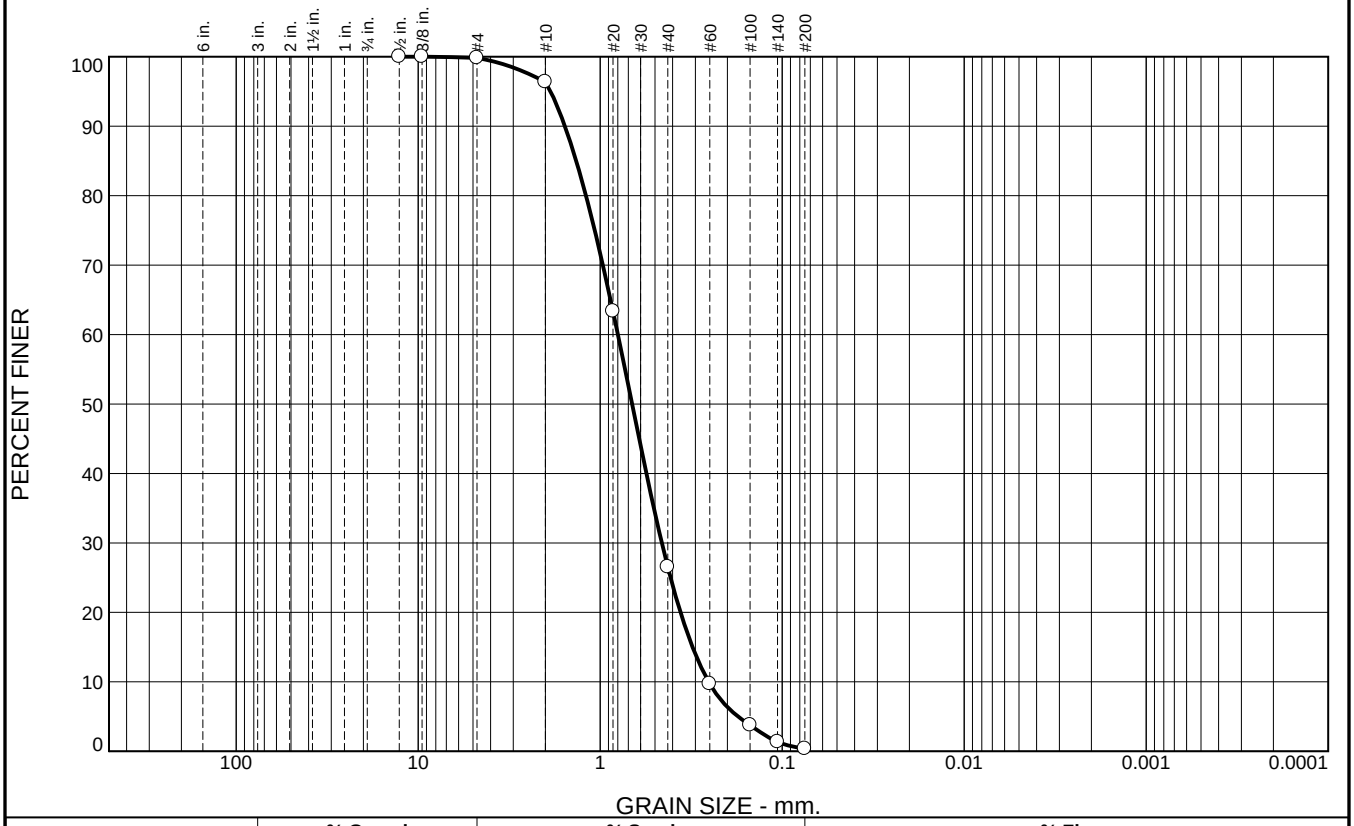
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	3.4	69.9	26.1	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#10	96.4		
#20	63.4		
#40	26.5		
#60	9.7		
#100	3.8		
#140	1.4		
#200	0.4		

* (no specification provided)

Material Description

Poor□y-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.5612 D_{85}= 1.3540 D_{60}= 0.7989
D_{50}= 0.6674 D_{30}= 0.4582 D_{15}= 0.3108
D_{10}= 0.2537 C_u= 3.15 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 1 **Date:**

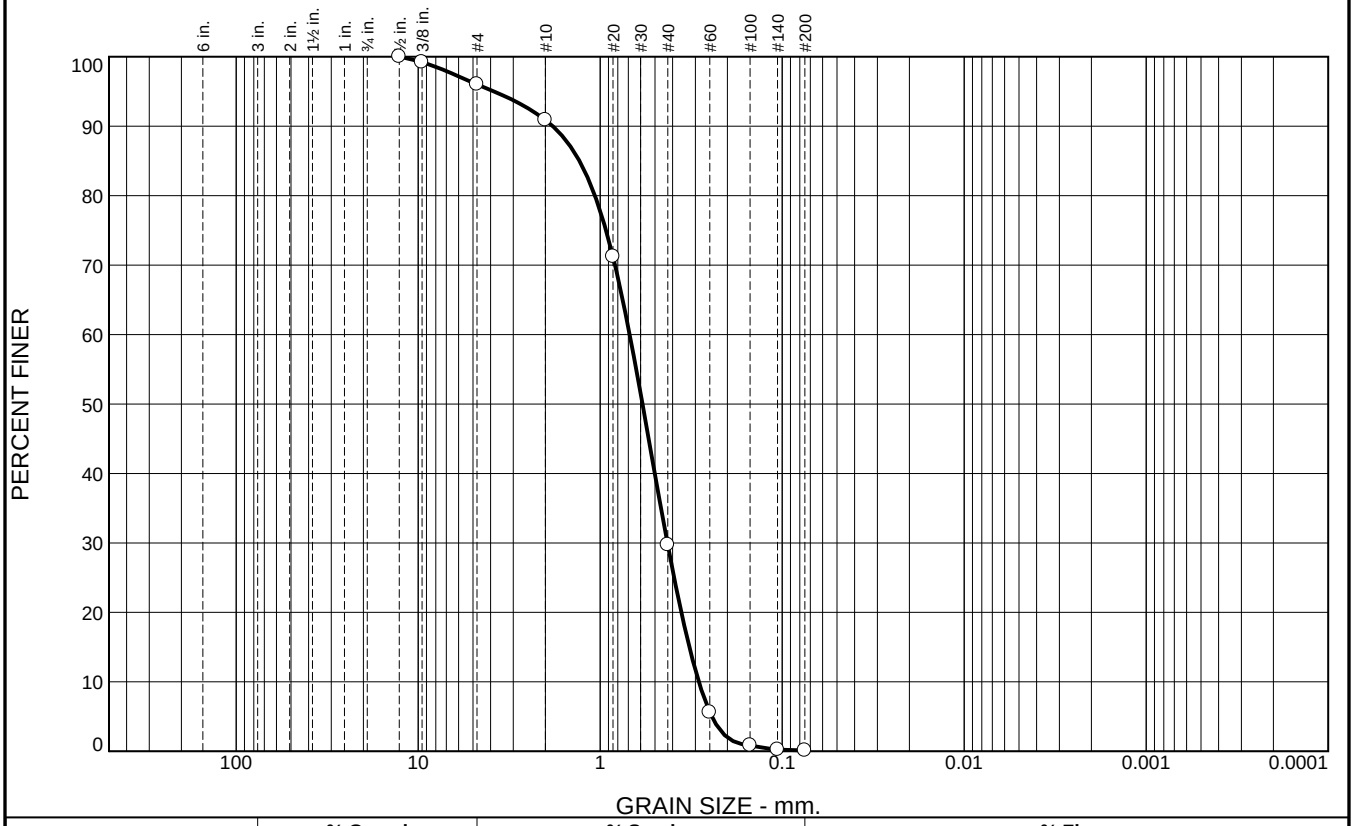
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.0	5.1	61.2	29.6	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.2		
#4	96.0		
#10	90.9		
#20	71.2		
#40	29.7		
#60	5.6		
#100	0.8		
#140	0.2		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.8245 D_{85}= 1.3002 D_{60}= 0.6885
D_{50}= 0.5854 D_{30}= 0.4270 D_{15}= 0.3235
D_{10}= 0.2871 C_u= 2.40 C_c= 0.92

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 2 **Date:**

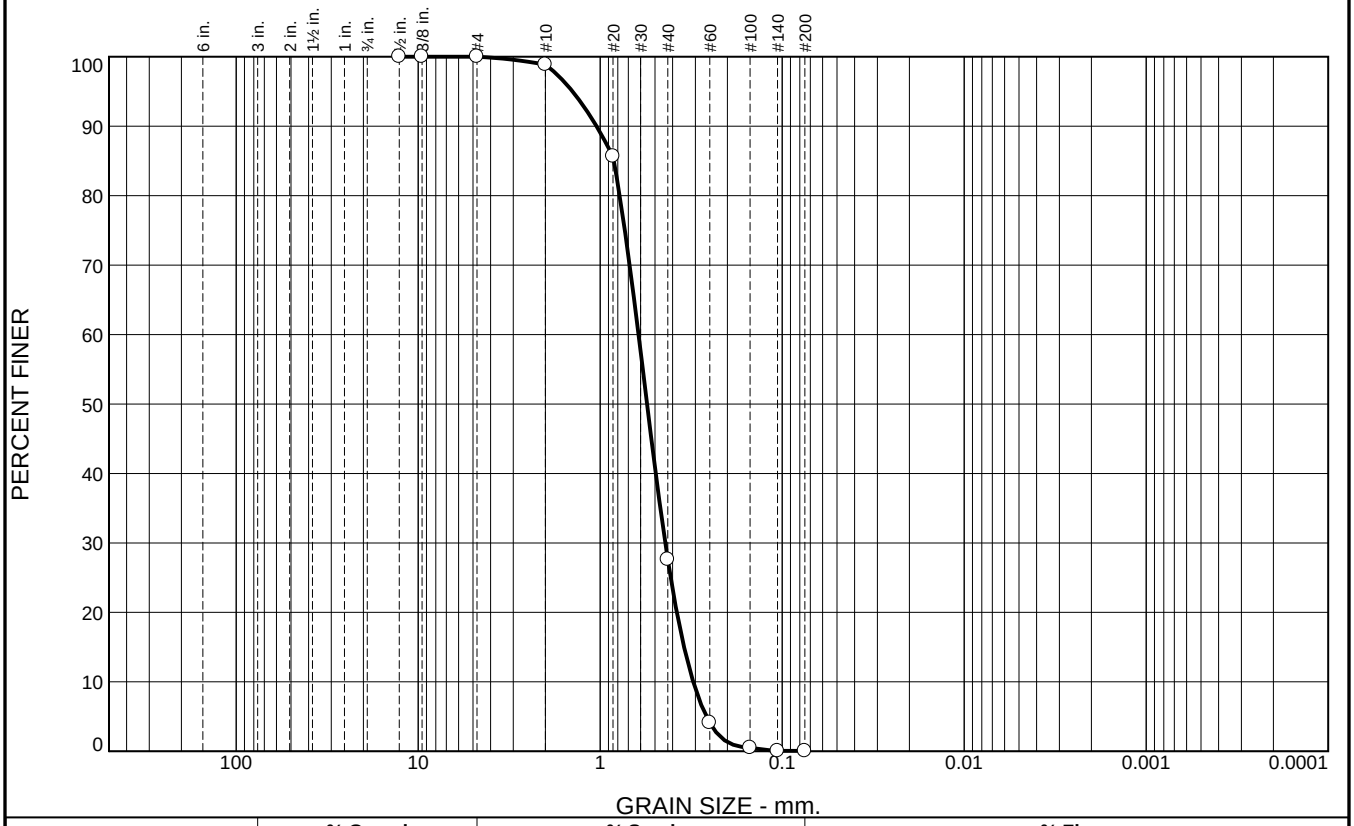
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	71.3	27.5	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	98.9		
#20	85.7		
#40	27.6		
#60	4.1		
#100	0.5		
#140	0.1		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0481 D_{85}= 0.8409 D_{60}= 0.6157
D_{50}= 0.5525 D_{30}= 0.4387 D_{15}= 0.3457
D_{10}= 0.3080 C_u= 2.00 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 3 **Date:**

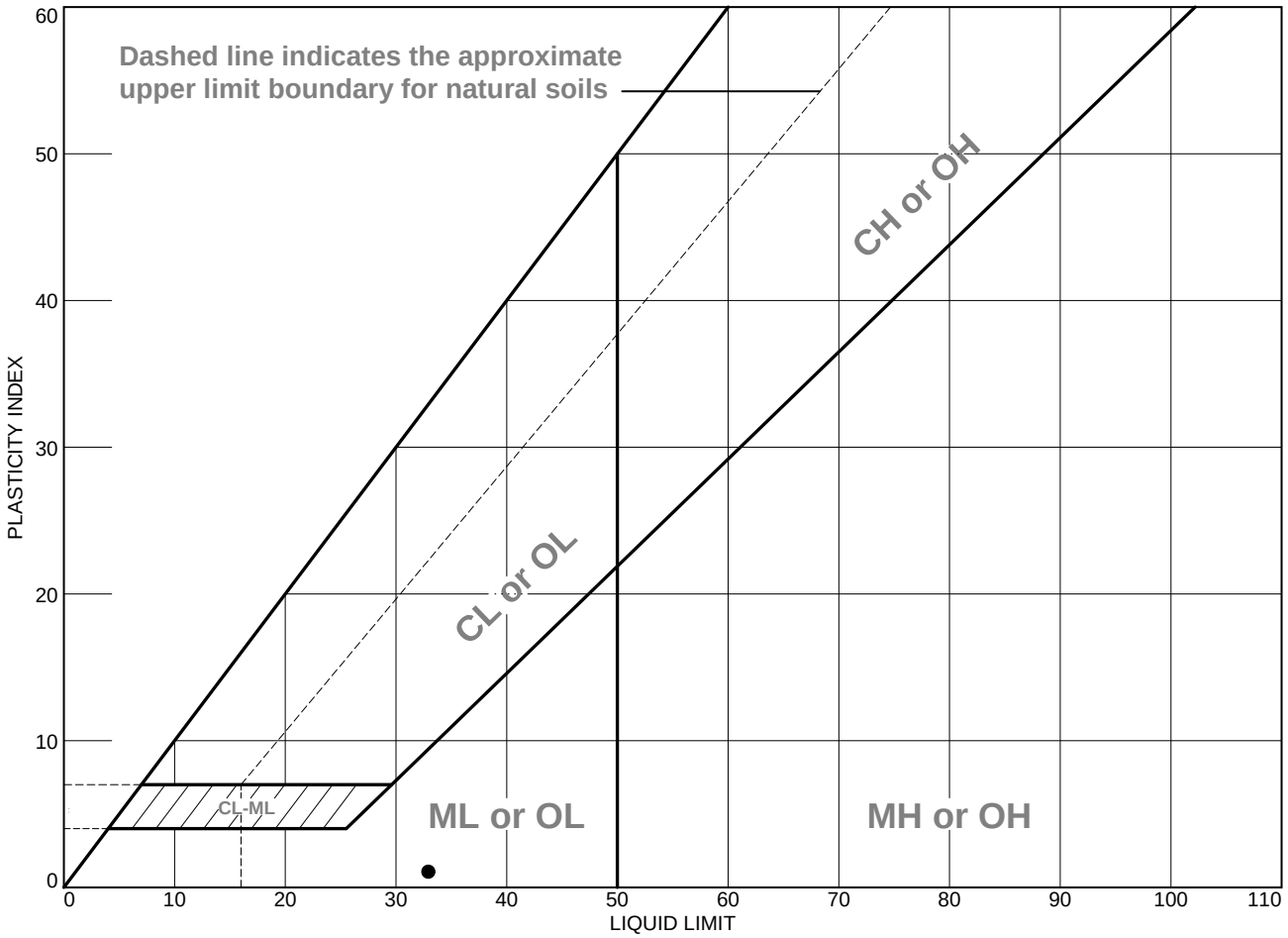
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SILTY SAND, dark brown	33	32	1		44.7	SM

Project No. 3825.X **Client:** Sutter Butte Flood Control Agency

Project: Feather River Sediment Removal Project

●**Source of Sample:** Live Oak **Depth:** 0-12" **Sample Number:** 2

Remarks:

Blackburn Consulting

W. Sacramento, CA

Figure

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX C

Photo Report



Photo 1: Live Oak Boat Launch, Sample Location 1



Photo 2: Live Oak Boat Launch, Sample Location 2



Photo 3: Yuba City Boat Launch, Typical Sample Location

ATTACHMENT E

Sampling Plan

SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

October 2020

Prepared for:

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Prepared by:

BLACKBURN
CONSULTING

2491 Boatman Ave.
West Sacramento, CA 95691

West Sacramento Office:
2491 Boatman Ave
West Sacramento, CA 95691
(916) 375-8706

BLACKBURN
CONSULTING

Auburn (530) 887-1494
Fresno (559) 438-8411

Blackburn File No. 3825.001
October 16, 2020

Mr. Chris Fritz
Peterson Brustad, Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: **SAMPLING AND ANALYSIS PLAN**
Yuba City Boat Ramp Sediment Removal Project
Sutter County, California

Dear Mr. Fritz,

Blackburn Consulting (Blackburn) prepared this Sampling and Analysis Plan (SAP) for the Yuba City Boat Ramp Sediment Removal Project (Project) at the Yuba City Boat Ramp in Sutter County, California. Blackburn prepared this SAP in accordance with our proposal dated August 7, 2020. This SAP provides sampling methodology and analytical testing criteria for sediment prior to dredging activities. The plan is in general compliance with the Clean Water Act (CWA) Section 404 as implemented by the US Army Corps of Engineers, CWA Section 401, and California Water Resources Control Board Porter-Cologne Water Quality Control Act.

Please call if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

Laura Long
Environmental Engineer

Reviewed by:

Robert Lokteff, PE, GE
Principal Geotechnical Engineer

Table of Contents

1 INTRODUCTION 1
1.1 Purpose of this SAP 2
2 SITE BACKGROUND 2
2.1 Site Conditions 2
2.2 Tier 1 3
2.2.1 2020 Sediment Screening 3
2.2.2 Tier I Summary 4
3 SAP OVERVIEW 4
3.1 Exposure Pathways 4
3.2 Beneficial Reuse Guidelines 5
3.3 Field Activities and Lab Analysis 6
3.3.1 Sampling Overview 6
3.3.2 Testing Overview 8
3.3.3 Data Analysis 9
4 PROJECT MANAGEMENT AND RESPONSIBLITIES 9
4.1 Program Management 9
4.2 Laboratory Management 9
4.3 Regulating Agencies and Permitting 9
5 SEDIMENT COLLECTION, HANDLING AND TESTING 10
5.1 Sediment Collection and Handling 10
5.1.1 Sediment Core Equipment 10
5.1.2 Sample Locations (positioning and depth measurement) 10
5.1.3 Collection of Sediment Samples – Vibracore Sampling Methods 11
5.1.4 Vibracore Decontamination 12
5.1.5 Core Processing 12
5.1.6 Decontamination and Sample Custody 14
5.2 Laboratory Testing Methods and Analyses 14
5.2.1 Bulk Sediment Chemical and Physical Analysis 14
5.2.2 Sediment Elutriate Preparation Method 15
5.2.3 Chemical Methods for Aqueous Extracts 15
5.2.4 Sediment Pore Water Characterization 15
5.2.5 Tier III Biological Testing 15
5.3 Collection of Water Samples 15

5.4 Sample Identification 15
6 QUALITY ASSURANCE/QUALITY CONTROL 16
6.1 Field Sampling Quality Management 16
6.2 Chemical Analyses Quality Management 16
6.3 Biological Testing 17
6.3.1 Water and Sediment Handling and Storage 17
6.3.2 Source and Condition of Test Organisms 17
6.3.3 Maintenance of Test Conditions and Corrective Actions 17
6.3.4 Calibration Procedures and Frequency 18
6.3.5 Reference Toxicant Testing and Data Accuracy and Precision 18
6.3.6 Data Evaluations 18
6.3.7 Sample Tracking 18
6.4 Deviations from Protocol 18
7 DATA ANALYSIS and REPORTING 18
7.1 Sediment Chemistry and Physical Data Analysis 18
7.2 Modified Elutriate Test Data Analysis 19
8 REPORTING and DELIVERABLES 19

FIGURES
Figure 1: Vicinity Map
Figure 2: Site Plan with Sampling Locations and Dredging Depths

TABLES
Table 1: Testing Framework and Screening Guidelines for Exposure Pathways (pg. 5)
Table 2: Testing Locations and Designed Dredge Depth (pg. 7)
Table 3: Sample Volumes and Storage Requirements
Table 4: Analytical Methods and Quantitation Limits for Solid Matrices
Table 5: Analytical Methods and Quantitation Limits for Water Matrices

APPENDIX A
Analytical Laboratory Statement of Qualifications Documents: Eurofins Calscience

APPENDIX B
Analytical Laboratory Statement of Qualifications Documents: Pacific EcoRisk

ATTACHMENT 1:
SOIL SCREENING DATA REPORT, Feather River Sediment Removal Project at Live Oak Boat Launch and Yuba City Boat Launch, California (Blackburn, 2020)

ACRONYMS

ASTM	American Society for Testing Materials	**NAD**	North American Datum
ANOVA	Analysis of Variance	**NA**	Not Applicable
BCDC	Bay Conservation and Development Commission	**NAVD 88**	North American Vertical Datum of 1988
CDFW	California Department of Fish and Wildlife	**ND**	Not Detected
COC	Constituent of Concern and Chain of Custody	**NOAA**	National Oceanic and Atmospheric Administration
CRM	Certified Reference Material	**PAH**	Polycyclic Aromatic Hydrocarbon
CRWRP	Cullinan Ranch Wetland Restoration Project	**PCB**	Polychlorinated biphenyl
CSLC	California State Land Commission	**PDS**	Post Digestion Spike
CTR	California Toxics Rule	**PDSD**	Post Digestion Spike Duplicate
CV	Coefficient of Variation	**RMP**	Regional Monitoring Program
CWA	Clean Water Act	**RPD**	Relative Percent Difference
CY	Cubic Yards	**SAP**	Sampling and Analysis Plan
DDD	Dichloro-diphenyl-dichloroethane	**SAR**	Sampling and Analysis Report
DDE	Dichloro-diphenyl-dichloroethylene	**SET**	Standard Elutriate Test
DDT	Dichlorodiphenyltrichloroethane	**SFBRWQCB**	SF Bay Regional Water Quality Control Board
DGPS	Differential Global Positioning Satellite	**SOP**	Standard Operating Procedure
DI-WET	Deionized Water Waste Extraction Test	**SM**	Standard Methods
DL	Detection Limit	**SP**	Solid Phase
DMMO	Dredge Material Management Office	**SPP**	Suspended Particulate Phase
DO	Dissolved Oxygen	**SRM**	Standard Reference Material
DUP	Duplicate	**TEQ**	Toxicity Equivalency Quotient
EC_{50}	50% of the Time Effects Concentration	**TMDL**	Total Maximum Daily Load
ERED	Environmental Residue-Effects Database	**TOC**	Total Organic Carbon
FDA	Food and Drug Administration	**TPH**	Total Petroleum Hydrocarbons
ITM	Inland Testing Manual	**TRV**	Toxicity Reference Value
LC_{50}	50 % of the Time Lethal Concentration	**TSS**	Total Suspended Solids
LCS	Laboratory Control Spike	**USACE**	U.S. Army Corps of Engineers
LCSD	Laboratory Control Spike Duplicate	**USCS**	Unified Soil Classification System
LOPE	Low Density Polyethylene	**USEPA**	U.S. Environmental Protection Agency
MDL	Method Detection Limit	**USFWS**	U.S. Fish and Wildlife Service
MET	Modified Elutriate Extract	**UTM**	Upland Testing Manual
MLLW	Mean Lower Low Water	**QA**	Quality Assurance
MS	Matrix Spike	**QC**	Quality Control
MSD	Matrix Spike Duplicate	**USNMFS**	U.S. National Marine Fisheries Service
MET	Modified Elutriate Extract	**UTM**	Upland Testing Manual
MLLW	Mean Lower Low Water	**QA**	Quality Assurance
MS	Matrix Spike	**QC**	Quality Control
MSD	Matrix Spike Duplicate		
MWRP	Montezuma Wetland Restoration Project		

1 INTRODUCTION

Blackburn Consulting (Blackburn) prepared this site-specific Sampling and Analysis Plan (SAP) to present the general approach to sampling and testing sediments planned for removal during maintenance dredging for the Yuba City Boat Launch Sediment Removal Project (Project) in Yuba City, California (Figure 1).

The Project involves maintenance dredging to remove sediment that has accumulated in portions of the Feather River. The dredging will remove approximately 66,000 cubic yards (CY) of sediment from the Yuba City Boat Launch facility. The dredging will be staged from the existing Yuba City Boat Launch facility and adjacent lands.

Peterson Brustad, Inc. (PBI) informed us that maintenance dredging at the Yuba City Boat Launch (Site):

- Is proposed to occur between June 15 and October 15, 2021.
- Would occur within the dredging limits to a depth of 9 feet below mean lower low water (MLLW) including a 1-foot overdepth allowance.
- Consists of an area of about 14.41 acres centered at about latitude 39.12858 degrees north, longitude 121.59892 degrees west. Figure 2 shows the approximate dredge area.

PBI informed us that the dredged material disposal location will be determined after the implementation of this SAP and interpretation of analytical laboratory test results. Proposed disposal locations include two upland beneficial use sites; the Marysville Wastewater Treatment Plant (WWTP) and Recology Ostrom Landfill (Landfill). We understand that dredged sediment may also be placed on agricultural fields. Dredge sediments are not planned to be returned to water. The sediment will be dried/dewatered under PBI's direction at a "rehandling" area near the Site. Water from the dewatering process will be returned to the Feather River.

Evaluation of dredged material for upland disposal relies on the use of physical, chemical, and/or biological tests to determine acceptability of disposal material and compliance with applicable regulatory requirements and guidelines. This SAP was completed using the guidelines, protocols, and quality assurance/quality control (QA/QC) measures in the following:

- Beneficial Reuse of Dredged Materials, Sediment Screening and Testing Guidelines (Guidelines), (SFBRWQCB, May 2000). https://www.waterboards.ca.gov/rwqcb2/water_issues/programs/dredging/beneficialreuse.pdf
- Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Inland Testing Manual (United States Army Corp of Engineers [USACE] and United States Environmental Protection Agency [EPA], 1998) also known as the Inland Testing Manual (ITM). https://www.epa.gov/sites/production/files/2015-08/documents/inland_testing_manual_0.pdf
- Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual [UTM] (USACE, 2003). https://clu-in.org/download/contaminantfocus/sediments/evaluation-dredged-Islandtrel03-1.pdf

- Dredge Material Management Office (DMMO) Public Notice 01-01 (Guidelines for Implementing the ITM in the San Francisco Bay Region; USACE 2001).
  https://www.spn.usace.army.mil/Portals/68/docs/Dredging/Public%20Notices/sfitm092101.pdf
- Proposed Guidance for Sampling and Analysis Plans (Quality Assurance Project Plans) for Dredging Projects within the USACE San Francisco District, Public Notice 99-4.
  https://www.spn.usace.army.mil/Portals/68/docs/Dredging/guidance/99-4.pdf
- Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region – Final Policy Environment Impact Statement/Programmatic Environment Impact Report (LTMS, 1998).
  https://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/entire%20LMTF.pdf
- Porter Cologne Water Quality Control Act, California State Water Resources Control Board (SWRCB).
- CWA Sections 404(b)(1), Section 401, and 402, RWQCB Resolution No. 92-145.

1.1 Purpose of this SAP

The purpose of this SAP is to provide guidance for the collection of physical, chemical, and biological data on the dredge sediment necessary to determine whether adverse impacts would result from dredging and dredged material disposal.

The Guidelines (SFBRWQCB, May 2000) provide a sediment evaluation framework for beneficial reuse disposal sites using a tiered approach in making disposal determinations. The sediment testing structure includes:

- Tier 1 – review of site-specific conditions and all prior physical, chemical and biological tests of the dredge material either at the site or from previous dredging operations at the site;
- Tier II - chemical and physical testing;
- Tier III - toxicity/biological testing; and
- Tier IV - bioaccumulation.

This SAP provides guidance for up to a Tier II analysis of the dredge sediment and Tier III analysis of return (dewatering) water. Tier II and Tier III testing described in this SAP are designed to allow the USACE and the RWQCB to make a suitability determination for upland disposal. Blackburn does not anticipate that a Tier IV bioaccumulation analysis will be necessary and therefore it is not addressed in this SAP.

2 SITE BACKGROUND

The following sections provide current Site conditions and data from previous sampling.

2.1 Site Conditions

The Yuba City Boat Launch is located approximately 600 feet upstream on the west side of the Feather River at the confluence with the Yuba River, between Yuba City, Marysville, and West Linda, California

(Figure 1). Based on our review of Google Earth (Google Earth Imagery, 2018) the Yuba City Boat Launch is comprised of a concrete ramp and floating dock. A parking area with about 35 parking spaces for truck/trailer parking is northwest and southwest of the boat launch. A Recreational Vehicle (RV) Park is northwest of the Site. The surrounding area to the west is rural/light industrial with Sutter County Airport to the south. Ponds are identified north of the site and the area east of the Site is agricultural.

Site runoff is generally towards the Feather River. We observed no stormwater outfalls during our site visits. Blackburn reviewed the web based Geotracker and EnviroStor databases. Geotracker is the California State Water Resources Control Board (SWRCB) data management system for managing sites that impact groundwater. EnviroStor is the California Department of Toxic Substance Control (DTSC) online database that identifies sites that have known contamination or sites for which there may be reason to investigate further. No Geotracker or EnviroStor database listed sites were identified in the vicinity of the Site

2.2 Tier 1

A Tier I analysis is a review of site-specific conditions and existing physical, chemical and/or biological tests results preformed on the proposed dredge material or from previous dredging operations at the site. If there is sufficient information, a decision may be made on the suitability of sediment for disposal after Tier I analysis. Chemical and physical tests previously conducted at the Site are discussed below.

2.2.1 2020 Sediment Screening

PBI requested Blackburn prepare a Soil Screening Data Report (Data Report) to "pre-profile" the proposed dredged material for general soil characteristics. Blackburn completed the assessment and prepared the Data Report (Blackburn, May 2020). A copy of the report is provided in Attachment 1.

To pre-profile the proposed dredge material, Blackburn collected sediment samples from three locations at the Site on May 5, 2020. Samples for chemical testing were retrieved at approximately 12" below the sediment surface. Samples for soil classification tests were retrieved from the upper 12" of sediment. Samples for chemical testing were submitted to SunStar Laboratories of Lake Forest, California for the following tests:

- Total Petroleum Hydrocarbon (TPH) as gasoline/diesel/motor oil by EPA Method 8015.
- Semi Volatile Organics (SVOC) by EPA Method 8270C.
- Organochlorine Pesticides (OCP) by EPA Method 8081A.
- Cam-17 Metals by EPA Methods 6010B and 7471A (mercury).

SVOCs, OCPs, and TPH as gasoline, diesel, and motor oil were not detected above laboratory reporting limits for the three samples analyzed. Barium, Chromium, Cobalt, Copper, Nickel, Vanadium, and Zinc were all detected in the three samples analyzed at concentrations below April 2019 Environmental Protection Agency Regional Screening Levels (EPA RSLs). All other tested metals were not detected above laboratory reporting limits for the three samples analyzed.

Bulk samples for classification were delivered to Blackburn's West Sacramento laboratory for soil classification testing. We performed the following soil classification test:

- Particle Size Analysis in accordance with ASTM D6913.

Classification tests indicate that the sediment samples tested classify as non-plastic poorly graded sand (SP).

2.2.2 Tier I Summary

The 2020 Data Report (Blackburn, 2020) did not identify significant impacts from OCPs, metals, SVOCs and TPHs in the samples tested. However, analysis for OPs, PCBs, VOCs, and methylmercury was not conducted, therefore all potential constituents of concern (COCs) have not been assessed.

The dredge sediment tested is classified as predominantly sand which meets particle size criteria (UTM, USACE, 2003) for a Tier II/III exemption for material that "…is composed predominantly of sand, gravel, rock, or any other naturally occurring bottom material with particle size larger than silt, and the material is found in areas of high current or wave energy". In addition, the Feather River has a relatively strong current at the Site, therefore it is unlikely a buildup of potential COCs would occur in the sediment.

Based on the above, the conditions for a Tier II/III exemption have been partially met.

3 SAP OVERVIEW

This SAP describes the methods, procedures, and materials to be used for sediment sampling and analysis at the Site. Tier II chemical and physical testing will be conducted for sediment and sediment elutriate. Tier III bioassay analysis will be conducted for sediment elutriate only. Tier IV bioaccumulation testing is not anticipated and is not addressed in this SAP.

3.1 Exposure Pathways

Exposure pathways to be evaluated by this SAP include receptors of concern (ROCs) and constituents of concern (COCs). Potential exposure pathways (routes of exposure) for non-human biological receptors identified for the Project are presented in Table 1 (Section 3.2). Conditions that create a potential source of COCs for the Site include:

- Gold mining in the Feather River watershed. COCs include methylmercury, mercury, and arsenic.
- Power plants in the Feather River watershed. COCs include Polychlorinated biphenyls (PCBs). There are no power plants between the Oroville Dam and the Site. If a significant portion of the sediment is from the 2017 Oroville Dam release, it is unlikely that PCBs from power plants further upstream are in the new sediment buildup.
- Agricultural runoff. COCs include Group A pesticides including diazinon, organophosphate pesticides (OPs), and organochlorine pesticides (OCPs).
- Urban runoff. COCs include volatile organic compounds (VOCs), semi-volatile organic compounds/polycyclic aromatic hydrocarbons (SVOCs/PAHs), PCBs, and metals.
- Recreational boat use. COCs include total petroleum hydrocarbons (TPHs).

ROCs are the resources at the disposal site that have a potential to be affected by a COC. Resources that may be a ROC for an exposure pathway for the Project include:

- Workers, plants, and wildlife exposed to sediment after placement at a landfill, WWTP, or as fill material;
- Future residents or workers, plants, and wildlife exposed to groundwater contaminated with leachate at the disposal location for dredged materials; and
- Ecological receptors (fish and wildlife) exposed in receiving waters due to effluent discharges associated with dewatering.

3.2 Beneficial Reuse Guidelines

The Guidelines (SFBRWQCB, May 2000) establish a testing framework and screening guidelines to be used to make suitability determinations for the reuse of dredged material in beneficial environments in the absence of specific criteria. Compliance with the screening values and a general suitability determination do not circumvent the need for site-specific permits at disposal locations. Those permits may have more (or less) stringent "acceptance criteria" depending on the site-specific conditions. Table 1 summarizes the Guideline's testing framework and screening guidelines applicable to the Project.

TABLE 1
Guidelines (SFBRWQCB, May 2000)
Testing Framework and Screening Guidelines for Exposure Pathways

Beneficial Reuse Environment	Potential routes of exposure for non-human biological receptors	Recommended Chemistry Test	Recommended Bioassays	Recommended Leachate Chemistry	Screening Guidelines for: 1-Chemistry 2-Toxicity 3-Leachate chemistry
Construction fill	Potential, but unlikely direct exposure to sediments. On-site exposure to leachate after placement	Sediment chemistry for analytes in Table 2	None	Modified WET-Citric or DI	1-PRG*, PEL** 2-Not applicable 3- Basin Plan WQOs[t] or similar
Landfill Daily Cover or WWTP Cover	No exposure	Testing and acceptability criteria specific to each landfill. Solids analysis may include WET-Citric for hazardous waste comparison to PRGs, local background soil concentrations, and DTSC SLs[tt]			
Discharge from dewatering dredged material	Receiving waters exposed to effluent discharge during placement	Elutriate chemistry for analytes.	Three species sediment elutriate bioassay.	Not Applicable	1-WQO's Basin Plan 2-No significant toxicity 3-Not applicable

*Preliminary Remediation Goal (PRG)
** Permissible Exposure Limit (PEL)
t Water Quality Objective (WQO)
tt Department of Toxic Substance Control Screening Levels

The above screening Guidelines are based on sediment chemistry, and, for effluent discharge, on elutriate chemistry and toxicity. The Guidelines do not address human exposure, however most of the chemical screening values are below levels of concern for human health (EPA Region IX Preliminary Remediation Goals [PRGs]) which are included in this SAP. Screening values in this SAP are guidelines and may be modified by the Regional Water Quality Control Board (RWQCB).

Placement of the dredged material at the rehandling (drying) and/or reuse site may include the discharge of effluent from the placement site. Therefore, this SAP includes characterization of sediment elutriate chemistry and toxicity (Tier III). Elutriate chemistry will be characterized by measuring the analytes listed in Table 5 for sediment elutriate, using appropriate methods, detection limits, and QA/QC procedures. The biological tests for elutriate toxicity testing recommended in Public Notice 01-01, including protocols and QA/QC procedures, will be used to characterize effluent toxicity.

3.3 Field Activities and Lab Analysis

The Project involves maintenance dredging to remove approximately 66,000 CY of sediment from the Yuba City Boat Ramp facility to allow users to continue safe operations. The proposed dredge area is shown on Figure 2.

Dredging will involve hydraulic or mechanical mining. Hydraulic mining would consist of a barge using suction to remove sediment from the river bottom and pumping the material to a location on the east or west side of the river, where it would be dewatered, and hauled by truck to a disposal site(s). Mechanical dredging would involve equipment such as an excavator with a bucket removing the sediment from shore and/or a barge, transporting the material to the dewatering area, then to the disposal site(s). The dredging is scheduled for June through October 2021. The proposed dredge site and depths are shown on Figure 2.

Before dredging can begin, representative sediments from the area and depths to be dredged will be evaluated to determine what potential effects the disposal of the dredge material could have on the chemical, physical, and biological (if needed) components of the environment at the disposal site.

Sediment evaluation will be accomplished by collecting and testing the material to be dredged, with test results compared against established chemical, physical, biological, toxicological and bioaccumulation (if needed) benchmarks, as applicable. A disposal suitability determination will be made by the RWQCB and USACE based on a weight of evidence approach. PBI understands that no dredging may occur until final approval is obtained from appropriate regulatory agencies. An overview of the sampling plan and associated analyses is presented below.

3.3.1 Sampling Overview

Vibracore sampling, as described in section 4.3.3 (Vibracore Sampling Methods) will be performed to collect sediment samples at eight locations within the dredge area. Approximate sampling locations are shown on Figure 2. We selected the sampling locations to represent coverage of the dredging volume which includes the dredging area and depth of dredge as shown in Figure 2. However, the locations may be adjusted in the field slightly if insufficient river water depths prevent access to the preferred locations. If possible and site conditions allow, all cores will be advanced to the design dredge elevation

plus one foot for overdepth allowance, plus an additional 0.5 feet for potential testing of the material to be left in place after dredging (Z-layer) to a total elevation of -2.5 to -8.81 feet below the mudline. Target coordinates and designed dredge depths for the sample locations are listed in Table 2.

TABLE 2
Target Sample Locations and Design Depth

Sample Name	Geographic Coordinates		Water Depth (ft.)	Design Depth + Overdepth + Z-Layer (ft.)	Expected Core Length (ft.)	Proposed Core Analyses	Proposed Composite Analyses
	Latitude North	Longitude West					
YCB-01	39.12976532	-121.59894054	X*	8.81	X*	Tier II	Tier II and Tier III
YCB-02	39.12941650	-121.59963036	X*	5.5	X*	Tier II	
YCB-03	39.12889981	-121.59875129	X*	6.5	X*	Tier II	
YCB-04	39.12804891	-121.59925224	X*	4.5	X*	Tier II	
YCB-05	39.12778395	-121.59836356	X*	5.5	X*	Tier II	Tier II and Tier III
YCB-06	39.12748188	-121.59767383	X*	8.81	X*	Tier II	
YCB-07	39.12674086	-121.59779266	X*	8.81	X*	Tier II	
YCB-08	39.12640447	-121.59879617	X*	6.5	X*	Tier II	

* Water depth and expected core length to be determined during field measurements

Two composite samples will be created from the sediment collected from the eight sampling locations, composited four samples to one, for bulk sediment chemistry and toxicity testing. Continuous samples from the mudline to project depths plus one foot for overdepth will be collected from all locations. Soil specimens from specific intervals will be homogenized and then combined with similar intervals to form each composite sample. Sediments collected below the overdepth elevation will not be included in the composite sample.

In addition to the composite samples, an archive bulk sediment chemistry sample will be collected from each sampling location at 2-foot intervals. After collection of the 2-foot interval samples, each of the sediment cores will be individually homogenized and a subsample of the homogenized sediment from each core will be archived for subsequent analysis, if needed. One archive sample from each location will represent the entire primary core interval (mudline to overdepth elevation). An additional bulk sediment chemistry sample of the Z-layer material (X.0 to X.5 ft, where X=-dredge depth) will be collected and archived from all sampling locations. Archive samples will be stored frozen at Eurofins Calscience for at least six months after sampling unless directed otherwise by Blackburn.

If determined necessary by regulatory agencies, Z-layer samples will be analyzed to ensure the new surface material does not expose sediment with contamination after dredging. The Z-layer samples will be processed in a similar fashion as to that described above; that is sediment cores will be individually homogenized, and a subsample of the homogenized sediment from each core will be archived for subsequent analysis of the individual core sediment as needed.

3.3.2 Testing Overview

Composite sample testing will be performed to cover the potential dredged material placement options. Testing of Tier II bulk sediment physical and chemical constituents are listed in Table 4 and include:

- Grain size distribution
- Percent solids
- Metals (CAM 17)
- OCPs
- OPs
- VOCs
- PCBs and congeners
- SVOCs including PAHs
- Dioxins/Furans
- TPHs
- Cyanide
- Asbestos

Evaluation of the leaching characteristics of proposed dredged sediments include a modified Waste Extraction Test (WET), as defined in the Title 23 of the California Code of Regulations, using citric acid or deionized water for the extraction, as applicable.

Prior to transport, during dewatering at the "rehandling" location, the return of decant water to the Feather River may occur. To address this, a modified elutriate test (MET) extract will be formed from the composite sediments and site water to characterize sediment elutriate chemistry and toxicity. Elutriate chemistry will be characterized by measuring the analytes listed below and in Table 5.

- Metals (CAM 17)
- OCPs
- OPs
- VOCs
- PCBs and congeners
- SVOCs including PAHs
- Dioxins/Furans
- TPHs
- Cyanide
- Asbestos
- Dissolved Oxygen (DO)
- Biological Oxygen Demand (BOD)
- Total Suspended Solids (TSS)
- Hardness
- Electrical conductance (EC)
- Total Dissolved Solids (TDS)
- Unionized ammonia nitrogen
- Total Organic Carbon (TOC)

The MET water will tested for toxicity using procedures referenced in DMMO Public Notice 01-01 (including protocols and QA/QC procedures) and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002* for the following freshwater tests:

- Cladocera water flea *Ceriodaphnia Dubia* (survival and reproduction test)
- Fathead minnow *Pimephales promelas* larval (survival and growth test); and
- Green alga, *Selenastrum capricornutum* (growth test).

3.3.3 Data Analysis

Blackburn will review data generated from the testing described above to determine suitability of the dredged material for the proposed placement/disposal options. Suitability with respect to sediment analytical chemistry will be determined by Blackburn through comparison of the test results with site-specific, USACE and RWQCB requirements. Blackburn will evaluate the MET sample biological test results to help confirm that decant water discharged during placement activities will follow applicable standards.

4 PROJECT MANAGEMENT AND RESPONSIBLITIES

This section describes the project management and responsibilities associated with this SAP.

4.1 Program Management

Following are the SAP program management roles for this Project:

- PBI will be responsible for overall project planning and coordination.
- A Blackburn SAP Project Manager will be designated prior to project initiation. The SAP Project Manager will be responsible for project coordination as well as production of deliverables.
- A Blackburn Field Engineer/Technician (FET) will coordinate fieldwork and sampling.
- A Field Team Leader (FTL) will be assigned from Kinnetic Laboratories (Kinnetic), Dixon Marine Services (Dixon), or similar qualified company. The FTL will be identified before fieldwork begins.
- The SAP Project Manager and the FTL will be involved in decisions regarding QA/QC and proper protocols for sample preservation, holding times, transport and sample control.
- The SAP Manager will prepare this SAP and review and interpret analytical results.
- The FTL will perform field activities as directed by the FET. Coring equipment, sample containers, and necessary marine equipment will be provided by Kinnetic or Dixon.

4.2 Laboratory Management

A Laboratory Manager will be appointed by each analytical laboratory. The Laboratory Manager will provide analytical support and be responsible for monitoring laboratory analyses and project data-quality objectives. Sediment samples will be sent to Eurofins Calscience in Garden Grove, California or Pacific EcoRisk in Fairfield, California. Both laboratories are State of California-approved analytical laboratories. A Blackburn Laboratory Manager will be assigned to manage soil classification testing..

4.3 Regulating Agencies and Permitting

Dredge-related projects in northern California are regulated by the following agencies:

- Regional Water Quality Control Board (RWQCB)
- Sutter Butte Flood Control Agency (SBFCA)
- Central Valley Flood Protection Board (CVFPB)
- United States Army Corps of Engineers (USACE)

- United States Environmental Protection Agency (USEPA)
- California Department of Fish and Wildlife (CDFW)
- US Fish and Wildlife Service (USFWS)

5 SEDIMENT COLLECTION, HANDLING AND TESTING

The overall approach is to1) sample dredge sediments to the planned dredge depth plus allowable overdepth, 2) composite sediments from individual locations into single samples, and 3) perform chemical and biological laboratory testing performed on the composite sample to determine if the sediments are environmentally suitable for the proposed disposal placement options. Sampling and testing will follow requirements and procedures detailed in the ITM (USEPA/USACE, 1998) with further guidance from DMMO Public Notice 01-01 (USACE, 2001), and draft Guidelines for the Beneficial Reuse of Dredged Materials (SFBRWQCB, 2000). Blackburn will use acceptability guidelines published in these documents to evaluate the suitability of the dredged sediments for disposal.

5.1 Sediment Collection and Handling

This section provides an overview of the sediment collection and handling procedures.

5.1.1 Sediment Core Equipment

Sediment cores will be collected by FTL using Vibracore equipment supplied by the selected FTL company. The Vibracore equipment will be deployed from a sampling vessel, using a purpose-built frame. This will allow mobility from one sampling location to the next sampling location. The FTL field staff will operate the Vibracore and a FET from Blackburn will direct sampling operations. The FTL field staff will collect enough sediment cores at each sampling location so that there is enough material for all required tests. Blackburn's filed FET will confirm correct soil volume has been collected before each core sample is placed in appropriate containers for transport to the lab(s).

5.1.2 Sample Locations (positioning and depth measurement)

Sample location selection and compositing in this SAP is designed to provide samples that represent the physical, chemical, and toxicological characteristics of the sediments to be removed during the dredging event. Approximate sampling locations are shown on Figure 2.

Sample location control will be the responsibility of FTL and will be accomplished using a global positioning system (GPS) that uses US Government Wide-Angle Augmentation System differential correction data to identify each sampling location. The navigation system will be calibrated to a known survey monument in the project area and will be used to guide the vessel to predetermined sampling locations and to identify the location where the core sampler strikes the mudline. The GPS navigation system will have positioning accuracy of 1 to 3 meters. For each sample, when the Vibracore makes contact with the sediment, the location will be recorded in a secondary coordinate dataset through the GPS system. Water depth will be measured by the FTL with a graduated lead line and corrected to MLLW.

Sampling locations will be within the area of dredge design limits. Actual locations listed on Table 2 may change for a number of reasons. If the desired location cannot be reached (due to insufficient water depth, obstructions etc.), a location within the project limits as close as practical shall be sampled instead.

5.1.3 Collection of Sediment Samples – Vibracore Sampling Methods

Samples will be collected using Vibracore equipment aboard a vessel supplied by the FTL. Vibracoring is a sediment sampling methodology that emits high frequency vibration through the Vibracore to liquify sediment around the core tube and collect continuous sediment samples in the core tube. Before the collection of each sample, the Vibracore will be cleaned with ambient water and loaded with a new, clean liner. A 3.75-inch diameter core will be used so that there is enough material for required tests.

The FTL will advance the core to the target sampling depth (project depth plus one foot for overdepth allowance pus 0.5 feet for Z-layer) or to refusal. The depth of refusal is defined as the depth at which the average rate of penetration is less than 0.1 feet/minute for a two-minute period. At sites where the depth of refusal is reached prior to the proposed sample depth, up to one additional attempt will be made to reach the sample depth if there is a reasonable chance of obtaining better results. If the sample depth cannot be reached after an additional attempt, the longer of the two cores will be retained for potential testing.

At the conclusion of a successful sample collection, the core liner will be removed and split open for observation and placement in approved containers. Extrusion of the core is not allowed. Sample processing will take place on shore.

Vibracore sampling will be carried out from the FTL's vessel. The vessel is equipped with an A-frame and winch suitable for handling coring equipment. The vessel will be secured for coring at each location using retractable spuds. The Vibracore consists of a 4-inch diameter aluminum coring tube, a stainless-steel cutting tip, and a stainless-steel core catcher. Food-grade clean polyethylene liners will be inserted into the core tubes. The vibrating unit has two counter rotating motors encased in a waterproof aluminum housing. A three-phase, 240-volt generator powers the motors. The Vibracore head and tube are lowered overboard via the boom or crane. The unit is then vibrated until it reaches target sampling elevation or until the depth of refusal is reached.

When penetration of the Vibracore is complete, power is shut off to the vibra-head, and the Vibracore is brought aboard the vessel. A check valve or piston located on top of the core tube reduces or prevents sediment loss during pull-out. The length of the sediment recovered is noted by measuring down the interior of the core tube to the top of the sediment. The core tube is then detached from the vibra-head, and the core cutting tip and catcher are removed. Afterwards, the core liners are removed and sealed on both ends and transported to the onshore processing area. Dixon will perform these steps.

Cores will be collected from a depth of -2 to -9.16 feet below the mudline (including overdepth) plus Z-layer (0.5 feet below the overdepth) MLLW inside the dredge footprint. The Vibracore will be advanced to the proposed sample depth plus the additional 0.5-feet for the Z-layer sample for a total depth of 9.66 feet. If shallow refusal is encountered at the proposed sampling locations or if complications arise

in the field, the sampling location may be moved to a new position as close to the original location as possible. Each core will include a Z-layer (0.5 feet) sample of sediment immediately below the project depth. The sediment from the Z-layer will be removed from each core section and stored in a separate container. Upon completion of core penetration at each station, the position coordinates will be recorded, and the sampler recovered. The FTL will perform these steps.

Once the corer is on deck, the soft-liner (bag) will be extracted from the corer barrel. The core will be observed to determine compliance with acceptability criteria as follows:

- The core penetrated and retained material to dredge depth (including Z-layer)
- The core material does not extend out the top of the core tube or contact any part of the sampling apparatus at the top of the core tube; and
- There are no obstructions in the cored material that might have blocked the subsequent entry of sediment into the core tube, resulting in incomplete core collection.

If core acceptance criteria are not achieved, the core will be rejected, and the procedure repeated until acceptance criteria are met. If the proposed depth of core cannot be attained, the sampling station may be moved to a new position. This process will be performed until acceptance criteria is met.

Once the proper depth has been achieved and sample retrieved, the FTL will cap and label the liner appropriately while on board the sampling vessel. The FET and FTL will note the physical characteristics of each core on the individual sediment core collection log, along with any stratification. Samples will be temporarily stored onboard the vessel on ice within insulated coolers.

5.1.4 Vibracore Decontamination

Sample contact surfaces will be stainless steel, polyethylene or Teflon coated. Compositing tools will be stainless steel or Teflon coated stainless steel. Except for the core liners, contact surfaces of the sampling devices and the coring tubes will be cleaned by the FTL for each sampling area. The cleaning protocol consists of:

- Rinsing with site water and wash with scrub brush until free of sediment,
- Washing with Alconox as needed; and
- Rinsing with site water taken from just below the surface or deionized water.

The polyethylene core liners will be new and of food-grade quality. Rinseate will be collected in containers and disposed of properly by the FTL. Sampling equipment that cannot be properly cleaned will not be used for subsequent sampling events.

5.1.5 Core Processing

The FET will observe compositing and homogenization of core sediments by the FTL onsite before the samples are transported to the laboratory. Whole cores will be processed on top of tables. The tables will have a plastic covering that is freshly changed for every core. Cores will be placed in a PVC core rack that is cleaned between cores. After placement in the core rack, core liners will be split lengthwise to

expose the recovered sediment. Once exposed, sediment that contacts the core liner will be removed by scraping with a pre-cleaned stainless-steel utensil.

Each core will be photographed, measured, and lithologically logged in accordance with the Unified Soil Classification System (USCS) as outlined in ASTM Standards D-2488 and D2487. Additional sediment characteristics and other observations will also be recorded.

Photographs will be taken of each core (each photograph will cover a maximum two-foot interval), and of sampling equipment and procedures. These photographs, with captions describing the subject and date, will be provided in Blackburn's Final Report. The photographs will be provided in electronic format. English units will be used for all measurements and calculations related to this SAP except where otherwise noted.

The sediment from each individual core will be individually homogenized in a stainless-steel bowl or HDPE container. A 500-ml subsample of the homogenized sediment from each individual core will be archived to allow for additional chemical analyses, if necessary. Archived samples will be frozen for six months after sample collection. Representative amounts of the remaining homogenized sediment from each core will be proportionately combined for the two 4:1 homogenized composite samples. A 500-ml aliquot of the homogenized site composites will be archived as described above. The Z-layer samples will be processed in a similar fashion and archived for analysis, if needed.

After logging, composite subsamples will be formed from each specific core interval by combining a representative sample from the mudline to overdepth elevation in a 500 ml pre-cleaned and certified glass jar with a Teflon-lined lid for archived material. An additional sample of the Z-layer material will be placed in another 500 ml glass jar. The remaining portion of each composite subsample identified for composite sample formation will be placed in pre-cleaned 3.5-gallon buckets with new food grade LDPE liners. Horizontal compositing and homogenization of these samples for Tier II and III testing will take place at the analytical testing laboratory.

The FTL will composite the samples by combining the contents of 3.5-gallon buckets from four sample locations (YCB-01, YCB-02, YCB-03, and YCB-04) into one composite, and by combining the contents of 3.5-gallon buckets from four sample locations (YCB-05, YCB-06, YCB-07, and YCB-08) into a second composite. The contents of the buckets will be combined into a large, 20-gallon stainless steel mixing bowl that by protocol, will be cleaned prior to use. A commercial dough mixer with a large aluminum paddle will be used to homogenize the sediments.

Once the composite samples have been homogenized, one subsample from each composite will be placed in new 1,000 ml glass jar with a Teflon-lined lid for chemical analyses and a second subsample placed in a Ziploc bag for grain size analysis. The remaining composited sediment will be placed back into 3.5-gallon buckets with new LDPE liners and rechilled. At least three gallons of composited sediment will be delivered to the bioassay laboratory Pacific EcoRisk in Fairfield, California. Chemistry and grain size samples will be shipped overnight to Eurofins Calscience in Garden Grove, California. A temperature blank will be placed in the cooler containing the chemistry sample.

Sample volumes, containers, and preservation requirements are summarized in Table 3. Except for archived material for chemical analyses, containers will be filled to minimize air bubbles being trapped in the sample container. A small amount of head space will be allowed for samples archived for potential chemical analyses to prevent container breakage during freezing. For the preservation of samples, the filled containers will be placed on ice immediately following processing and maintained at 2 to 4 degrees Celsius until analyzed. Archived samples for chemical analysis will be placed on ice initially and then frozen as soon as possible. The sample containers will be sealed to prevent moisture loss and possible contamination. Samples showing external contamination due to handling or incorrect sampling procedures will be re-sampled.

5.1.6 Decontamination and Sample Custody

Samples will be labeled with sample location, date, time, and required analyses. Samples will be handled under Chain of Custody (COC) protocols beginning at the time of collection. A copy of the field data logs will be included in the Draft and Final Reports. An inventory will be included of samples taken and delivered. Standard COC procedures will be used for samples collected, transferred, and analyzed as part of this project. COC forms will be used to identify the samples, custodians, and dates of transfer.

COC forms will include sample identification, sample collection date and time, sample matrices, required analyses, container type, preservation method, sample identification, and name of sampler. Completed COC forms will be placed in a sealable plastic bag that will be placed in the cooler with the samples. COC forms will be signed by an analytical laboratory representative upon receipt. COC records will be included in the final report prepared by the analytical testing laboratory.

5.2 Laboratory Testing Methods and Analyses

Chemical analyses will be initiated as soon as practical after sample collection. Biological analyses will be initiated after initial review by RWQCB and USACE of the sediment chemical and physical characteristics. Analytical chemical and biological testing of sediments for this project will be performed by Eurofins Calscience and Pacific EcoRisk using USEPA and USACE approved methodologies. Laboratory statement of qualifications for the laboratories are in Appendix A and B.

5.2.1 Bulk Sediment Chemical and Physical Analysis

The two sediment composite samples collected from the Site will be analyzed according to the parameters, methods, and quantification limits specified in Table 4. Samples will be extracted and analyzed within specified USEPA holding times and will be accomplished with appropriate quality control measures. Sediment chemical and physical analyses will be conducted in accordance with relevant USEPA, USACE, and ASTM guidelines.

In addition to the chemical and physical testing parameters for Tier II testing, disposal at a landfill or wastewater treatment plant require specific chemical testing (soluble threshold limit concentrations (STLC) utilizing Waste Extraction Test [WET] chemistry) to assess the ability of potential contaminants to leach either into surface soils or into site runoff. Analytical chemical testing utilizing WET test of sediments for this project will be performed by Eurofins Calscience according to methods in Table 4.

5.2.2 Sediment Elutriate Preparation Method

MET samples will be prepared following the methods described in the ITM, Appendix B-3.3. A slurry of sediment and dredge site water will be prepared at a concentration of 150 ug/L (dry weight). The slurry will be mixed for five minutes to a uniform consistency with a laboratory mixer, and then vigorously aerated for one hour. The aerated slurry will then be allowed to settle for 24 hours, and the supernatant will be siphoned off and used for chemical and biological analyses.

5.2.3 Chemical Methods for Aqueous Extracts

Chemical analytes, test methods, and quantification limits for MET chemical analyses are in Table 5.

5.2.4 Sediment Pore Water Characterization

Before the initiation of the sediment tests, the composited, homogenized sediments will be removed from refrigerated storage, and the composite samples will be rehomogenized in a large stainless-steel bowl. Aliquots of the rehomogenized composite sediments will be centrifuged at 2,500 g (i.e. relative centrifugal) for 15 minutes; the resulting supernatant pore waters will be collected and analyzed for routine water quality characteristics, including pH, temperature, dissolved oxygen (DO) and salinity.

5.2.5 Tier III Biological Testing

Dredged material disposal regulations for any project that discharges from dewatering dredged materials requires evaluation of sediment MET elutriate. Testing for upland disposal requires only a single suspended particulate phase (SPP) bioassay be conducted on a MET extract. Sediment elutriate tests will be performed using *Ceriodaphnia Dubia*, *Pimephales promelas*, and *Selenastrum* biospecimens, as described in EPA/821/R-01/012 (Test Method 2007.0)

5.3 Collection of Water Samples

Ambient surface water will be collected by the FTL from within the dredge limits to prepare the elutriate for chemical analysis and biological testing. Site water will be collected from approximately 0.5 feet below the surface using a battery-operated peristaltic pump fitted with Tygon tubing. Site water will be "pre-pumped" through the tubing for approximately 3 minutes before the sample is collected. Water will then be pumped into a 20-liter polypropylene carboy, with the carboy being pre-rinsed three times with site water before the site water sample is collected. After the site water samples are collected, the carboys will be sealed, labeled, and stored on ice until delivered to the laboratory. A sample of background water will also be collected to assess ambient aquatic chemistry.

5.4 Sample Identification

Blackburn will assign each individual sediment core and composite sediment sample a unique alphanumeric identifier using the format below:

The first three characters will identify the area (YCB = Yuba City Boat Launch). The last two characters will be used to identify the core location. The water sample will be identified as YCB-Water. A "Z" in the third column identifies a Z-layer sample.

- Using this approach, the individual core samples will be identified as
- YCB-01 YCB-01Z (Z-layer)
- YCB-02 YCB-02Z (Z-layer)

6 QUALITY ASSURANCE/QUALITY CONTROL

The objectives of the QA/QC Program are to document the field and laboratory data collected to maintain data integrity from the time of field collection through storage and archiving, and to produce quality and dependable data. Quality assurance involves the planned and systematic actions necessary to provide confidence that work performed conforms to contract requirements, laboratory methodologies, state and federal regulation requirements, and corporate Standard Operating Procedures (SOPs). This program is designed to assess the data for the following: Precision, Accuracy, Comparability, Representativeness, and Completeness. These parameters are controlled by adhering to documented methods and procedures and by the analysis of quality control (QC) samples on a routine basis.

6.1 Field Sampling Quality Management

Field Quality Control procedures are summarized below and includes adherence to SOPs and formal sample documentation and tracking. QA/QC records for the testing programs will be kept on file for review by regulatory personnel.

- Vibracore Sampling SOP
- Grab Sampling SOP
- Protocol Cleaning/Low Detection Limits
- Certified Clean Laboratory Containers
- Horizontal and Vertical Controls
- Core Logging and Subsampling Protocols
- Sample Control/Chain of Custody Procedures
- Field Logs and Core Logs
- Sample Preservation & Shipping Procedures

6.2 Chemical Analyses Quality Management

The Laboratory Statement of Qualifications for Eurofins Calscience is provided in Appendix A.

Analytical chemistry QC is formalized by USEPA and State certification agencies and involves internal quality control checks including QA checks such as method blanks, matrix spike/spike duplicates (MS/MSDs), laboratory control spike/laboratory control spike duplicates (LCS/LCSDs), laboratory replicates, and calibration standards. Post digestion spike/spike duplicates (PDS/PDSDs) are also run for the inorganic analyses.

Data will be reviewed by the analytical laboratory team leaders and by the laboratory director. Each laboratory project QA officer will be responsible for final data review and qualification. The laboratory

will supply data in both electronic and hard copy formats and results will be retained in the project files at Blackburn's West Sacramento laboratory. Data analysis will consist of tabulation and comparison with reference and control data.

Analytical data collected for this sediment-testing program will undergo QA/QC evaluation according to USEPA National Functional Guidelines for organic and inorganic data review. A summary of QA/QC findings will be included in the final report. QA/QC data and evaluation will be included.

Analytical laboratories will supply testing results in both hard copy and electronic formats. Data in summary tables will be coded as to quality. Each laboratory will be responsible for data report accuracy. After completion of sediment data review, hard copies will be stored at Blackburn's West Sacramento office and included as appendices to the final report. Data will be entered into appropriate digital spreadsheets by the laboratories so appropriate summary tables and graphics can be constructed for the draft and final reports.

6.3 Biological Testing

MET toxicity tests will incorporate standard toxicity testing QA/QC procedures so that the test results are valid. Standard QA/QC procedures include the use of negative controls, positive controls (reference toxicant tests), reference sediment samples, replicates, and measurements of water quality during testing. The Laboratory Statement of Qualifications for Pacific Ecorisk is in Appendix B.

6.3.1 Water and Sediment Handling and Storage

Sediment samples will be maintained at 0-6 ^{o} Celsius in the dark until they are used in the bioassay testing. Sediment samples will be held in sealed, labeled sample storage bags. Subsamples designated for long-term storage will be archived under the appropriate holding conditions. Site water samples will be similarly stored in sealed, labeled containers at 0-6° Celsius. Seawater will not be used in these tests.

6.3.2 Source and Condition of Test Organisms

Test organisms will be obtained from reputable suppliers who have provided the biological laboratory, Pacific Ecorisk, with organisms in the past. Normally, all test organisms will be maintained in the laboratory for acclimation to test conditions. If mortality in excess of 10 percent is noted in the holding stock, the animals will be discarded, and a new batch ordered.

6.3.3 Maintenance of Test Conditions and Corrective Actions

Each of the biological tests has a set of specific test conditions that are defined in the standard testing procedures. For example, water quality measurements will be monitored to ensure that test conditions are within the prescribed limits for each test procedure. The limits for various test condition parameters are noted in the section on the acceptability of each test. If these criteria are not met, the test may be rerun if appropriate.

6.3.4 Calibration Procedures and Frequency

Instruments will be calibrated daily according to laboratory SOPs and calibration data will be logged and initialed. Calibration logs will be monitored weekly to ensure completeness.

6.3.5 Reference Toxicant Testing and Data Accuracy and Precision

The accuracy of the toxicity test endpoints will not be evaluated in the same fashion as chemical analyses. Instead, accuracy and precision will be assessed by evaluating the sensitivity of the test organisms to toxicant stress via concurrent reference toxicant testing. This will be achieved by comparing the sensitivity of the current test organism to the "typical" response range established by previously performed reference toxicant tests.

6.3.6 Data Evaluations

Bioassay tests will be performed according to accepted protocols and standard test conditions. Test data, data analyses, and other relevant records for each test will be reviewed for accuracy and completeness by the Pacific Ecorisk QC unit. Deviations from the standard testing guidelines will be reported in the final report. If such deviations are observed, the test will be evaluated to determine whether it is valid according to the regulatory agencies to which it will be submitted. If it is determined to be invalid, the client (Blackburn) will be notified, and the test rerun.

6.3.7 Sample Tracking

Sample COC sheets, sample receipt logs, sample holding, and sample labeling procedures will be audited weekly by the Pacific Ecorisk QC unit. Subsamples designated for long-term storage will be archived under the appropriate holding conditions.

6.4 Deviations from Protocol

Any deviations from approved standard operating procedures or this SAP will be summarized and qualified with respect to how they may have affected data quality.

7 DATA ANALYSIS AND REPORTING

Blackburn will analyze and present data clearly so that sediment suitability for various sediment placement options can be determined. Blackburn will review analytical data for accuracy before reporting. The physical and chemical characteristics and biological testing of sediment samples will be evaluated by Blackburn according to the disposal site acceptance criteria and return water discharge limits.

7.1 Sediment Chemistry and Physical Data Analysis

Data analysis of sediment chemistry and physical parameters will be completed by Blackburn and consist of tabulation and comparison with existing regulatory guidelines. Sediment chemistry results will be used by Blackburn to identify areas that may require higher resolution analysis (e.g. analysis of sediment material from the individual cores that have been archived), and/or to assist in evaluating appropriate

disposal options. Blackburn will evaluate the grain size analyses test results to help determine sediment compatibility between the dredging and final placement sites.

7.2 Modified Elutriate Test Data Analysis

Results for biological testing performed on the MET sample will be evaluated by Blackburn to determine if decant water discharged during placement activities is in compliance with discharge requirements.

8 REPORTING AND DELIVERABLES

Blackburn will prepare a Sampling and Analysis Report (SAR) documenting activities associated with the collection, transportation, handling, sample shipment, chemical and physical analyses, and biological testing of sediment and MET. Data reports received from the subcontracted analytical laboratories will be included as appendices to the SAR. At a minimum, Blackburn will include the following in the SAR:

- Summary of field activities including a description of deviations from the approved SAP.
- Locations of sediment sampling stations in latitude and longitude, and vertical elevations of the mudline and water surface.
- A project map with actual sampling locations.
- Analytical data results and QA/QC review.
- Summary of chemical and biological results.
- Limitations.

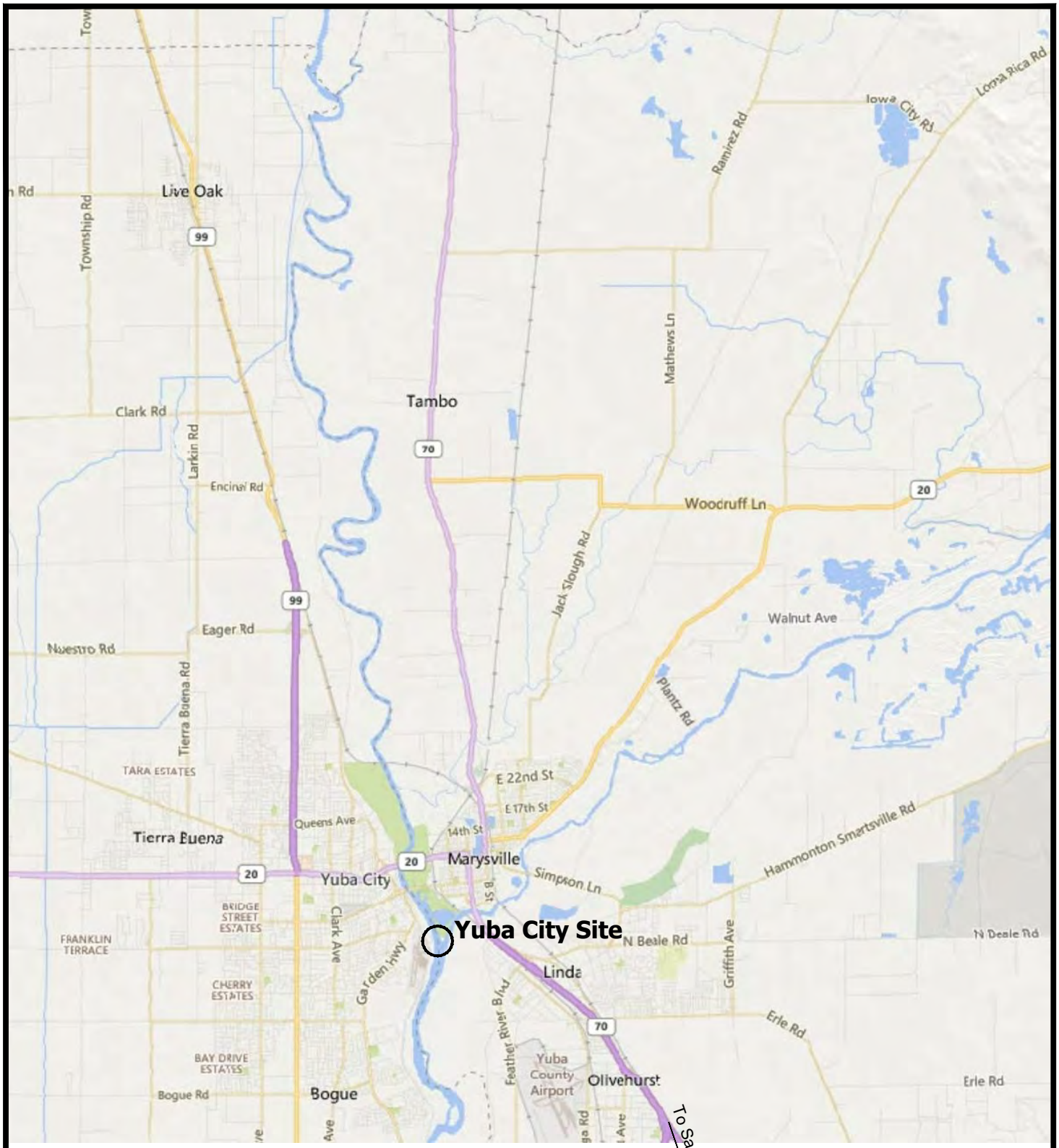
SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

FIGURES

Figure 1: Vicinity Map
Figure 2: Site Plan with Sampling Locations and Dredging Depths



SCALE 1"=10,000'

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VICINITY MAP

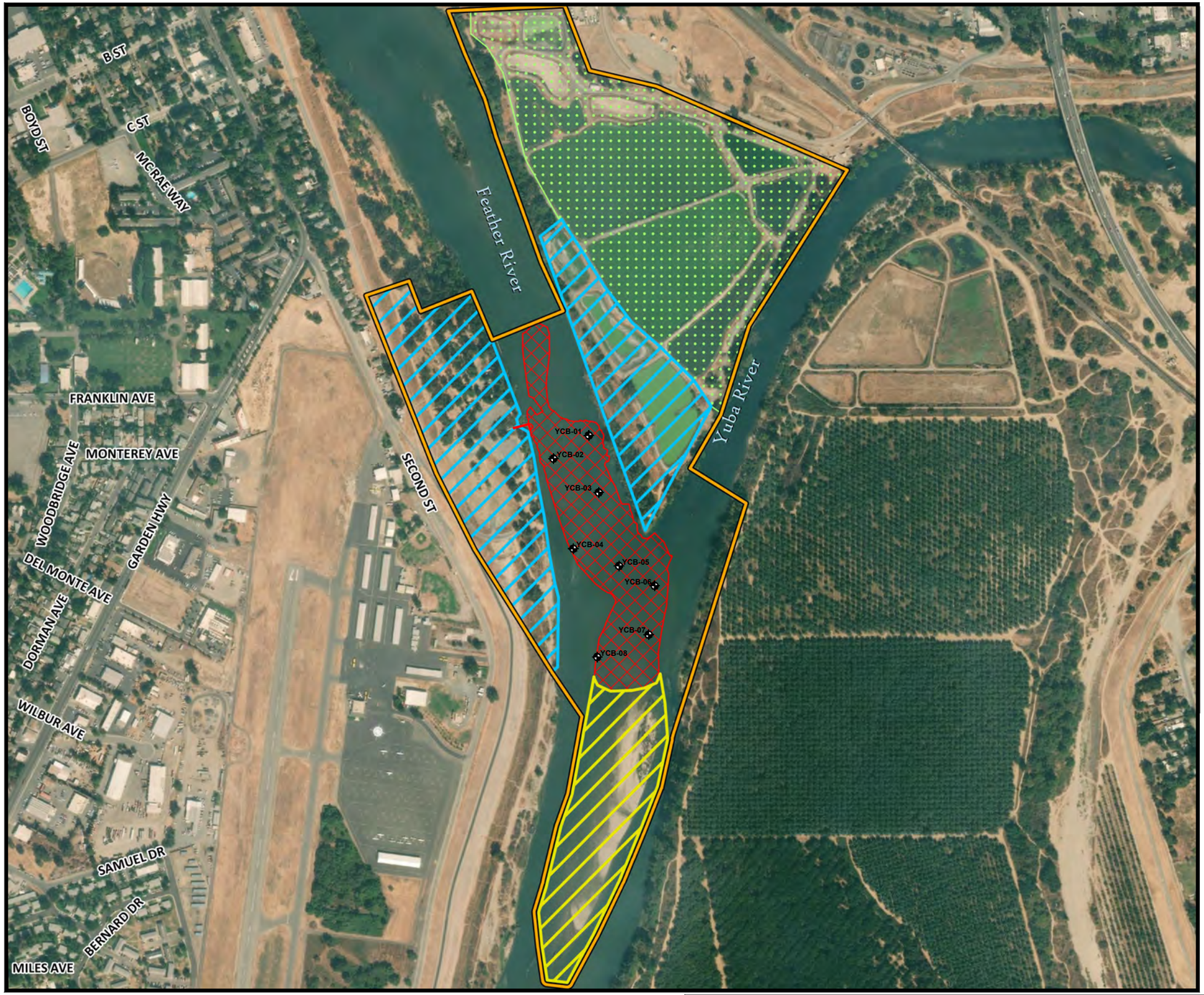
Feather River Sediment Removal Project
Yuba City Boat Launch
Sutter County, California

File No. 3825.001

October 2020

Figure 1

10/16/2020 3825.001 Fig1 Yuba City Boatramp.dwg



Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

N

SCALE 1" = 600'

LEGEND

- Proposed Sampling Location

NOTES:
1. Aerial and project features from Client Review Draft report, Yuba City Boat Ramp Sediment Removal Project by ECORP Consulting, Inc., no date.

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SITE PLAN

Feather River Sediment Removal Project
Yuba City Boat Launch
Sutter County, California

File No. 3825.001

October 2020

Figure 2

10/16/2020 3825.001 Fig2 Yuba City Boatramp.dwg

SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

TABLES

Table 1: Testing Framework and Screening Guidelines for Exposure Pathways (pg. 5)
Table 2: Testing Locations and Designed Dredge Depth (pg. 7)
Table 3: Sample Volumes and Storage Requirements
Table 4: Analytical Methods and Quantitation Limits for Solid Matrices
Table 5: Analytical Methods and Quantitation Limits for Water Matrices

TABLE 3
Sediment Sample Volumes and Storage Requirements

Parameter	Holding Time	Min. Sample Size[a]	Container[b]	Temperature[c]	Archived[d]
Grain Size	NA	2L	1 gallon Ziploc	NA	Yes
TDS, TSS	7 days	50g	1L Glass[b] (Combined)	2°- 4° C	Yes 500 mL Glass (Frozen)
TOC, Anions	28 days	50g			
Mercury		50g			
Metals (except mercury)	6 months	200g			
OCP, OP, PCB, TPH	14 days pre-extraction 40 days post-extraction	300g			
VOC, SVOC, PAH		200g			
Dioxins/Furans cyanide		200g			
MET Chemistry	6 months preserved Filter within 48 hours	150g			No
MET Toxicity	8 weeks	2L	3.5 Gallon Bucket (LDPE Liner)	2°- 4° C	Yes Composite Only

[a] Required sample sizes for one laboratory analysis. Actual volumes to be collected have been increased to provide a margin of error and allow for retests.

[b] Containers will be completely filled with minimal head space.

[c] During transport to the laboratory, samples will be stored on ice.

[d] For each sampling station, two 500 mL glass containers will be filled and kept frozen and used as needed for any of the chemical analyses indicated.

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Table 4

Analytical Methods and Quantitation Limits for Solid Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Metals (ICP/MS)				
Arsenic	6020	1000	334	ug/Kg
Cadmium		1000	450	ug/Kg
Chromium		2000	300	ug/Kg
Copper		1000	269	ug/Kg
Lead		1000	215	ug/Kg
Nickel		1000	270	ug/Kg
Selenium		1000	581	ug/Kg
Silver		1000	331	ug/Kg
Zinc		5000	4620	ug/Kg
Mercury (CVAA)				
Mercury	7471A	83.3	13.5	ug/Kg
Organochlorine Pesticides (GC)				
4,4'-DDD	8081A	1.00	0.243	ug/Kg
4,4'-DDE		1.00	0.168	ug/Kg
4,4'-DDT		1.00	0.302	ug/Kg
Aldrin		1.00	0.175	ug/Kg
alpha-BHC		2.00	1.09	ug/Kg
alpha-Chlordane		1.00	0.0820	ug/Kg
beta-BHC		1.00	0.707	ug/Kg
Chlordane		10.0	0.680	ug/Kg
delta-BHC		2.00	0.938	ug/Kg
Dieldrin		1.00	0.100	ug/Kg
Endosulfan I		1.00	0.106	ug/Kg
Endosulfan II		1.00	0.194	ug/Kg
Endosulfan sulfate		1.00	0.273	ug/Kg
Endrin		1.00	0.106	ug/Kg
Endrin aldehyde		2.00	1.12	ug/Kg
Endrin ketone		1.00	0.296	ug/Kg
gamma-Chlordane		2.00	0.640	ug/Kg
gamma-BHC		1.00	0.192	ug/Kg
Heptachlor		1.00	0.147	ug/Kg
Heptachlor epoxide		1.00	0.125	ug/Kg
Methoxychlor		1.00	0.202	ug/Kg
Toxaphene		20.0	3.13	ug/Kg

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Polychlorinated Biphenyls (PCBs) by Gas Chromatography				
Aroclor-1016	8082	10.0	2.04	ug/Kg
Aroclor-1221		10.0	6.31	ug/Kg
Aroclor-1232		10.0	2.35	ug/Kg
Aroclor-1242		10.0	1.64	ug/Kg
Aroclor-1248		10.0	1.18	ug/Kg
Aroclor-1254		10.0	1.16	ug/Kg
Aroclor-1260		10.0	2.34	ug/Kg
Aroclor-1262		10.0	1.13	ug/Kg
Aroclor-1268		10.0	0.683	ug/Kg
PCB Congeners (GC/MS)				
PCB-3	8270C_SIM_CON	0.200	0.0376	ug/Kg
PCB-5/8		0.400	0.0768	ug/Kg
PCB-15		0.200	0.0321	ug/Kg
PCB-18		0.200	0.0649	ug/Kg
PCB-27		0.200	0.0295	ug/Kg
PCB-28		0.200	0.0694	ug/Kg
PCB-29		0.200	0.0430	ug/Kg
PCB-31		0.200	0.0507	ug/Kg
PCB-33		0.200	0.0382	ug/Kg
PCB-37		0.200	0.0606	ug/Kg
PCB-44		0.200	0.152	ug/Kg
PCB-49		0.200	0.0496	ug/Kg
PCB-52		0.200	0.190	ug/Kg
PCB-56		0.200	0.0756	ug/Kg
PCB-60		0.200	0.0525	ug/Kg
PCB-64		0.200	0.0398	ug/Kg
PCB-66		0.200	0.123	ug/Kg
PCB-70		0.200	0.0716	ug/Kg
PCB-74		0.200	0.0901	ug/Kg
PCB-77		0.200	0.116	ug/Kg
PCB-81		0.200	0.0904	ug/Kg
PCB-87		0.200	0.112	ug/Kg
PCB-95		0.200	0.107	ug/Kg
PCB-97		0.200	0.0462	ug/Kg
PCB-99		0.200	0.0474	ug/Kg
PCB-101		0.200	0.0443	ug/Kg
PCB-105		0.200	0.0535	ug/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
PCB-110	8270C_SIM_CON	0.200	0.0339	ug/Kg
PCB-114		0.200	0.0741	ug/Kg
PCB-118		0.200	0.0346	ug/Kg
PCB-119		0.200	0.0625	ug/Kg
PCB-123		0.200	0.0729	ug/Kg
PCB-126		0.200	0.0549	ug/Kg
PCB-128		0.200	0.120	ug/Kg
PCB-132/153		0.400	0.162	ug/Kg
PCB-137		0.200	0.0664	ug/Kg
PCB-138/158		0.400	0.352	ug/Kg
PCB-141		0.200	0.0490	ug/Kg
PCB-146		0.200	0.0709	ug/Kg
PCB-149		0.200	0.118	ug/Kg
PCB-151		0.200	0.0875	ug/Kg
PCB-156		0.200	0.0773	ug/Kg
PCB-157		0.200	0.0848	ug/Kg
PCB-167		0.200	0.133	ug/Kg
PCB-168		0.200	0.143	ug/Kg
PCB-169		0.200	0.0651	ug/Kg
PCB-170		0.200	0.111	ug/Kg
PCB-174		0.200	0.0419	ug/Kg
PCB-177		0.200	0.117	ug/Kg
PCB-180		0.200	0.0918	ug/Kg
PCB-183		0.200	0.0935	ug/Kg
PCB-184		0.200	0.0668	ug/Kg
PCB-185		0.200	0.126	ug/Kg
PCB-187		0.200	0.103	ug/Kg
PCB-189		0.200	0.0641	ug/Kg
PCB-194		0.200	0.0740	ug/Kg
PCB-195		0.200	0.0601	ug/Kg
PCB-198		0.200	0.0876	ug/Kg
PCB-199		0.200	0.104	ug/Kg
PCB-200		0.200	0.0654	ug/Kg
PCB-201		0.200	0.0340	ug/Kg
PCB-203		0.200	0.0577	ug/Kg
PCB-206		0.200	0.116	ug/Kg
PCB 209		0.200	0.0614	ug/Kg
Total PCB Congeners		0.400	0.352	ug/Kg
Total RMP 40		0.400	0.352	ug/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Organotins (GC/MS SIM)				
Tetrabutyltin	Organotins_SIM	3.00	0.743	ug/Kg
Tributyltin		3.00	1.49	ug/Kg
Dibutyltin		3.00	0.730	ug/Kg
Monobutyltin		3.00	1.38	ug/Kg
Semivolatile Organic Compounds PAH (GC/MS)				
1-Methylnaphthalene	8270C	500	56.2	ug/Kg
2-Methylnaphthalene		500	60.4	ug/Kg
Acenaphthene		500	63.2	ug/Kg
Acenaphthylene		500	59.7	ug/Kg
Anthracene		500	63.2	ug/Kg
Benzo[a]anthracene		500	56.9	ug/Kg
Benzo[a]pyrene		500	54.4	ug/Kg
Benzo[b]fluoranthene		500	63.7	ug/Kg
Benzo[g,h,i]perylene		500	55.2	ug/Kg
Benzo[k]fluoranthene		500	64.8	ug/Kg
Chrysene		500	64.2	ug/Kg
Dibenz(a,h)anthracene		500	46.4	ug/Kg
Fluoranthene		500	62.3	ug/Kg
Fluorene		500	63.5	ug/Kg
Indeno[1,2,3-cd]pyrene		500	53.5	ug/Kg
Naphthalene		500	58.6	ug/Kg
Phenanthrene		500	68.6	ug/Kg
Pyrene		500	76.6	ug/Kg
Diesel Range Organics (DRO) (GC)				
C13-C22	8015B_DRO	5000	3550	ug/Kg
C23-C40		5000	3550	ug/Kg
C6-C12		5000	3550	ug/Kg
Percent Moisture				
Percent Solids	Moisture	0.100		%
Dioxins and Furans (HRGC/HRMS)				
2,3,7,8-TCDD	8290	1	0.15	pg/g
2,3,7,8-TCDF		1.00	0.110	pg/g
1,2,3,7,8-PeCDD		5.00	0.300	pg/g
1,2,3,7,8-PeCDF		5.00	0.270	pg/g
2,3,4,7,8-PeCDF		5.00	0.290	pg/g
1,2,3,4,7,8-HxCDD		5.00	0.710	pg/g
1,2,3,6,7,8-HxCDD		5.00	0.580	pg/g
1,2,3,7,8,9-HxCDD		5.00	0.580	pg/g
1,2,3,4,7,8-HxCDF		5.00	0.300	pg/g

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
1,2,3,6,7,8-HxCDF	8290	5.00	0.380	pg/g
2,3,4,6,7,8-HxCDF		5.00	0.300	pg/g
1,2,3,7,8,9-HxCDF		5.00	0.430	pg/g
1,2,3,4,6,7,8-HpCDD		5.00	0.460	pg/g
1,2,3,4,6,7,8-HpCDF		5.00	0.380	pg/g
1,2,3,4,7,8,9-HpCDF		5.00	0.650	pg/g
OCDD		10.0	1.50	pg/g
OCDF		10.0	1.20	pg/g
Total TCDD		1.00	0.150	pg/g
Total TCDF		1.00	0.110	pg/g
Total PeCDD		5.00	0.300	pg/g
Total PeCDF		5.00	0.290	pg/g
Total HxCDD		5.00	0.710	pg/g
Total HxCDF		5.00	0.300	pg/g
Total HpCDD		5.00	0.460	pg/g
Total HpCDF		5.00	0.650	pg/g
13C-2,3,7,8-TCDD		200		pg/g
13C-2,3,7,8-TCDF		200		pg/g
13C-1,2,3,7,8-PeCDD		200		pg/g
13C-1,2,3,7,8-PeCDF		200		pg/g
13C-1,2,3,6,7,8-HxCDD		200		pg/g
13C-1,2,3,4,7,8-HxCDF		200		pg/g
13C-1,2,3,4,6,7,8-HpCDD		200		pg/g
13C-1,2,3,4,6,7,8-HpCDF		200		pg/g
13C-OCDD		400		pg/g
Volatile Organic Compounds (GC/MS)				
1,1,1,2-Tetrachloroethane	8260B	100	29.1	ug/Kg
1,1,1-Trichloroethane		100	23.4	ug/Kg
1,1,2,2-Tetrachloroethane		200	54.4	ug/Kg
1,1,2-Trichloro-1,2,2-trifluoroethane		1000	46.2	ug/Kg
1,1,2-Trichloroethane		100	46.4	ug/Kg
1,1-Dichloroethane		100	28.0	ug/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
1,1-Dichloroethene	8260B	100	26.5	ug/Kg
1,1-Dichloropropene		200	38.8	ug/Kg
1,2,3-Trichlorobenzene		200	100	ug/Kg
1,2,3-Trichloropropane		200	41.9	ug/Kg
1,2,4-Trichlorobenzene		200	41.1	ug/Kg
1,2,4-Trimethylbenzene		200	60.0	ug/Kg
1,2-Dibromo-3-Chloropropane		1000	677	ug/Kg
1,2-Dibromoethane		100	20.6	ug/Kg
1,2-Dichlorobenzene		100	25.1	ug/Kg
1,2-Dichloroethane		100	27.6	ug/Kg
1,2-Dichloropropane		100	27.6	ug/Kg
1,3,5-Trimethylbenzene		200	60.0	ug/Kg
1,3-Dichlorobenzene		100	25.2	ug/Kg
1,3-Dichloropropane		100	29.5	ug/Kg
1,4-Dichlorobenzene		100	30.7	ug/Kg
2,2-Dichloropropane		500	27.1	ug/Kg
2-Butanone		2000	451	ug/Kg
2-Chlorotoluene		100	25.2	ug/Kg
2-Hexanone		2000	307	ug/Kg
4-Chlorotoluene		100	24.2	ug/Kg
4-Methyl-2-pentanone		2000	291	ug/Kg
Acetone		2000	983	ug/Kg
Benzene		100	25.8	ug/Kg
Bromobenzene		100	20.8	ug/Kg
Bromochloromethane		200	44.5	ug/Kg
Bromodichloromethane		100	15.9	ug/Kg
Bromoform		500	132	ug/Kg
Bromomethane		2000	658	ug/Kg
cis-1,2-Dichloroethene		100	33.7	ug/Kg
cis-1,3-Dichloropropene		100	34.9	ug/Kg
Carbon disulfide		1000	40.0	ug/Kg
Carbon tetrachloride		100	29.9	ug/Kg
Chlorobenzene		100	26.8	ug/Kg
Chloroethane		200	150	ug/Kg
Chloroform		100	58.9	ug/Kg
Chloromethane		2000	154	ug/Kg
Dibromochloromethane		200	27.3	ug/Kg
Dibromomethane		100	30.5	ug/Kg

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Table 4

Analytical Methods and Quantitation Limits for Solid Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Dichlorodifluoromethane	8260B	200	45.4	ug/Kg
Ethylbenzene		100	20.6	ug/Kg
Isopropylbenzene		100	60.0	ug/Kg
Methylene Chloride		1000	312	ug/Kg
Methyl-t-Butyl Ether (MTBE)		200	18.8	ug/Kg
Naphthalene		1000	521	ug/Kg
n-Butylbenzene		100	21.0	ug/Kg
N-Propylbenzene		200	60.0	ug/Kg
o-Xylene		100	60.0	ug/Kg
m,p-Xylene		200	47.4	ug/Kg
p-Isopropyltoluene		100	70.0	ug/Kg
sec-Butylbenzene		100	60.0	ug/Kg
Styrene		100	70.0	ug/Kg
trans-1,2-Dichloroethene		100	30.1	ug/Kg
trans-1,3-Dichloropropene		200	28.0	ug/Kg
tert-Butylbenzene		100	25.4	ug/Kg
Tetrachloroethene		100	22.3	ug/Kg
Toluene		100	60.0	ug/Kg
Xylenes, Total		300	70.4	ug/Kg
Trichloroethene		200	38.6	ug/Kg
Trichlorofluoromethane		1000	27.3	ug/Kg
Vinyl acetate		1000	391	ug/Kg
Vinyl chloride		100	37.9	ug/Kg
Volatile Organic Compounds (GC/MS)				
1,1,1,2-Tetrachloroethane	8260B	100	29.1	ug/Kg
1,1,1-Trichloroethane		100	23.4	ug/Kg
1,1,2,2-Tetrachloroethane		200	54.4	ug/Kg
1,1,2-Trichloro-1,2,2-trifluoroethane		1000	46.2	ug/Kg
1,1,2-Trichloroethane		100	46.4	ug/Kg
1,1-Dichloroethane		100	28.0	ug/Kg
1,1-Dichloroethene		100	26.5	ug/Kg
1,1-Dichloropropene		200	38.8	ug/Kg
1,2,3-Trichlorobenzene		200	100	ug/Kg
1,2,3-Trichloropropane		200	41.9	ug/Kg
1,2,4-Trichlorobenzene		200	41.1	ug/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
1,2,4-Trimethylbenzene	8260B	200	60.0	ug/Kg
1,2-Dibromo-3-Chloropropane		1000	677	ug/Kg
1,2-Dibromoethane		100	20.6	ug/Kg
1,2-Dichlorobenzene		100	25.1	ug/Kg
1,2-Dichloroethane		100	27.6	ug/Kg
1,2-Dichloropropane		100	27.6	ug/Kg
1,3,5-Trimethylbenzene		200	60.0	ug/Kg
1,3-Dichlorobenzene		100	25.2	ug/Kg
1,3-Dichloropropane		100	29.5	ug/Kg
1,4-Dichlorobenzene		100	30.7	ug/Kg
2,2-Dichloropropane		500	27.1	ug/Kg
2-Butanone		2000	451	ug/Kg
2-Chlorotoluene		100	25.2	ug/Kg
2-Hexanone		2000	307	ug/Kg
4-Chlorotoluene		100	24.2	ug/Kg
4-Methyl-2-pentanone		2000	291	ug/Kg
Acetone		2000	983	ug/Kg
Benzene		100	25.8	ug/Kg
Bromobenzene		100	20.8	ug/Kg
Bromochloromethane		200	44.5	ug/Kg
Bromodichloromethane		100	15.9	ug/Kg
Bromoform		500	132	ug/Kg
Bromomethane		2000	658	ug/Kg
cis-1,2-Dichloroethene		100	33.7	ug/Kg
cis-1,3-Dichloropropene		100	34.9	ug/Kg
Carbon disulfide		1000	40.0	ug/Kg
Carbon tetrachloride		100	29.9	ug/Kg
Chlorobenzene		100	26.8	ug/Kg
Chloroethane		200	150	ug/Kg
Chloroform		100	58.9	ug/Kg
Chloromethane		2000	154	ug/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Dibromochloromethane	8260B	200	27.3	ug/Kg
Dibromomethane		100	30.5	ug/Kg
Dichlorodifluoromethane		200	45.4	ug/Kg
Ethylbenzene		100	20.6	ug/Kg
Isopropylbenzene		100	60.0	ug/Kg
Methylene Chloride		1000	312	ug/Kg
Methyl-t-Butyl Ether (MTBE)		200	18.8	ug/Kg
Naphthalene		1000	521	ug/Kg
n-Butylbenzene		100	21.0	ug/Kg
N-Propylbenzene		200	60.0	ug/Kg
o-Xylene		100	60.0	ug/Kg
m,p-Xylene		200	47.4	ug/Kg
p-Isopropyltoluene		100	70.0	ug/Kg
sec-Butylbenzene		100	60.0	ug/Kg
Styrene		100	70.0	ug/Kg
trans-1,2-Dichloroethene		100	30.1	ug/Kg
trans-1,3-Dichloropropene		200	28.0	ug/Kg
tert-Butylbenzene		100	25.4	ug/Kg
Tetrachloroethene		100	22.3	ug/Kg
Toluene		100	60.0	ug/Kg
Xylenes, Total		300	70.4	ug/Kg
Trichloroethene		200	38.6	ug/Kg
Trichlorofluoromethane		1000	27.3	ug/Kg
Vinyl acetate		1000	391	ug/Kg
Vinyl chloride		100	37.9	ug/Kg
Cyanide				
Cyanide, Total	9014	0.500	0.0210	mg/Kg
Cyanide				
Cyanide, Total	9014	0.500	0.0210	mg/Kg
Organophosphorous Pesticides (GC)				
Azinphos-methyl	8141A	0.500	0.180	mg/Kg
Bolstar		0.500	0.246	mg/Kg
Chlorpyrifos		0.500	0.123	mg/Kg
Coumaphos		0.500	0.196	mg/Kg
Demeton-o/s		1.00	0.274	mg/Kg
Diazinon		0.500	0.101	mg/Kg

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Dichlorvos	8141A	0.500	0.111	mg/Kg
Disulfoton		0.500	0.121	mg/Kg
Ethoprop		0.500	0.113	mg/Kg
Fensulfothion		0.500	0.180	mg/Kg
Fenthion		0.500	0.134	mg/Kg
Merphos		0.500	0.217	mg/Kg
Methyl parathion		0.500	0.246	mg/Kg
Mevinphos		0.500	0.103	mg/Kg
Naled		4.00	0.410	mg/Kg
Phorate		0.500	0.130	mg/Kg
Ronnel		0.500	0.135	mg/Kg
Stirophos		2.00	0.142	mg/Kg
Tokuthion		0.500	0.127	mg/Kg
Trichloronate		0.500	0.118	mg/Kg
Organophosphorous Pesticides (GC)				
Azinphos-methyl	8141A	0.500	0.180	mg/Kg
Bolstar		0.500	0.246	mg/Kg
Chlorpyrifos		0.500	0.123	mg/Kg
Coumaphos		0.500	0.196	mg/Kg
Demeton-o/s		1.00	0.274	mg/Kg
Diazinon		0.500	0.101	mg/Kg
Dichlorvos		0.500	0.111	mg/Kg
Disulfoton		0.500	0.121	mg/Kg
Ethoprop		0.500	0.113	mg/Kg
Fensulfothion		0.500	0.180	mg/Kg
Fenthion		0.500	0.134	mg/Kg
Merphos		0.500	0.217	mg/Kg
Methyl parathion		0.500	0.246	mg/Kg
Mevinphos		0.500	0.103	mg/Kg
Naled		4.00	0.410	mg/Kg
Phorate		0.500	0.130	mg/Kg
Ronnel		0.500	0.135	mg/Kg
Stirophos		2.00	0.142	mg/Kg
Tokuthion		0.500	0.127	mg/Kg
Trichloronate		0.500	0.118	mg/Kg
Asbestos				
Asbestos	PLM		<1%	
Asbestos				
Asbestos	Point Count	<0.25% (400 pt)	0.25% (400 pt)	
		<0.1% (1000 pt)	0.1% (1000 pt)	

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Table 5

Analytical Methods and Quantitation Limits for Water Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Metals (ICP/MS)				
Arsenic	6020	1.00	0.320	ug/L
Cadmium		1.00	0.210	ug/L
Chromium		1.00	0.280	ug/L
Copper		1.00	0.270	ug/L
Lead		1.00	0.230	ug/L
Nickel		1.00	0.230	ug/L
Selenium		1.00	0.630	ug/L
Silver		1.00	0.200	ug/L
Zinc		5.00	3.19	ug/L
Mercury (CVAA)				
Mercury	7470A	0.500	0.141	ug/L
Organochlorine Pesticides (GC)				
4,4'-DDD	8081A	0.0500	0.0135	ug/L
4,4'-DDE		0.0200	0.00850	ug/L
4,4'-DDT		0.0500	0.0260	ug/L
Aldrin		0.0500	0.0110	ug/L
alpha-BHC		0.0200	0.00950	ug/L
alpha-Chlordane		0.0200	0.00750	ug/L
beta-BHC		0.0200	0.00750	ug/L
Chlordane		0.100	0.0365	ug/L
delta-BHC		0.0200	0.00750	ug/L
Dieldrin		0.0500	0.0115	ug/L
Endosulfan I		0.0500	0.0120	ug/L
Endosulfan II		0.0500	0.0105	ug/L
Endosulfan sulfate		0.0500	0.0135	ug/L
Endrin		0.0200	0.0100	ug/L
Endrin aldehyde		0.100	0.0320	ug/L
Endrin ketone		0.0500	0.0125	ug/L
gamma-Chlordane		0.0500	0.0140	ug/L
gamma-BHC		0.0200	0.00700	ug/L
Heptachlor		0.0200	0.00750	ug/L
Heptachlor epoxide		0.0200	0.00800	ug/L
Methoxychlor		0.0500	0.0195	ug/L
Toxaphene		0.300	0.146	ug/L

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Analytical Methods and Quantitation Limits for Water Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Polychlorinated Biphenyls (PCBs) by Gas Chromatography				
Aroclor-1016	8082	0.500	0.0345	ug/L
Aroclor-1221		0.500	0.190	ug/L
Aroclor-1232		0.500	0.0580	ug/L
Aroclor-1242		0.500	0.0456	ug/L
Aroclor-1248		0.500	0.0540	ug/L
Aroclor-1254		0.500	0.0890	ug/L
Aroclor-1260		0.500	0.0370	ug/L
Aroclor-1262		0.500	0.0305	ug/L
Aroclor-1268		0.500	0.0455	ug/L
PCB Congeners (GC/MS)				
PCB-3	8270C_SIM_CON	0.00200	0.000396	ug/L
PCB-5/8		0.00400	0.000511	ug/L
PCB-15		0.00200	0.000269	ug/L
PCB-18		0.00200	0.000462	ug/L
PCB-27		0.00200	0.000274	ug/L
PCB-28		0.00200	0.000527	ug/L
PCB-29		0.00200	0.000249	ug/L
PCB-31		0.00200	0.000272	ug/L
PCB-33		0.00200	0.000402	ug/L
PCB-37		0.00200	0.000301	ug/L
PCB-44		0.00200	0.000712	ug/L
PCB-49		0.00200	0.000527	ug/L
PCB-52		0.00200	0.000556	ug/L
PCB-56		0.00200	0.000569	ug/L
PCB-60		0.00200	0.00125	ug/L
PCB-64		0.00200	0.000394	ug/L
PCB-66		0.00200	0.000402	ug/L
PCB-70		0.00200	0.000413	ug/L
PCB-74		0.00200	0.000485	ug/L
PCB-77		0.00200	0.000622	ug/L
PCB-81		0.00200	0.000484	ug/L
PCB-87		0.00200	0.000710	ug/L
PCB-95		0.00200	0.000776	ug/L
PCB-97		0.00200	0.000496	ug/L
PCB-99		0.00200	0.000609	ug/L
PCB-101		0.00200	0.000497	ug/L
PCB-105		0.00200	0.000467	ug/L

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
PCB-110	8270C_SIM_CON	0.00200	0.000338	ug/L
PCB-114		0.00200	0.000466	ug/L
PCB-118		0.00200	0.000499	ug/L
PCB-119		0.00200	0.000172	ug/L
PCB-123		0.00200	0.000833	ug/L
PCB-126		0.00200	0.000253	ug/L
PCB-128		0.00200	0.000433	ug/L
PCB-132/153		0.00400	0.000692	ug/L
PCB-137		0.00200	0.000625	ug/L
PCB-138/158		0.00400	0.000595	ug/L
PCB-141		0.00200	0.000604	ug/L
PCB-146		0.00200	0.000459	ug/L
PCB-149		0.00200	0.000234	ug/L
PCB-151		0.00200	0.000405	ug/L
PCB-156		0.00200	0.000402	ug/L
PCB-157		0.00200	0.000405	ug/L
PCB-167		0.00200	0.000808	ug/L
PCB-168		0.00200	0.000519	ug/L
PCB-169		0.00200	0.000404	ug/L
PCB-170		0.00200	0.000422	ug/L
PCB-174		0.00200	0.000404	ug/L
PCB-177		0.00200	0.000276	ug/L
PCB-180		0.00200	0.000602	ug/L
PCB-183		0.00200	0.000522	ug/L
PCB-184		0.00200	0.000585	ug/L
PCB-185		0.00200	0.000694	ug/L
PCB-187		0.00200	0.000431	ug/L
PCB-189		0.00200	0.000488	ug/L
PCB-194		0.00200	0.000251	ug/L
PCB-195		0.00200	0.000748	ug/L
PCB-198		0.00200	0.000465	ug/L
PCB-199		0.00200	0.000566	ug/L
PCB-200		0.00200	0.000494	ug/L
PCB-201		0.00200	0.000469	ug/L
PCB-203		0.00200	0.00140	ug/L
PCB-206		0.00200	0.000430	ug/L
PCB 209		0.00200	0.00127	ug/L
Total PCB Congeners		0.00400	0.00140	ug/L
Total RMP 40		0.00400	0.00140	ug/L

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Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Organotins (GC/MS SIM)				
Tetrabutyltin	Organotins_SIM	3.00	1.94	ng/L
Tributyltin		3.00	1.36	ng/L
Dibutyltin		3.00	1.77	ng/L
Monobutyltin		3.00	2.37	ng/L
Semivolatile Organic Compounds PAH (GC/MS)				
1-Methylnaphthalene	8270C	10.0	2.83	ug/L
2-Methylnaphthalene		10.0	2.81	ug/L
Acenaphthene		10.0	2.81	ug/L
Acenaphthylene		10.0	2.89	ug/L
Anthracene		10.0	3.02	ug/L
Benzo[a]anthracene		10.0	4.67	ug/L
Benzo[a]pyrene		10.0	2.42	ug/L
Benzo[b]fluoranthene		10.0	2.28	ug/L
Benzo[g,h,i]perylene		10.0	2.54	ug/L
Benzo[k]fluoranthene		10.0	3.24	ug/L
Chrysene		10.0	2.85	ug/L
Dibenz(a,h)anthracene		10.0	2.54	ug/L
Fluoranthene		10.0	3.11	ug/L
Fluorene		10.0	2.71	ug/L
Indeno[1,2,3-cd]pyrene		10.0	2.14	ug/L
Naphthalene		10.0	2.87	ug/L
Phenanthrene		10.0	2.92	ug/L
Pyrene		10.0	2.98	ug/L
Diesel Range Organics (DRO) (GC)				
C12-C22	8015B_DRO	50.0	17.0	ug/L
C23-C40		50.0	17.0	ug/L
C6-C12		50.0	17.0	ug/L
Dioxins and Furans (HRGC/HRMS)				
2,3,7,8-TCDD	8290	10.0	1.20	pg/L
2,3,7,8-TCDF		10.0	2.00	pg/L
1,2,3,7,8-PeCDD		50.0	2.50	pg/L
1,2,3,7,8-PeCDF		50.0	2.20	pg/L
2,3,4,7,8-PeCDF		50.0	4.30	pg/L
1,2,3,4,7,8-HxCDD		50.0	10.0	pg/L
1,2,3,6,7,8-HxCDD		50.0	5.70	pg/L
1,2,3,7,8,9-HxCDD		50.0	5.20	pg/L
1,2,3,4,7,8-HxCDF		50.0	2.10	pg/L
1,2,3,6,7,8-HxCDF		50.0	5.10	pg/L
2,3,4,6,7,8-HxCDF		50.0	2.20	pg/L
1,2,3,7,8,9-HxCDF		50.0	2.30	pg/L
1,2,3,4,6,7,8-HpCDD		50.0	9.40	pg/L

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Analytical Methods and Quantitation Limits for Water Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
1,2,3,4,6,7,8-HpCDF	8290	50.0	2.50	pg/L
1,2,3,4,7,8,9-HpCDF		50.0	3.80	pg/L
OCDD		100	46.0	pg/L
OCDF		100	8.60	pg/L
Total TCDD		10.0	1.20	pg/L
Total TCDF		10.0	2.00	pg/L
Total PeCDD		50.0	2.50	pg/L
Total PeCDF		50.0	4.30	pg/L
Total HxCDD		50.0	10.0	pg/L
Total HxCDF		50.0	5.10	pg/L
Total HpCDD		50.0	9.40	pg/L
Total HpCDF		50.0	3.80	pg/L
13C-2,3,7,8-TCDD		2000		pg/L
13C-2,3,7,8-TCDF		2000		pg/L
13C-1,2,3,7,8-PeCDD		2000		pg/L
13C-1,2,3,7,8-PeCDF		2000		pg/L
13C-1,2,3,6,7,8-HxCDD		2000		pg/L
13C-1,2,3,4,7,8-HxCDF		2000		pg/L
13C-1,2,3,4,6,7,8-HpCDD		2000		pg/L
13C-1,2,3,4,6,7,8-HpCDF		2000		pg/L
13C-OCDD		4000		pg/L
BOD, 5 Day				
Biochemical Oxygen Demand		1.00	0.584	mg/L
Solids, Total Suspended (TSS)				
Total Suspended Solids		1.00	0.829	mg/L
Oxygen, Dissolved				
Dissolved Oxygen		0.0100		mg/L
Hardness, Total (mg/l as CaC03)				
Hardness as calcium carbonate		2.00	0.989	mg/L
Conductivity, Specific Conductance				
Specific Conductance		1.00	0.500	umhos/cm
Solids, Total Dissolved (TDS)				
Total Dissolved Solids		1.00	0.870	mg/L
Ammonia, Unionized				
Unionized Ammonia		0.00120	0.000400	mg/L
Field pH		1.00	1.00	SU
Field Temperature		1.00	1.00	Deg. C
Ammonia		0.100	0.0665	mg/L
Volatile Organic Compounds (GC/MS)				
1,1,1,2-Tetrachloroethane	8260B	2.00	0.329	ug/L
1,1,1-Trichloroethane		1.00	0.318	ug/L
1,1,2,2-Tetrachloroethane		1.00	0.203	ug/L
1,1,2-Trichloro-1,2,2-trifluoroethane		10.0	0.582	ug/L
1,1,2-Trichloroethane		1.00	0.296	ug/L

Fresno Office:
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BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
West Sacramento Office: (916) 375-8706

Table 5

Analytical Methods and Quantitation Limits for Water Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
1,1-Dichloroethane	8260B	1.00	0.368	ug/L
1,1-Dichloroethene		1.00	0.331	ug/L
1,1-Dichloropropene		1.00	0.454	ug/L
1,2,3-Trichlorobenzene		1.00	0.432	ug/L
1,2,3-Trichloropropane		5.00	0.274	ug/L
1,2,4-Trichlorobenzene		1.00	0.362	ug/L
1,2,4-Trimethylbenzene		1.00	0.343	ug/L
1,2-Dibromo-3-Chloropropane		10.0	1.50	ug/L
1,2-Dibromoethane		1.00	0.379	ug/L
1,2-Dichlorobenzene		1.00	0.276	ug/L
1,2-Dichloroethane		0.500	0.216	ug/L
1,2-Dichloropropane		1.00	0.388	ug/L
1,3,5-Trimethylbenzene		1.00	0.338	ug/L
1,3-Dichlorobenzene		1.00	0.260	ug/L
1,3-Dichloropropane		1.00	0.296	ug/L
1,4-Dichlorobenzene		1.00	0.244	ug/L
2,2-Dichloropropane		1.00	0.551	ug/L
2-Butanone		20.0	3.56	ug/L
2-Chlorotoluene		1.00	0.270	ug/L
2-Hexanone		10.0	3.13	ug/L
4-Chlorotoluene		1.00	0.322	ug/L
4-Methyl-2-pentanone		10.0	2.95	ug/L
Acetone		20.0	10.0	ug/L
Benzene		0.500	0.197	ug/L
Bromobenzene		1.00	0.302	ug/L
Bromochloromethane		2.00	0.300	ug/L
Bromodichloromethane		1.00	0.283	ug/L
Bromoform		5.00	1.46	ug/L
Bromomethane		25.0	15.0	ug/L
cis-1,2-Dichloroethene		1.00	0.510	ug/L
cis-1,3-Dichloropropene		0.500	0.230	ug/L
Carbon disulfide		10.0	0.397	ug/L
Carbon tetrachloride		0.500	0.344	ug/L
Chlorobenzene		1.00	0.208	ug/L
Chloroethane		5.00	2.39	ug/L
Chloroform		1.00	0.500	ug/L
Chloromethane		10.0	2.32	ug/L
Dibromochloromethane		2.00	0.340	ug/L
Dibromomethane		1.00	0.376	ug/L
Dichlorodifluoromethane		5.00	0.565	ug/L
Ethylbenzene		1.00	0.329	ug/L
Isopropylbenzene		1.00	0.372	ug/L
Methylene Chloride		10.0	4.00	ug/L
Methyl-t-Butyl Ether (MTBE)		1.00	0.340	ug/L

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Table 5

Analytical Methods and Quantitation Limits for Water Matrices

Analyte Description	Method Code	Reporting Limit	Method Detection Limit	Units
Naphthalene	8260B	10.0	5.00	ug/L
n-Butylbenzene		1.00	0.292	ug/L
N-Propylbenzene		1.00	0.414	ug/L
o-Xylene		1.00	0.257	ug/L
m,p-Xylene		2.00	0.483	ug/L
p-Isopropyltoluene		1.00	0.381	ug/L
sec-Butylbenzene		1.00	0.289	ug/L
Styrene		1.00	0.376	ug/L
trans-1,2-Dichloroethene		1.00	0.315	ug/L
trans-1,3-Dichloropropene		0.500	0.299	ug/L
tert-Butylbenzene		1.00	0.357	ug/L
Tetrachloroethene		1.00	0.349	ug/L
Toluene		1.00	0.338	ug/L
Xylenes, Total		3.00	0.740	ug/L
Trichloroethene		1.00	0.349	ug/L
Trichlorofluoromethane		10.0	0.360	ug/L
Vinyl acetate		10.0	4.59	ug/L
Vinyl chloride		0.500	0.265	ug/L
Organophosphorous Pesticides (GC)				
Azinphos-methyl	8141A	0.00500	0.00110	mg/L
Bolstar		0.00500	0.000363	mg/L
Chlorpyrifos		0.00500	0.000631	mg/L
Coumaphos		0.00500	0.000726	mg/L
Demeton-o/s		0.0100	0.00208	mg/L
Diazinon		0.00500	0.00103	mg/L
Dichlorvos		0.00500	0.00140	mg/L
Disulfoton		0.0100	0.000973	mg/L
Ethoprop		0.00500	0.000774	mg/L
Fensulfothion		0.00500	0.00160	mg/L
Fenthion		0.00500	0.000358	mg/L
Merphos		0.00500	0.000895	mg/L
Methyl parathion		0.00500	0.000627	mg/L
Mevinphos		0.00500	0.00130	mg/L
Naled		0.0400	0.00864	mg/L
Phorate		0.00500	0.00204	mg/L
Ronnel		0.00500	0.000650	mg/L
Stirophos		0.0200	0.00133	mg/L
Tokuthion		0.00500	0.000635	mg/L
Trichloronate		0.00500	0.000589	mg/L

SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

APPENDIX A

Analytical Laboratory Statement of Qualifications
Documents: Eurofins Calscience

Founded in 1986 and located in Orange County California, Eurofins Calscience, LLC is the largest full-service laboratory on the West Coast offering a comprehensive portfolio of analytical methods for the testing of air, wastewater, groundwater, sea water, sediment, soil, and tissue. Calscience built their reputation on service and quality, consistently delivering on-time legally defensible results and offering rush turn-around time that clients have come to rely upon.

Eurofins Calscience facilities total nearly 110,000 square feet of laboratory and office space with approximately 240 dedicated professionals. They are committed to staying current with new technologies, adding instrumentation and expanding capabilities to meet the needs of their clients and to meet new regulatory drivers.

Eurofins Calscience focuses on servicing the environmental community, not only to provide reliable data, but to help our customers meet their goals in terms of project profitability and timely completion. Our customers know that Eurofins Calscience, more than any other laboratory, will allow them to run their projects more efficiently, save labor hours, and provide data and information when they need it and how they need it. Stability, integrity, and service; these are but a few of the reasons Eurofins Calscience is valued by our clients and why they keep coming back.

Our clients come from a diverse range of consultants, private industry, and federal, state, and local governments. With a strong industry reputation, we provide contract analytical services to Fortune 100 Companies. Our services support various industries and project types including:

- Petroleum Marketing & Refining
- Electrical and Gas Utilities
- Department of Defense
- Ports & Shipyards
- Aerospace Industry
- Transportation Agencies
- School Districts
- Chemical Industry
- Recycling Facilities
- Treatment Facilities
- Municipalities
- Landfills



Eurofins Calscience offers a full range of analytical methods and data deliverable products to meet the requirements of numerous environmental regulatory programs. Our staff of environmental professionals and project managers can assist clients with regulatory issues and are available to consult with clients to choose the appropriate test methods for their projects. Eurofins Calscience is committed to staying current with new technologies, adding instrumentation and expanding capabilities to meet the needs of our clients. With our extensive instrument inventory, Eurofins Calscience has the capacity to meet the demands of the most rigorous field schedules.

SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

APPENDIX B

Analytical Laboratory Statement of Qualifications
Documents: Pacific EcoRisk

Statement of Qualifications

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

About our Company and our Consulting Services

Pacific EcoRisk is an environmental consulting firm conducting research and testing in the fields of environmental toxicology, aquatic biology, and environmental chemistry. Our staff is comprised entirely of degreed professionals who are skilled in integrating their experience in these areas to produce high-quality, cost-effective, and often innovative solutions to complex environmental problems. Our work is conducted in guidance with a highly effective QA/QC program, and we are certified as a Toxicity Testing Laboratory by the State of California, resulting in reliable evaluations and testing programs. Our primary objective is to produce and provide the best information available for our clients, which include POTWs, industry and agriculture, ports and marinas, US military services, local, state, and federal regulatory agencies, as well as support services for other environmental or engineering firms.

Our services include:

- **Sediment, Sediment Porewater, and Sediment Elutriate Toxicity Testing**
  - Toxicity testing with freshwater, estuarine, and marine species.
  - Bioaccumulation studies with freshwater, estuarine, and marine species.
  - U.S. ACOE-Permitted Dredge Materials Evaluation.
  - TIE evaluations to determine cause(s) of toxicity.
  - Sediment-Water Interface core testing.

- **Aquatic Toxicity Testing**
  - Acute and chronic testing with freshwater, estuarine, and marine species.
  - TIE and TRE evaluations to determine cause(s) of toxicity.
  - Water quality criteria development (including water effects ratios & site specific criteria).
  - Stormwater/surface runoff toxicity evaluations.

- **Environmental Studies**

- **Ecological Risk Assessment**

- **Remediation Monitoring Studies**

- **CERCLA (Superfund) Site Assessments**

- **Natural Resource Damage Assessments**

- **Areas of Special Expertise**
  - Toxicity assessment of oil and petroleum hydrocarbon contamination of sediments and water;
  - Toxicity assessment of mining activities and acid mine drainage; and
  - Toxicity assessment of pesticides.

Selected Project Experience

Selected Project Experience:

US ACOE-permitted Biological Testing of Dredged Sediments - As part of new and on-going dredging maintenance programs, Pacific EcoRisk has managed or participated in numerous dredged sediment evaluation projects, including:

- preparation of Sampling and Analysis Plans (SAPs) and negotiation of SAPs with regulators,
- performance of field sampling,
- sample management, including preparation for physio/chemical and biological analyses,
- management of contract analytical labs,
- performance of toxicity testing (including solid-phase sediment tests with amphipods and polychaetes and suspended particulate phase (elutriate) tests with bivalve and echinoderm embryos),
- performance of bioaccumulation testing (including 28-day sediment bioaccumulation tests with polychaetes and bivalves),
- preparation and presentation of Data Reports, and negotiation of resultant dredging requirements with regulators,
- preparation of Tier I exclusions, and negotiation of acceptance with regulators.

These sediment evaluations have been performed under the Inland Disposal Testing Manual, the Ocean Disposal Testing Manuals, and the Upland Disposal Testing Manual, as well as various Regional Implementation Manuals.

Clients:	U.S. Army Corps of Engineers	Greenbrae Marina
	U.S. Navy	Clipper Yacht Harbor
	Port of Oakland	Western Dock Enterprises
	Port of Redwood City	Hansen Aggregate
	City and County of San Francisco	Manson Construction
	URS Corp.	Aquifer Sciences
	Blasland, Bouck, & Lee, Inc.	Castrol Oil
	Anchor Environmental, Inc.	Point San Pablo Yacht Harbor
	Battelle	Versar, Inc
	Valero Refining Co.	Entrix, Inc

Monitoring of Wetland Sediment Toxicity at the Mare Island Naval Shipyard - As part of an ecological risk assessment of wetlands at Mare Island, Pacific EcoRisk performed toxicity evaluations of surface water and sediment samples, consisting of chronic water toxicity tests with the crustacean *Ceriodaphnia dubia* and the echinoderm *(Dendraster excentricus)* embryo development tests, as well as 10-day bulk sediment toxicity tests with the freshwater amphipod *Hyalella azteca*.

Monitoring of Wetland Sediment Toxicity under the Bay Protection and Toxic Clean-up Program - In an evaluation of tidal marsh sediment quality, Pacific EcoRisk performed sediment tests with the amphipod *Eohaustorius estuarius*, 28-day bioaccumulation tests with *Macoma nasuta*, bivalve tests of sediment porewater. This project included extensive characterization of sediment, sediment elutriate, and sediment porewater chemistry.
Client: Zeneca Ag Products

Selected Project Experience: **(continued)**

Monitoring of Sediment Toxicity at the Oakland Army Base - Pacific EcoRisk performed a wide variety of sediment tests as part of an investigation at the Oakland Army Base, including: sediment-water interface bivalve development tests, 10-day amphipod sediment toxicity tests, and sediment bioaccumulation tests with *Macoma* and polychaetes.
Client: Blasland, Bouck, & Lee

Monitoring of Sediment Toxicity off the Alameda Naval Air Station - As part of the US Navy CLEAN II Program, Pacific EcoRisk successfully performed numerous solid-phase sediment toxicity tests with the amphipod *Eohaustorius estuarius,* 28-day sediment toxicity tests with the polychaete *Neanthes arenacoedentata,* 28-day sediment bioaccumulation tests with the bivalve *Macoma nasuta,* and sediment water interface tests with fish embryos.
Client: TetraTech EMI.

Evaluation of Freshwater Sediment Toxicity at McClellan Air Force Base - As part of a preliminary investigation in the potential for sediment toxicity in two creeks running through McClellan Air Force Base, Pacific EcoRisk performed numerous acute sediment toxicity tests with the insect *Chironomus tentans,* experimental chronic toxicity tests with the amphipod *Hyalella azteca,* and bioaccumulation tests with the oligochaete *Lumbriculus variegatus*.
Client: Radian International.

Monitoring of Sediment Toxicity off the Pt. Molate Naval Fuel Depot - As part of the US Navy CLEAN II Program, Pacific EcoRisk successfully performed numerous solid-phase sediment toxicity tests with the amphipod Eohaustorius estuarius, sediment water interface tests with the mysid shrimp *Mysidopsis bahia* and fish embryos. Sediment water interface tests with fish embryos.
Client: ENTRIX, (713) 662-1975

Monitoring of Off-Shore Sediment Toxicity under the Bay Protection and Toxic Clean-up Program - As part of an on-going evaluation of off-shore sediment quality, Pacific EcoRisk has performed numerous solid-phase sediment tests with the amphipod *Eohaustorius estuarius,* including extensive evaluation of ammonia and sulfide as contributing toxicity factors.
Client: City and County of San Francisco

Monitoring of Sediment Toxicity at Concord Naval Weapons Station - As part of the US Navy CLEAN Program, Pacific EcoRisk successfully collected sediment samples and performed numerous sediment water interface tests with fish embryos. This included extensive analysis of the toxicity of ammonia to the fish embryos.
Client: TetraTech EMI

Toxicity Monitoring of the Ambient Waters of San Francisco Bay - The San Francisco Estuary Regional Monitoring Program (RMP) was established by the San Francisco Bay Regional Water Quality Control Board and the San Francisco Estuary Institute to develop a long-term database on contaminants in the estuary. As part of this prestigious project, Pacific EcoRisk is performing 'short-term chronic' toxicity tests on ambient water collected from throughout the estuary.
Client: San Francisco Estuary Institute (510) 231-5731

Selected Project Experience: **(continued)**

Toxicity Evaluation of Petroleum Hydrocarbon-Contaminated Soils at the Presidio of San Francisco - As part of the National Parks Service recreation of historical wetlands at the Presidio of San Francisco, Pacific EcoRisk is evaluating the toxicity risk posed by soils and groundwaters which have been contaminated with petroleum hydrocarbons during the previous military use of the Presidio. These evaluations include marine sediment toxicity tests, and sediment-elutriate testing using mysid shrimp and the bivalve embryo development test.
Client: IT Corp.

SUPERFUND (CERCLA) Toxicity Testing of Metals-Contaminated Sediments - As part of a CERCLA evaluation of acid mine drainage, Pacific EcoRisk performed toxicity evaluations of sediment porewater and sediment elutriates contaminated with high concentrations of several heavy metals. This included performance of sediment porewater TIEs to determine the cause(s) of any observed toxicity.
Client: U.S. EPA, U.S. Geological Survey, CHM2 Hill

Natural Resources Damage Assessment (NRDA) of Toxic Impacts of Acid Mine Drainage on Invertebrates and Fish - Pacific EcoRisk assisted in the design of a field sampling program, and supervised the testing of water samples collected from throughout the watershed associated with the Leviathan Mine, including East Fork of the Carson River. The laboratory testing consisted of acute and chronic aquatic toxicity tests with fish and invertebrates to assess the toxic impacts of pH and metals contamination resulting from Acid Mine Drainage into this important Sierra watershed.
Client: U.S. Fish & Wildlife Service.

Environmental Assessment of Petroleum Hydrocarbon-Contaminated Sediments in an Alpine Stream System - In response to an oil spill in a pristine alpine stream feeding into Lake Tahoe, Pacific EcoRisk is evaluating the effects of stormwater runoff and of contaminated sediments at the site. These evaluations include the use of an innovative short-term trout survival and growth test, as well as several standardized freshwater tests.

Natural Resources Damage Assessment (NRDA) of Petroleum-Contaminated Groundwater Seepage to Southern California Intertidal Areas - As part of an NRDA Evaluation of petroleum-contaminated groundwater which is seeping into intertidal areas in Southern California, Pacific EcoRisk is preparing and providing evaluations of the toxic effects of Water Accommodated Fraction (WAF) of the crude oil to marine/estuarine crustaceans.

Development of Guidelines for Interpretation of Artifactual Toxicity in Sediment Toxicity Tests - Developed sediment toxicity data base, and then designed and performed experiments to determine the toxicity of artifactual causes of sediment toxicity (e.g. naturally-present ammonia) using standard sediment toxicity test endpoints.

NPDES Effluent Toxicity Testing and TIE/TRE Projects
PER has successfully provided NPDES permit testing, permit renewal Species Screening Studies, and TIEs for many municipal and industrial dischargers within the regulatory oversight of the San Francisco Bay and Central Valley Regional Water Quality Control Boards (RWQCB). This has

included: NPDES compliance sample collection, laboratory (including on-site facilities) testing, preparation and implementation of TRE Study Plans, including Phase I-III TIEs, bench-top and pilot-scale TRE studies, and forensic "upstream" sourcing studies (when appropriate), preparation of interim and final reports, collaborative work with plant environmental specialists and engineers, and representation of dischargers to the RWQCBs. For some of these projects, Pacific EcoRisk has managed numerous sub-contracting analytical laboratories. Under PER's management, these dischargers successfully met their NPDES permit requirements; in cases where toxicity was observed, subsequent TIE evaluations successfully resolved the toxicity issues, including toxicity related to ammonia, metals, surfactants, non-polar organics, major ions, and pesticides, and interferences resulting from pathogens.

Clients:

Conoco-Phillips Rodeo Refinery
South Bayside System Authority
Shell Oil Products US Martinez Refinery
Valero Refining Co., Benicia Refinery
Valero Refining Co., Texas City Refinery
GWP Power Systems
Rhodia, Inc.
US Navy – Ft. Kamehameha
US Navy - MCBH-Kaneohe Reclamation Facility
Frontier El Dorado Refinery
City of Santa Rosa
City of Sunnyvale
Las Gallinas Valley Sanitary District
South Bay International WWTP
City of Benicia
Cit of Willits
Fugro West, Inc.
Crescent City
C&H Sugar
Central Marin Sanitation District
Delta Diablo Sanitation District
City of Merced
South Bayside System Authority
City of Loleta
Mountain View Sanitary District
City of Pacifica
City of Petaluma
Placer County
Rodeo Sanitary District
Solano Irrigation District
City of Stockton
City of Manteca

NPDES Toxicity testing and Toxicity Identification Evaluation (TIE) of Municipal Effluent - As part of a special U.S. EPA investigation, Pacific EcoRisk was selected to perform acute and chronic toxicity testing of effluent produced by the South Bay International Wastewater Treatment Plant (from Tijuana, Mexico) which is discharging effluent into the United States through a special NPDES Permit. As part of this project, Pacific EcoRisk has performed several TIEs of the effluent, evaluating seasonal differences, and sources of toxicity.

Toxicity Assessment of Jet Fuel Contamination at the San Francisco International Airport - Prepared water-accommodated fractions (WAFs) of Jet Fuel in seawater, and performed toxicity assessment of the Jet Fuel WAF to estuarine invertebrates.

Testing Capabilities

Testing Capabilities

Aquatic (NPDES) Effluent & Receiving Water Toxicity Testing: including Ambient Water Quality/Toxicity Monitoring

Pacific EcoRisk is very experienced in the performance of aquatic toxicity testing for NPDES purposes as well as for ambient monitoring programs. This work is performed following the guidelines set forth by the appropriate U.S. EPA and/or ASTM test methods manuals:

Acute Toxicity Testing

- Methods for measuring the acute toxicity of effluents to freshwater and marine organisms, Third Edition. EPA/600/4-85/013. U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

- Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms, Fourth Edition. EPA/600/4-90/027F. U.S. EPA, Office of Research and Development, Washington, D.C.

- Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms, Fifth Edition. EPA/821/R-02/012. U.S. EPA, Office of Water, Washington, D.C.

- Guide for conducting acute toxicity tests with fishes, macroinvertebrates, and amphibians. ASTM E729-88a. American Society for Testing and Materials, Philadelphia, PA.

Chronic Toxicity Testing

- Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms, Second Edition. EPA/600/4-89/001. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, OH.
- Third Edition. EPA/600/4-91/002. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, OH.
- Fourth Edition. EPA/821/R-02/013. U.S. EPA, Office of Water, Washington, D.C.

- Short-term methods for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms. EPA/600/4-87/028. U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH.
- Second Edition. EPA-600-4-91-003. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, OH.
- Third Edition. EPA-821-R-02-014. U.S. EPA, Office of Water, Washington, D.C.

Aquatic/NPDES/Ambient Monitoring Toxicity Testing (continued)

- Short-term methods for estimating the chronic toxicity of effluents and receiving waters to West Coast marine and estuarine organisms. EPA/600/R-95/136. U.S. EPA, Office of Research and Development, Washington, D.C.

Partial List of Aquatic/NPDES Toxicity Testing Species:

	Acute Toxicity - Freshwater/Estuarine
Invertebrates:	*Ceriodaphnia dubia* or *Daphnia magna* - 48 hr % survival
	Hyalella azteca or *Chironomus tentans* - 96 hr % survival
Fish:	Fathead Minnow / Rainbow Trout / 3-Spine Stickleback - 96 hr % survival
	Acute Toxicity - Estuarine/Marine
Invertebrates:	*Mysidopsis bahia / Holmesimysis costata / Neomysis mercedis* - 96 hr % survival
	Eohaustorius estuarius - 96 hr % survival
Fish:	Inland Silversides (*Menidia beryllina*) - 96 hr % survival
	Sheepshead Minnow (*Cyprinodon variegatus*) - 96 hr % survival
	Topsmelt (*Atherinops affinis*) - 96 hr % survival
	Chronic Toxicity - Freshwater
Algae:	*Selenastrum capricornutum* - 96 hr population growth
Invertebrates:	*Ceriodaphnia dubia* - 7 day survival and fecundity
	Daphnia magna - 7 or 21 day survival and fecundity
Fish:	Fathead Minnow (*Pimephales promelas*) - 7 day survival & growth
	Fathead Minnow - 7 day embryo-larval survival and teratogenicity
	Chronic Toxicity - Estuarine/Marine
Algae:	*Skeletonema costatum* or *Thalassiosira pseudonana* - 96 hr population growth
	Giant Kelp (*Macrocystis pyrifera*) - spore germination and growth
Invertebrates:	*Mysidopsis bahia* - 7 day survival, growth & fecundity
	Holmesimysis costata - 7 day survival & growth
	Mussel (*Mytilus edulis*) or Oyster (*Crassostrea gigas*)-embryo development
	Purple Urchin (*S. purpuratus)* or Sand Dollar (*Dendraster excentricus*) - sperm fertilization and/or embryo development
	Red Abalone (*Haliotus rufens*) - embryo development
Fish:	Inland Silversides (*Menidia beryllina*) - 7 day survival & growth
	Sheepshead Minnow (*Cyprinodon variegatus*) - 7 day survival & growth
	Topsmelt (*Atherinops affinis*) - 7 day survival & growth
MicroTox®	Freshwater, estuarine, & marine waters and effluents.

Testing with Other Species

Pacific EcoRisk has considerable experience in the use of non-standard species in their research and testing. If the use of resident or native species is desired, please inquire.

Testing Capabilities (continued)

Sediment Toxicity & Bioaccumulation Testing

Evaluation of Dredged Material and Dredging Operations

The scientists at Pacific EcoRisk are skilled at providing cost-effective testing and evaluation of contamination, toxicity, and bioaccumulation of dredged and/or bedded (in place) sediments, sediment elutriates, and sediment porewaters. Our dredging evaluations incorporate the latest regulatory recommendations as per the Long Term Management Strategy. Our evaluation and testing services follow the guidelines established by the appropriate U.S. EPA, U.S. Army Corps of Engineers, and ASTM testing and evaluation methods manuals:

- Long-term management strategy (LTMS) for the placement of dredged material in the San Francisco Bay Region. U.S. EPA Region 9, U.S. Army Corps of Engineers, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, California State Water Resources Control Board.

- Evaluation of dredge material proposed for ocean disposal - Testing Manual. EPA-503/8-91/001. U.S. EPA-U.S. Army Corps of Engineers, Washington, D.C.

- Evaluation of dredged material proposed for discharge in waters of the U.S. - Inland Testing Manual. EPA-823/B-94/002. U.S. EPA-U.S. Army Corps of Engineers, Washington, D.C.

- QA/QC guidance for sampling and analysis of sediments, water, and tissues for dredged material evaluations. Phase 1 - Chemical evaluations. EPA 823-B-95-001. U.S. EPA, Office of Water, Washington, D.C.

- Methods for measuring the toxicity of sediment-associated contaminants with estuarine and marine amphipods. EPA-600/R-94/025. U.S. EPA, Env. Research Laboratory, Narragansett, RI.

- Guidance manual: bedded sediment bioaccumulation tests. EPA-600/X-89/302. U.S. EPA Environmental Research Laboratory, Newport, OR.

- Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates, second edition. EPA/600/R-99/064. U.S. EPA, Office of Research and Development, Washington, D.C.

- Standard guide for conducting sediment toxicity tests with freshwater invertebrates. ASTM E1383-94. American Society for Testing and Materials, Philadelphia, PA.

- Standard guide for collection, storage, characterization, and manipulation of sediments for toxicity testing. ASTM E1391-90. American Society Testing & Materials, Philadelphia, PA.

Testing Capabilities (continued)

Sediment Toxicity & Bioaccumulation Testing (continued)

- Sediment toxicity identification evaluation: Phase 1 (characterization), Phase II (identification), and Phase III (confirmation). Modifications of effluent procedures. EPA-600/6-91/007. U.S. EPA, Environmental research Laboratory, Duluth, MN.

Sediment matrices Tested:
solid-phase sediment sediment elutriate sediment porewater ***Sediment-Water Interface***

Partial List of Sediment Toxicity and Bioaccumulation Testing Species:

Freshwater/Estuarine

Porewater/Elutriate Tests: *Ceriodaphnia dubia* - acute or chronic
Daphnia magna - acute or chronic

Solid-Phase: *Hyalella azteca* – acute (10-day) survival and growth
chronic (42-day) survival, growth, reproduction
Chironomus sp – acute (10-day) survival
chronic life-cycle testing
Hexagenia sp – acute (21-day) survival and growth

Lumbriculus variegatus – 28-day bioaccumulation test

Estuarine/Marine

Porewater/Elutriate Tests: *Mysidopsis bahia* - acute or chronic
Holmesimysis costata - acute or chronic
Mussel (*Mytilus sp*) - embryo development
Oyster (*Crassostrea gigas*) - embryo development
Purple Urchin (*S. purpuratus)* or Sand Dollar (*Dendraster excentricus*) - sperm fertilization or embryo development

Solid-Phase: *Ampelisca abdita* – 10-day survival
Eohaustorius estuarius – 10-day survival
Rhephoxynius abronius – 10-day survival
Grandidierella japonica – 10-day survival
Corophium insidiosum – 10-day survival
Leptocheirus plumulosus – 10-day survival
Nereis (Neanthes) arenacoedentata – 21-day survival & growth
Nephtys caecoides – 28-day bioaccumulation test
Macoma nasuta – 28-day bioaccumulation test

Testing Capabilities (continued)

Sediment Toxicity & Bioaccumulation Testing (continued)

MicroTox® Freshwater, estuarine, & marine sediments and sediment porewater.

Testing with Other Species

Pacific EcoRisk has considerable experience in the use of non-standard species in their research and testing. If the use of resident or native species is desired, please inquire.

Toxicity Identification Evaluations / Toxicity Reduction Evaluations (TIEs / TREs)

The Pacific EcoRisk staff has developed a reputation for excellence in the development and implementation of TIE and TRE procedures for the evaluation of effluent, stormwater runoff, receiving water, and sediment toxicity problems.

- Methods for Aquatic Toxicity Identification Evaluations: Phase 1 Toxicity Characterization Procedures (Second Edition). EPA-600/6-91/003. U.S. EPA, Environmental Research Laboratory, Duluth, MN.

- Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-92/080. U.S. EPA, Office of Research and Development, Washington, D.C.

- Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-92/081. U.S. EPA, Office of Research and Development, Washington, D.C.

- Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants. EPA/600/2-88/062. U.S. EPA, Water Engineering Research Laboratory, Cincinnati, OH.

- Sediment toxicity identification evaluation: Phase 1 (characterization), Phase II (identification), and Phase III (confirmation). Modifications of effluent procedures. EPA-600/6-91/007. U.S. EPA, Environmental research Laboratory, Duluth, MN.

Facilities & Equipment

Laboratory Facilities - Successful evaluation of contaminated waters and sediments by Pacific EcoRisk is due in no small part to our excellent laboratory facilities. Our current laboratory in Fairfield provides over 3000 sq. ft. of office and conference facilities, and over 9000 sq. ft. of actual laboratory space for conducting bioassays, culturing test organisms, storing and preparing water, effluent, and sediment samples for use in the tests, routine chemical analyses, and TIE fractionations. The various laboratory rooms comprising our facility are all designed for efficient and optimal performance of the testing services we provide.

Laboratory Equipment - Pacific EcoRisk has all of the equipment necessary to successfully perform the EPA and ASTM water, effluent, and sediment tests. All of our testing and analytical equipment is maintained and calibrated as per our QA/QC Plan. All of our plastic and glass lab-ware is cleaned according to EPA guidelines, and is stored in clean, dust-free cabinets until used.

Field Sampling/Monitoring Equipment - Pacific EcoRisk maintains a fleet of field sampling vehicles, including several Honda Odyssey vans and a 4-wheel drive Ford Explorer. Pacific EcoRisk also maintains a fleet of sampling boats, ranging from a 10-ft pond boating (equipped with trolling motor), a 21-ft shallow-draft deck boat (equipped with state-of-the-art location electronics and electric winch system for deployment of various sampling gear [e.g., ponars, etc]), and a 30-ft custom-designed off-shore boat (equipped with all the ‘bells and whistles” for performance of water, sediment, and biota sample collection). Finally, Pacific EcoRisk maintains all of the requisite fooled sampling and monitoring equipment (water quality meters, water sample collection devices and pumping systems, and a variety of sediment grab devices) needed to collect water, sediment, and biota efficiently, and in a technically-correct fashion.

A selected list of our Laboratory testing equipment is provided on the accompanying pages.

Laboratory Facilities & Equipment (continued)

Selected Equipment List

Toxicity Testing

American	25X	Electric Autoclave
Burrell	75	Wrist Action Shaker
Universal	UTCH-1	Digital Chiller/Heater Units
Testrite	PC1512DY	Light Boxes
Testrite	N/A	Temperature Control Baths
VWR	N/A	Desiccators
Rio	2100	Water Circulation Pumps
Hagen	N/A	Air Pump
Otto	TC300H	Submersible Heaters
Aquaclear	150	Power Filters
Emperor	1600	Bio-Wheel Power Filter
Coulter Counter	#10	Particle Counter

Microscopy

Cambridge Inst.	BA120	Compound Microscopes
Wolfe		Stereo Microscope
Zeiss	AxialVert 25	Inverted Microscopes
ClearOne		Flexible Microscope Camera
Hausser Sci.	3800	Sedgewick-Rafter Chamber
Reichert	N/A	Hemacytometers

Balances and Weights

Ohaus	AP250D	Precision Analytical Balance
Mettler/Toledo	PB3002	High Capacity Balance

Water Quality Analyses

Varian	SD-2000	HPLC
Alpkem	CN Solution 3000	Cyanide Ligand Exchange Analyzer
YSI	various	D.O. Meters
Orion	various	Conductivity/Salinity meters
Orion	various	pH meters
Orion	710A	pH/ISE meter
VWR	Model 2000	pH/ISE meter
Hach	DR/2010	Spectrophotometer
Orion	various	NH_3, Cl_2, sulfide, fluoride electrodes
Universal Ent.	DLM2	Light Meters
Supco	CR-87	Temperature Chart Recorders

Laboratory Facilities & Equipment (continued)

Selected Equipment List

Centrifuge Systems

IEC	HN-SII	Centrifuge
Forma Scientific	GP-8R	High-G, High Volume Centrifuge
IEC	B22-M	Ultra-G, High Volume Centrifuge

Key Scientific Personnel

An important part of the success of Pacific EcoRisk in evaluating environmental contamination problems is the knowledge, skills, and expertise provided by the team of scientists comprising the PER staff. The scientists on our staff have each earned a well-deserved reputation for high-quality scientific work, and each has made significant contributions to the field of aquatic and sediment ecotoxicology. We believe that our scientists are some of the best in the business, and each staff member has been carefully selected to complement the individual expertise of the others.

A brief ‘Bio” is presented on the accompanying pages for the Key Personnel at Pacific EcoRisk. The resumes for the company principals are provided at the end of this SOQ.

Key Scientific Personnel (continued)

Richard Scott Ogle, Ph.D., Principal - For over 20 years, Dr. Ogle has been directing research and testing of the effects of contaminants on aquatic ecosystems. Dr. Ogle's educational background involved specialization in aquatic biology, chemistry, and toxicology, and this has provided the foundation leading to his recognition for success and excellence in evaluating potential water pollution problems. As a professional scientist, Dr. Ogle has directed and participated in projects which have covered the spectrum of the aquatic eco-toxicology field, and which have included all of the EPA and ASTM aquatic and sediment toxicity and bioaccumulation tests, as well as innovative development of new approaches for evaluation of contaminants in the environment. Selected projects which have involved a leadership role by Dr. Ogle include:

- monitoring of ambient water toxicity in a variety of ecosystems;
- evaluation of sediment toxicity in a variety of ecosystems;
- development of site-specific water criteria for several trace metals, including Selenium;
- evaluation of petroleum and petroleum product toxicity to aquatic organisms;
- evaluation of surface/stormwater runoff toxicity;
- NPDES toxicity evaluations;
- single species and food chain bioaccumulation studies;
- biomonitoring of bioaccumulation in contaminated field systems;
- toxicity and bioaccumulation testing for ecological risk assessments;
- fate studies for various trace elements;
- literature reviews on a wide variety of water pollution problems;
- critical review of technical reports and proposed regulatory actions.

Jeffrey Cotsifas, Principal - For almost 17 years, Jeffrey Cotsifas has been conducting research and testing in the areas of aquatic ecotoxicology and environmental chemistry, including work as a regulator reviewing dredging operations and evaluations for the San Francisco Bay Regional Board. Jeff has been involved in the development of sediment porewater TI/RE guidelines for the San Francisco Bay System as well as evaluating the application of TI/RE methods to stormwater discharges. Jeff has project management experience including direction and performance of all of the standard EPA and ASTM toxicity tests. He has participated in developing site-specific water-effects-ratios for copper and nickel in San Francisco Bay. Jeff also participated in the development of site-specific water quality objectives for selenium in San Francisco Bay, as well as developing site-specific water quality objectives for heavy metals at an EPA Superfund site. Selected projects which have involved a leadership role by Jeff include:

- development and implementation of TIEs for both potw and industrial dischargers;
- evaluation of stormwater runoff toxicity using TIEs;
- development and implementation of sediment (porewater) TIEs;
- screening of new test species for evaluation of stormwater runoff toxicity;
- NPDES toxicity testing for municipal and industrial dischargers;
- development of QA/QC programs for several toxicity testing labs;
- monitoring of ambient water toxicity in a variety of ecosystems;
- biomonitoring of bioaccumulation in contaminated field systems.

Key Scientific Personnel (continued)

Stephen L. Clark, Project Director - For almost 20 years, Stephen L. Clark has been directing and participating in research and testing in the areas of aquatic ecotoxicology and environmental chemistry. Mr. Clark's recent emphasis for his Ph.D. dissertation research has been on the effects of

contaminants on aquatic organism at the cellular/biochemical level (e.g., "biomarkers"). Stephen has also been actively involved in the development of sediment toxicity testing approaches, including sediment-water interface testing, as well as the development of toxicity identification evaluation (TIE) methods for algae. Stephen's professional and academic research has included extensive experience with a suite of established EPA and ASTM aquatic and sediment toxicity tests, ranging from freshwater,
estuarine and marine organisms. Stephen is also expert in regulatory aspects of aquatic ecotoxicology, and has contributed in the preparation and implementation of Management and/or Monitoring Plans for San Francisco Bay, the Pacific Coast, Monterey Bay, and the Sacramento River Watershed. Stephen is also an effective communicator of issues related to aquatic toxicology to the general public and has developed an outreach program designed to improve environmental education in grades 7-12 through hands on environmental testing. Selected projects that involved a leadership role by Stephen include:

- development and implementation of aquatic TIEs for ambient waters
- evaluation of sediment, elutriate, and pore water toxicity in a variety of sloughs and estuaries throughout the west coast of the U.S.
- evaluation of petroleum related toxicity to a native California fish species
- toxicity testing of agricultural runoff to native California fish and invertebrate species
- development of new marine and estuarine bioassay tests for sediment and ambient waters
- NPDES toxicity testing for municipal and industrial dischargers
- assessment of surface water runoff toxicity in urban and agricultural dominated regions

QA/QC Policy & Important QA/QC Points

Pacific EcoRisk QA Policy Statement

Pacific EcoRisk maintains a QA Plan that provides a detailed description of quality assurance and quality control (QA/QC) procedures for all testing and chemical analyses performed by Pacific EcoRisk. These procedures address all aspects of toxicity testing that can potentially affect data quality and interpretation, including sampling and handling of test materials, collection, holding and conditioning of test organisms, test conditions and procedures, calibration of instruments, experimental design, reference toxicant testing, record keeping, and statistical evaluation of data.

Pacific EcoRisk follows Laboratory Standard Operating Procedures in accordance to methods established by the U.S. Environmental Protection Agency (EPA), ASTM, and Standard Methods. Quality Control Procedures are documented and follow EPA protocols. As a result of the quality of the data, Pacific EcoRisk is able to provide technical support related to NPDES, Water Quality Criteria Development, (Dredging) 404 Certification, and Ecological Risk Assessments.

The primary objective of the Pacific EcoRisk Quality Assurance Plan is to ensure that all of the data generated and reported are scientifically valid, legally defensible and of known accuracy, precision, representativeness and comparability.

All of the testing performed at Pacific EcoRisk meet the following Criteria.

- Methods and procedures conform to the specifications and requirements of the appropriate regulatory agencies (EPA, Regional Water Quality Control Boards, U.S. ACOE, DTSC, etc.)
- When applicable, all measures of precision, accuracy, representativeness, and comparability are reported in the data package.
- All data is reviewed relative to the quality control plan. Corrective actions are implemented when data fail to meet established quality control criteria.
- Standard operating procedures have been developed and are used in order to ensure that good quality data is collected.
- All final reports are reviewed in order to meet the clients objectives with respect to quality and completeness.

The content of the QA plan is reviewed and revised on a regular basis.

QA/QC Policy and Important QA/QC Points (continued)

Laboratory Accreditation
Pacific EcoRisk is a National Environmental Laboratory Accreditation Program (NELAP) certified lab for the performance of toxicity testing by the State of California's Environmental Laboratory Accreditation Program. This certification is based upon a critical review of the Laboratory's QA/QC Plan (including all relevant Standard Operating Procedures) and an extensive laboratory site audit.

Introduction
This summary of Important QA/QC Points from the Pacific EcoRisk Quality Assurance (QA) Program outlines the procedures employed for assuring the integrity of the data generated by the laboratory. If review and examination of our complete QA Plan is desired, please inquire. Pacific EcoRisk recognizes that the establishment of a continuing program to insure the reliability and validity of results is one of the fundamental responsibilities of any high-quality laboratory.

Standard Operating Procedures
A Standard Operating Procedure is available for all laboratory procedures that require specific knowledge and/or adherence to a specific sequence of procedural steps. This includes but is not restricted to the following:

- Sample collection, preservation, and holding time
- Sample custody, receipt, and document control
- Analytical methods and Instrument calibration, maintenance and repair
- Test Methods
- Reference Toxicant Preparation
- Safety & Hazardous waste

Any laboratory personnel participating in or performing any testing-related activity in the lab must be familiar with the relevant SOPs. A copy of each SOP is maintained in: Office File; Laboratory File or posted above work station; and Laboratory QA/QC Manual.

Quality Assurance Objectives for Measurement of Data
Data are only as good as the scientists measuring and recording that data. To ensure that data generated by this laboratory meet the highest standards, all laboratory staff participating in any lab-related activity that affects the quality of the tests being performed shall be familiar with the Standard Operating Procedures established for that lab-related activity. Furthermore, each staff person shall demonstrate, in the presence and under the guidance of the Lab Director or Lab Manager, their hands-on competency in following the SOPs and performance of specific tasks.

Sampling, Transport and Handling of Waters, Effluents and Sediments
Samples shall be collected according to established guidelines for the specific type of sample and type of sampling location. Samples shall be collected within 36 hours of the scheduled initiation of the bioassay test. Precautions should be taken to ensure that methods for collection and storage of samples (including materials used) do not contribute to sample toxicity (i.e. use appropriately cleaned sample containers, etc.). Samples may be shipped in glass or plastic (polyethylene of polypropylene) bottles, or in disposable Cubitainers. All samples should be shipped on ice and stored in the laboratory at 4°C. Each sample must have a identification tag or label securely attached to the sample container; write labels legibly with waterproof ink.

QA/QC Policy and Important QA/QC Points (continued)

Chain of Custody - Samples must be accompanied by a chain of custody record that includes the client name, location of collection (or station number and location), date and time of collection, type of sample, sequence number, number of containers, analysis required, and the collectors' signatures. The purpose of using a Chain of Custody is to maintain a written record that can be used to trace the possession of the sample from the moment of its collection through its final analysis. In addition, the chain of custody documents that the samples are handled only by authorized and properly trained personnel. The sample collector is responsible for the care and custody of the samples until they are transferred to the appropriate laboratory or relinquished to an assigned custodian.

Sample Tracking - Samples should be minimally handled. Samples are stored in a secure area at the appropriate temperature. For certain projects, sample tracking documentation is initiated and follows the sample through the laboratory during storage, and removal of sub-samples for testing and analyses.

Sample Holding and Disposal
All effluent and sediment samples will be held at 4°C in the dark for the duration of the testing period. For use in initiating a test, samples must be used within 36 hours of completion of sample collection unless otherwise stated.

All samples will be disposed of properly in accordance with accepted procedures. All samples that fall under the designation of hazardous waste will be stored in the proper containers for later pick-up and disposal by a commercial hazardous waste disposal company.

Laboratory Water
Reverse-Osmosis, De-ionized water is used in the laboratory for the preparation of dilution water, preparation of reference toxicant reagent solutions and the final rinsing of glassware. Conductivity of the deionized water is monitored daily to insure good quality.

Glassware and Test Chambers
Volumetric glassware, Class A, is used in all precise measurements of volume. All glassware and test chambers are cleaned in accordance to EPA guidelines.

Instrumentation
All instruments are adjusted and calibrated to the manufacture's specifications. Maintenance is performed in instrumentation as specified by the manufacturer or more frequently when necessary.

Toxicity Testing Precision and Accuracy: Reference Toxicant Tests
Reference toxicant tests are performed to assess the precision and accuracy of the bioassays performed for each set of organisms tested in the laboratory. Reference toxicant tests indicate the sensitivity of the organisms being used and the suitability of the test methodology. Reference toxicant tests are performed on in-house cultures once a month. A database on all reference toxicant tests performed at this laboratory is kept and used as a tool to evaluate the acceptability of any new reference toxicant test performed in conjunction with testing as well as monitor the health of in-house cultures.

QA/QC Policy and Important QA/QC Points (continued)

Internal Quality Control Checks
The following procedures are performed as internal quality control checks to ensure that all infrastructural functions and generation of data in the laboratory are within acceptable performance ranges: water bath temperature monitoring, DI water quality monitoring, review of test data, instrumentation calibration log entries, test organisms acclimation and husbandry log, sample acquisition log, calibration of equipment according to SOP's, and continual training of laboratory personnel.

Acquisition, Reduction, Validation and Reporting of Data
All data is entered onto data sheets in permanent black ink. All data entries are initialled and dated with any incorrect data struck out with one line, initialed and dated. During the data reduction process, all calculations are double-checked by qualified personnel. Test reports shall include: dates of sample receipt and testing; test method descriptions (including references) and results of tests, reference toxicant results (if applicable); listing of acceptability criteria and whether results met these criteria; copies of raw data, chain-of-custody form(s), and printouts of the statistical analyses. Reports shall also include descriptions of any deviations from protocols and discussion of deviation impact on study results. Any reports that are amended or revised will be clearly labeled so as to be distinguishable from any earlier versions.

External Quality Control Checks (Performance Evaluations)
Pacific EcoRisk participates in performance evaluations administered by the California State Department of Health Services and the U.S. EPA. These performance evaluations serve as external quality control programs to further substantiate the defensibility and validity of the data generated.

Resumes of Company Key Staff

JEFFREY SCOTT COTSIFAS
Principal/Special Projects Director

Areas of Expertise

- **NPDES Testing**
- **Toxicity Identification Evaluations**
- **Development of Site Specific Criteria**
- **Water Effect Ratio Testing**
- **Dredged Material Permitting**
- **Dredged Material Assessment**
- **Sediment Assessments**
- **Project Management**
- **Ecological Risk Assessment**
- **Ambient Monitoring**

Education

M.S., Environmental Management
University of San Francisco (expected)

B. A., Environmental Studies
(Natural Resource Mgt., Biology)
University of California, Santa Barbara

Professional History

Principal
Special Projects Director
PACIFIC ECORISK
Martinez, CA
1994-Present

Senior Scientist
S.R. HANSEN & ASSOCIATES
Concord, CA
1991-1994

Jeffrey Cotsifas has over 17 years of experience in the areas of aquatic ecotoxicology, environmental chemistry, environmental/ecological risk assessment, contaminant fate studies, and regulatory permitting and negotiation. Jeff currently heads up Pacific EcoRisk's Dredge Materials Program which provides services for a wide variety of clients including the Port of Oakland, Port of San Francisco, as well as numerous port terminals and marinas. Jeff is active in the development of sediment quality guidelines for San Francisco Bay. Jeff's current research interests are in the development and implementation of surface water, sediment porewater and sediment toxicity identification/ reduction evaluation (TI/RE) methods using standard EPA test species as well as resident aquatic organisms. Jeff is also actively investigating the fate and effects of petroleum and petroleum products in the aquatic environment. Jeff was very involved in the development of sediment porewater TI/RE guidelines for the San Francisco Bay System as well as evaluating the application of TI/RE methods to stormwater discharges.

Jeff has extensive experience in aquatic and sediment toxicity issues and has managed and performed numerous studies that have included water-column, whole sediment, sediment elutriate, sediment porewater, sediment bioaccumulation and intact sediment core (sediment-water interface) testing approaches. Jeff has experience in directing large-scale projects, including management of multi-subcontractor teams. In addition, Jeff is very familiar with relevant regulatory issues and has worked with all the major regulatory agencies as well as multi-agency groups such as the San Francisco Dredge Materials Management Office (DMMO).

RICHARD SCOTT OGLE, Ph.D.
Principal/Special Projects Director

Areas of Expertise

- **Aquatic/Sediment Toxicology**
- **Sediment Contaminant Bioaccumulation**
- **Ambient Water/Watershed Monitoring**
- **Pesticides/PCBs/Metals/Petroleum-PAHs**
- **TMDLs**

Education

Ph.D. Ecology (Aquatic Ecotoxicology)
M.S. Water Science (Water Pollution Biology)
University of California, Davis, CA

B.S. Fisheries Biology (Water Quality)
Humboldt State University, Arcata, CA

Professional History

Principal and Special Projects Director
PACIFIC ECORISK
Martinez, CA
1994-Present

Senior Scientist
S.R. HANSEN & ASSOCIATES
Concord, CA
1991-1994

Teaching Assistant (Fish Physiology)
Research Assistant
UNIVERSITY OF CALIFORNIA
Davis, CA
1991

Biological Aide
U.S. FISH & WILDLIFE SERVICE
Dixon, CA
1985

For over 20 years, Dr. Scott Ogle has been directing and/or participating in research in the areas of aquatic ecotoxicology and environmental chemistry. A major area of Dr. Ogle's past research efforts has focused on factors affecting toxicity and bioaccumulation of selenium to algae, invertebrates, and fish and have established him as an expert in this field. Current research activities include evaluation of the fate and effects of metals, pesticides, and petroleum and petroleum products in the aquatic environment, monitoring and investigation of contaminants and toxicity in ambient waters, point-source and non-point source discharges, and stormwater runoff. Dr. Ogle is also an expert in all aspects of freshwater, estuarine, and marine sediment toxicity and bioaccumulation issues, and has served as Lead Instructor for the SETAC sediment toxicity professional short course at the regional and national level. Dr. Ogle has directed and participated in numerous projects encompassing all of the standardized EPA and ASTM test procedures as well as projects involving development of new testing procedures. Performance of all of these projects has involved a leadership role by Scott, from conception and design of experimental approach, through completion of studies and analyses of results, and finally, reporting of the results to the concerned parties.

SCIENTIFIC/RESEARCH AWARDS:

1989-1990 Pre-Doctoral Fellow, Society of Environmental Toxicology and Chemistry.
Best Student Presentation, SETAC, 9th Annual Meeting, 1988.
Jastro-Shields Graduate Research Award, 1986. University of California, Davis.

STEPHEN L. CLARK
Laboratory Director/Special Projects Director

Areas of Expertise

- **NPDES Testing**
- **Toxicity Identification Evaluations**
- **Development of Site Specific Criteria**
- **Water Effect Ratio Testing**
- **Ambient Monitoring**
- **Sediment Assessments**
- **Project Management**

Education

Ph.D. Ecotoxicology (expected)
University of California, Davis, CA

B.S. Biology
California State University, Stanislaus

Professional History

Laboratory Director/Special Projects Director
PACIFIC ECORISK
Martinez, CA
1999-Present

Doctoral Studies
UNIVERSITY OF CALIFORNIA
Davis, CA
1994-2000

Laboratory Assistant
UNIVERSITY OF CALIFORNIA
Santa Cruz, CA
1992-1994

Fish & Wildlife Scientific Aide
CALIFORNIA FISH & GAME DEPT.
Sacramento, CA
1991-1992

For more than 20 years, Stephen Clark has been directing and participating in research and testing in the areas of aquatic ecotoxicology and environmental chemistry. Stephen's's recent emphasis for his Ph.D. dissertation research has been on the effects of contaminants on aquatic organism at the cellular/biochemical level (e.g., "biomarkers"). Stephen has also been actively involved in the development of sediment toxicity testing approaches, including sediment-water interface testing, as well as the development of toxicity identification evaluation (TIE) methods for algae. Stephen's professional and academic research has included extensive experience with a suite of established EPA and ASTM aquatic and sediment toxicity tests, ranging from freshwater, estuarine and marine organisms. Stephen is also expert in regulatory aspects of aquatic ecotoxicology, and has contributed in the preparation and implementation of Management and/or Monitoring Plans for San Francisco Bay, the Pacific Coast, Monterey Bay, and the Sacramento River Watershed.

Stephen has extensive experience in sediment toxicity issues, having performed numerous sediment studies including solid-phase, liquid-suspended-phase (elutriate), sediment porewater, and developed intact sediment core (sediment-water interface) testing approaches.

Stephen is also an effective communicator of issues related to aquatic toxicology to the general public and has developed an outreach program designed to improve environmental education in grades 7-12 through hands-on environmental testing.

SAMPLING AND ANALYSIS PLAN

Yuba City Boat Ramp Sediment Removal Project

Sutter County, California

ATTACHMENT 1

SOIL SCREENING DATA REPORT, Feather River Sediment Removal Project at Live Oak Boat Launch and Yuba City Boat Launch, California (Blackburn, 2020)

West Sacramento Office:
2491 Boatman Ave
West Sacramento, CA 95691
(916) 375-8706

BLACKBURN
CONSULTING

Auburn (530) 887-1494
Fresno (559) 438-8411

Blackburn File No. 3825.X
May 21, 2020

Mr. Chris Fritz
Peterson Brustad, Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: **SOIL SCREENING DATA REPORT**
Feather River Sediment Removal Project
Live Oak Boat Launch and Yuba City Boat Launch
Sutter County, California

Dear Mr. Fritz,

Blackburn Consulting (Blackburn) prepared this Soil Screening Data Report (Data Report) for the Feather River Sediment Removal Project (Project) in Sutter County, California. Blackburn prepared this Data Report in accordance with our proposal dated April 6, 2020. This Data Report is a preliminary assessment and intended for planning purposes. Additional sampling and testing are necessary to comply with US Army Corps of Engineers (USACE) standards and provide adequate data for design-level project documents. This Data Report contains Project Description, Soil Sample Collection and Test Results, and Conclusions.

PROJECT DESCRIPTION

Peterson Brustad, Inc. (PBI) requested Blackburn perform soil classification and environmental testing on accumulated sediment for proposed dredging activities at the Live Oak Boat Launch and the Yuba City Boat Launch in Sutter County, California (Figure 1). The USACE and other regulatory bodies require testing of water way sediments prior to dredging activities. PBI requested Blackburn "pre-profile" the proposed dredged material for general soil characteristics before a more rigorous sampling and testing plan is implemented prior to dredging activities.

SOIL SAMPLE COLLECTION AND TEST RESULTS

Sample Locations and Depths

Blackburn collected samples of the sediment soil for testing on May 5, 2020. Blackburn collected two samples from the Live Oak Boat Launch and three samples from the Yuba City Boat Launch at the approximate locations presented on Figure 2. We collected samples for environmental tests at

approximately 12" below the sediment surface. We collected samples for soil classification tests from the upper 12" of sediment.

Soil Sample Collection Methodology

Blackburn collected soil samples with a hand auger where the sediment surface was above the water elevation. We collected samples below the water surface at the Yuba City Boat Launch by hand-driving an open-ended, small-diameter PVC pipe into the sediment . Appendix C contains photos of the general sample locations.

Blackburn transferred the samples for environmental tests into laboratory-supplied 4-ounce glass jars. The sample jars were labeled and placed in a chilled cooler for transport to Sunstar Laboratories, a California certified analytical laboratory, under continuous chain-of-custody documentation. Blackburn cleaned the sampling equipment with an Alconox wash solution and a distilled water rinse between each sample. The samples were submitted to SunStar Laboratories of Lake Forest, California for the following tests:

- Total Petroleum Hydrocarbon (TPH) as gasoline/diesel/motor oil by EPA Method 8015.
- Semi Volatile Organics (SVOC) by EPA Method 8270C.
- Organochlorine Pesticides (OCP) by EPA Method 8081A.
- Cam-17 Metals by EPA Methods 6010B and 7471A (mercury).

We placed soil samples for classification tests in plastic bags and delivered them to our West Sacramento Laboratory for soil classification testing. We performed the following classification tests:

- 200 Wash in accordance with ASTM D1140.
- Particle Size Analysis in accordance with ASTM D6913.
- Atterberg Limits in accordance with ASTM D4318

Environmental Test Results

Reported detection levels and environmental test results are presented in Tables 1-4 and discussed below. Applicable screening levels from the US EPA Regional Screening Levels (RSLs) are included in the tables for comparison. Appendix A presents Sunstar's analytical test result report and chain-of-custody documentation.

Total Petroleum Hydrocarbons (TPHs), Table 1: TPH as Motor Oil (MORO) was detected in both samples at the Live Oak Boat Launch. Detected concentrations were below RSLs for residential land use. TPH as Gasoline (GRO) and Diesel (DRO) was not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Semi-Volatile Organic Compounds (SVOCs), Table 2: SVOCs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Organochlorine Pesticides (OCPs), Table 3: OCPs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Cam -17 Metals, Table 4: Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the soil samples at concentrations below the RSLs for residential land use. All other metals were not detected at concentrations equal to or greater than laboratory reporting limits.

Soil Classification Test Results

We collected five soil samples of the sediment at the boat launch facilities for classification tests; two at the Live Oak Boat Launch and three at the Yuba City Boat Launch. Our test results are shown in the following tables.

Soil Classification Test Results - Gradation					
Sample ID	**Soil Classification**	**Sieve Opening Size – Percent Finer**			
		½ -Inch	**No. 4**	**No. 40**	**No. 200**
Live Oak-1 0-12”	Poorly-graded SAND with SILT (SP-SM)	100	100	98.0	10.6
Live Oak-2 0-12”	SILTY SAND (SM)	NA	NA	NA	44.7
Yuba City-1 0-12”	Poorly-graded SAND (SP)	100	99.8	26.5	0.4
Yuba City-2 0-12”	Poorly-graded SAND (SP)	100	96.0	29.7	0.1
Yuba City-3 0-12”	Poorly-graded SAND (SP)	100	100	27.6	0.1

Soil Classification Test Results – Atterberg Limits			
Sample ID	**Soil Classification USCS**	**Liquid Limit**	**Plasticity Index**
Live Oak-2 0-12”	SILTY SAND (SM)	33	1

Appendix B contains the soil classification laboratory test results.

CONCLUSIONS

This Data Report provides preliminary information about the accumulated sediment at the Yuba City and Live Oak boat launch facilities prior to the development and implementation of a more detailed sampling and testing program required before any dredging activities. The preliminary tests indicate that the sediment tested at both facilities meets EPA RSLs for unrestricted land use, however, additional testing is required to determine project-wide conditions and compliance with USACE standards.

Our classification tests indicate that the sediment samples tested from the Yuba City Boat Launch are all non-plastic poorly graded sand (SP). The sediment samples we tested from the Live Oak Boat Launch classify as non-plastic poorly-graded sand with silt (SP-SM) and silty sand (SM).

Thank you for including Blackburn on your project team. Please let us know if you have any questions or need more information.

Sincerely,

BLACKBURN CONSULTING

Prepared by:

Luke Morrell, E.I.T.
Environmental Engineer

Reviewed by:

Laura Long
Environmental Project Manager



Robert Lokteff, P.E., G.E.
Principal Geotechnical Engineer

Attachments:
Figure 1: Vicinity Map
Figures 2a-2b: Site Map
Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals
Appendix A: Sunstar Laboratory Reports
Appendix B: Soil Classification Laboratory Test Results
Appendix C: Photo Report

SOIL SCREENING DATA REPORT

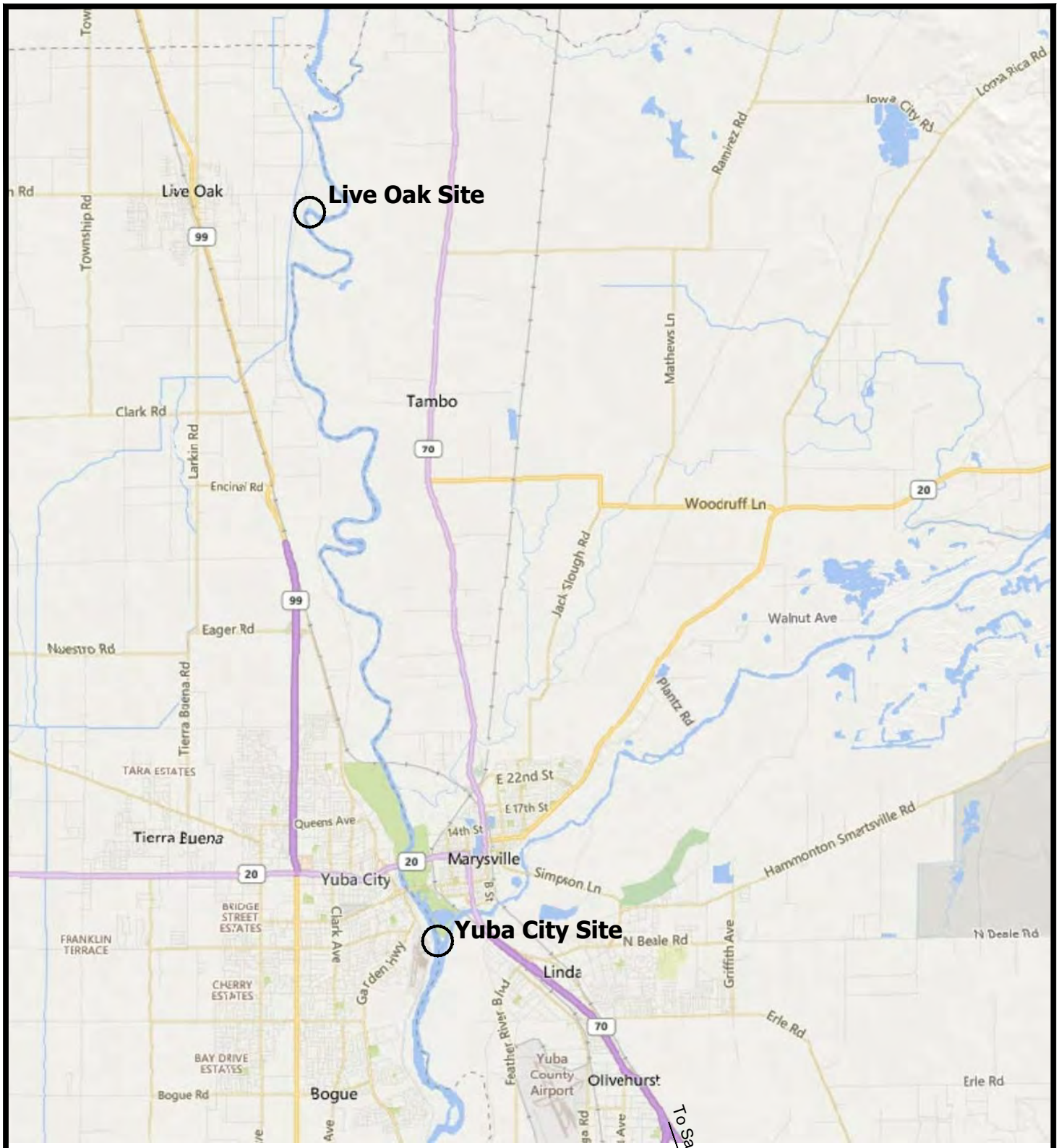
FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

FIGURES

Figure 1: Vicinity Map
Figures 2a-2b: Site Map



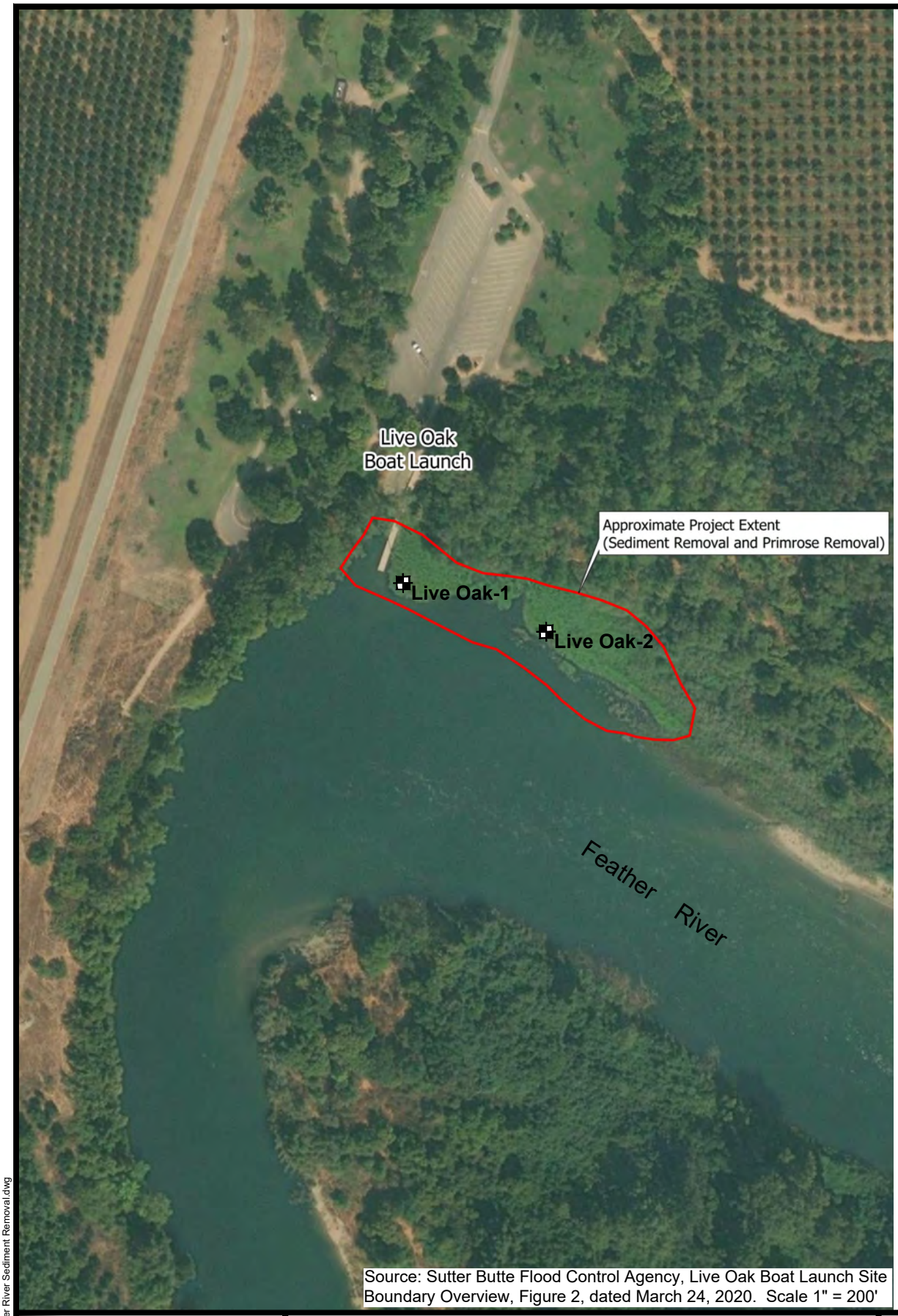
BLACKBURN CONSULTING

VICINITY MAP

Feather River Sediment Removal Project
Live Oak and Yuba City Boat Launches
Butte & Sutter Counties, California

File No. 3825.x
May 2020
Figure 1

5/11/2020 3825.x Fig1 Feather River Sediment Removal.dwg



Source: Sutter Butte Flood Control Agency, Live Oak Boat Launch Site Boundary Overview, Figure 2, dated March 24, 2020. Scale 1" = 200'

N

SCALE 1"= 200'

LEGEND

Approximate Sample Location

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

Live Oak Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2A

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg



Source: Sutter Butte Flood Control Agency, Feather River Sediment Removal Project Site Specific Map, Figure 2, dated October 2019. Scale 1" = 400'

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

Yuba City Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2B

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

TABLES

Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals

West Sacramento Office:
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(916) 375-8706

BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 1 Extractable Petroleum Hydrocarbons (TPHs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS (mg/kg)

Sample Date	Sample ID:	TPH (Extractable Petroleum Hydrocarbons) (mg/kg)		
		EPA Method 8015B		
		Gasoline (C6-C12)	Diesel Fuel (C13-C28)	Motor Oil (C29-C40)
5/5/2020	Live Oak-1 12"	ND	ND	**22**
	Live Oak-2 12"	ND	ND	**17**
	Yuba City-1 12"	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND
Reporting Limit**		10	10	10
EPA RSLs	Residential	82	96	2,500

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2A Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	Aniline	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	1-Methylnaphthalene	3-Nitroaniline	4-Methylphenol	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	1.0	1.0	1.0	1.0	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	0.3	1.0	1.0	0.3	1.0	0.3	0.3
EPA RSLs	Residential	7.8	1,800	95	---	2.6	6,300	7.8	190	1,300	130	1.7	0.36	4,100	340	190	3,200	630	---	9.9	---	---	5.1	---	6,300	2.7	---

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2B Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		4-Nitroaniline	4-Nitrophenol	2,3,5,6-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Carbazole	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	N-Nitrosodiphenylamine	N-Nitrosodimethylamine	Nitrobenzene	Pentachlorophenol	Phenol
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	0.3	1.0	0.3	0.3	0.3	0.3	1.0	1.0	1.0
EPA RSLs	**Residential**	27	---	---	1,900	6,300	6,300	0.1	3,100	39	290		6,300	630	66	51,000	---	0.19	1.2	1.8	1.8	570	110	0.002	5.1	1.0	19,000

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2C Semi-Volatile Organic Compounds (SVOCs) PAHs

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																	
		EPA Method 8270C																	
		Pyridine	Azobenzene	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a] anthracene	Benzo[a] pyrene	Benzo[b] fluoranthene	Benzo (g,h,i) perylene	Benzo[k] fluor anthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno [1,2,3-cd] pyrene	Naphthalene	Phenanthrene	Pyrene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPA RSLs	**Residential**	5.8	5.6	3,300	---	17,000	1.1	0.11	1.1	---	11	110	0.028	2,400	2,300	1.1	2.0	---	1,800

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit
** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 3a Organochlorine Pesticides (OCPs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Organochlorine Pesticides (OCPs) by EPA Method 8081A (mg/kg)																				
		4,4'-DDE	4,4'-DDT	4,4'-DDD	alpha-BHC	alpha-Chlordane	Aldrin	beta-BHC	Chlordane (Technical)	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin Ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.020
EPA RSLs	Residential	1.9	2.0	1.9	0.039	0.086	0.44	0.3	0.44	---	0.034	470	470	---	19	---	---	0.57	0.44	0.13	0.07	320	0.49

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram

- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019

- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 4 Cam-17 Metals

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	CAM-17 Metals (mg/kg)																
		EPA Method 6010B																EPA Method 7471A
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
5/5/2020	Live Oak-1 12"	ND	ND	**39**	ND	ND	**23**	**8.6**	**14**	**3.5**	ND	**35**	ND	ND	ND	**27**	**21**	ND
	Live Oak-2 12"	ND	ND	**41**	ND	ND	**29**	**8.8**	**12**	ND	ND	**42**	ND	ND	ND	**27**	**22**	ND
	Yuba City-1 12"	ND	ND	**60**	ND	ND	**22**	**7.7**	**7.1**	ND	ND	**41**	ND	ND	ND	**20**	**18**	ND
	Yuba City-2 12"	ND	ND	**49**	ND	ND	**17**	**6.6**	**6.3**	ND	ND	**31**	ND	ND	ND	**19**	**15**	ND
	Yuba City-3 12"	ND	ND	**42**	ND	ND	**22**	**6.8**	**7.3**	ND	ND	**37**	ND	ND	ND	**21**	**17**	ND
Reporting Limit**		3.0	5.0	1.0	1.0	2.0	2.0	2.0	1.0	3.0	5.0	2.0	5.0	2.0	2.0	5.0	1.0	0.1
EPA RSLs	**Residential**	31	0.11	15,000	16	71	36,000	23	3,100	80	390	820	390	390	0.78	390	23,000	1

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX A

Sunstar Laboratory Reports

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

13 May 2020

Luke Morrell
Blackburn Consulting-West Sac.
2491 Boatman Ave.
West Sacramento, CA 95691

RE: Feather River Sediment Removal

Enclosed are the results of analyses for samples received by the laboratory on 05/06/20 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Mike Jaroudi
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
YubaCity-3 12"	T202211-01	Soil	05/05/20 09:10	05/06/20 09:40
YubaCity-2 12"	T202211-02	Soil	05/05/20 09:30	05/06/20 09:40
YubaCity-1 12"	T202211-03	Soil	05/05/20 09:50	05/06/20 09:40
LiveOAk-1 12"	T202211-04	Soil	05/05/20 11:25	05/06/20 09:40
LiveOAk-2 12"	T202211-05	Soil	05/05/20 12:00	05/06/20 09:40

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Mike Jaroudi, Project Manager

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

DETECTIONS SUMMARY

Sample ID: YubaCity-3 12" **Laboratory ID:** T202211-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**42**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.8**	2.0	mg/kg	EPA 6010b	
Copper	**7.3**	1.0	mg/kg	EPA 6010b	
Nickel	**37**	2.0	mg/kg	EPA 6010b	
Vanadium	**21**	5.0	mg/kg	EPA 6010b	
Zinc	**17**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-2 12" **Laboratory ID:** T202211-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**49**	1.0	mg/kg	EPA 6010b	
Chromium	**17**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.6**	2.0	mg/kg	EPA 6010b	
Copper	**6.3**	1.0	mg/kg	EPA 6010b	
Nickel	**31**	2.0	mg/kg	EPA 6010b	
Vanadium	**19**	5.0	mg/kg	EPA 6010b	
Zinc	**15**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-1 12" **Laboratory ID:** T202211-03

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**60**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**7.7**	2.0	mg/kg	EPA 6010b	
Copper	**7.1**	1.0	mg/kg	EPA 6010b	
Nickel	**41**	2.0	mg/kg	EPA 6010b	
Vanadium	**20**	5.0	mg/kg	EPA 6010b	
Zinc	**18**	1.0	mg/kg	EPA 6010b	

SunStar Laboratories, Inc.



Mike Jaroudi, Project Manager

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Sample ID: LiveOAk-1 12" **Laboratory ID:** T202211-04

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**22**	10	mg/kg	EPA 8015B	
Barium	**39**	1.0	mg/kg	EPA 6010b	
Chromium	**23**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.6**	2.0	mg/kg	EPA 6010b	
Copper	**14**	1.0	mg/kg	EPA 6010b	
Lead	**3.5**	3.0	mg/kg	EPA 6010b	
Nickel	**35**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**21**	1.0	mg/kg	EPA 6010b	

Sample ID: LiveOAk-2 12" **Laboratory ID:** T202211-05

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**17**	10	mg/kg	EPA 8015B	
Barium	**41**	1.0	mg/kg	EPA 6010b	
Chromium	**29**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.8**	2.0	mg/kg	EPA 6010b	
Copper	**12**	1.0	mg/kg	EPA 6010b	
Nickel	**42**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*91.7 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**42**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**22**	2.0	"	"	"	"	"	"	
Cobalt	**6.8**	2.0	"	"	"	"	"	"	
Copper	**7.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**37**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**21**	5.0	"	"	"	"	"	"	
Zinc	**17**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*108 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*108 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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T202211-01 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*43.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*63.1 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*75.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*67.8 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*52.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*56.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*92.4 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**49**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**17**	2.0	"	"	"	"	"	"	
Cobalt	**6.6**	2.0	"	"	"	"	"	"	
Copper	**6.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**31**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**19**	5.0	"	"	"	"	"	"	
Zinc	**15**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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YubaCity-2 12"

T202211-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.9 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*92.6 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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Mike Jaroudi, Project Manager

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*66.2 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*72.6 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*95.5 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*79.5 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*73.3 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*85.5 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*96.2 %*		*65-135*	"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	05/08/20	"	
Arsenic	ND	5.0	"	"	"	"	05/08/20	"	
Barium	**60**	1.0	"	"	"	"	05/08/20	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**22**	2.0	"	"	"	"	05/08/20	"	
Cobalt	**7.7**	2.0	"	"	"	"	05/08/20	"	
Copper	**7.1**	1.0	"	"	"	"	05/08/20	"	
Lead	ND	3.0	"	"	"	"	05/08/20	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**41**	2.0	"	"	"	"	05/08/20	"	
Selenium	ND	5.0	"	"	"	"	05/08/20	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**20**	5.0	"	"	"	"	05/08/20	"	
Zinc	**18**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*96.8 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*94.0 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*46.6 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*71.2 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*65.0 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*97.3 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*66.8 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**22**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.1 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**39**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**23**	2.0	"	"	"	"	"	"	
Cobalt	**8.6**	2.0	"	"	"	"	"	"	
Copper	**14**	1.0	"	"	"	"	"	"	
Lead	**3.5**	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**35**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**21**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*98.4 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*99.4 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-1 12"

T202211-04 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*66.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*68.5 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*47.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*70.7 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.9 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*73.7 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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LiveOAk-2 12"

T202211-05 (Soil)

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Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**17**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*95.2 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**41**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**29**	2.0	"	"	"	"	"	"	
Cobalt	**8.8**	2.0	"	"	"	"	"	"	
Copper	**12**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**42**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.5 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*93.7 %*		*35-140*	"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*50.0 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*77.4 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*66.2 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*82.9 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*79.7 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*74.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050726 - EPA 3550B GC										
Blank (0050726-BLK1)				Prepared & Analyzed: 05/07/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*96.7*		*"*	*99.0*		*97.6*	*65-135*			
LCS (0050726-BS1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	470	10	mg/kg	495		94.5	75-125			
Surrogate: p-Terphenyl	*100*		*"*	*99.0*		*101*	*65-135*			
LCS Dup (0050726-BSD1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	460	10	mg/kg	495		92.2	75-125	2.38	20	
Surrogate: p-Terphenyl	*101*		*"*	*99.0*		*102*	*65-135*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Blank (0050634-BLK1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							J
LCS (0050634-BS1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	94.3	5.0	mg/kg	100		94.3	75-125			
Barium	96.9	1.0	"	100		96.9	75-125			
Cadmium	96.8	2.0	"	100		96.8	75-125			
Chromium	97.5	2.0	"	100		97.5	75-125			
Lead	95.1	3.0	"	100		95.1	75-125			
Matrix Spike (0050634-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	58.6	5.0	mg/kg	91.7	2.00	61.7	75-125			QM-05
Barium	155	1.0	"	91.7	89.9	70.7	75-125			QM-05
Cadmium	59.5	2.0	"	91.7	ND	64.8	75-125			QM-05
Chromium	66.9	2.0	"	91.7	7.52	64.7	75-125			QM-05
Lead	55.2	3.0	"	91.7	1.55	58.4	75-125			QM-05

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Matrix Spike Dup (0050634-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	62.6	5.0	mg/kg	100	2.00	60.6	75-125	6.61	20	QM-05
Barium	171	1.0	"	100	89.9	81.2	75-125	10.0	20	QM-05
Cadmium	61.3	2.0	"	100	ND	61.3	75-125	2.98	20	QM-05
Chromium	70.5	2.0	"	100	7.52	63.0	75-125	5.17	20	QM-05
Lead	60.7	3.0	"	100	1.55	59.1	75-125	9.51	20	QM-05

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050633 - EPA 7471A Soil										
Blank (0050633-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	ND	0.10	mg/kg							
LCS (0050633-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.378	0.10	mg/kg	0.391		96.7	80-120			
Matrix Spike (0050633-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.415	0.10	mg/kg	0.417	ND	99.6	75-125			
Matrix Spike Dup (0050633-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.431	0.10	mg/kg	0.417	ND	104	75-125	3.89	20	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
Blank (0050637-BLK1)				Prepared: 05/08/20 Analyzed: 05/11/20						
alpha-BHC	ND	5.0	ug/kg							
gamma-BHC (Lindane)	ND	5.0	"							
beta-BHC	ND	5.0	"							
delta-BHC	ND	5.0	"							
Heptachlor	ND	5.0	"							
Aldrin	ND	5.0	"							
Heptachlor epoxide	ND	5.0	"							
gamma-Chlordane	ND	5.0	"							
alpha-Chlordane	ND	5.0	"							
Endosulfan I	ND	5.0	"							
4,4´-DDE	ND	5.0	"							
Dieldrin	ND	5.0	"							
Endrin	ND	5.0	"							
4,4´-DDD	ND	5.0	"							
Endosulfan II	ND	5.0	"							
4,4´-DDT	ND	5.0	"							
Endrin aldehyde	ND	5.0	"							
Endosulfan sulfate	ND	5.0	"							
Methoxychlor	ND	5.0	"							
Endrin ketone	ND	5.0	"							
Toxaphene	ND	20	"							
Surrogate: Tetrachloro-meta-xylene	*9.37*		*"*	*10.0*		*93.7*	*35-140*			
Surrogate: Decachlorobiphenyl	*8.97*		*"*	*10.0*		*89.7*	*35-140*			
LCS (0050637-BS1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	37.9	5.0	ug/kg	40.0		94.8	40-120			
Heptachlor	39.7	5.0	"	40.0		99.2	40-120			
Aldrin	28.7	5.0	"	40.0		71.8	40-120			
Dieldrin	39.2	5.0	"	40.0		98.0	40-120			
Endrin	38.4	5.0	"	40.0		95.9	40-120			
4,4´-DDT	37.8	5.0	"	40.0		94.6	33-147			
Surrogate: Tetrachloro-meta-xylene	*9.65*		*"*	*10.0*		*96.5*	*35-140*			
Surrogate: Decachlorobiphenyl	*9.30*		*"*	*10.0*		*93.0*	*35-140*			

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
LCS Dup (0050637-BSD1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	44.0	5.0	ug/kg	40.0		110	40-120	14.9	30	
Heptachlor	46.6	5.0	"	40.0		117	40-120	16.1	30	
Aldrin	33.8	5.0	"	40.0		84.4	40-120	16.2	30	
Dieldrin	45.5	5.0	"	40.0		114	40-120	14.8	30	
Endrin	45.0	5.0	"	40.0		113	40-120	16.0	30	
4,4´-DDT	40.6	5.0	"	40.0		102	33-147	7.11	30	
Surrogate: Tetrachloro-meta-xylene	*11.1*		*"*	*10.0*		*111*	*35-140*			
Surrogate: Decachlorobiphenyl	*10.4*		*"*	*10.0*		*104*	*35-140*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Carbazole	ND	300	ug/kg							
Aniline	ND	300	"							
Phenol	ND	1000	"							
2-Chlorophenol	ND	1000	"							
1,4-Dichlorobenzene	ND	300	"							
N-Nitrosodi-n-propylamine	ND	300	"							
1,2,4-Trichlorobenzene	ND	300	"							
4-Chloro-3-methylphenol	ND	1000	"							
2-Methylnaphthalene	ND	300	"							
1-Methylnaphthalene	ND	300	"							
Acenaphthene	ND	300	"							
4-Nitrophenol	ND	1000	"							
2,4-Dinitrotoluene	ND	300	"							
Pentachlorophenol	ND	1000	"							
Pyrene	ND	300	"							
Acenaphthylene	ND	300	"							
Anthracene	ND	300	"							
Benzo (a) anthracene	ND	300	"							
Benzo (b) fluoranthene	ND	300	"							
Benzo (k) fluoranthene	ND	300	"							
Benzo (g,h,i) perylene	ND	1000	"							
Benzo (a) pyrene	ND	300	"							
Benzyl alcohol	ND	300	"							
Bis(2-chloroethoxy)methane	ND	300	"							
Bis(2-chloroethyl)ether	ND	300	"							
Bis(2-chloroisopropyl)ether	ND	300	"							
Bis(2-ethylhexyl)phthalate	ND	300	"							
4-Bromophenyl phenyl ether	ND	300	"							
Butyl benzyl phthalate	ND	300	"							
4-Chloroaniline	ND	300	"							
2-Chloronaphthalene	ND	300	"							
4-Chlorophenyl phenyl ether	ND	300	"							
Chrysene	ND	300	"							
Dibenz (a,h) anthracene	ND	300	"							
Dibenzofuran	ND	300	"							
Di-n-butyl phthalate	ND	300	"							

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
1,2-Dichlorobenzene	ND	300	ug/kg							
1,3-Dichlorobenzene	ND	300	"							
2,4-Dichlorophenol	ND	1000	"							
Diethyl phthalate	ND	300	"							
2,4-Dimethylphenol	ND	1000	"							
Dimethyl phthalate	ND	300	"							
4,6-Dinitro-2-methylphenol	ND	1000	"							
2,4-Dinitrophenol	ND	1000	"							
2,6-Dinitrotoluene	ND	1000	"							
Di-n-octyl phthalate	ND	300	"							
Fluoranthene	ND	300	"							
Fluorene	ND	300	"							
Hexachlorobenzene	ND	1500	"							
Hexachlorobutadiene	ND	300	"							
Hexachlorocyclopentadiene	ND	1000	"							
Hexachloroethane	ND	300	"							
Indeno (1,2,3-cd) pyrene	ND	300	"							
Isophorone	ND	300	"							
2-Methylphenol	ND	1000	"							
4-Methylphenol	ND	1000	"							
Naphthalene	ND	300	"							
2-Nitroaniline	ND	300	"							
3-Nitroaniline	ND	300	"							
4-Nitroaniline	ND	300	"							
Nitrobenzene	ND	1000	"							
2-Nitrophenol	ND	1000	"							
N-Nitrosodimethylamine	ND	300	"							
N-Nitrosodiphenylamine	ND	300	"							
2,3,5,6-Tetrachlorophenol	ND	300	"							
2,3,4,6-Tetrachlorophenol	ND	300	"							
Phenanthrene	ND	300	"							
Azobenzene	ND	300	"							
2,4,5-Trichlorophenol	ND	1000	"							
Pyridine	ND	300	"							
2,4,6-Trichlorophenol	ND	1000	"							

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Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: 2-Fluorophenol	*1610*		*ug/kg*	*3260*		*49.6*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3260*		*63.6*	*24-113*			
Surrogate: Nitrobenzene-d5	*2580*		*"*	*3260*		*79.3*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*2230*		*"*	*3260*		*68.3*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2310*		*"*	*3260*		*71.0*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2670*		*"*	*3260*		*82.0*	*29.1-130*			
LCS (0050636-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2170	1000	ug/kg	3320		65.3	34-114			
2-Chlorophenol	2120	1000	"	3320		63.9	34-114			
1,4-Dichlorobenzene	2070	300	"	3320		62.4	34-114			
N-Nitrosodi-n-propylamine	1990	300	"	3320		59.8	30-110			
1,2,4-Trichlorobenzene	2260	300	"	3320		67.9	39-119			
4-Chloro-3-methylphenol	2600	1000	"	3320		78.3	50-130			
Acenaphthene	2350	300	"	3320		70.7	34-114			
Pentachlorophenol	3090	1000	"	3320		93.0	50-130			
Pyrene	1840	300	"	3320		55.5	33.7-123			
Surrogate: 2-Fluorophenol	*1680*		*"*	*3320*		*50.5*	*15-121*			
Surrogate: Phenol-d6	*2140*		*"*	*3320*		*64.3*	*24-113*			
Surrogate: Nitrobenzene-d5	*2050*		*"*	*3320*		*61.6*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1750*		*"*	*3320*		*52.5*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2620*		*"*	*3320*		*78.9*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2800*		*"*	*3320*		*84.2*	*29.1-130*			
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2110	1000	ug/kg	3250		65.0	34-114	2.73	42	
2-Chlorophenol	2200	1000	"	3250		67.7	34-114	3.47	40	
1,4-Dichlorobenzene	2060	300	"	3250		63.6	34-114	0.489	28	
N-Nitrosodi-n-propylamine	2350	300	"	3250		72.3	30-110	16.7	38	
1,2,4-Trichlorobenzene	2220	300	"	3250		68.4	39-119	1.62	28	
4-Chloro-3-methylphenol	2620	1000	"	3250		80.6	50-130	0.633	42	
Acenaphthene	2450	300	"	3250		75.4	34-114	4.04	31	
Pentachlorophenol	3180	1000	"	3250		98.0	50-130	2.86	50	
Pyrene	1830	300	"	3250		56.4	33.7-123	0.762	31	
Surrogate: 2-Fluorophenol	*1840*		*"*	*3250*		*56.8*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3250*		*63.6*	*24-113*			

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: Nitrobenzene-d5	*2630*		*ug/kg*	*3250*		*81.2*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1940*		*"*	*3250*		*59.6*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*3510*		*"*	*3250*		*108*	*18.1-105*			*S-GC*
Surrogate: Terphenyl-dl4	*2760*		*"*	*3250*		*84.9*	*29.1-130*			

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Notes and Definitions

S-GC	Surrogate recovery outside of established control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
J	Detected but below the Standard Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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SunStar Laboratories

25712 Commercentre Drive, Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Blackburn Consulting
Address: 2491 Boatman Ave West Sac, CA
Phone: 916-375-8706 Fax:
Project Manager: Luke Morrell / Laura Long

Date: 5/5/20 Page: 1 Of 1
Project Name: Feather River Sediment Removal
Collector: LDM Client Project #: 3825.X
Batch #: T202211 EDF #:

Laboratory ID #	Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270 SVOCs	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals (cont'd)	6020 ICP-MS Metals	7471A Mercury	8081 OCPs			Comments/Preservative	Total # of containers
01	Yuba City-3 12"	5/5/20	9:10	Jar	Soil				X				X	X		X	X				1
02	Yuba City-2 12"		9:30						X				X	X		X	X				1
03	Yuba City-1 12"		9:50						X				X	X		X	X				1
04	Live Oak-1 12"		11:25						X				X	X		X	X				1
05	Live Oak-2 12"		12:00						X				X	X		X	X				1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	5/5/20 1315	[signature]	5/5/20 1315
[signature]	5/6/20 9:40	[signature]	5/6/20 9:40

Total # of containers: 5
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold: 3.4

Turn around time: STD

Notes

Sample disposal Instructions: Disposal @ $2.00 each ___ Return to client ___ Pickup ___

COC 18142

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T202211

Client Name: BLACKBURN Project: FEATHER RIVER SEDIMENT

Delivered by: ☐ Client ☐ SunStar Courier ☒ GSO ☐ FedEx ☐ Other

If Courier, Received by: _____ Date/Time Courier Received: _____

Lab Received by: BRIAN Date/Time Lab Received: 5/6/20 940

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due : 6/27/20

Temperature:	Cooler #1 2.2	°C +/- the CF (+ 1.2°C)	= 3.4	°C corrected temperature
Temperature:	Cooler #2	°C +/- the CF (+ 1.2°C)	=	°C corrected temperature
Temperature:	Cooler #3	°C +/- the CF (+ 1.2°C)	=	°C corrected temperature

Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☒ **Yes** ☐ **No**
If NO:		
Samples received on ice?	☐ Yes	☐ **No → Complete Non-Conformance Sheet**
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ **No → Complete Non-Conformance Sheet**

Custody seals intact on cooler/sample	☒ Yes	☐ No*	☐ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: BC 5/6/20

Comments:

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

WORK ORDER

T202211

Client:	**Blackburn Consulting-West Sac.**	**Project Manager:**	**Mike Jaroudi**
Project:	**Feather River Sediment Removal**	**Project Number:**	**3825.x**

Report To:
Blackburn Consulting-West Sac.
Luke Morrell
2491 Boatman Ave.
West Sacramento, CA 95691

Date Due:	05/13/20 17:00 (5 day TAT)		
Received By:	Brian Charon	Date Received:	05/06/20 09:40
Logged In By:	Brian Charon	Date Logged In:	05/06/20 09:58

Samples Received at: **3.4°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirı	No		

Analysis	Due	TAT	Expires	Comments
T202211-01 YubaCity-3 12'' [Soil] Sampled 05/05/20 09:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:10	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:10	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:10	
8270C	05/13/20 15:00	5	05/19/20 09:10	
T202211-02 YubaCity-2 12'' [Soil] Sampled 05/05/20 09:30 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:30	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:30	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:30	
8270C	05/13/20 15:00	5	05/19/20 09:30	
T202211-03 YubaCity-1 12'' [Soil] Sampled 05/05/20 09:50 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:50	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:50	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:50	
8270C	05/13/20 15:00	5	05/19/20 09:50	

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202211

Client: **Blackburn Consulting-West Sac.** **Project Manager:** **Mike Jaroudi**

Project: **Feather River Sediment Removal** **Project Number:** **3825.x**

Analysis	Due	TAT	Expires	Comments
T202211-04 LiveOAk-1 12'' [Soil] Sampled 05/05/20 11:25 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 11:25	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 11:25	
8081 Pesticides	05/13/20 15:00	5	05/19/20 11:25	
8270C	05/13/20 15:00	5	05/19/20 11:25	
T202211-05 LiveOAk-2 12'' [Soil] Sampled 05/05/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 12:00	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 12:00	
8081 Pesticides	05/13/20 15:00	5	05/19/20 12:00	
8270C	05/13/20 15:00	5	05/19/20 12:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By Date

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

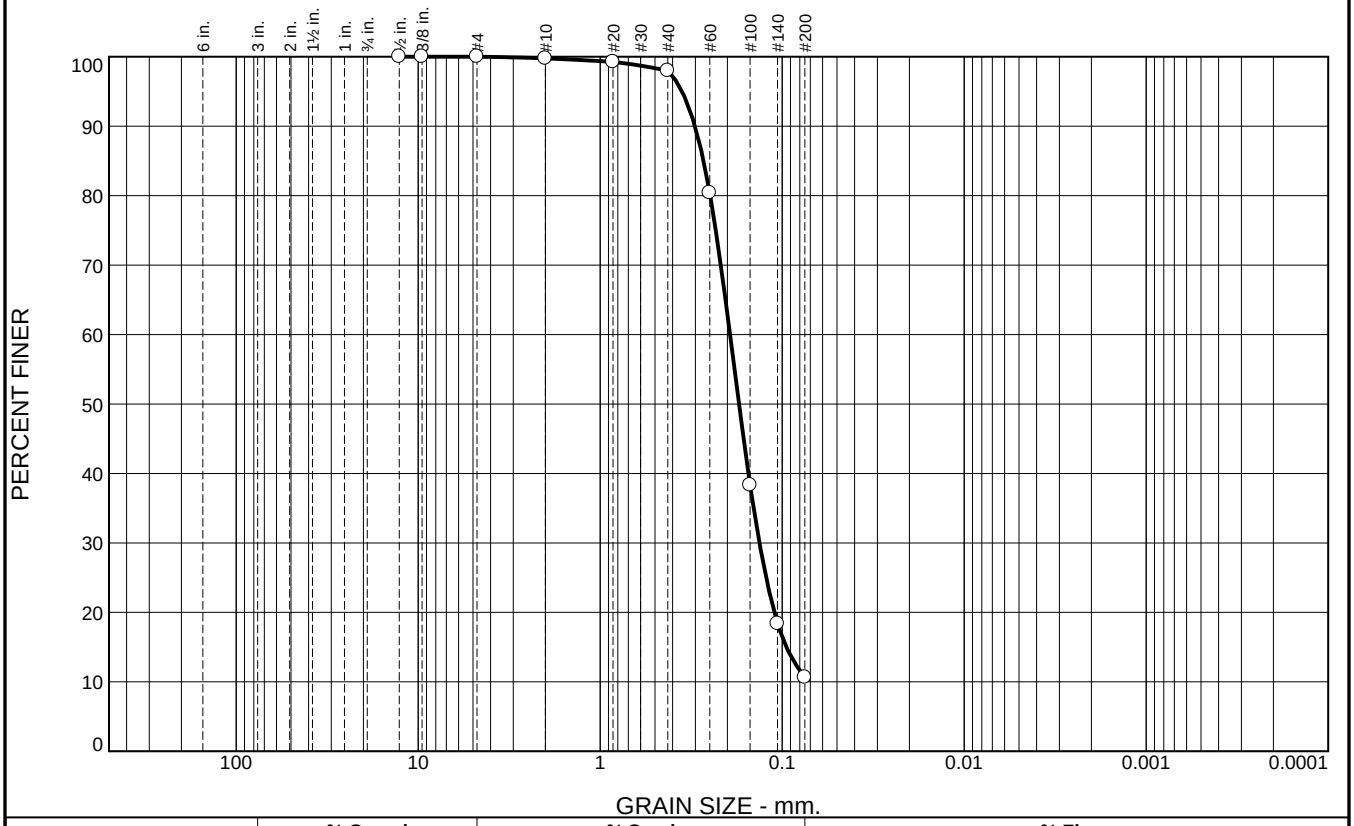
Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX B

Soil Classification Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	87.4	10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	98.0		
#60	80.4		
#100	38.3		
#140	18.4		
#200	10.6		

* (no specification provided)

Material Description

Poorly-graded SAND with SILT, mottled dark gray & brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3013 D_{85}= 0.2703 D_{60}= 0.1933
D_{50}= 0.1726 D_{30}= 0.1334 D_{15}= 0.0949
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 1 **Date:**

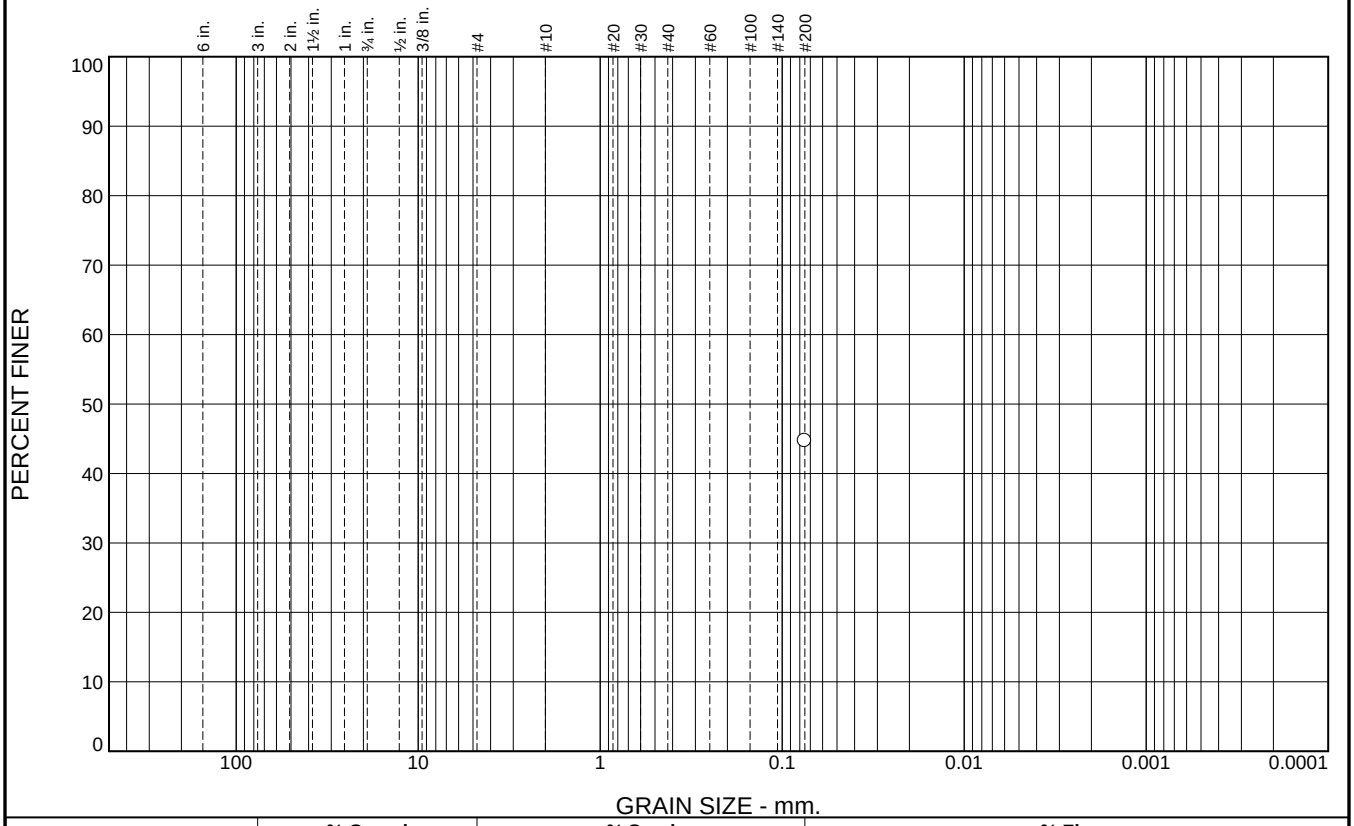
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						44.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	44.7		

* (no specification provided)

Material Description

SILTY SAND, dark brown

Atterberg Limits

PL= 32 LL= 33 PI= 1

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 2 **Date:**

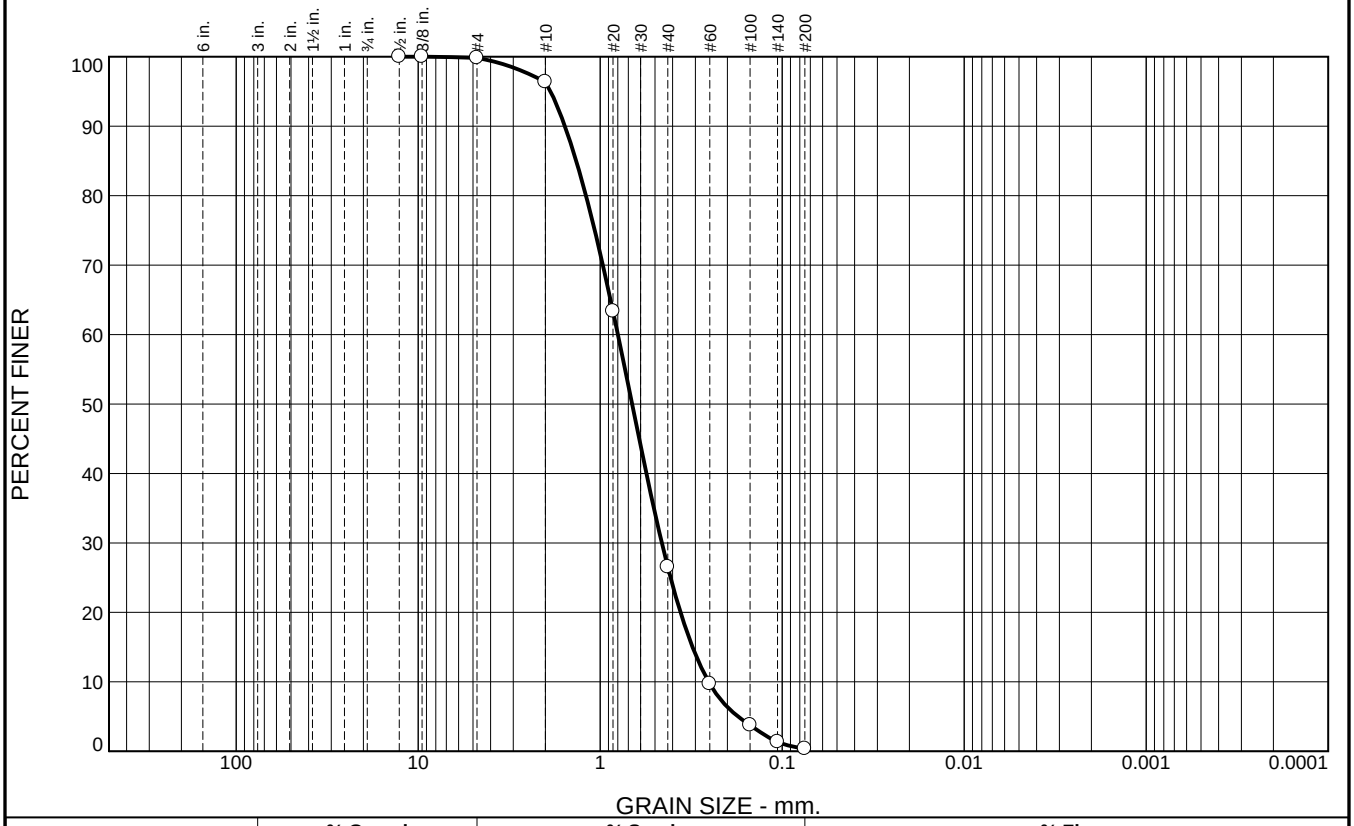
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	3.4	69.9	26.1	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#10	96.4		
#20	63.4		
#40	26.5		
#60	9.7		
#100	3.8		
#140	1.4		
#200	0.4		

* (no specification provided)

Material Description

Poor□y-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.5612 D_{85}= 1.3540 D_{60}= 0.7989
D_{50}= 0.6674 D_{30}= 0.4582 D_{15}= 0.3108
D_{10}= 0.2537 C_u= 3.15 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 1 **Date:**

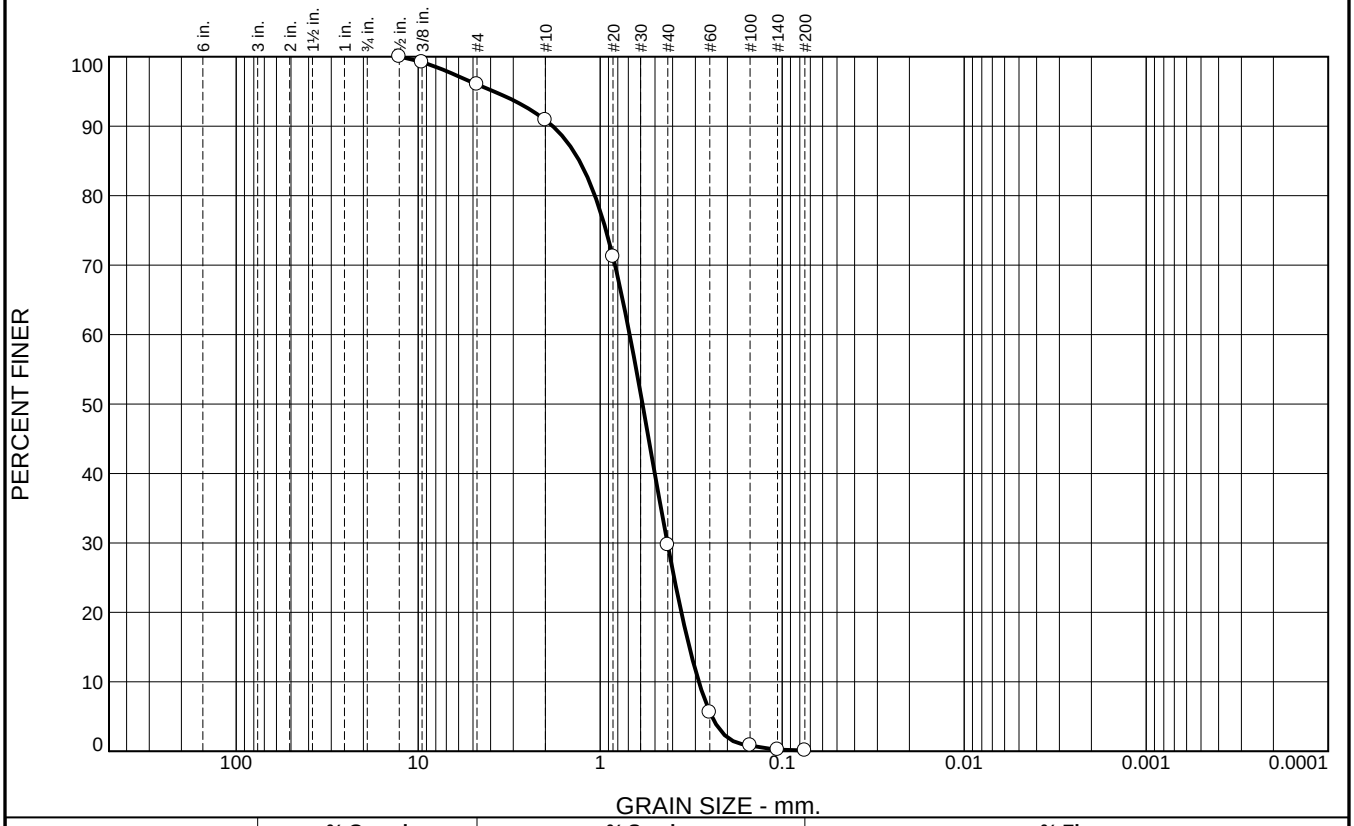
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.0	5.1	61.2	29.6	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.2		
#4	96.0		
#10	90.9		
#20	71.2		
#40	29.7		
#60	5.6		
#100	0.8		
#140	0.2		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.8245 D_{85}= 1.3002 D_{60}= 0.6885
D_{50}= 0.5854 D_{30}= 0.4270 D_{15}= 0.3235
D_{10}= 0.2871 C_u= 2.40 C_c= 0.92

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 2 **Date:**

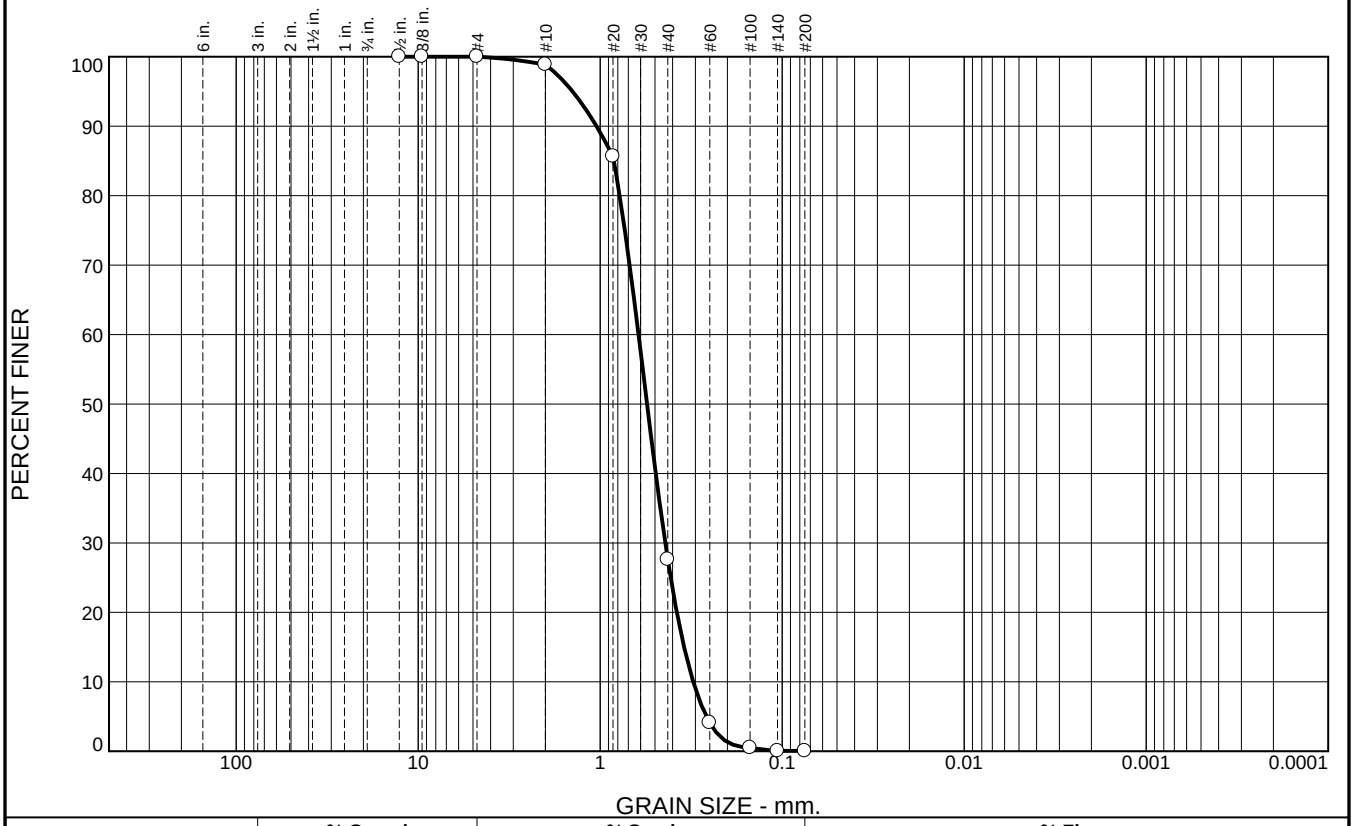
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	71.3	27.5	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	98.9		
#20	85.7		
#40	27.6		
#60	4.1		
#100	0.5		
#140	0.1		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0481 D_{85}= 0.8409 D_{60}= 0.6157
D_{50}= 0.5525 D_{30}= 0.4387 D_{15}= 0.3457
D_{10}= 0.3080 C_u= 2.00 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 3 **Date:**

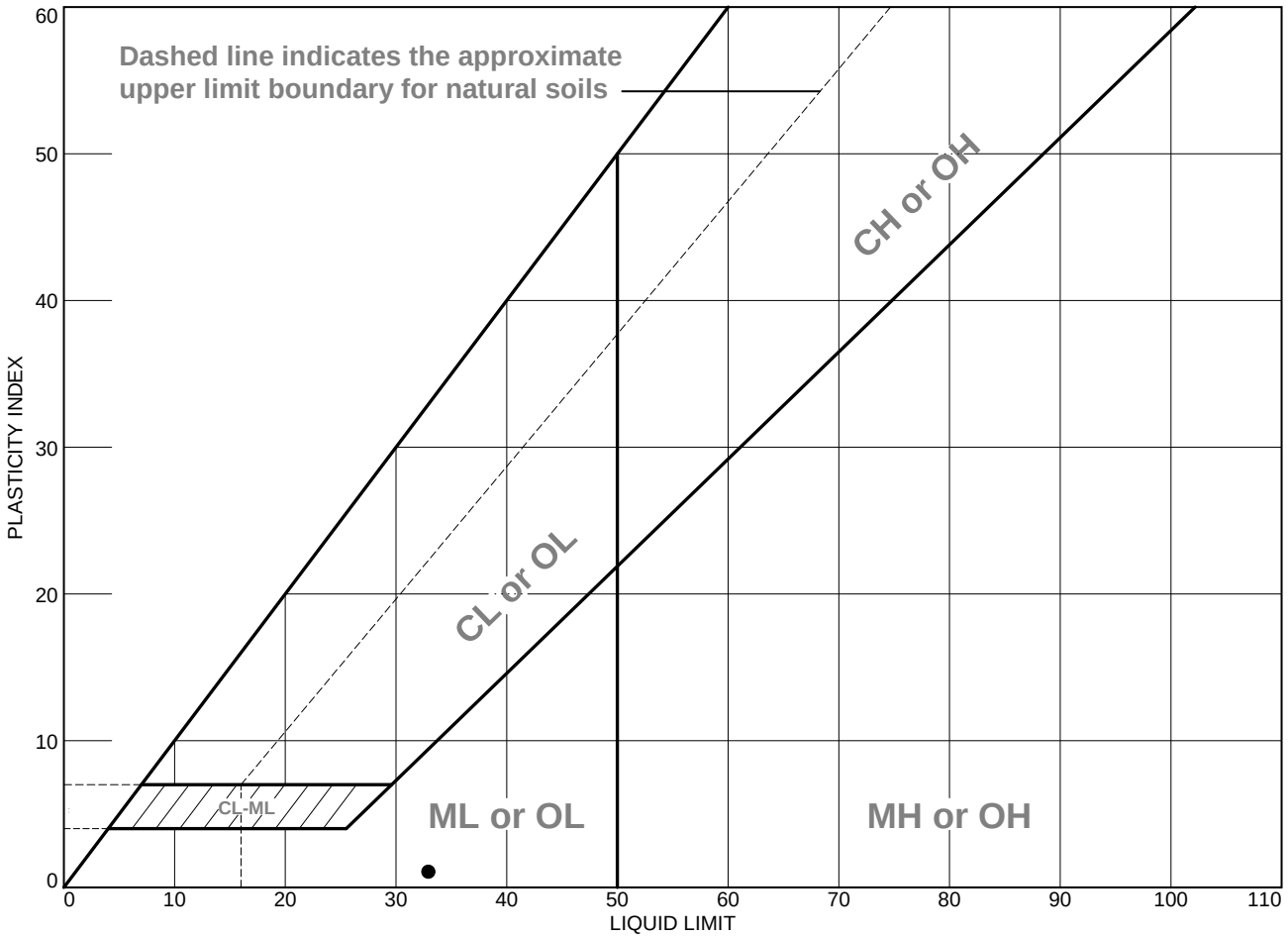
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SILTY SAND, dark brown	33	32	1		44.7	SM

Project No. 3825.X **Client:** Sutter Butte Flood Control Agency

Project: Feather River Sediment Removal Project

●**Source of Sample:** Live Oak **Depth:** 0-12" **Sample Number:** 2

Remarks:

Blackburn Consulting

W. Sacramento, CA

Figure

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX C

Photo Report



Photo 1: Live Oak Boat Launch, Sample Location 1



Photo 2: Live Oak Boat Launch, Sample Location 2



Photo 3: Yuba City Boat Launch, Typical Sample Location

ATTACHMENT F

Water Quality Monitoring Plan

Water Quality Monitoring Plan

Yuba City Boat Ramp Sediment Removal Project

Sutter and Yuba Counties, California

Prepared for:

Sutter Butte Flood Control Agency

November 3, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

1.0 INTRODUCTION 3
1.1 Purpose and Background 3
1.2 Project Location 3
1.3 Project Description 6
1.3.1 Dredging Methods 6
1.3.2 Dewatering Operations 6
1.4 Construction Schedule 6
2.0 WATER QUALITY MONITORING 7
2.1 Discharges Associated with In-Water Work Activities 7
2.1.1 Water Quality Parameters to be Monitored 7
2.1.2 Water Quality Monitoring Locations 8
2.2 Discharges Associated with Dewatering Activities 9
2.2.1 Representative Sample 9
2.2.2 Water Quality Monitoring Location 12
2.2.3 Water Quality Parameters to be Monitored During Discharge 13
3.0 REPORTING 13
3.1 Discharges Associated with In-Water Work Activities 13
3.2 Discharges Associated with Dewatering Activities 13
4.0 REFERENCES 14

LIST OF TABLES

Table 1. Water quality sample method and frequency for in-water construction activities. 7
Table 2. Beneficial Uses of Feather and Yuba Rivers 10
Table 3. Screening Levels for Tier 1B Wastewater 11

LIST OF FIGURES

Figure 1. Yuba City Boat Ramp Location and Vicinity 4
Figure 2. Project Components 5

LIST OF ACRONYMS AND ABBREVIATIONS

CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
cy	Cubic yards
DO	Dissolved oxygen
EPA	Environmental Protection Agency
mg/L	Milligrams per liter
mL/L	Milliliters per liter
MUN	Municipal and Domestic Supply
NRCS	Natural Resources Conservation Service
NTU	Nephelometric turbidity unit
PCBs	Polychlorinated biphenyls
Plan	Water Quality Monitoring Plan
Project	Yuba City Boat Ramp Sediment Removal Project
SBFCA	Sutter Butte Flood Control Agency
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WQC	Water Quality Certification
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

1.1 Purpose and Background

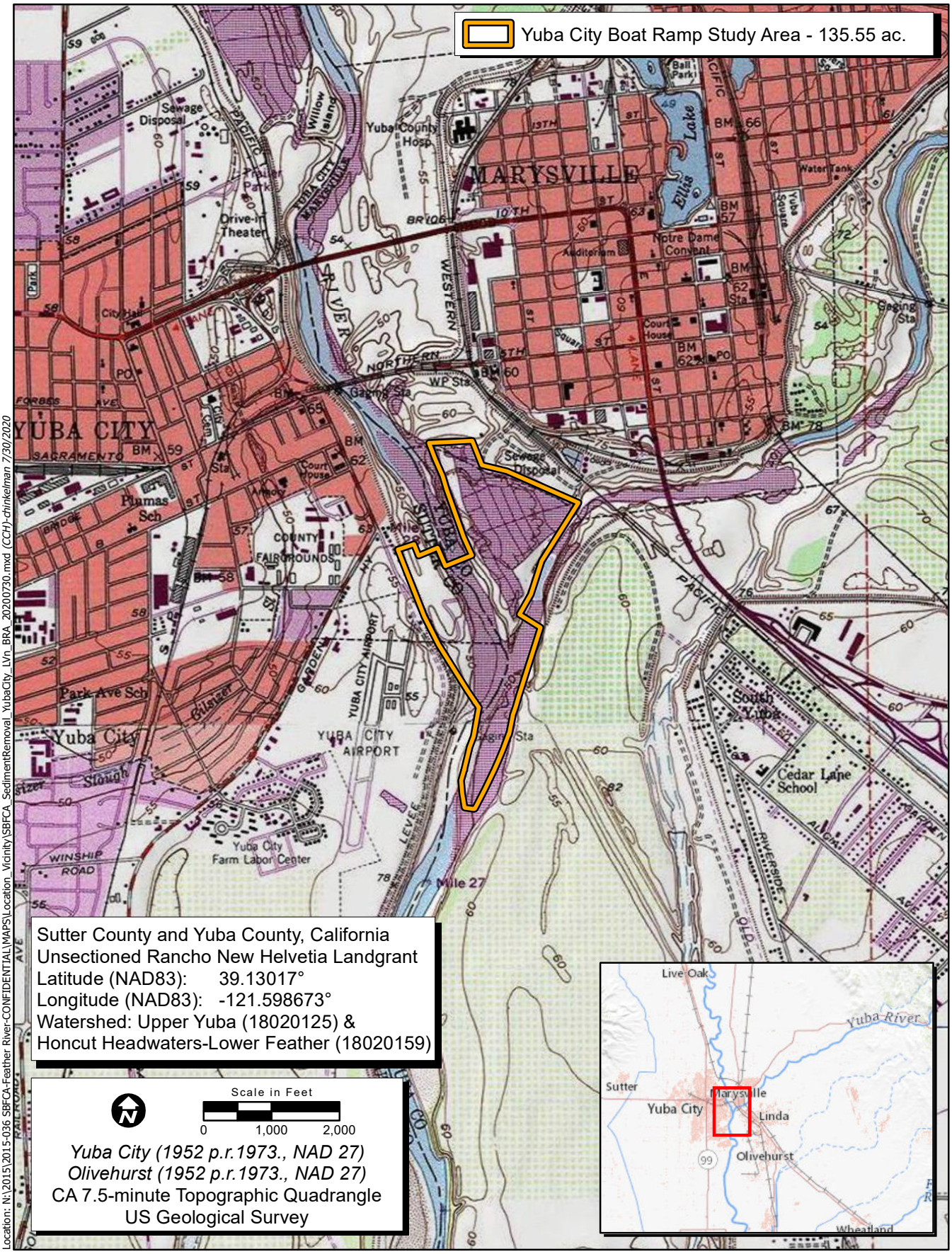
The purpose of this Water Quality Monitoring Plan (Plan) is to provide the Central Valley Regional Water Quality Control Board (CVRWQCB) and U.S. Army Corps of Engineers (USACE) with proposed protocols for monitoring water quality during dredging and dewatering of dredged materials during the Sutter Butte Flood Control Agency's (SBFCA's) Yuba City Boat Ramp Sediment Removal Project (Project). SBFCA proposes to conduct dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 1).

The Project is needed to remove sediment that has accumulated at the Yuba City Boat Ramp and the confluence of the Yuba and Feather rivers, exacerbated by the 2017 Oroville Dam Spillway incident. This has hampered recreational users and public safety as it has affected emergency vessel launching capabilities at the boat ramp. The Project has received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River as part of restoration, protection and development of river parkways in accordance with the California River Parkways Grant Program. Restoring river access and fish passage conditions at the Project will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) bring commerce to local restaurants, hotels, and other businesses.

This Plan addresses monitoring of surface water quality in the Feather River near the Yuba River confluence during dredging operations. SBFCA is currently considering several options for dewatering and disposal of the dredged material. Under these alternatives, dredged material will be dewatered either on land or within tanks or basins, and decanted filtered water will be discharged back to the Feather or Yuba rivers within the Project boundary. Sediment analyses will be performed on the dredged material under a separate monitoring plan to conduct final waste characterization prior to disposal. Initial sampling of sediment in the Project area indicates that the dredged material would not pose a significant risk to human health or the environment.

1.2 Project Location

The Project is located in a portion of unsectioned Rancho New Helvetia Land grant lands within the "Olivehurst, California" and "Yuba City, California" 7.5-minute quadrangles (U.S. Geological Survey [USGS] 1952a, photo revised 1973 and 1952b, photo revised 1973, respectively). The approximate center of the Yuba City location is 39.13017° latitude, -121.598673° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code #18020159, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016) (Figure 1. *Yuba City Boat Ramp Location and Vicinity*).



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Location_Vicinity\SBFCA_SedimentRemoval_YubaCity_LVn_BRA_20200730.mxd (CCH)-dhinkelman 7/30/2020

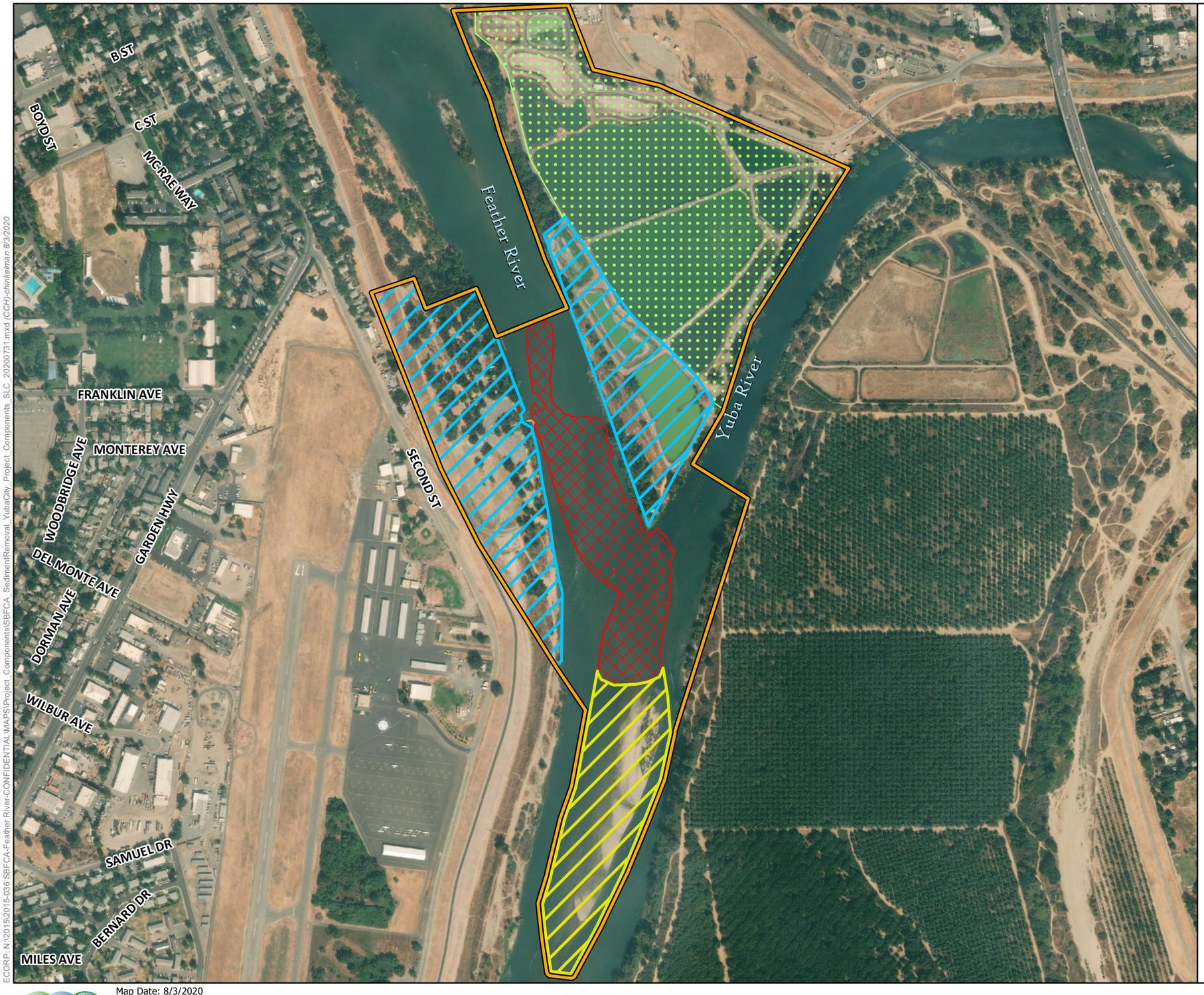
Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Yuba City Boat Ramp Location and Vicinity

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



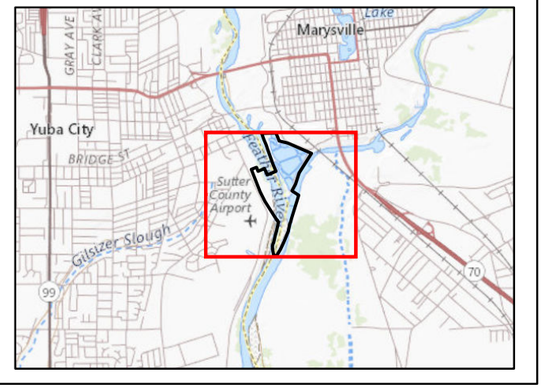
Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Project_Components\SBFCA_SedimentRemoval_YubaCity_Project_Components_SLC_20200731.mxd (CCH)-chinkelman 8/3/2020

Map Date: 8/3/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 560

Figure 2. Project Components

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

1.3 Project Description

The Project consists of maintenance dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 2. *Project Components*). Approximately 315,600 cubic yards (cy) of dredged material would be removed within an ±28-acre area and may occur over two phases. Phase 1 includes the removal of approximately 65,600 cy of dredged material within a ±14.41-acre Dredging Area as part of restoration, protection and development of river parkways in accordance with the California River Parkways Grant Program. Phase 2 includes an additional approximately 250,000 cy within a ±14.40-acre Future Dredging Area immediately downstream to further restore fish passage and improve conveyance at the confluence of the Yuba and Feather rivers to be funded by other sources. The timing of Phase 2 will depend on availability of funding and may occur concurrently with Phase 1.

1.3.1 Dredging Methods

Two potential dredging methods are being evaluated for the Project: hydraulic dredging and mechanical dredging, depending upon the results of the hydrographic and geophysical surveys of the area proposed to be dredged. Hydraulic dredging involves a barge with suction to remove sediment from the river bottom and pumping the material to shore. Mechanical dredging involves a barge with equipment to excavate the sediment from the river bottom, storage of the dredged material on a transport barge, and subsequent transfer of the material from the transport barge to shore.

1.3.2 Dewatering Operations

Dredged material will be placed on land within empty wastewater ponds at the Marysville Wastewater Treatment Plant (WWTP) via a discharge pipeline or via mechanical equipment. The existing wastewater ponds serve as existing confined basins within which water would be decanted from the dredged material and evaporative drying of the dredged material would take place. Progressive surface trenching will be used to mechanically manipulate the dredged material to speed evaporative drying. Settling basins will also be used to clean water drained from sediment before it is discharged back into the Feather River.

Phase 2 dredged material would be dewatered in the Marysville WWTP North Ponds as well if funding is received in time for use of the Marysville WWTP site. If Phase 2 dredged material cannot be dewatered at the Marysville WWTP, dredged material would be placed into fractionation tanks or other temporary dewatering basins staged at the Yuba City Boat Ramp facility, either via a discharge pipeline or mechanical equipment, where water would be decanted from the dredged material. Fractionation tanks would be manifolded together in series and decanted water would be routed to a filtration system, stored, and tested. It is anticipated that filtered water would then be disposed of either to land or disposed of back into the Feather River.

1.4 Construction Schedule

Dredging operations and dewatering activities are proposed to be limited to between June 15 and October 15 to align with work windows to avoid impacts to special-status fish species. The remainder of the construction period would be dedicated to pre-construction surveys, mobilization and demobilization

activities, and completion of the transfer of dewatered dredged material to the City of Marysville for spread of the material over the 46-acre North Ponds area.

Completion of Phase 1 of the Project is anticipated to occur in in 2021, with Phase 2 being completed in the following year(s). It is assumed that nighttime operations may be required for the Project.

2.0 WATER QUALITY MONITORING

Water quality monitoring will be performed:

1. during all in-water work activities and
2. for discharge of decanted water from dewatering of the dredged materials.

2.1 Discharges Associated with In-Water Work Activities

Monitoring will be performed on all days that in-water work activities occur or whenever Project-related discharges are made to the river due to in-water work activities, including dredging, work associated with site preparation, and debris removal, as described below.

2.1.1 Water Quality Parameters to be Monitored

The following water quality parameters will be measured during in-water work activities:

- Turbidity;
- Settleable solids;
- Dissolved oxygen (DO);
- pH;
- Water temperature; and
- Visible construction-related pollutants (e.g., oil, grease, foam, fuel, petroleum products, and construction-related excavated, organic, or earthen materials).

These parameters will be sampled using the type and sampling frequencies identified in Table 1.

Table 1. Water quality sample method and frequency for in-water construction activities.

Water Quality Parameter	Unit of Measurement	Sample Method	Minimum Sampling Frequency
Turbidity	NTU	Grab	Every 4 hours
Settleable Solids	mL/L	Grab	Every 4 hours
Dissolved Oxygen (DO)	mg/L/% saturation	Grab	Every 4 hours
pH	Standard Units	Grab	Every 4 hours
Water temperature	°C/°F	Grab	Every 4 hours
Visible Construction-related Pollutants	Observation	Visual Inspections	Continuously throughout the construction period

Measurements of turbidity (in nephelometric turbidity units [NTU]), dissolved oxygen (DO), pH, and water temperature will be made using a handheld multi-parameter water quality meter (e.g., Horiba U-50). These measurements will be made by staff trained in the proper use and maintenance of the instrument. The instrument will be calibrated prior to each monitoring event in accordance with the manufacturer's recommendations. Sampling personnel will maintain onsite a calibration and maintenance log for any meters used for these grab samples.

Grab samples will be collected from the water column at approximately mid-depth. On all days of in-water work activities, grab samples will be collected prior to commencement of in-water work to establish a baseline, every four hours during in-water work, and upon completion of in-water work for the day. To the extent possible, the sampling start time will be varied each day such that samples will be collected at different times to better represent natural variability of the receiving waters (i.e., Feather and Yuba rivers).

Settleable solids will be collected and analyzed by field staff using the Hach Company (2015) Method 8165 direct measurement methodology for solids and settleable matter. Briefly, water samples will be collected from the Feather River at each station in clean glass or plastic bottles and labeled with the sample collection station, date, and time. Samples will be refrigerated or kept on ice for no more than 24 hours prior to analysis. The samples will be allowed to come to room temperature and thoroughly mixed (e.g., by shaking) immediately prior to analysis. Samples will be poured into an Imhoff cone to the 1-L mark and left to sit untouched for 45 minutes to become stable. The cone will be twisted back and forth several times to remove materials on the sloped side of the Imhoff cone and left to sit untouched for another 15 minutes. The amount of settleable matter (in mL/L) will be determined by reading the graduated scale on the Imhoff cone at the top of the solids layer and recorded on a data sheet.

Visual inspections for construction-related pollutants will be conducted continuously throughout all in-water and sediment dewatering/surface water discharge activities to determine if these activities are causing a visible film or water surface coating of oils, greases, waxes, or other construction-related materials in the surrounding waters. Any such visual observations will be noted and photo-documented for inclusion in the water quality monitoring reports.

2.1.2 Water Quality Monitoring Locations

Measurements and sample collections for these water quality parameters will be made throughout the in-water work period at representative locations upstream (i.e., unaffected by dredging and other Project-related in-water activities) and downstream of the project boundary in the Feather River at the following stations:

Station	Description
R-1	In an area unaffected by the dredging operation and not to exceed 300 feet upstream from the upstream edge of the overall Project boundary.
R-2	Within 300 feet downstream of the downstream edge of the overall Project boundary.

The Project boundary encompasses the sediment dredging area and any points of discharge of decanted water from the sediment dewatering to the Feather or Yuba rivers. As such, the water quality monitoring stations will be used to evaluate any potential Project-related water quality impacts associated with dredging, transport, and dewatering of dredged soils If effluent associated with land-based dewatering of the dredged materials (see Section 2.2 below) is discharged to the Yuba River adjacent to the Marysville WWTP, additional monitoring stations will be established in the Yuba River 300 feet upstream (i.e., R-1b) and 300 feet downstream (i.e., R-2b) of the point(s) of discharge into the Yuba River to monitor the potential water quality impacts during active discharge of return water.

Measurements and water sample collections will be made at the R-2 station(s) first, followed by the R-1 station(s) to prevent the potential for sediment resuspended at R-1 during measurements to affect the R-2 measurements. All measurements and water sample collections will be made at mid-channel at approximately the same distance from each bank as the most recent dredging activity. To the extent possible, samples will be collected from the shore to avoid entering the water and potentially disturbing benthic sediments, thereby increasing the potential for resuspending sediments and increasing turbidity and/or settleable solids concentrations in the water column. If collection of samples from the shoreline is not possible, the sampling personnel will collect grab samples at the R-2 station first followed by the R-1 station to avoid creation of a sediment plume that could affect downstream samples. At each sampling station, the sampling personnel will approach the sampling station from downstream and collect samples by facing upstream to avoid sampling portions of the water column that have been disturbed by wading or boating.

2.2 Discharges Associated with Dewatering Activities

Discharges associated with dewatering of dredged materials on land at the Marysville WWTP (i.e., return water) are assumed to be prohibited. Monitoring that will be performed for discharges of decanted water from tanks or basins is described in more detail below.

Although the Section 401 Water Quality Certification (WQC) issued for the Project by the CVRWQCB will govern monitoring and reporting, the Proposed monitoring below is intended to comply with CVRWQCB's *General Waste Discharge Requirements (WDR) for Limited Threat Discharges to Surface Water (Order R5-2016-0076-01) (Limited Threat Order)* which applies to this type of discharge.

2.2.1 Representative Sample

Under the Limited Threat Order, collection and analysis of a representative sample of the wastewater is required first to determine what Tier discharge the wastewater falls under as defined as follows in the Order:

Tier 1: Clean or relatively pollutant-free wastewaters that pose little or no threat to water quality.

Tier 1A. Discharges of less than 0.25 million gallons per day (MGD) or less than 4 months in duration (or as determined by the Executive Officer); or

Tier 1B. Discharges greater than or equal to 0.25 MGD and greater than or equal to 4 months in duration (or as determined by the Executive Officer).

Tier 2: Wastewater that may contain toxic organic constituents, volatile organic compounds (VOCs), petroleum fuel pollution constituents, pesticides, inorganic constituents, chlorine, and other chemical constituents for which treatment technologies are well-established to eliminate constituents that pose a threat to water quality and that require treatment prior to discharge.

Given the results of initial sediment sampling in the Project area, it is expected that wastewater generated from dewatering would likely qualify as a Tier 1B discharge. However, as required by the Limited Threat Order, a representative wastewater sample will be collected, analyzed, and compared with screening levels for the constituents in Table I-1 of Appendix I of the Limited Threat Order to determine the Tier of discharge. If results exceed Tier 1B screening thresholds, the wastewater must be categorized as Tier 2 wastewater.

Screening levels vary depending upon the beneficial uses of the water bodies. Beneficial uses for the Feather and Yuba rivers in the Project area are shown in Table 2.

Table 2. Beneficial Uses of Feather and Yuba Rivers

Feather River	Yuba River
Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.	
Agricultural Supply (AGR) for Irrigation - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.	**Agricultural Supply (AGR) for Irrigation and Stock Watering** - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.
	Industrial Process Supply (PRO) - Uses of water for industrial activities that depend primarily on water quality.
	Hydropower Generation (POW) - Uses of water for hydropower generation.
Water Contact Recreation (REC-1) including Canoeing and Rafting - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.	**Water Contact Recreation (REC-1) including Canoeing and Rafting** - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
Non-contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.	**Non-contact Water Recreation (REC-2)** - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
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. (Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use	**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. (Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use

Table 2. Beneficial Uses of Feather and Yuba Rivers	
Feather River	**Yuba River**
designations will be considered COLD water bodies for the application of water quality objectives).	designations will be considered COLD water bodies for the application of water quality objectives).
Migration of Aquatic Organisms (MIGR) for Warm and Cold Water Species - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)	**Migration of Aquatic Organisms (MIGR) for Warm and Cold Water Species** - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)
Spawning, Reproduction, and/or Early Development (SPWN) for Warm and Cold Water Species - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)	**Spawning, Reproduction, and/or Early Development (SPWN) for Warm and Cold Water Species** - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)
Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.	**Wildlife Habitat (WILD)** - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

The Feather River has a beneficial use of Municipal and Domestic Supply (MUN), therefore, MUN screening levels apply to the Project. Additional sampling and analyses for pollutants causing impairment under the federal Clean Water Act (CWA) section 303(d) List, is also required under the Limited Threat Order. The Lower Feather River, from the Lake Oroville Dam to the confluence of the Sacramento River including the Project area, is on the Category 5 303(d) list of impaired water bodies for chlorpyrifos, Group A pesticides, mercury, polychlorinated biphenyls (PCBs), and other unknown toxicity (USEPA 2020). Group A Pesticides include one or more of the following compounds: dieldrin, endrin, alpha-chlordane, gamma-chlordane, cis-Nonachlor, trans-Nonachlor, oxychlordane, heptachlor, and heptachlor epoxide. The Lower Yuba River is on the Category 5 303(d) list for copper and mercury (USEPA 2020). A Category 5 list contains water bodies that have listed pollutants that still require the development of a Total Maximum Daily Load.

Therefore, a representative wastewater sample will be collected prior to construction by collecting a sediment sample from the Project area, analyzing the elutriate, and comparing results with screening levels for the constituents in Table 3.

Table 3. Screening Levels for Tier 1B Wastewater
Constituent/Parameter1
Biochemical Oxygen Demand (5-day @ 20°C)
Total Suspended Solids (TSS)
Dissolved Oxygen (DO)
Hardness

Table 3. Screening Levels for Tier 1B Wastewater
pH
Temperature
Electrical Conductivity (EC) (aka Specific Conductance)
Total Dissolved Solids (TDS)[3]
Unionized Ammonia Nitrogen, Total (as N)
California Toxics Rule (CTR) Priority Pollutants[4]:
Metals (EPA Method 6010/7471 for Mercury)
Cyanide, Total (as CN)
Asbestos
2,3,7,8-TCDD (Dioxin)
Volatile organic compounds (VOCs) (EPA Method 8260)
Semi-volatile organic compounds (SVOCs) (EPA Method 8270)
Organochlorine pesticides (EPA Method 8080)
Organophosphate pesticides (including chlorpyrifos) (EPA Method 8141B)
PCBs (Aroclors) (EPA Method 8081)

Notes:
1 Constituents/Parameters shall be analyzed using the analytical methods described in 40 Code of Federal Regulations Part 136 and in accordance with the General Monitoring Provisions contained in section I of the Monitoring and Reporting Program (Attachment C) of the Limited Threat Order).
2 MUN = Municipal and Domestic Supply Beneficial Use.
4 Table I-3 of Appendix I of Limited Threat Order
3 Screening level is based on Total Suspended Solids (TSS); Both organic and inorganic particles of all sizes can contribute to the suspended solids concentration. TSS are particles that are larger than 2 microns found in the water column; particles smaller than 2 microns (average filter size) is considered a dissolved solid

Because chronic toxicity tests on the effluent will be required during discharge per the Limited Threat Order requirements, baseline chronic toxicity tests are also recommended on the receiving water in the Project area. Specifically, the following chronic toxicity tests with the shall be run on a laboratory control and 100 percent receiving water sample (i.e., serial dilutions not required) in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002:

- The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
- The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
- The green alga, *Selenastrum capricornutum* (growth test).

2.2.2 Water Quality Monitoring Location

Regular water quality monitoring will be performed on the decanted water discharged to the Feather and/or Yuba rivers as a result of the dewatering process for dredged material. For Tier 1B discharges, water quality monitoring must be performed on the wastewater effluent as defined below:

EFF-001 *A location where a representative sample of the effluent discharged at Discharge Point 001 can be collected prior to discharging to surface water. Discharge Point 001 is the first discharge point. Monitoring requirements and effluent limitations apply to all discharge points if there are multiple discharge points.*

Additional monitoring at receiving water locations would be required if the wastewater is categorized as a Tier 2 discharge.

2.2.3 Water Quality Parameters to be Monitored During Discharge

The frequency and constituents that must be analyzed in the effluent will be set by the CVRWQCB in the Section 401 WQC issued for the Project depending upon the results of the analysis on the representative wastewater sample discussed in Section 2.2.1 above. Sampling frequency could be on a weekly, monthly, or quarterly basis.

In addition to analytical testing, annual chronic toxicity testing of the decanted water will be required per the Limited Threat Order requirements. Specifically, the following chronic toxicity tests shall be run on a laboratory control and 100% receiving water sample (i.e., serial dilutions not required) in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002:

- The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
- The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
- The green alga, *Selenastrum capricornutum* (growth test).

3.0 REPORTING

3.1 Discharges Associated with In-Water Work Activities

All water quality measurements will be recorded on data sheets and scanned or saved electronically for subsequent reporting, as required in the CVRWQCB Section 401 WQC. Reports will provide water quality analytical results in a tabular format such that the sampling dates, locations, constituents, and analytical results are readily discernable and clearly identify compliance or non-compliance with the 401 WQC requirements, once issued. Reports will be prepared and submitted in accordance with the instructions provided in the 401 WQC, once issued.

3.2 Discharges Associated with Dewatering Activities

Results of the sampling and analysis must be reported with, or during the processing of, the application for the Section 401 WQC. Water quality monitoring results performed during discharge of decanted water from the dewatering process will be performed as Self-Monitoring Reports in accordance with the requirements of the Section 401 WQC, once issued.

4.0 REFERENCES

Hach Company. 2015. Solids, Settleable Matter, Direct Measurement, Method 8165. DOC3165.53.01202. Edition 8. August.

NRCS, USGS, and USEPA. 2016. Watershed Boundary Dataset for California. Available online: http://datageteway.nrcs.usda.gov. Accessed September 21, 2016.

USEPA . 2020. California 2014-2016 CWA Section 303(d) List of Impaired Waters. Region IX. April 6, 2018. Accessed at https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml?wbid=CAR5192200019980817161057 on September 1, 2020.

_____. 2002. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October.

USGS. 1952a "Olivehurst, California" 7.5-minute Quadrangle. Photorevised 1973. U.S. Department of the Interior.

_____. 1952b "Yuba City, California" 7.5-minute Quadrangle. Photorevised 1973. U.S. Department of the Interior.

APPENDIX E

Cultural Resources Documentation

Sutter Butte Flood Control Agency
Post Office Box M
Yuba City, CA 95991
(530) 755-9859

sutterbutteflood.org

COUNTIES
Butte County
Sutter County

CITIES
City of Biggs
City of Gridley
City of Live Oak
City of Yuba City

LEVEE DISTRICTS
Levee District 1
Levee District 9

April 6, 2020

Gene Whitehouse
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

RE: Notice of Opportunity to Consult for the Feather River Sediment and Invasive Species Removal Project, Yuba City, California

Dear Chairman Whitehouse:

On June 28, August 2, and November 8, 2019, the Sutter Butte Flood Control Agency (SBFCA) provided the United Auburn Indian Community with preliminary information about a future project, referred to at that time as the Proposition 68 dredging project. The advance notice was provided in accordance with SBFCA's 2015 and 2016 Addendum Tribal Consultation Policies within the context of meetings between SBFCA and tribal leadership. At that time, the project was characterized to tribal leadership as using Proposition 68 funding to remove sediment from up to five boat launch locations along the Feather River. These locations of the river saw an increase in sedimentation as a result of major flood events, including, but not limited to, the 2017 incident at the Oroville Dam.

Since our early notifications to tribal leadership, funding limitations have reduced the scope of the project to limit it only to two key locations. The Yuba City Boat Launch facility is located at 80 Second Street in Yuba City, and the Live Oak Recreational Boat Launch facility is located on Pennington Road in Live Oak. Both are located in Sutter County. Project location maps are enclosed for your information.

The currently proposed "Feather River Sediment and Invasive Species Removal Project" will remove sediment and invasive primrose vegetation from these two locations. The majority of work will be in-water work. Contractors will use hydraulic or mechanical dredging to remove sediment and debris from the Yuba City Boat Launch location and will employ mechanical removal and disposal of sediment plus approximately 1.5 acres of invasive water primrose (*Ludwigia peploides*) from the Live Oak location.

Although the project description is still under development, SBFCA is ready to initiate environmental review under the California Environmental Quality Act (CEQA) for the proposed project. Assembly Bill 52 (AB 52) and Section 21080.3.1(d) of the California Public Resources Code (PRC) require that we respond to your written request to be notified of projects in our jurisdiction that will be reviewed under CEQA. Your name was provided to

us as the point of contact for your tribe. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC, and in accordance with our tribal consultation policies. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts.

In accordance with Section 21080.3.1(d) of the PRC, you have 30 days from the receipt of this letter to either request or decline consultation in writing for this project. Please send your written response to my attention at the Sutter Butte Flood Control Agency, P.O. Box M, Yuba City, CA 95992 or by email to m.bessette@sutterbutteflood.org. If I do not receive a response within 30 days, then we will proceed. Thank you and we look forward to your response.

Respectfully,



Michael W. Bessette, P.E.
Executive Director
Sutter Butte Flood Control Agency

cc: Marcos Guerrero and Jason Camp, UAIC

APPENDIX F

Noise Output Files

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/3/2020
Case Description: Hydraulic Dredging

Description	**Affected Land Use**
Hydraulic Dredging	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Pumps	No	50		80.9	620	0
Generator	No	50		80.6	620	0
Generator	No	50		80.6	620	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Pumps		59.1	56.1
Generator		58.8	55.8
Generator		58.8	55.8
	Total	**59.1**	**60.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/3/2020
Case Description: Mechanical Dredging

Description	**Affected Land Use**
Mechanical Dredging	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Crane	No	16		80.6	620	0
Generator	No	50		80.6	620	0
Generator	No	50		80.6	620	0
Pumps	No	50		80.9	620	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Crane		58.7	50.7
Generator		58.8	55.8
Generator		58.8	55.8
Pumps		59.1	56.1
	Total	**59.1**	**61.1**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/3/2020
Case Description: Onshore Equipment

Description **Affected Land Use**
Onshore Equipment Residential & Parkland

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	900	0
Gradall	No	40		83.4	900	0
Gradall	No	40		83.4	900	0
Grader	No	40	85		900	0
Dozer	No	40		81.7	900	0
Dozer	No	40		81.7	900	0
Tractor	No	40	84		900	0
Tractor	No	40	84		900	0
Excavator	No	40		80.7	900	0
Water Jet deleading	No	20		92.1	900	0

Results

Equipment	Calculated (dBA) *Lmax	Leq
Crane	55.4	47.5
Gradall	58.3	54.3
Gradall	58.3	54.3
Grader	59.9	55.9
Dozer	56.6	52.6
Dozer	56.6	52.6
Tractor	58.9	54.9
Tractor	58.9	54.9
Excavator	55.6	51.6
Water Jet deleading	67	60
Total	**67**	**64.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/3/2020
Case Description: Alternative 2 Onshore Equipment

Description	**Affected Land Use**
Alternative 2 Material Handling	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Dozer	No	40		81.7	400	0
Backhoe	No	40		77.6	400	0
Backhoe	No	40		77.6	400	0

Results

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Dozer	63.6	59.6
Backhoe	59.5	55.5
Backhoe	59.5	55.5
Total	**63.6**	**62.1**

*Calculated Lmax is the Loudest value.

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2015-036.10
Project Name: Yuba City Boat Ramp

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Section 3.0 Project Description
Community Noise Descriptor: L_{dn}: _____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition						Vehicle Mix		Distance from Centerline of Roadway					Traffic Volumes			
Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Medium Trucks	Heavy Trucks	CNEL at 25 Feet	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Day	Eve	Night
Project Implementation																
2nd Street	2	0	38	35	0.5	88.0%	0.1%	**60.0**	-	-	-	54	25	30	5	4
5th Street	2	0	38	35	0.5	88.0%	0.1%	**60.0**	-	-	-	54	25	30	5	4
Highway 70	4	0	38	65	0.5	88.0%	0.1%	**61.8**	-	-	-	71	25	30	5	4
Highway 65	4	0	38	65	0.5	88.0%	0.1%	**61.8**	-	-	-	71	25	30	5	4

Model Vehicle Mix only permitted to reach 88% truck, with 12% passenger auto. Passenger Auto Reference Energy Levels adjusted to equate to Medium Trucks to account for 100% truck fleet.

APPENDIX G

Water Quality Documentation

G1 Sediment Sampling Analytical Results (Blackburn Consulting, Inc. 2020)

G2 Summary of Sampling Results

G3 Water Quality Monitoring Plan for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

West Sacramento Office:
2491 Boatman Ave
West Sacramento, CA 95691
(916) 375-8706

BLACKBURN
CONSULTING

Auburn (530) 887-1494
Fresno (559) 438-8411

Blackburn File No. 3825.X
May 21, 2020

Mr. Chris Fritz
Peterson Brustad, Inc.
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: **SOIL SCREENING DATA REPORT**
Feather River Sediment Removal Project
Live Oak Boat Launch and Yuba City Boat Launch
Sutter County, California

Dear Mr. Fritz,

Blackburn Consulting (Blackburn) prepared this Soil Screening Data Report (Data Report) for the Feather River Sediment Removal Project (Project) in Sutter County, California. Blackburn prepared this Data Report in accordance with our proposal dated April 6, 2020. This Data Report is a preliminary assessment and intended for planning purposes. Additional sampling and testing are necessary to comply with US Army Corps of Engineers (USACE) standards and provide adequate data for design-level project documents. This Data Report contains Project Description, Soil Sample Collection and Test Results, and Conclusions.

PROJECT DESCRIPTION

Peterson Brustad, Inc. (PBI) requested Blackburn perform soil classification and environmental testing on accumulated sediment for proposed dredging activities at the Live Oak Boat Launch and the Yuba City Boat Launch in Sutter County, California (Figure 1). The USACE and other regulatory bodies require testing of water way sediments prior to dredging activities. PBI requested Blackburn "pre-profile" the proposed dredged material for general soil characteristics before a more rigorous sampling and testing plan is implemented prior to dredging activities.

SOIL SAMPLE COLLECTION AND TEST RESULTS

Sample Locations and Depths

Blackburn collected samples of the sediment soil for testing on May 5, 2020. Blackburn collected two samples from the Live Oak Boat Launch and three samples from the Yuba City Boat Launch at the approximate locations presented on Figure 2. We collected samples for environmental tests at

approximately 12" below the sediment surface. We collected samples for soil classification tests from the upper 12" of sediment.

Soil Sample Collection Methodology

Blackburn collected soil samples with a hand auger where the sediment surface was above the water elevation. We collected samples below the water surface at the Yuba City Boat Launch by hand-driving an open-ended, small-diameter PVC pipe into the sediment . Appendix C contains photos of the general sample locations.

Blackburn transferred the samples for environmental tests into laboratory-supplied 4-ounce glass jars. The sample jars were labeled and placed in a chilled cooler for transport to Sunstar Laboratories, a California certified analytical laboratory, under continuous chain-of-custody documentation. Blackburn cleaned the sampling equipment with an Alconox wash solution and a distilled water rinse between each sample. The samples were submitted to SunStar Laboratories of Lake Forest, California for the following tests:

- Total Petroleum Hydrocarbon (TPH) as gasoline/diesel/motor oil by EPA Method 8015.
- Semi Volatile Organics (SVOC) by EPA Method 8270C.
- Organochlorine Pesticides (OCP) by EPA Method 8081A.
- Cam-17 Metals by EPA Methods 6010B and 7471A (mercury).

We placed soil samples for classification tests in plastic bags and delivered them to our West Sacramento Laboratory for soil classification testing. We performed the following classification tests:

- 200 Wash in accordance with ASTM D1140.
- Particle Size Analysis in accordance with ASTM D6913.
- Atterberg Limits in accordance with ASTM D4318

Environmental Test Results

Reported detection levels and environmental test results are presented in Tables 1-4 and discussed below. Applicable screening levels from the US EPA Regional Screening Levels (RSLs) are included in the tables for comparison. Appendix A presents Sunstar's analytical test result report and chain-of-custody documentation.

Total Petroleum Hydrocarbons (TPHs), Table 1: TPH as Motor Oil (MORO) was detected in both samples at the Live Oak Boat Launch. Detected concentrations were below RSLs for residential land use. TPH as Gasoline (GRO) and Diesel (DRO) was not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Semi-Volatile Organic Compounds (SVOCs), Table 2: SVOCs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Organochlorine Pesticides (OCPs), Table 3: OCPs were not detected at concentrations equal to or greater than laboratory reporting limits in any of the samples tested.

Cam -17 Metals, Table 4: Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in the soil samples at concentrations below the RSLs for residential land use. All other metals were not detected at concentrations equal to or greater than laboratory reporting limits.

Soil Classification Test Results

We collected five soil samples of the sediment at the boat launch facilities for classification tests; two at the Live Oak Boat Launch and three at the Yuba City Boat Launch. Our test results are shown in the following tables.

Soil Classification Test Results - Gradation					
Sample ID	**Soil Classification**	**Sieve Opening Size – Percent Finer**			
		½ -Inch	**No. 4**	**No. 40**	**No. 200**
Live Oak-1 0-12”	Poorly-graded SAND with SILT (SP-SM)	100	100	98.0	10.6
Live Oak-2 0-12”	SILTY SAND (SM)	NA	NA	NA	44.7
Yuba City-1 0-12”	Poorly-graded SAND (SP)	100	99.8	26.5	0.4
Yuba City-2 0-12”	Poorly-graded SAND (SP)	100	96.0	29.7	0.1
Yuba City-3 0-12”	Poorly-graded SAND (SP)	100	100	27.6	0.1

Soil Classification Test Results – Atterberg Limits			
Sample ID	**Soil Classification USCS**	**Liquid Limit**	**Plasticity Index**
Live Oak-2 0-12”	SILTY SAND (SM)	33	1

Appendix B contains the soil classification laboratory test results.

CONCLUSIONS

This Data Report provides preliminary information about the accumulated sediment at the Yuba City and Live Oak boat launch facilities prior to the development and implementation of a more detailed sampling and testing program required before any dredging activities. The preliminary tests indicate that the sediment tested at both facilities meets EPA RSLs for unrestricted land use, however, additional testing is required to determine project-wide conditions and compliance with USACE standards.

Our classification tests indicate that the sediment samples tested from the Yuba City Boat Launch are all non-plastic poorly graded sand (SP). The sediment samples we tested from the Live Oak Boat Launch classify as non-plastic poorly-graded sand with silt (SP-SM) and silty sand (SM).

Thank you for including Blackburn on your project team. Please let us know if you have any questions or need more information.

Sincerely,

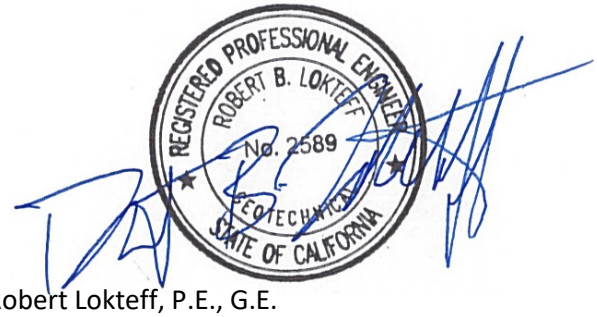
BLACKBURN CONSULTING

Prepared by:

Luke Morrell, E.I.T.
Environmental Engineer

Reviewed by:

Laura Long
Environmental Project Manager



Robert Lokteff, P.E., G.E.
Principal Geotechnical Engineer

Attachments:
Figure 1: Vicinity Map
Figures 2a-2b: Site Map
Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals
Appendix A: Sunstar Laboratory Reports
Appendix B: Soil Classification Laboratory Test Results
Appendix C: Photo Report

SOIL SCREENING DATA REPORT

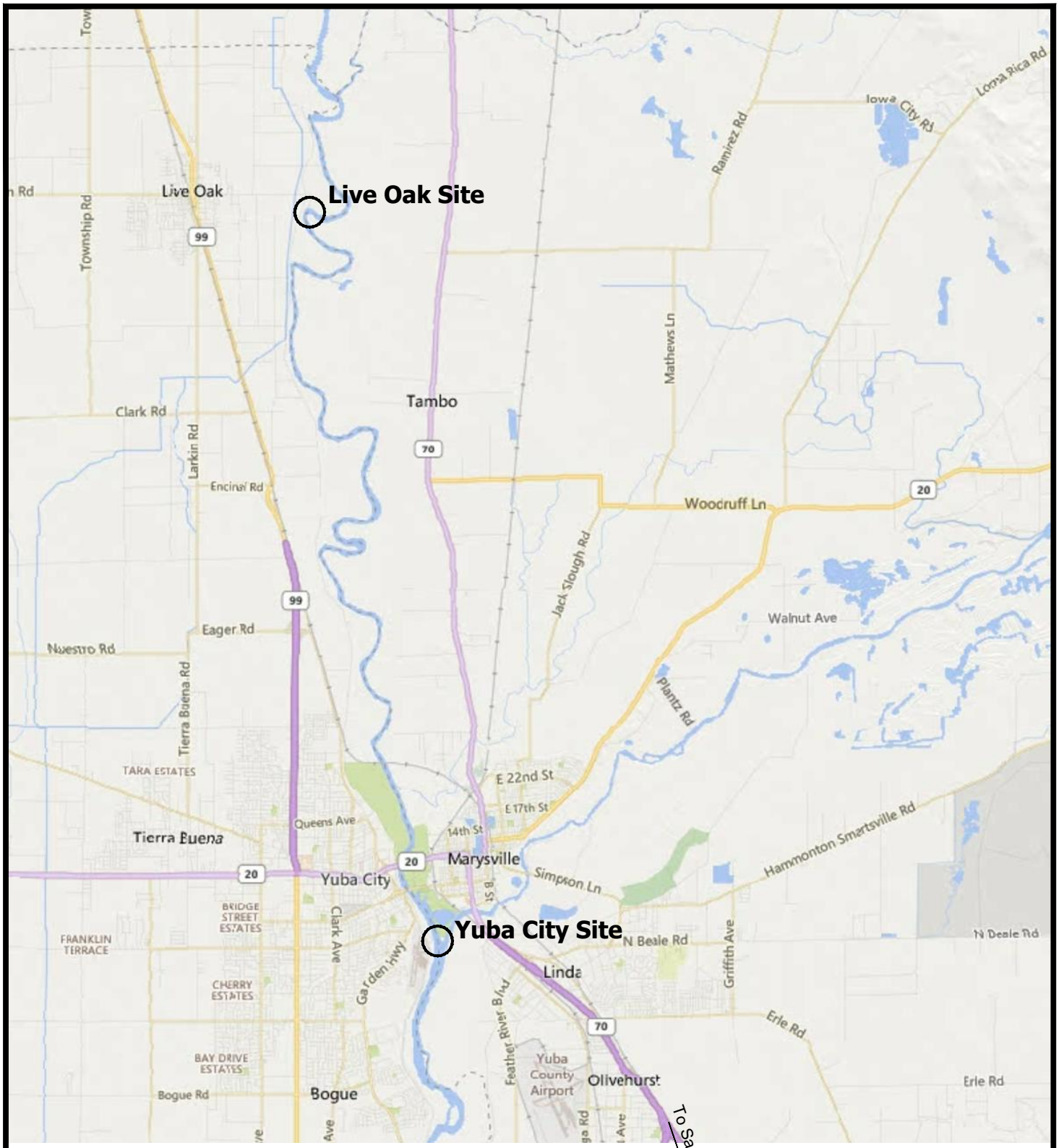
FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

FIGURES

Figure 1: Vicinity Map
Figures 2a-2b: Site Map



5/11/2020 3825.x Fig1 Feather River Sediment Removal.dwg

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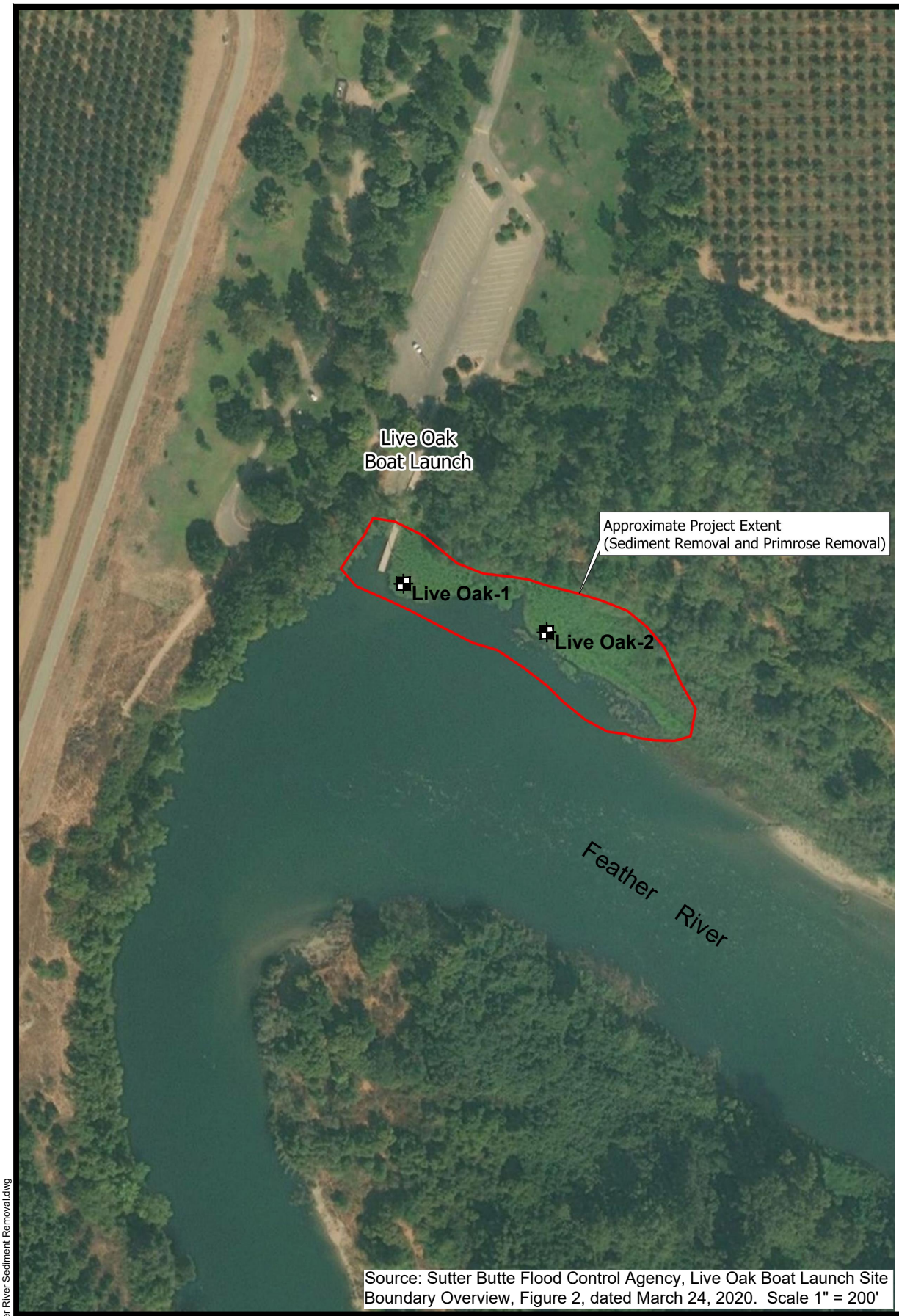
VICINITY MAP

Feather River Sediment Removal Project
Live Oak and Yuba City Boat Launches
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 1



Source: Sutter Butte Flood Control Agency, Live Oak Boat Launch Site Boundary Overview, Figure 2, dated March 24, 2020. Scale 1" = 200'

N

SCALE 1"= 200'

LEGEND

Approximate Sample Location

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

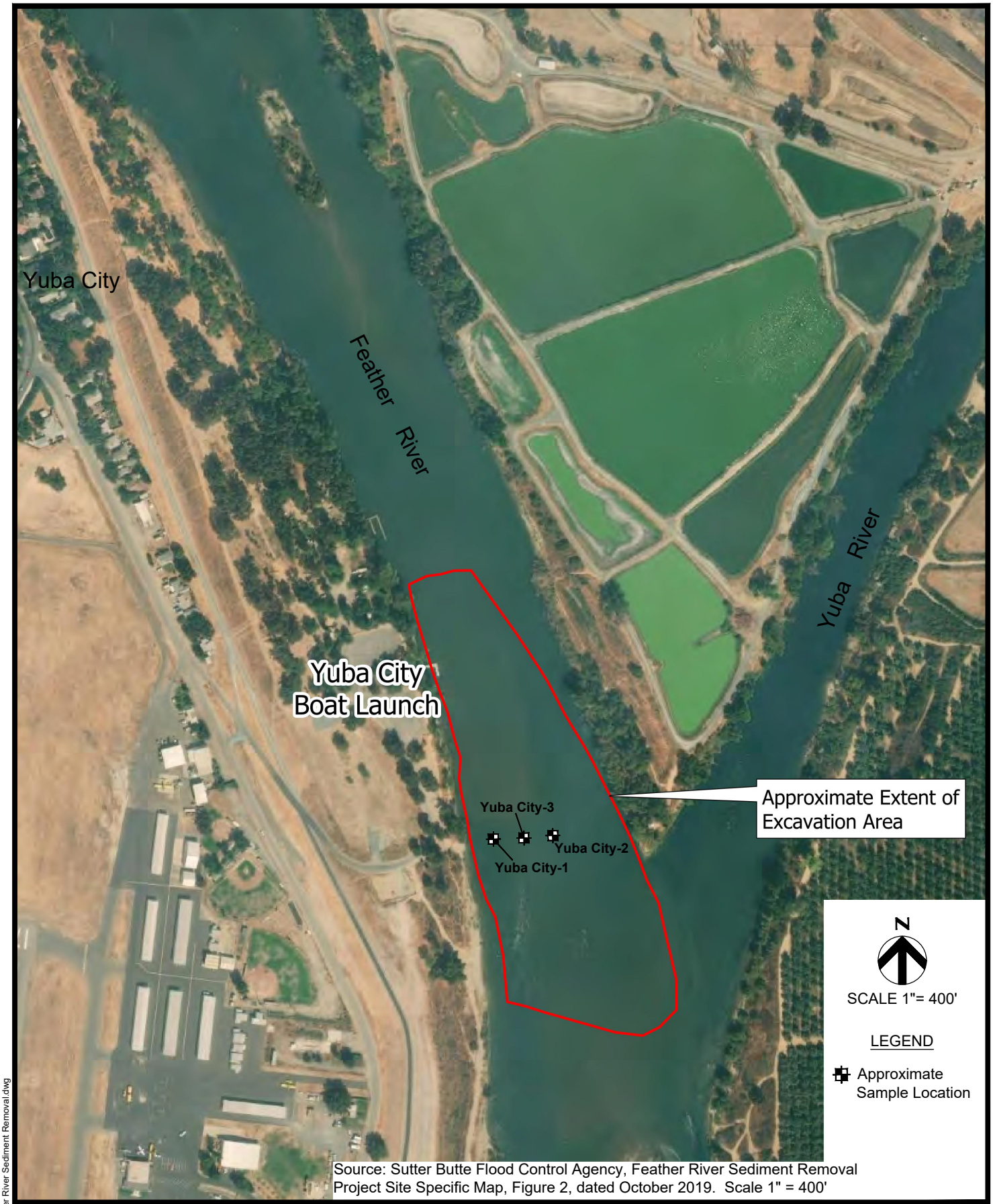
Live Oak Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2A

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg



Source: Sutter Butte Flood Control Agency, Feather River Sediment Removal Project Site Specific Map, Figure 2, dated October 2019. Scale 1" = 400'

BLACKBURN CONSULTING

APPROXIMATE SAMPLING LOCATIONS

Yuba City Boat Launch
Feather River Sediment Removal Project
Butte & Sutter Counties, California

File No. 3825.x

May 2020

Figure 2B

5/11/2020 3825.x Fig2 Feather River Sediment Removal.dwg

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

TABLES

Table 1: Summary of Laboratory Analysis Results — TPHs
Table 2: Summary of Laboratory Analysis Results — SVOCs
Table 3: Summary of Laboratory Analysis Results — OCPs
Table 4: Summary of Laboratory Analysis Results — Cam-17 Metals

West Sacramento Office:
2491 Boatman Ave., Sacramento, CA 95691
(916) 375-8706

BLACKBURN CONSULTING

Main Auburn Office: (530) 887-1494
Fresno Office: (559) 438-8411

Table 1 Extractable Petroleum Hydrocarbons (TPHs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS (mg/kg)

Sample Date	Sample ID:	TPH (Extractable Petroleum Hydrocarbons) (mg/kg)		
		EPA Method 8015B		
		Gasoline (C6-C12)	Diesel Fuel (C13-C28)	Motor Oil (C29-C40)
5/5/2020	Live Oak-1 12"	ND	ND	**22**
	Live Oak-2 12"	ND	ND	**17**
	Yuba City-1 12"	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND
Reporting Limit**		10	10	10
EPA RSLs	Residential	82	96	2,500

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2A Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	Aniline	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	1-Methylnaphthalene	3-Nitroaniline	4-Methylphenol	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	1.0	1.0	1.0	1.0	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	1.0	0.3	0.3	1.0	1.0	0.3	1.0	0.3	0.3
EPA RSLs	**Residential**	7.8	1,800	95	---	2.6	6,300	7.8	190	1,300	130	1.7	0.36	4,100	340	190	3,200	630	---	9.9	---	---	5.1	---	6,300	2.7	---

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2B Semi-Volatile Organic Compounds (SVOCs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																								
		EPA Method 8270C																								
		4-Nitroaniline	4-Nitrophenol	2,3,5,6-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Carbazole	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	N-Nitrosodiphenylamine	N-Nitrosodimethylamine	Nitrobenzene	Pentachlorophenol	Phenol
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	0.3	1.0	0.3	0.3	0.3	0.3	1.0	1.0	1.0
EPA RSLs	**Residential**	27	---	---	1,900	6,300	6,300	0.1	3,100	39	290		6,300	630	66	51,000	---	0.19	1.2	1.8	1.8	570	110	0.002	5.1	1.0	19,000

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 2C Semi-Volatile Organic Compounds (SVOCs) PAHs

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																	
		EPA Method 8270C																	
		Pyridine	Azobenzene	Acenaphthene	Acenaphthylene	Anthracene	Benzo[a] anthracene	Benzo[a] pyrene	Benzo[b] fluoranthene	Benzo (g,h,i) perylene	Benzo[k] fluor anthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno [1,2,3-cd] pyrene	Naphthalene	Phenanthrene	Pyrene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPA RSLs	**Residential**	5.8	5.6	3,300	---	17,000	1.1	0.11	1.1	---	11	110	0.028	2,400	2,300	1.1	2.0	---	1,800

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface
"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface
- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit
** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 3a Organochlorine Pesticides (OCPs)

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	Organochlorine Pesticides (OCPs) by EPA Method 8081A (mg/kg)																				
		4,4'-DDE	4,4'-DDT	4,4'-DDD	alpha-BHC	alpha-Chlordane	Aldrin	beta-BHC	Chlordane (Technical)	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin Ketone	gamma-BHC (Lindane)	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
5/5/2020	Live Oak-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Live Oak-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-1 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-2 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Yuba City-3 12"	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Limit**		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.020
EPA RSLs	Residential	1.9	2.0	1.9	0.039	0.086	0.44	0.3	0.44	---	0.034	470	470	---	19	---	---	0.57	0.44	0.13	0.07	320	0.49

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram

- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019

- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

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Table 4 Cam-17 Metals

TABULATED SOIL SAMPLE ANALYTICAL RESULTS

Sample Date	Sample ID:	CAM-17 Metals (mg/kg)																
		EPA Method 6010B																EPA Method 7471A
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
5/5/2020	Live Oak-1 12"	ND	ND	**39**	ND	ND	**23**	**8.6**	**14**	**3.5**	ND	**35**	ND	ND	ND	**27**	**21**	ND
	Live Oak-2 12"	ND	ND	**41**	ND	ND	**29**	**8.8**	**12**	ND	ND	**42**	ND	ND	ND	**27**	**22**	ND
	Yuba City-1 12"	ND	ND	**60**	ND	ND	**22**	**7.7**	**7.1**	ND	ND	**41**	ND	ND	ND	**20**	**18**	ND
	Yuba City-2 12"	ND	ND	**49**	ND	ND	**17**	**6.6**	**6.3**	ND	ND	**31**	ND	ND	ND	**19**	**15**	ND
	Yuba City-3 12"	ND	ND	**42**	ND	ND	**22**	**6.8**	**7.3**	ND	ND	**37**	ND	ND	ND	**21**	**17**	ND
Reporting Limit**		3.0	5.0	1.0	1.0	2.0	2.0	2.0	1.0	3.0	5.0	2.0	5.0	2.0	2.0	5.0	1.0	0.1
EPA RSLs	**Residential**	31	0.11	15,000	16	71	36,000	23	3,100	80	390	820	390	390	0.78	390	23,000	1

Notes

"Live Oak-1 12""- Live Oak Boat Launch, Sample 1, collected at twelve inches below ground surface

"Yuba City-1 12""- Yuba City Boat Launch, Sample 1, collected at twelve inches below ground surface

- mg/kg = milligrams per kilogram
- EPA RSLs: US Environmental Protection Agency, Regional Screening Levels, April 2019
- ND: not detected at or above method reporting limit

** Reporting Limit may vary depending upon analytical results, see full analytical results report

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX A

Sunstar Laboratory Reports

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

13 May 2020

Luke Morrell
Blackburn Consulting-West Sac.
2491 Boatman Ave.
West Sacramento, CA 95691

RE: Feather River Sediment Removal

Enclosed are the results of analyses for samples received by the laboratory on 05/06/20 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Mike Jaroudi
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
YubaCity-3 12"	T202211-01	Soil	05/05/20 09:10	05/06/20 09:40
YubaCity-2 12"	T202211-02	Soil	05/05/20 09:30	05/06/20 09:40
YubaCity-1 12"	T202211-03	Soil	05/05/20 09:50	05/06/20 09:40
LiveOAk-1 12"	T202211-04	Soil	05/05/20 11:25	05/06/20 09:40
LiveOAk-2 12"	T202211-05	Soil	05/05/20 12:00	05/06/20 09:40

SunStar Laboratories, Inc.



Mike Jaroudi, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

DETECTIONS SUMMARY

Sample ID: YubaCity-3 12" **Laboratory ID:** T202211-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**42**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.8**	2.0	mg/kg	EPA 6010b	
Copper	**7.3**	1.0	mg/kg	EPA 6010b	
Nickel	**37**	2.0	mg/kg	EPA 6010b	
Vanadium	**21**	5.0	mg/kg	EPA 6010b	
Zinc	**17**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-2 12" **Laboratory ID:** T202211-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**49**	1.0	mg/kg	EPA 6010b	
Chromium	**17**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.6**	2.0	mg/kg	EPA 6010b	
Copper	**6.3**	1.0	mg/kg	EPA 6010b	
Nickel	**31**	2.0	mg/kg	EPA 6010b	
Vanadium	**19**	5.0	mg/kg	EPA 6010b	
Zinc	**15**	1.0	mg/kg	EPA 6010b	

Sample ID: YubaCity-1 12" **Laboratory ID:** T202211-03

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**60**	1.0	mg/kg	EPA 6010b	
Chromium	**22**	2.0	mg/kg	EPA 6010b	
Cobalt	**7.7**	2.0	mg/kg	EPA 6010b	
Copper	**7.1**	1.0	mg/kg	EPA 6010b	
Nickel	**41**	2.0	mg/kg	EPA 6010b	
Vanadium	**20**	5.0	mg/kg	EPA 6010b	
Zinc	**18**	1.0	mg/kg	EPA 6010b	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Sample ID: LiveOAk-1 12" **Laboratory ID:** T202211-04

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**22**	10	mg/kg	EPA 8015B	
Barium	**39**	1.0	mg/kg	EPA 6010b	
Chromium	**23**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.6**	2.0	mg/kg	EPA 6010b	
Copper	**14**	1.0	mg/kg	EPA 6010b	
Lead	**3.5**	3.0	mg/kg	EPA 6010b	
Nickel	**35**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**21**	1.0	mg/kg	EPA 6010b	

Sample ID: LiveOAk-2 12" **Laboratory ID:** T202211-05

Analyte	Result	Reporting Limit	Units	Method	Notes
C29-C40 (MORO)	**17**	10	mg/kg	EPA 8015B	
Barium	**41**	1.0	mg/kg	EPA 6010b	
Chromium	**29**	2.0	mg/kg	EPA 6010b	
Cobalt	**8.8**	2.0	mg/kg	EPA 6010b	
Copper	**12**	1.0	mg/kg	EPA 6010b	
Nickel	**42**	2.0	mg/kg	EPA 6010b	
Vanadium	**27**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

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YubaCity-3 12"

T202211-01 (Soil)

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Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*91.7 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**42**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**22**	2.0	"	"	"	"	"	"	
Cobalt	**6.8**	2.0	"	"	"	"	"	"	
Copper	**7.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**37**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**21**	5.0	"	"	"	"	"	"	
Zinc	**17**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*108 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*108 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-3 12"

T202211-01 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*43.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*63.1 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*75.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*67.8 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*52.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*56.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*92.4 %*		*65-135*	"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**49**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	"	"	
Chromium	**17**	2.0	"	"	"	"	"	"	
Cobalt	**6.6**	2.0	"	"	"	"	"	"	
Copper	**6.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**31**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**19**	5.0	"	"	"	"	"	"	
Zinc	**15**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.9 %*		*35-140*	"	"	"	"	
Surrogate: Decachlorobiphenyl		*92.6 %*		*35-140*	"	"	"	"	

Semivolatile Organic Compounds by EPA Method 8270C

Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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YubaCity-2 12"

T202211-02 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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Mike Jaroudi, Project Manager

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-2 12"

T202211-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Semivolatile Organic Compounds by EPA Method 8270C									
Surrogate: 2-Fluorophenol	*66.2 %*		*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*72.6 %*		*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*95.5 %*		*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*79.5 %*		*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*73.3 %*		*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*85.5 %*		*29.1-130*		*"*	*"*	*"*	*"*	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*96.2 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	05/08/20	"	
Arsenic	ND	5.0	"	"	"	"	05/08/20	"	
Barium	**60**	1.0	"	"	"	"	05/08/20	"	
Beryllium	ND	1.0	"	"	"	"	"	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**22**	2.0	"	"	"	"	05/08/20	"	
Cobalt	**7.7**	2.0	"	"	"	"	05/08/20	"	
Copper	**7.1**	1.0	"	"	"	"	05/08/20	"	
Lead	ND	3.0	"	"	"	"	05/08/20	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**41**	2.0	"	"	"	"	05/08/20	"	
Selenium	ND	5.0	"	"	"	"	05/08/20	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**20**	5.0	"	"	"	"	05/08/20	"	
Zinc	**18**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*96.8 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*94.0 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

YubaCity-1 12"

T202211-03 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*46.6 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*71.2 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*65.0 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*97.3 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.4 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*66.8 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**22**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.1 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**39**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**23**	2.0	"	"	"	"	"	"	
Cobalt	**8.6**	2.0	"	"	"	"	"	"	
Copper	**14**	1.0	"	"	"	"	"	"	
Lead	**3.5**	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**35**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**21**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*98.4 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*99.4 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-1 12"

T202211-04 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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T202211-04 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-1 12"

T202211-04 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*66.1 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*68.5 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*47.8 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*70.7 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*75.9 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*73.7 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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LiveOAk-2 12"

T202211-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SunStar Laboratories, Inc.									
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	0050726	05/07/20	05/07/20	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	**17**	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*95.2 %*		*65-135*	"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	0050634	05/06/20	05/08/20	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**41**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/08/20	"	
Cadmium	ND	2.0	"	"	"	"	05/08/20	"	
Chromium	**29**	2.0	"	"	"	"	"	"	
Cobalt	**8.8**	2.0	"	"	"	"	"	"	
Copper	**12**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**42**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**27**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	0050633	05/06/20	05/11/20	EPA 7471A Soil	

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organochlorine Pesticides by EPA Method 8081A									
alpha-BHC	ND	5.0	ug/kg	1	0050637	05/08/20	05/11/20	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4´-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4´-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4´-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	5.0	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	20	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		*93.5 %*	*35-140*		"	"	"	"	
Surrogate: Decachlorobiphenyl		*93.7 %*	*35-140*		"	"	"	"	
Semivolatile Organic Compounds by EPA Method 8270C									
Carbazole	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
Phenol	ND	1000	"	"	"	"	"	"	
Aniline	ND	300	"	"	"	"	"	"	
2-Chlorophenol	ND	1000	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	300	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	300	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	300	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
4-Chloro-3-methylphenol	ND	1000	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2-Methylnaphthalene	ND	300	"	"	"	"	"	"	
1-Methylnaphthalene	ND	300	"	"	"	"	"	"	
Acenaphthene	ND	300	"	"	"	"	"	"	
4-Nitrophenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrotoluene	ND	300	"	"	"	"	"	"	
Pentachlorophenol	ND	1000	"	"	"	"	"	"	
Pyrene	ND	300	"	"	"	"	"	"	
Acenaphthylene	ND	300	"	"	"	"	"	"	
Anthracene	ND	300	"	"	"	"	"	"	
Benzo (a) anthracene	ND	300	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	300	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	1000	"	"	"	"	"	"	
Benzo (a) pyrene	ND	300	"	"	"	"	"	"	
Benzyl alcohol	ND	300	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	300	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	300	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	300	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	300	"	"	"	"	"	"	
4-Chloroaniline	ND	300	"	"	"	"	"	"	
2-Chloronaphthalene	ND	300	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	300	"	"	"	"	"	"	
Chrysene	ND	300	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	300	"	"	"	"	"	"	
Dibenzofuran	ND	300	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	300	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	300	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	300	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

SunStar Laboratories, Inc.

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Diethyl phthalate	ND	300	ug/kg	1	0050636	05/06/20	05/11/20	EPA 8270C	
2,4-Dimethylphenol	ND	1000	"	"	"	"	"	"	
Dimethyl phthalate	ND	300	"	"	"	"	"	"	
4,6-Dinitro-2-methylphenol	ND	1000	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	1000	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	1000	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	300	"	"	"	"	"	"	
Fluoranthene	ND	300	"	"	"	"	"	"	
Fluorene	ND	300	"	"	"	"	"	"	
Hexachlorobenzene	ND	1500	"	"	"	"	"	"	
Hexachlorobutadiene	ND	300	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	1000	"	"	"	"	"	"	
Hexachloroethane	ND	300	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	300	"	"	"	"	"	"	
Isophorone	ND	300	"	"	"	"	"	"	
2-Methylphenol	ND	1000	"	"	"	"	"	"	
4-Methylphenol	ND	1000	"	"	"	"	"	"	
Naphthalene	ND	300	"	"	"	"	"	"	
2-Nitroaniline	ND	300	"	"	"	"	"	"	
3-Nitroaniline	ND	300	"	"	"	"	"	"	
4-Nitroaniline	ND	300	"	"	"	"	"	"	
Nitrobenzene	ND	1000	"	"	"	"	"	"	
2-Nitrophenol	ND	1000	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	300	"	"	"	"	"	"	
N-Nitrosodiphenylamine	ND	300	"	"	"	"	"	"	
2,3,5,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
2,3,4,6-Tetrachlorophenol	ND	300	"	"	"	"	"	"	
Phenanthrene	ND	300	"	"	"	"	"	"	
Azobenzene	ND	300	"	"	"	"	"	"	
Pyridine	ND	300	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	1000	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	1000	"	"	"	"	"	"	

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LiveOAk-2 12"

T202211-05 (Soil)

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Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Fluorophenol	*50.0 %*	*15-121*		*0050636*	*05/06/20*	*05/11/20*	*EPA 8270C*	
Surrogate: Phenol-d6	*77.4 %*	*24-113*		*"*	*"*	*"*	*"*	
Surrogate: Nitrobenzene-d5	*66.2 %*	*21.3-119*		*"*	*"*	*"*	*"*	
Surrogate: 2-Fluorobiphenyl	*82.9 %*	*32.4-102*		*"*	*"*	*"*	*"*	
Surrogate: 2,4,6-Tribromophenol	*79.7 %*	*18.1-105*		*"*	*"*	*"*	*"*	
Surrogate: Terphenyl-dl4	*74.0 %*	*29.1-130*		*"*	*"*	*"*	*"*	

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050726 - EPA 3550B GC										
Blank (0050726-BLK1)				Prepared & Analyzed: 05/07/20						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*96.7*		*"*	*99.0*		*97.6*	*65-135*			
LCS (0050726-BS1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	470	10	mg/kg	495		94.5	75-125			
Surrogate: p-Terphenyl	*100*		*"*	*99.0*		*101*	*65-135*			
LCS Dup (0050726-BSD1)				Prepared & Analyzed: 05/07/20						
C13-C28 (DRO)	460	10	mg/kg	495		92.2	75-125	2.38	20	
Surrogate: p-Terphenyl	*101*		*"*	*99.0*		*102*	*65-135*			

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Blackburn Consulting-West Sac.	Project: Feather River Sediment Removal	
2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Blank (0050634-BLK1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							J
LCS (0050634-BS1)				Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	94.3	5.0	mg/kg	100		94.3	75-125			
Barium	96.9	1.0	"	100		96.9	75-125			
Cadmium	96.8	2.0	"	100		96.8	75-125			
Chromium	97.5	2.0	"	100		97.5	75-125			
Lead	95.1	3.0	"	100		95.1	75-125			
Matrix Spike (0050634-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	58.6	5.0	mg/kg	91.7	2.00	61.7	75-125			QM-05
Barium	155	1.0	"	91.7	89.9	70.7	75-125			QM-05
Cadmium	59.5	2.0	"	91.7	ND	64.8	75-125			QM-05
Chromium	66.9	2.0	"	91.7	7.52	64.7	75-125			QM-05
Lead	55.2	3.0	"	91.7	1.55	58.4	75-125			QM-05

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050634 - EPA 3050B										
Matrix Spike Dup (0050634-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/08/20						
Arsenic	62.6	5.0	mg/kg	100	2.00	60.6	75-125	6.61	20	QM-05
Barium	171	1.0	"	100	89.9	81.2	75-125	10.0	20	QM-05
Cadmium	61.3	2.0	"	100	ND	61.3	75-125	2.98	20	QM-05
Chromium	70.5	2.0	"	100	7.52	63.0	75-125	5.17	20	QM-05
Lead	60.7	3.0	"	100	1.55	59.1	75-125	9.51	20	QM-05

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050633 - EPA 7471A Soil										
Blank (0050633-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	ND	0.10	mg/kg							
LCS (0050633-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.378	0.10	mg/kg	0.391		96.7	80-120			
Matrix Spike (0050633-MS1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.415	0.10	mg/kg	0.417	ND	99.6	75-125			
Matrix Spike Dup (0050633-MSD1)	**Source: T202201-01**			Prepared: 05/06/20 Analyzed: 05/11/20						
Mercury	0.431	0.10	mg/kg	0.417	ND	104	75-125	3.89	20	

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
Blank (0050637-BLK1)				Prepared: 05/08/20 Analyzed: 05/11/20						
alpha-BHC	ND	5.0	ug/kg							
gamma-BHC (Lindane)	ND	5.0	"							
beta-BHC	ND	5.0	"							
delta-BHC	ND	5.0	"							
Heptachlor	ND	5.0	"							
Aldrin	ND	5.0	"							
Heptachlor epoxide	ND	5.0	"							
gamma-Chlordane	ND	5.0	"							
alpha-Chlordane	ND	5.0	"							
Endosulfan I	ND	5.0	"							
4,4´-DDE	ND	5.0	"							
Dieldrin	ND	5.0	"							
Endrin	ND	5.0	"							
4,4´-DDD	ND	5.0	"							
Endosulfan II	ND	5.0	"							
4,4´-DDT	ND	5.0	"							
Endrin aldehyde	ND	5.0	"							
Endosulfan sulfate	ND	5.0	"							
Methoxychlor	ND	5.0	"							
Endrin ketone	ND	5.0	"							
Toxaphene	ND	20	"							
Surrogate: Tetrachloro-meta-xylene	*9.37*		*"*	*10.0*		*93.7*	*35-140*			
Surrogate: Decachlorobiphenyl	*8.97*		*"*	*10.0*		*89.7*	*35-140*			
LCS (0050637-BS1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	37.9	5.0	ug/kg	40.0		94.8	40-120			
Heptachlor	39.7	5.0	"	40.0		99.2	40-120			
Aldrin	28.7	5.0	"	40.0		71.8	40-120			
Dieldrin	39.2	5.0	"	40.0		98.0	40-120			
Endrin	38.4	5.0	"	40.0		95.9	40-120			
4,4´-DDT	37.8	5.0	"	40.0		94.6	33-147			
Surrogate: Tetrachloro-meta-xylene	*9.65*		*"*	*10.0*		*96.5*	*35-140*			
Surrogate: Decachlorobiphenyl	*9.30*		*"*	*10.0*		*93.0*	*35-140*			

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Organochlorine Pesticides by EPA Method 8081A - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050637 - EPA 3550 ECD/GCMS										
LCS Dup (0050637-BSD1)				Prepared: 05/08/20 Analyzed: 05/11/20						
gamma-BHC (Lindane)	44.0	5.0	ug/kg	40.0		110	40-120	14.9	30	
Heptachlor	46.6	5.0	"	40.0		117	40-120	16.1	30	
Aldrin	33.8	5.0	"	40.0		84.4	40-120	16.2	30	
Dieldrin	45.5	5.0	"	40.0		114	40-120	14.8	30	
Endrin	45.0	5.0	"	40.0		113	40-120	16.0	30	
4,4´-DDT	40.6	5.0	"	40.0		102	33-147	7.11	30	
Surrogate: Tetrachloro-meta-xylene	*11.1*		*"*	*10.0*		*111*	*35-140*			
Surrogate: Decachlorobiphenyl	*10.4*		*"*	*10.0*		*104*	*35-140*			

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Carbazole	ND	300	ug/kg							
Aniline	ND	300	"							
Phenol	ND	1000	"							
2-Chlorophenol	ND	1000	"							
1,4-Dichlorobenzene	ND	300	"							
N-Nitrosodi-n-propylamine	ND	300	"							
1,2,4-Trichlorobenzene	ND	300	"							
4-Chloro-3-methylphenol	ND	1000	"							
2-Methylnaphthalene	ND	300	"							
1-Methylnaphthalene	ND	300	"							
Acenaphthene	ND	300	"							
4-Nitrophenol	ND	1000	"							
2,4-Dinitrotoluene	ND	300	"							
Pentachlorophenol	ND	1000	"							
Pyrene	ND	300	"							
Acenaphthylene	ND	300	"							
Anthracene	ND	300	"							
Benzo (a) anthracene	ND	300	"							
Benzo (b) fluoranthene	ND	300	"							
Benzo (k) fluoranthene	ND	300	"							
Benzo (g,h,i) perylene	ND	1000	"							
Benzo (a) pyrene	ND	300	"							
Benzyl alcohol	ND	300	"							
Bis(2-chloroethoxy)methane	ND	300	"							
Bis(2-chloroethyl)ether	ND	300	"							
Bis(2-chloroisopropyl)ether	ND	300	"							
Bis(2-ethylhexyl)phthalate	ND	300	"							
4-Bromophenyl phenyl ether	ND	300	"							
Butyl benzyl phthalate	ND	300	"							
4-Chloroaniline	ND	300	"							
2-Chloronaphthalene	ND	300	"							
4-Chlorophenyl phenyl ether	ND	300	"							
Chrysene	ND	300	"							
Dibenz (a,h) anthracene	ND	300	"							
Dibenzofuran	ND	300	"							
Di-n-butyl phthalate	ND	300	"							

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
1,2-Dichlorobenzene	ND	300	ug/kg							
1,3-Dichlorobenzene	ND	300	"							
2,4-Dichlorophenol	ND	1000	"							
Diethyl phthalate	ND	300	"							
2,4-Dimethylphenol	ND	1000	"							
Dimethyl phthalate	ND	300	"							
4,6-Dinitro-2-methylphenol	ND	1000	"							
2,4-Dinitrophenol	ND	1000	"							
2,6-Dinitrotoluene	ND	1000	"							
Di-n-octyl phthalate	ND	300	"							
Fluoranthene	ND	300	"							
Fluorene	ND	300	"							
Hexachlorobenzene	ND	1500	"							
Hexachlorobutadiene	ND	300	"							
Hexachlorocyclopentadiene	ND	1000	"							
Hexachloroethane	ND	300	"							
Indeno (1,2,3-cd) pyrene	ND	300	"							
Isophorone	ND	300	"							
2-Methylphenol	ND	1000	"							
4-Methylphenol	ND	1000	"							
Naphthalene	ND	300	"							
2-Nitroaniline	ND	300	"							
3-Nitroaniline	ND	300	"							
4-Nitroaniline	ND	300	"							
Nitrobenzene	ND	1000	"							
2-Nitrophenol	ND	1000	"							
N-Nitrosodimethylamine	ND	300	"							
N-Nitrosodiphenylamine	ND	300	"							
2,3,5,6-Tetrachlorophenol	ND	300	"							
2,3,4,6-Tetrachlorophenol	ND	300	"							
Phenanthrene	ND	300	"							
Azobenzene	ND	300	"							
2,4,5-Trichlorophenol	ND	1000	"							
Pyridine	ND	300	"							
2,4,6-Trichlorophenol	ND	1000	"							

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
Blank (0050636-BLK1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: 2-Fluorophenol	*1610*		*ug/kg*	*3260*		*49.6*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3260*		*63.6*	*24-113*			
Surrogate: Nitrobenzene-d5	*2580*		*"*	*3260*		*79.3*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*2230*		*"*	*3260*		*68.3*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2310*		*"*	*3260*		*71.0*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2670*		*"*	*3260*		*82.0*	*29.1-130*			
LCS (0050636-BS1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2170	1000	ug/kg	3320		65.3	34-114			
2-Chlorophenol	2120	1000	"	3320		63.9	34-114			
1,4-Dichlorobenzene	2070	300	"	3320		62.4	34-114			
N-Nitrosodi-n-propylamine	1990	300	"	3320		59.8	30-110			
1,2,4-Trichlorobenzene	2260	300	"	3320		67.9	39-119			
4-Chloro-3-methylphenol	2600	1000	"	3320		78.3	50-130			
Acenaphthene	2350	300	"	3320		70.7	34-114			
Pentachlorophenol	3090	1000	"	3320		93.0	50-130			
Pyrene	1840	300	"	3320		55.5	33.7-123			
Surrogate: 2-Fluorophenol	*1680*		*"*	*3320*		*50.5*	*15-121*			
Surrogate: Phenol-d6	*2140*		*"*	*3320*		*64.3*	*24-113*			
Surrogate: Nitrobenzene-d5	*2050*		*"*	*3320*		*61.6*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1750*		*"*	*3320*		*52.5*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*2620*		*"*	*3320*		*78.9*	*18.1-105*			
Surrogate: Terphenyl-dl4	*2800*		*"*	*3320*		*84.2*	*29.1-130*			
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Phenol	2110	1000	ug/kg	3250		65.0	34-114	2.73	42	
2-Chlorophenol	2200	1000	"	3250		67.7	34-114	3.47	40	
1,4-Dichlorobenzene	2060	300	"	3250		63.6	34-114	0.489	28	
N-Nitrosodi-n-propylamine	2350	300	"	3250		72.3	30-110	16.7	38	
1,2,4-Trichlorobenzene	2220	300	"	3250		68.4	39-119	1.62	28	
4-Chloro-3-methylphenol	2620	1000	"	3250		80.6	50-130	0.633	42	
Acenaphthene	2450	300	"	3250		75.4	34-114	4.04	31	
Pentachlorophenol	3180	1000	"	3250		98.0	50-130	2.86	50	
Pyrene	1830	300	"	3250		56.4	33.7-123	0.762	31	
Surrogate: 2-Fluorophenol	*1840*		*"*	*3250*		*56.8*	*15-121*			
Surrogate: Phenol-d6	*2070*		*"*	*3250*		*63.6*	*24-113*			

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2491 Boatman Ave.	Project Number: 3825.x	**Reported:**
West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0050636 - EPA 3550 ECD/GCMS										
LCS Dup (0050636-BSD1)				Prepared: 05/06/20 Analyzed: 05/11/20						
Surrogate: Nitrobenzene-d5	*2630*		*ug/kg*	*3250*		*81.2*	*21.3-119*			
Surrogate: 2-Fluorobiphenyl	*1940*		*"*	*3250*		*59.6*	*32.4-102*			
Surrogate: 2,4,6-Tribromophenol	*3510*		*"*	*3250*		*108*	*18.1-105*			*S-GC*
Surrogate: Terphenyl-dl4	*2760*		*"*	*3250*		*84.9*	*29.1-130*			

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West Sacramento CA, 95691	Project Manager: Luke Morrell	05/13/20 16:46

Notes and Definitions

S-GC	Surrogate recovery outside of established control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
J	Detected but below the Standard Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Chain of Custody Record

Client: Blackburn Consulting
Address: 2491 Boatman Ave West Sac, CA
Phone: 916-375-8706 Fax:
Project Manager: Luke Morrell / Laura Lony

Date: 5/5/20 Page: 1 Of 1
Project Name: Feather River Sediment Removal
Collector: LDM Client Project #: 3825.X
Batch #: T202211 EDF #:

Laboratory ID #	Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270 SVOCs	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals Cam 17	6020 ICP-MS Metals	7471A Mercury	8081 OCPs		Comments/Preservative	Total # of containers
01	Yuba City-3 12"	5/5/20	9:10	Jar	50:1				X				X	X		X	X			1
02	Yuba City-2 12"		9:30						X				X	X		X	X			1
03	Yuba City-1 12"		9:50						X				X	X		X	X			1
04	Live Oak-1 12"		11:25						X				X	X		X	X			1
05	Live Oak-2 12"		12:00						X				X	X		X	X			1

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
[signature]	5/5/20 1315	Ed Stevens	5/5/20 1315
GLS	5/6/20 9:40	[signature]	5/6/20 9:40

Total # of containers: 5
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold: 3.4

Turn around time: STD

Notes

Sample disposal Instructions: Disposal @ $2.00 each ___ Return to client ___ Pickup ___

COC 18142

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T202211

Client Name: BLACKBURN Project: FEATHER RIVER SEDIMENT

Delivered by: ☐ Client ☐ SunStar Courier ☒ GSO ☐ FedEx ☐ Other

If Courier, Received by: _____ Date/Time Courier Received: _____

Lab Received by: BRIAN Date/Time Lab Received: 5/6/20 940

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due : 6/27/20

Temperature: Cooler #1	2.2 °C +/- the CF (+ 1.2°C) =	3.4	°C corrected temperature
Temperature: Cooler #2	°C +/- the CF (+ 1.2°C) =		°C corrected temperature
Temperature: Cooler #3	°C +/- the CF (+ 1.2°C) =		°C corrected temperature
Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☒ **Yes**	☐ **No**
If NO:			
Samples received on ice?	☐ Yes	☐ **No → Complete Non-Conformance Sheet**	
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ **No → Complete Non-Conformance Sheet**	

Custody seals intact on cooler/sample	☒ Yes	☐ No*	☐ N/A
Sample containers intact	☒ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☒ Yes	☐ No*	
Total number of containers received match COC	☒ Yes	☐ No*	
Proper containers received for analyses requested on COC	☒ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☒ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: BC 5/6/20

Comments:

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202211

Client:	**Blackburn Consulting-West Sac.**	**Project Manager:**	**Mike Jaroudi**
Project:	**Feather River Sediment Removal**	**Project Number:**	**3825.x**

Report To:
Blackburn Consulting-West Sac.
Luke Morrell
2491 Boatman Ave.
West Sacramento, CA 95691

Date Due:	05/13/20 17:00 (5 day TAT)		
Received By:	Brian Charon	Date Received:	05/06/20 09:40
Logged In By:	Brian Charon	Date Logged In:	05/06/20 09:58

Samples Received at: **3.4°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirı	No		

Analysis	Due	TAT	Expires	Comments
T202211-01 YubaCity-3 12'' [Soil] Sampled 05/05/20 09:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:10	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:10	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:10	
8270C	05/13/20 15:00	5	05/19/20 09:10	
T202211-02 YubaCity-2 12'' [Soil] Sampled 05/05/20 09:30 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:30	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:30	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:30	
8270C	05/13/20 15:00	5	05/19/20 09:30	
T202211-03 YubaCity-1 12'' [Soil] Sampled 05/05/20 09:50 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 09:50	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 09:50	
8081 Pesticides	05/13/20 15:00	5	05/19/20 09:50	
8270C	05/13/20 15:00	5	05/19/20 09:50	

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T202211

Client: **Blackburn Consulting-West Sac.** **Project Manager:** **Mike Jaroudi**

Project: **Feather River Sediment Removal** **Project Number:** **3825.x**

Analysis	Due	TAT	Expires	Comments
T202211-04 LiveOAk-1 12'' [Soil] Sampled 05/05/20 11:25 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 11:25	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 11:25	
8081 Pesticides	05/13/20 15:00	5	05/19/20 11:25	
8270C	05/13/20 15:00	5	05/19/20 11:25	
T202211-05 LiveOAk-2 12'' [Soil] Sampled 05/05/20 12:00 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/13/20 15:00	5	11/01/20 12:00	
8015 Carbon Chain	05/13/20 15:00	5	05/19/20 12:00	
8081 Pesticides	05/13/20 15:00	5	05/19/20 12:00	
8270C	05/13/20 15:00	5	05/19/20 12:00	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By Date

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

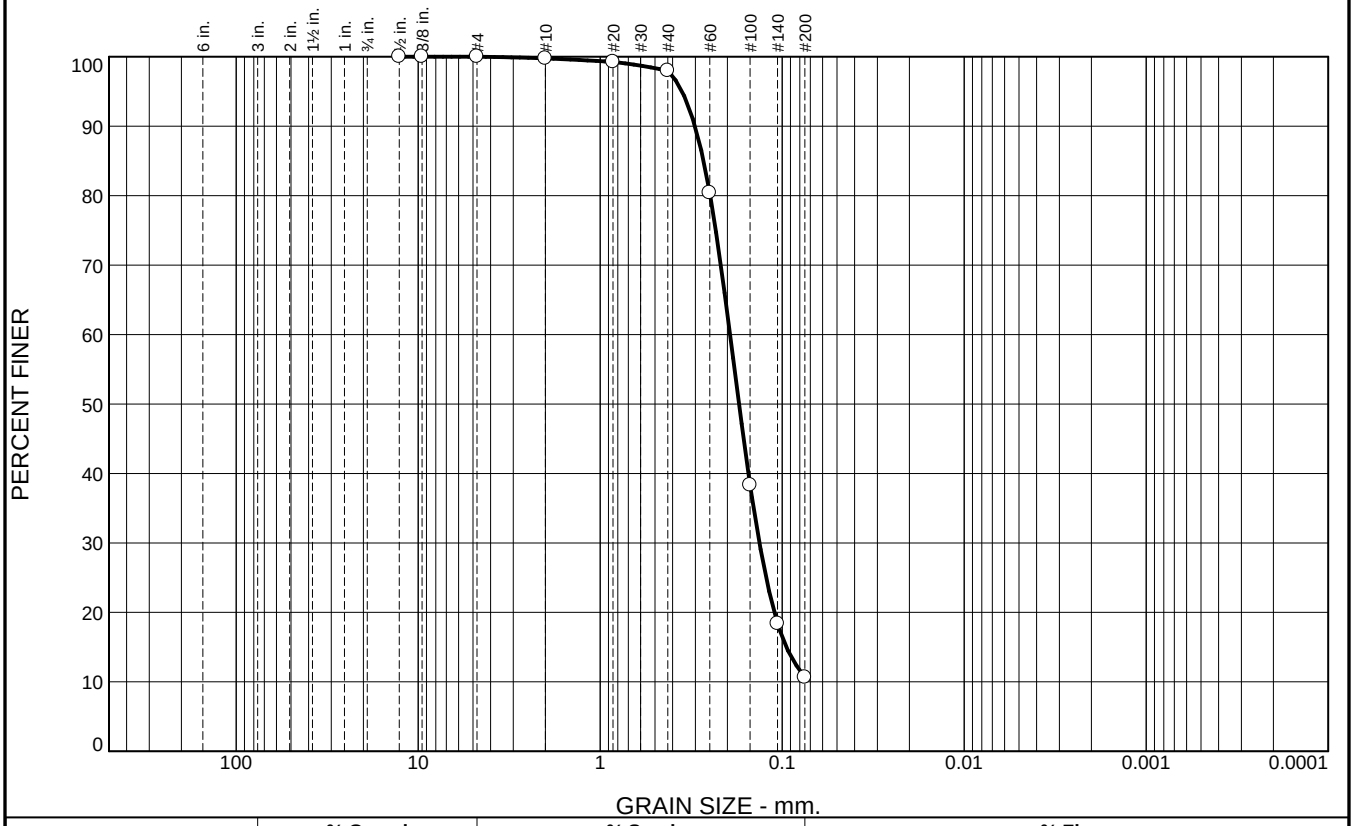
Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX B

Soil Classification Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	87.4	10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	98.0		
#60	80.4		
#100	38.3		
#140	18.4		
#200	10.6		

* (no specification provided)

Material Description

Poorly-graded SAND with SILT, mottled dark gray & brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3013 D_{85}= 0.2703 D_{60}= 0.1933
D_{50}= 0.1726 D_{30}= 0.1334 D_{15}= 0.0949
D_{10}= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 1 **Date:**

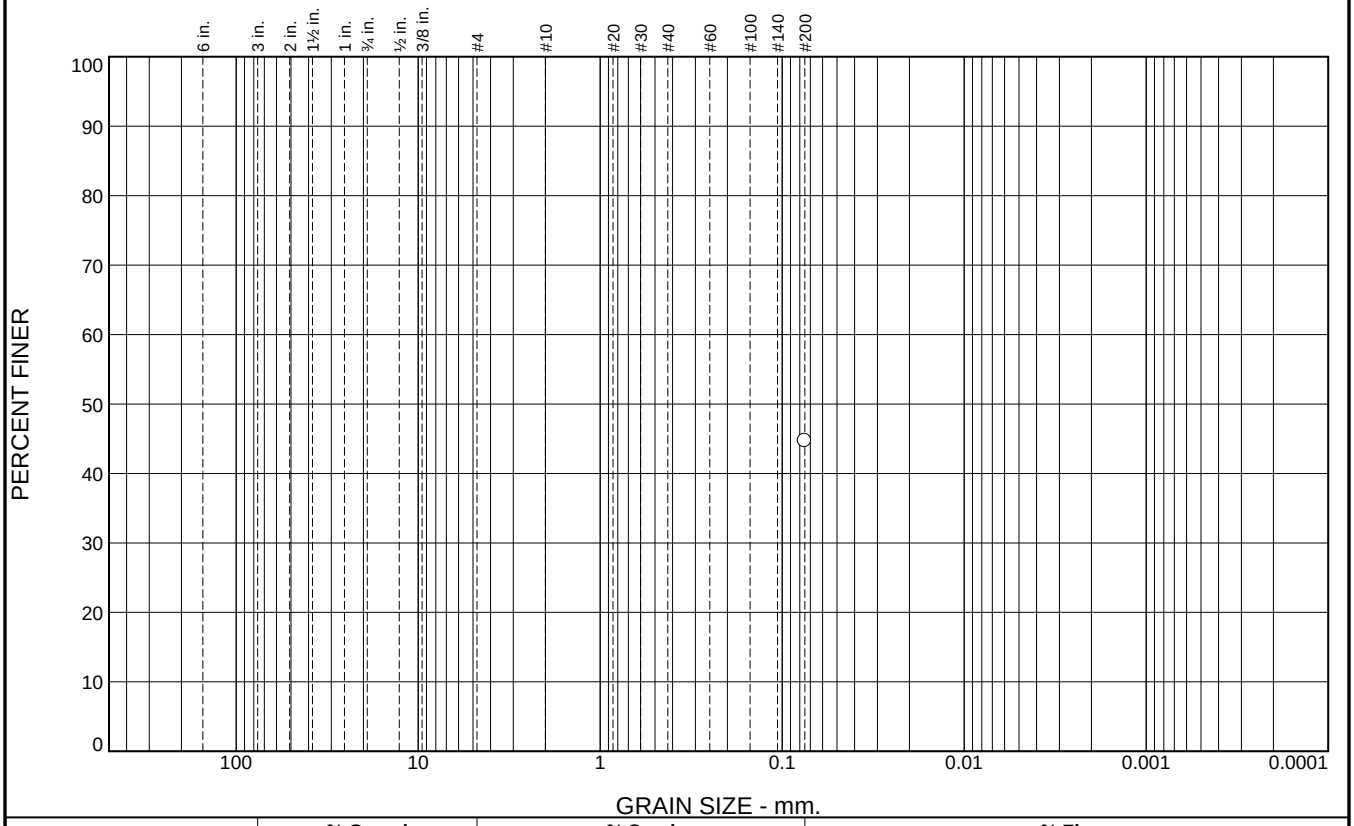
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						44.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	44.7		

* (no specification provided)

Material Description

SILTY SAND, dark brown

Atterberg Limits

PL= 32 LL= 33 PI= 1

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Source of Sample: Live Oak **Depth:** 0-12"
Sample Number: 2 **Date:**

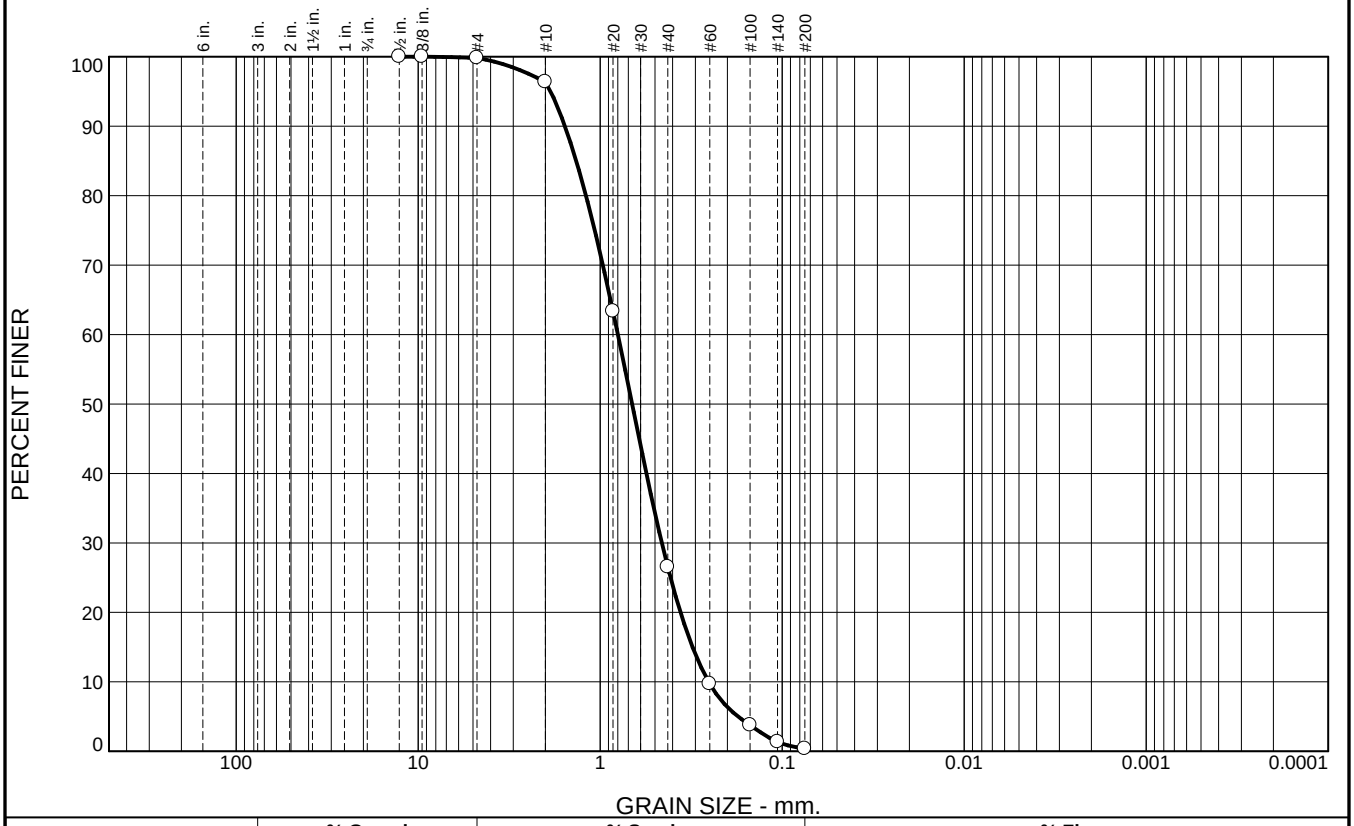
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	3.4	69.9	26.1	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#10	96.4		
#20	63.4		
#40	26.5		
#60	9.7		
#100	3.8		
#140	1.4		
#200	0.4		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.5612 D_{85}= 1.3540 D_{60}= 0.7989
D_{50}= 0.6674 D_{30}= 0.4582 D_{15}= 0.3108
D_{10}= 0.2537 C_u= 3.15 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 1 **Date:**

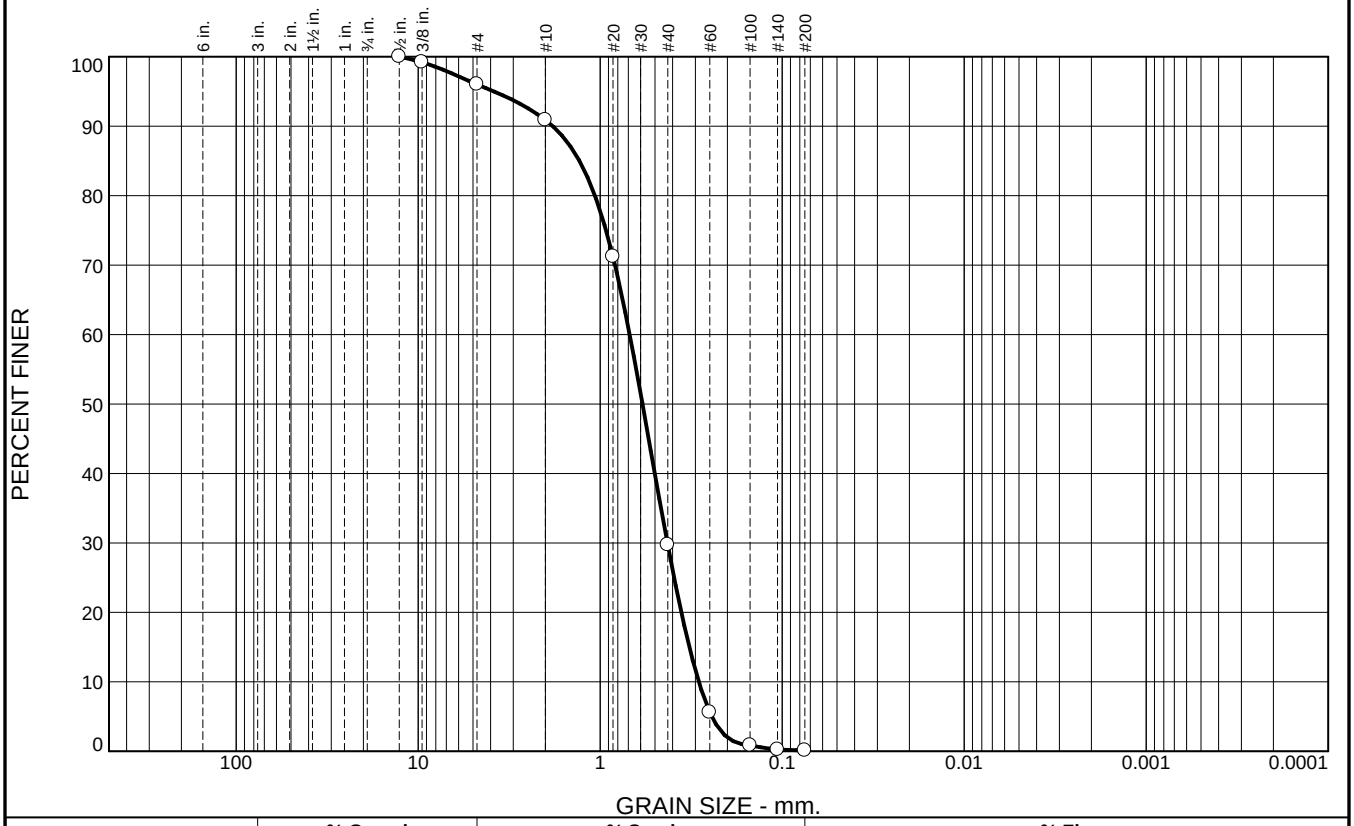
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.0	5.1	61.2	29.6	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.2		
#4	96.0		
#10	90.9		
#20	71.2		
#40	29.7		
#60	5.6		
#100	0.8		
#140	0.2		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.8245 D_{85}= 1.3002 D_{60}= 0.6885
D_{50}= 0.5854 D_{30}= 0.4270 D_{15}= 0.3235
D_{10}= 0.2871 C_u= 2.40 C_c= 0.92

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 2 **Date:**

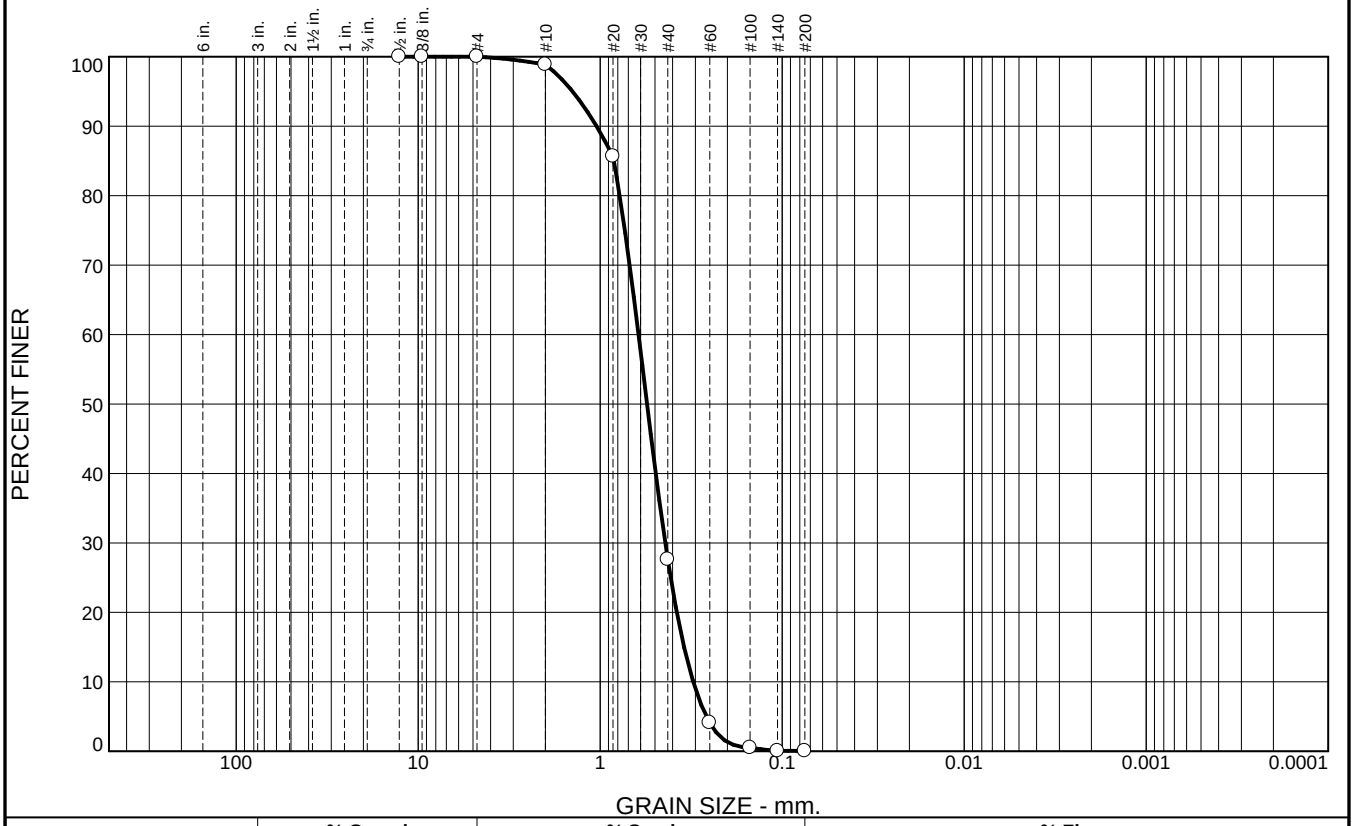
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	71.3	27.5	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#10	98.9		
#20	85.7		
#40	27.6		
#60	4.1		
#100	0.5		
#140	0.1		
#200	0.1		

* (no specification provided)

Material Description

Poorly-graded SAND, dark brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0481 D_{85}= 0.8409 D_{60}= 0.6157
D_{50}= 0.5525 D_{30}= 0.4387 D_{15}= 0.3457
D_{10}= 0.3080 C_u= 2.00 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

Source of Sample: Yuba City **Depth:** 0-12"
Sample Number: 3 **Date:**

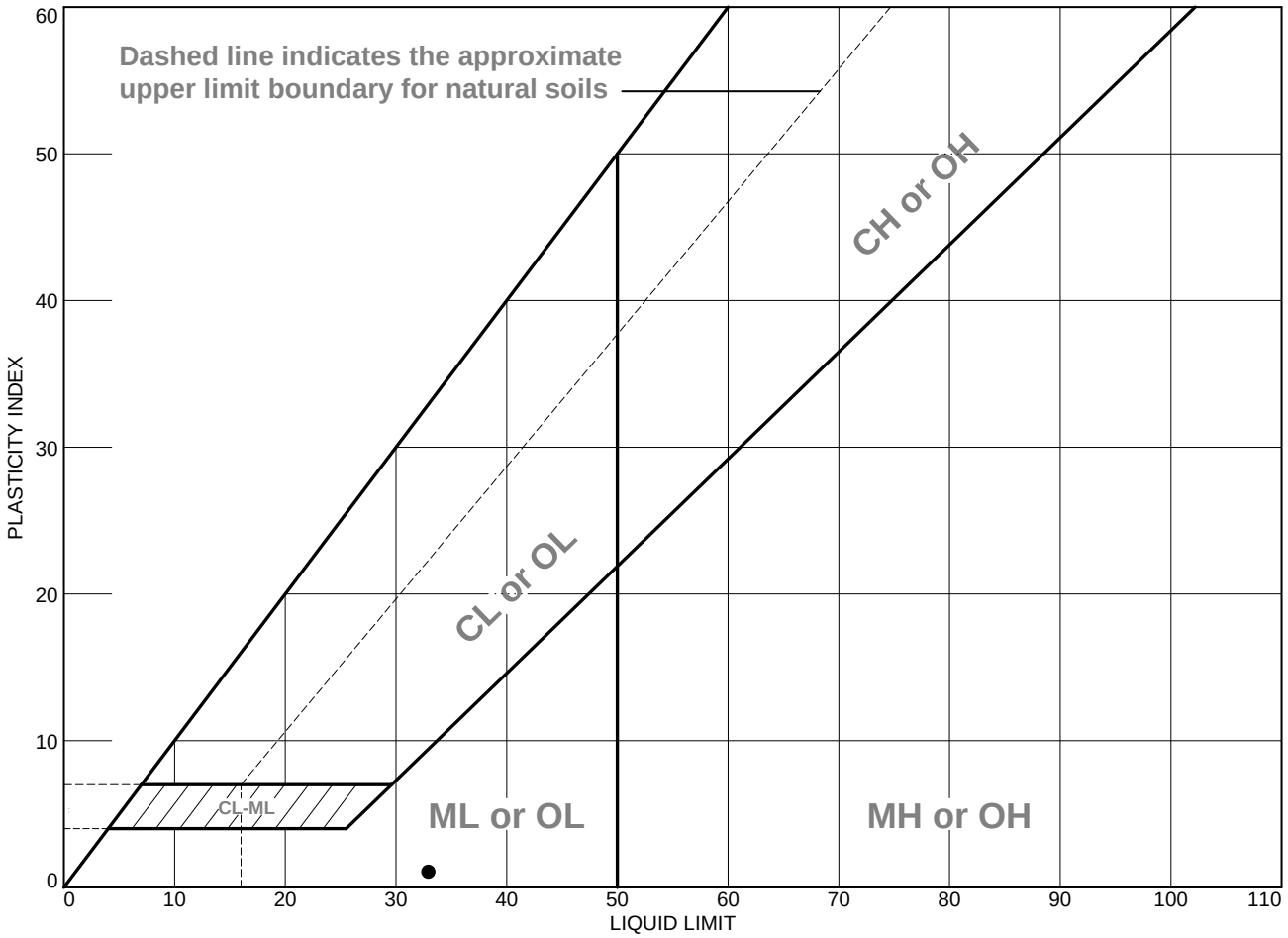
Blackburn Consulting

W. Sacramento, CA

Client: Sutter Butte Flood Control Agency
Project: Feather River Sediment Removal Project

Project No: 3825.X **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SILTY SAND, dark brown	33	32	1		44.7	SM

Project No. 3825.X **Client:** Sutter Butte Flood Control Agency

Project: Feather River Sediment Removal Project

●**Source of Sample:** Live Oak **Depth:** 0-12" **Sample Number:** 2

Remarks:

Blackburn Consulting

W. Sacramento, CA

Figure

SOIL SCREENING DATA REPORT

FEATHER RIVER SEDIMENT REMOVAL PROJECT

Live Oak Boat Launch and Yuba City Boat Launch,

Sutter County, CA

APPENDIX C

Photo Report



Photo 1: Live Oak Boat Launch, Sample Location 1



Photo 2: Live Oak Boat Launch, Sample Location 2



Photo 3: Yuba City Boat Launch, Typical Sample Location

APPENDIX G

Water Quality Documentation

G1 Sediment Sampling Analytical Results (Blackburn Consulting, Inc. 2020)

G2 Summary of Sampling Results

G3 Water Quality Monitoring Plan for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

Table G2-1. Sediment Sampling Results and Comparison with Hazardous Waste Thresholds

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
Total Petroleum Hydrocarbons (TPH) (Method 8015)								
TPH – Gasoline (C6-C12)	ND	10	8,000	--	--	--	--	No
TPH – Diesel (C13-C28)	ND	10	8,000	--	--	--	--	No
TPH-Motor Oil (C29-C40)	ND	10	25,000	--	--	--	--	No
Semi-Volatile Organic Compounds (SVOCs) (Method 8270C)								
1,2,4-Trichlorobenzene	ND	0.3	--	--	--	7.5	150	No
1,2-Dichlorobenzene	ND	0.3	--	--	--	--	--	--
Aniline	ND	0.3	--	--	--	--	--	--
1,3-Dichlorobenzene	ND	0.3	--	--	--	--	--	--
1,4-Dichlorobenzene	ND	0.3	--	--	--	--	--	--
2,4,5-Trichlorophenol	ND	1.0	--	--	--	400	8,000	No
2,4,6-Trichlorophenol	ND	1.0	--	--	--	2	40	No
2,4-Dichlorophenol	ND	1.0	--	--	--	--	--	--
2,4-Dimethylphenol	ND	1.0	--	--	--	--	--	--
2,4-Dinitrophenol	ND	1.0	--	--	--	--	--	--
2,4-Dinitrotoluene	ND	0.3	--	--	--	0.13	2.6	No*
2,6-Dinitrotoluene	ND	1.0	--	--	--	--	--	--
2-Chloronaphthalene	ND	0.3	--	--	--	--	--	--
2-Chlorophenol	ND	1.0	--	--	--	--	--	--
2-Methylnaphthalene	ND	0.3	--	--	--	--	--	--
2-Methylphenol	ND	1.0	--	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
2-Nitroaniline	ND	0.3	--	--	--	--	--	--
2-Nitrophenol	ND	1.0	--	--	--	--	--	--
1-Methylnaphthalene	ND	0.3	--	--	--	--	--	--
3-Nitroaniline	ND	0.3	--	--	--	--	--	--
4-Methylphenol	ND	1.0	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ND	1.0	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ND	0.3	--	--	--	--	--	--
4-Chloro-3-methylphenol	ND	1.0	--	--	--	--	--	--
4-Chloroaniline	ND	0.3	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ND	0.3	--	--	--	--	--	--
4-Nitroaniline	ND	0.3	--	--	--	--	--	--
4-Nitrophenol	ND	1.0	--	--	--	--	--	--
2,3,5,6-Tetrachlorophenol	ND	0.3	--	--	--	--	--	--
2,3,4,6-Tetrachlorophenol	ND	0.3	--	--	--	--	--	--
Benzyl alcohol	ND	0.3	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	ND	0.3	--	--	--	--	--	--
Bis(2-chloroethyl) ether	ND	0.3	--	--	--	--	--	--
Bis(2-chloroisopropyl) ether	ND	0.3	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	ND	0.3	--	--	--	--	--	--
Butyl benzyl phthalate	ND	0.3	--	--	--	--	--	--
Carbazole	ND	0.3	--	--	--	--	--	--
Di-n-butyl phthalate	ND	0.3	--	--	--	--	--	--
Di-n-octyl phthalate	ND	0.3	--	--	--	--	--	--
Dibenzofuran	ND	0.3	--	--	--	--	--	--
Diethyl phthalate	ND	0.3	--	--	--	--	--	--
Dimethyl phthalate	ND	0.3	--	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
Hexachlorobenzene	ND	1.5	--	--	--	0.13	2.6	No
Hexachlorobutadiene	ND	0.3	--	--	--	0.5	10	No
Hexachlorocyclopentadiene	ND	1.0	--	--	--	--	--	--
Hexachloroethane	ND	0.3	--	--	--	3	60	No
Isophorone	ND	0.3	--	--	--	--	--	--
N-Nitrosodiphenylamine	ND	0.3	--	--	--	--	--	--
N-Nitrosodimethylamine	ND	0.3	--	--	--	--	--	--
Nitrobenzene	ND	1.0	--	--	--	--	--	--
Pentachlorophenol	ND	1.0	17	1.7		100	2,000	No
Phenol	ND	1.0	--	--	--	--	--	--
Pyridine	ND	0.3	--	--	--	--	--	--
Azobenzene	ND	0.3	--	--	--	--	--	--
Acenaphthene	ND	0.3	--	--	--	--	--	--
Acenaphthylene	ND	0.3	--	--	--	--	--	--
Anthracene	ND	0.3	--	--	--	--	--	--
Benzo(a)anthracene	ND	0.3	--	--	--	--	--	--
Benzo(a)pyrene	ND	0.3	--	--	--	--	--	--
Benzo(b)fluoranthene	ND	0.3	--	--	--	--	--	--
Benzo(g,h,i)perylene	ND	1.0	--	--	--	--	--	--
Benzo(k)fluoranthene	ND	0.3	--	--	--	--	--	--
Chrysene	ND	0.3	--	--	--	--	--	--
Dibenz(a,h)anthracene	ND	0.3	--	--	--	--	--	--
Fluoranthene	ND	0.3	--	--	--	--	--	--
Fluorene	ND	0.3	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene	ND	0.3	--	--	--	--	--	--
Naphthalene	ND	0.3	--	--	--	--	--	--
Phenanthrene	ND	0.3	--	--	--	--	--	--
Pyrene	ND	0.3	--	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
Organochlorine Pesticides (Method 8081B)								
4,4'-DDE	ND	0.005	1	0.1	1	--	--	No
4,4'-DDT	ND	0.005	1	0.1	1	--	--	No
4,4-DDD	ND	0.005	1	0.1	1	--	--	No
alpha-BHC	ND	0.005	--	--	--	--	--	--
alpha-Chlordane	ND	0.005	--	--	--	--	--	--
Aldrin	ND	0.005	1.4	0.14	1.4	--	--	No
beta-BHC	ND	0.005	--	--	--	--	--	--
Dieldrin	ND	0.005	8	0.8	8	--	--	No
Endosulfan I	ND	0.005	--	--	--	--	--	--
Endosulfan II	ND	0.005	--	--	--	--	--	--
Endosulfan sulfate	ND	0.005	--	--	--	--	--	--
Endrin	ND	0.005	0.2	0.02	0.2	0.02	0.4	No
Endrin aldehyde	ND	0.005	--	--	--	--	--	--
Endrin ketone	ND	0.005	--	--	--	--	--	--
gamma-BHC (Lindane)	ND	0.005	4	0.4	4	0.4	8	No
gamma-Chlordane	ND	0.005	2.5	0.25	2.5	0.03	0.6	No
Heptachlor	ND	0.005	4.7	0.47	4.7	0.008	0.16	No
Heptachlor epoxide	ND	0.005	--	--	--	--	--	--
Methoxychlor	ND	0.005	100	10	100	10	20	No
Toxaphene	ND	0.020	--	--	--	--	--	--
Metals (Methods 6010B & 7471 [Mercury])[4]								
Antimony	ND	3.0	500	15	150	--	--	No
Arsenic	ND	5.0	500	5	50	5	100	No
Barium	**42-60**	1.0	10,000	100	1,000	100	2,000	No
Beryllium	ND	1.0	75	0.75	7.5	--	--	No
Cadmium	ND	2.0	100	1	10	1	20	No
Chromium	**17-22**	2.0	2,500	560	50	5	100	No

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
Cobalt	**6.6-7.7**	2.0	8,000	80	800	--	--	No
Copper	**6.3-7.3**	1.0	2,500	25	250	--	--	No
Lead	ND	3.0	1,000	5	50	5	100	No
Molybdenum	ND	5.0	3,500	350	3,500	--	--	No
Nickel	**31-41†**	2.0	2,000	20	200	--	--	No
Selenium	ND	5.0	100	1	10	1	20	No
Silver	ND	2.0	500	5	50	5	100	No
Thallium	ND	2.0	700	7	70	--	--	No
Vanadium	**19-21**	5.0	2,400	24	240	--	--	No
Zinc	**15-18**	1.0	5,000	250	2,500	--	--	No
Mercury	ND	0.1	20	0.2	2	0.2	4	No
Volatile Organic Compounds (VOCs) (EPA Method 8260)								
Benzene	NA	--	--	--	--	0.5	10	--
Carbon tetrachloride	NA	--	--	--	--	0.5	20	--
Chlorobenzene	NA	--	--	--	--	100	2,000	--
Chloroform	NA	--	--	--	--	6	120	--
Cresol	NA	--	--	--	--	200	4,000	--
2,4-Dichlorophenoxyacetic acid	NA	--	10	10	100	100	2,000	--
1,4-Dichloroethane	NA	--	--	--	--	0.5	10	--
1,1-Dichloroethylene	NA	--	--	--	--	0.7	14	--
Kepone	NA	--	21	2.1	21	--	--	--
Methyl ethyl ketone (MEK)	NA	--	--	--	--	200	4,000	--
Mirex	NA	--	21	2.1	21	--	--	--
Tetrachloroethylene	NA	--	--	--	--	0.7	14	--
Toxaphene	NA	--	5	0.5	5	0.5	10	--
Trichloroethylene (TCE)	NA	--	2,040	204	2,040	0.5	10	--
2,4,5-Trichlorophenoxypropionic acid	NA	--	10	1	10	1	20	--
2,4,5-TP (Silvex)	NA	--	--	--	--	1	20	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	CCR Title 22 Hazardous Waste Criteria[3]					
			Threshold (TTLC) (mg/kg)	STLC (mg/L)	STLC Threshold (10XSTLC)	TCLP (mg/L)	TCLP Threshold (20XTCLP)	Exceeds Threshold?
Vinyl chloride	NA	--	--	--	--	0.2	4	--
PCBs (EPA 8082)	NA	--	50	5	50	--	--	--
Aroclor 1016	NA	--	--	--	--	--	--	--
Aroclor 1221	NA	--	--	--	--	--	--	--
Aroclor 1232	NA	--	--	--	--	--	--	--
Aroclor 1242	NA	--	--	--	--	--	--	--
Aroclor 1248	NA	--	--	--	--	--	--	--
Aroclor 1254	NA	--	--	--	--	--	--	--
Aroclor 1260	NA	--	--	--	--	--	--	--
Aroclor 5460	NA	--	--	--	--	--	--	--
Dioxin (2,3,7,8-TCDD) (EPA Method 8290)	NA	--	0.01	0.001	0.01	--	--	--

Notes:

*****Threshold is below the reporting limit

†Results are 31, 37, and 41 mg/kg

[1]Results are from surface sediment grab samples collected within the top 12 inches. Results are expressed in wet weight.

[2]Reporting Limit may vary depending upon analytical results.

[3]For metals, if total concentrations exceed 10 times the Soluble Threshold Limit Concentration (STLC), a WET test (Waste Extraction Test) is required. For SVOCs, VOCs, organochlorine pesticides, and PCBs, if total concentrations exceed 20 times the Toxicity Characteristic Leaching Procedure (TCLP) threshold, a TCLP test is required. If WET results equal or exceed the STLC values, the waste is considered hazardous. If TCLP results equal or exceed the TCLP, the waste is considered hazardous. If total concentrations equal or exceed the TTLC, the waste is considered hazardous.

[4]Metals concentrations were measured as total concentrations rather than dissolved, or soluble concentrations.

CCR California Code of Regulations

mg/kg milligrams per kilogram (or parts per million [ppm])

ND Not detected

NA Not analyzed

STLC Soluble Threshold Limit Concentration

TCLP Toxicity Characteristic Leaching Procedure

TTLC Total Threshold Limit Concentration

Table G2-2. Sediment Sampling Results and Comparison with Sediment Quality Guidelines

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
Total Petroleum Hydrocarbons (TPH) (Method 8015)											
TPH – Gasoline (C6-C12)	ND	10	--	82	0.017	No	--	--	--	--	--
TPH – Diesel (C13-C28)	ND	10	--	97	0.023	No	--	--	--	--	--
TPH-Motor Oil (C29-C40)	ND	10	--	2400	89	No	--	--	--	--	--
Semi-Volatile Organic Compounds (SVOCs) (Method 8270C)											
1,2,4-Trichlorobenzene	ND	0.3	1.2	24	0.0034	No*	--	--	--	--	--
1,2-Dichlorobenzene	ND	0.3	1.0	1,800	0.3	No	--	--	--	--	--
Aniline	ND	0.3	--	95	0.0046	No*	--	--	--	--	--
1,3-Dichlorobenzene	ND	0.3	6.0	--	--	No	--	--	--	--	--
1,4-Dichlorobenzene	ND	0.3	0.2	2.6	0.00046	No*	--	--	--	--	--
2,4,5-Trichlorophenol	ND	1.0	2.9	6,300	4	No	--	--	--	--	--
2,4,6-Trichlorophenol	ND	1.0	0.04	49	0.004	No*	--	--	--	--	--
2,4-Dichlorophenol	ND	1.0	0.0075	190	0.023	No*	--	--	--	--	--
2,4-Dimethylphenol	ND	1.0	8.1	1,300	0.42	No*	--	--	--	--	--
2,4-Dinitrophenol	ND	1.0	3	130	0.044	No*	--	--	--	--	--
2,4-Dinitrotoluene	ND	0.3	0.023	1.7	0.00044	No*	--	--	--	--	--
2,6-Dinitrotoluene	ND	1.0	--	0.36	0.000067	No*	--	--	--	--	--
2-Chloronaphthalene	ND	0.3	--	4,800	3.9	No	--	--	--	--	--
2-Chlorophenol	ND	1.0	0.012	390	0.089	No*	--	--	--	--	--
2-Methylnaphthalene	ND	0.3	0.88	240	0.19	No*	0.065	0.67	--	--	No*

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
2-Methylphenol	ND	1.0	--	3,200	--	No	--	--	--	--	--
2-Nitroaniline	ND	0.3	--	630	0.08	No*	--	--	--	--	--
2-Nitrophenol	ND	1.0	--	--	--	--	--	--	--	--	--
1-Methylnaphthalene	ND	0.3	--	18	0.006	No*	--	--	--	--	--
3-Nitroaniline	ND	0.3	--	--	--	--	--	--	--	--	--
4-Methylphenol	ND	1.0	--	--	--		--	--	--	--	--
4,6-Dinitro-2-methylphenol	ND	1.0	--	5.1	--	No	--	--	--	--	--
4-Bromophenyl phenyl ether	ND	0.3	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ND	1.0	--	6,300	--	No	--	--	--	--	--
4-Chloroaniline	ND	0.3	0.0067	2.7	0.00016	No*	--	--	--	--	--
4-Chlorophenyl phenyl ether	ND	0.3	--	--	--		--	--	--	--	--
4-Nitroaniline	ND	0.3	--	27	0.0016	No*	--	--	--	--	--
4-Nitrophenol	ND	1.0	--	--	--		--	--	--	--	--
2,3,5,6-Tetrachlorophenol	ND	0.3	--	--	--		--	--	--	--	--
2,3,4,6-Tetrachlorophenol	ND	0.3	--	1,900	0.18	No*	--	--	--	--	--
Benzyl alcohol	ND	0.3	--	6,300	0.48	No	--	--	--	--	--
Bis(2-chloroethoxy)methane	ND	0.3	--	190	0.013	No*	--	--	--	--	--
Bis(2-chloroethyl) ether	ND	0.3	0.000034	0.23	0.0000036	No*	--	--	--	--	--
Bis(2-chloroisopropyl) ether	ND	0.3	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	ND	0.3	0.8	39	1.3	No	--	--	--	--	--
Butyl benzyl phthalate	ND	0.3	--	290	0.24	No*	--	--	--	--	--
Carbazole	ND	0.3	--	--	--		--	--	--	--	--
Di-n-butyl phthalate	ND	0.3	--	6,300	2.3	No	--	--	--	--	--
Di-n-octyl phthalate	ND	0.3	--	630	57	No	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
Dibenzofuran	ND	0.3	--	78	0.15	No*	--	--	--	--	--
Diethyl phthalate	ND	0.3	0.025	51,000	6.1	No	--	--	--	--	--
Dimethyl phthalate	ND	0.3	0.035	--	--	No*	--	--	--	--	--
Hexachlorobenzene	ND	1.5	0.0008	0.21	0.00024	No*	--	--	--	--	--
Hexachlorobutadiene	ND	0.3	0.028	1.2	0.00027	No*	--	--	--	--	--
Hexachlorocyclopentadiene	ND	1.0	--	1.8	0.0013	No*	--	--	--	--	--
Hexachloroethane	ND	0.3	0.019	1.8	0.0002	No*	--	--	--	--	--
Isophorone	ND	0.3	--	570	0.026	No*	--	--	--	--	--
N-Nitrosodiphenylamine	ND	0.3	--	110	0.067	No*	--	--	--	--	--
N-Nitrosodimethylamine	ND	0.3	--	0.002	0.000000027	No*	--	--	--	--	--
Nitrobenzene	ND	1.0	--	5.1	0.000092	No*	--	--	--	--	--
Pentachlorophenol	ND	1.0	0.013	1.0	0.000057	No*	--	--	--	--	--
Phenol	ND	1.0	0.16	19,000	3.3	No*	--	--	--	--	--
Pyridine	ND	0.3	--	78	0.0068	No*	--	--	--	--	--
Azobenzene	ND	0.3	--	5.6	0.00093	No*	--	--	--	--	--
Acenaphthene	ND	0.3	120	3,600	5.5	No	0.150	0.650	--	--	No*
Acenaphthylene	ND	0.3	6.4	--	--	No	--	--	--	--	--
Anthracene	ND	0.3	1.9	18,000	58	No	0.085	0.960	0.0572	0.845	No*
Benzo(a)anthracene	ND	0.3	0.63	1.1	0.011	No*	0.230	1.6	0.108	1.050	No*
Benzo(a)pyrene	ND	0.3	0.11	0.11	0.029	No*	0.400	2.5	0.150	1.450	No*
Benzo(b)fluoranthene	ND	0.3	1.1	1.1	0.3	No	--	--	--	--	--
Benzo(g,h,i)perylene	ND	1.0	2.5	--	--	No	--	--	--	--	--
Benzo(k)fluoranthene	ND	0.3	2.8	11	2.9	No	--	--	--	--	--
Chrysene	ND	0.3	2.2	110	9	No	0.400	2.8	0.166	1.290	No*
Dibenz(a,h)anthracene	ND	0.3	0.11	0.11	0.096	No*	0.060	0.26	0.033	--	No*
Fluoranthene	ND	0.3	0.69	2,400	89	No	0.600	3.6	0.423	2.230	No
Fluorene	ND	0.3	6	2,400	5.4	No	0.035	0.64	0.0774	0.536	No*
Indeno(1,2,3-c,d)pyrene	ND	0.3	0.48	1.1	0.98	No	--	--	--	--	--
Naphthalene	ND	0.3	0.042	2.0	0.00038	No*	0.340	2.1	0.176	0.561	No*

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
Phenanthrene	ND	0.3	7.8	--	--	No	0.225	1.38	0.204	1.170	No*
Pyrene	ND	0.3	45	1,800	13	No	0.350	2.2	0.195	1.520	No*
Organochlorine Pesticides (Method 8081B)											
4,4'-DDE	ND	0.005	0.33	1.9	0.0075	No	0.002	0.015	0.00316	0.0313	No*
4,4'-DDT	ND	0.005	0.0011	2.0	0.011	No*	0.001	0.007	0.00416	0.0629	No*
4,4-DDD	ND	0.005	2.7	1.9	0.0075	No	0.002	0.020	0.00488	0.028	No*
alpha-BHC	ND	0.005	--	--	--	--	--	--	--	--	--
alpha-Chlordane	ND	0.005	0.0085	--	--	No	0.0005	0.006	0.00324	0.0176	No*
Aldrin	ND	0.005	0.0024	0.039	0.00015	No*	--	--	--	--	--
beta-BHC	ND	0.005	--	--	--	--	--	--	--	--	--
Dieldrin	ND	0.005	0.00046	0.034	0.000071	No*	0.00002	0.008	0.0019	0.0618	No*
Endosulfan I	ND	0.005	0.0098	470	1.4	No	--	--	--	--	--
Endosulfan II	ND	0.005	--	470	1.4	No	--	--	--	--	--
Endosulfan sulfate	ND	0.005	--	380	2.1	No	--	--	--	--	--
Endrin	ND	0.005	0.0011	19	0.092	No*	0.00002	0.045	0.00222	0.207	No*
Endrin aldehyde	ND	0.005	--	--	--	--	--	--	--	--	--
Endrin ketone	ND	0.005	--	--	--	--	--	--	--	--	--
gamma-BHC (Lindane)	ND	0.005	--	0.57	0.00024	No*	--	--	0.00237	0.00499	No*
gamma-Chlordane	ND	0.005	--	1.7	0.0027	No*	--	--	--	--	--
Heptachlor	ND	0.005	0.12	0.13	0.00012	No*	--	--	--	--	--
Heptachlor epoxide	ND	0.005	0.00018	0.07	0.000028	No*	--	--	0.00247	0.016	No*
Methoxychlor	ND	0.005	0.013	320	2.0	No	--	--	--	--	--
Toxaphene	ND	0.020	0.51	0.49	0.011	No*	--	--	--	--	--
Metals (Methods 6010B & 7471 [Mercury])[8]											
Antimony	ND	3.0	11	31	0.35	No*	2	25	--	--	No*
Arsenic	ND	5.0	0.067	0.68	0.0015	No*	33	85	9.79	33	No
Barium	**42-60**	1.0	390	15,000	160	No	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
Beryllium	ND	1.0	5	160	19	No	--	--	--	--	--
Cadmium	ND	2.0	1.9	71	0.69	No*	5	9	0.99	4.98	No*
Chromium	**17-22**	2.0	160	12,000	40,000,000	No	80	145	43.4	111	No
Cobalt	**6.6-7.7**	2.0	23	23	0.27	No	--	--	--	--	--
Copper	**6.3-7.3**	1.0	180	3,100	28	No	70	390	31.6	149	No
Lead	ND	3.0	32	400	--	No	35	110	35.8	128	No
Molybdenum	ND	5.0	6.9	390	2	No*	--	--	--	--	--
Nickel	**31-41†**	2.0	86	1,500	26	**Yes**	30	50	22.7	48.6	**Yes**
Selenium	ND	5.0	2.4	390	0.52	No*	--	--	--	--	--
Silver	ND	2.0	25	390	0.8	No*	1	2.2	--	--	No*
Thallium	ND	2.0	0.78	0.78	0.014	No*	--	--	--	--	--
Vanadium	**19-21**	5.0	18	390	86	**Yes**	--	--	--	--	--
Zinc	**15-18**	1.0	340	23,000	370	No	120	270	121	459	No
Mercury	ND	0.1	13	11	0.033	No*	0.15	1.3	0.18	1.06	No
Volatile Organic Compounds (VOCs) (EPA Method 8260)											
Benzene	NA	--	0.025	1.2	0.00023	--	--	--	--	--	--
Carbon tetrachloride	NA	--	0.076	0.65	0.00018	--	--	--	--	--	--
Chlorobenzene	NA	--	1.4	280	0.053	--	--	--	--	--	--
Chloroform	NA	--	0.023	0.32	0.000061	--	--	--	--	--	--
Cresol	NA	--	--	6,300	1.3	--	--	--	--	--	--
2,4-Dichlorophenoxyacetic acid	NA	--	--	--	--	--	--	--	--	--	--
1,4-Dichloroethane	NA	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	NA	--	0.54	230	0.1	--	--	--	--	--	--
Kepone	NA	--	--	0.054	0.00012	--	--	--	--	--	--
Methyl ethyl ketone (MEK)	NA	--	6.1	27,000	1.2	--	--	--	--	--	--
Mirex	NA	--	--	0.036	0.00063	--	--	--	--	--	--
Tetrachloroethylene	NA	--	0.08	24	0.0051	--	--	--	--	--	--
Toxaphene	NA	--	0.51	0.49	0.011	--	--	--	--	--	--

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
Trichloroethylene (TCE)	NA	--	0.085	0.94	0.00018	--	--	--	--	--	--
2,4,5-Trichlorophenoxypropionic acid	NA	--	--	510	50	--	--	--	--	--	--
2,4,5-TP (Silvex)	NA	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	NA	--	0.0015	0.059	0.0000065	--	--	--	--	--	--
PCBs (EPA 8082)	NA	--	0.23	--	--	--	0.005	0.4	0.0598	0.676	--
Aroclor 1016	NA	--	--	4.1	0.021	--	--	--	--	--	--
Aroclor 1221	NA	--	--	0.2	0.00008	--	--	--	--	--	--
Aroclor 1232	NA	--	--	0.17	0.00008	--	--	--	--	--	--
Aroclor 1242	NA	--	--	0.23	0.0012	--	--	--	--	--	--
Aroclor 1248	NA	--	--	0.23	0.0012	--	--	--	--	--	--
Aroclor 1254	NA	--	--	0.24	0.002	--	--	--	--	--	--
Aroclor 1260	NA	--	--	0.24	0.0055	--	--	--	--	--	--
Aroclor 5460	NA	--	--	35	2	--	--	--	--	--	--
Dioxin (2,3,7,8-TCDD) (EPA Method 8290)	NA	--	0.0000048	0.0000048	0.000000059	--	--	--	--	--	--

Notes:

*****Threshold is below the reporting limit

†Results are 31, 37, and 41 mg/kg

[1]Results are from surface sediment grab samples collected within the top 12 inches. Results are expressed in wet weight.

[2]Reporting Limit may vary depending upon analytical results.

[3]San Francisco Regional Water Quality Control Board (SFRWQCB) (January 2019)

[4]U.S. Environmental Protection Agency (EPA) Regional Screening Levels for soil for residential land uses (May 2020)

[5]U.S. Environmental Protection Agency (EPA) Regional Screening Levels for soil for protection of groundwater, (May 2020)

[6]Effects Range – Low (ERL) and Effects Range - Median (ERM) from Long and Morgan 1991. Thresholds are expressed as dry weight. Metals concentrations are expressed as totals rather than dissolved, or soluble, concentrations.

[7]Threshold Effect Concentration (TEC) and Probable Effects Concentration (PEC) from MacDonald *et al*. 2000. Thresholds are expressed as dry weight. Metals concentrations are expressed as totals rather than dissolved, or soluble, concentrations.

[8]Metals concentrations were measured as total concentrations rather than dissolved, or soluble concentrations.

CCR California Code of Regulations

ERL Effects Range – Low

ERM Effects Range – Medium

Constituent	Result[1] (mg/kg)	Reporting Limit[2] (mg/kg)	Sediment Quality Guidelines for Protection of Human Health				Sediment Quality Guidelines for Protection of Environment				
			Environmental Screening Level (ESL)[3] (mg/kg)	Regional Screening Level for Soil – Residential (RSL)[4] (mg/kg)	Regional Screening Level for Protection of GW (RSL)[5] (mg/kg)	Exceeds Threshold?	ERL[6] (mg/kg)	ERM[6] (mg/kg)	TEC[7] (mg/kg)	PEC[7] (mg/kg)	Exceeds Threshold?
ESL Environmental Screening Level mg/kg milligrams per kilogram (or parts per million [ppm]) ND Not detected NA Not analyzed PEC Probable Effect Concentration RSL Regional Screening Level TEC Threshold Effect Concentration											

As reported in Long and Morgan (1991), the National Oceanic and Atmospheric Administration (NOAA) collected and analyzed sediment samples from freshwater, estuarine, and coastal marine sites throughout the United States on an annual basis through their National Status & Trends (NST) program. At some of these sites, measures of biological effects have been performed. The lower 10 percentile of concentrations resulting in biological effects were identified as Effects Range – Low (ER-L) concentrations, and the median concentrations resulting in biological effects were identified as Effects Range – Median (ER-M) concentrations. Data derived from freshwater, estuarine, and marine samples were merged together, therefore, differences in toxicity associated with these different types of sediment were not evaluated. The majority of the data were collected from estuarine and marine samples.

Using data collected by Long and Morgan (1991), and past data from other studies, MacDonald et al. (200), developed Threshold Effect Concentrations (TECs) and Probably Effect Concentrations (PEC) for freshwater sediment toxicity to aquatic life. TECs represent concentrations below harmful effects are not likely to be observed; PECs represent concentrations above which harmful effects on likely to be observed.

References

Long, E.R. and L.G. Morgan

1991 *The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program*. NOAA Technical Memorandum NOS OMA 72. August.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger

2000 Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Archives of Environmental Contamination and Toxicology*, 39, 20-31.

San Francisco Regional Water Quality Control Board (SFRWQCB)

2019 *Environmental Screening Levels (ESLs), Tier 1 (2019), Revision 2*. January 24. Obtained from https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.html on August 20, 2020.

U.S. Environmental Protection Agency (EPA)

2020 *Regional Screening Level (RSL) Summary Table (Form (Target Cancer Risk [TR]=1E-06, non-cancer Target Hazard Quotient [THQ]=1) May 2020 (Corrected). Generic Table*. Accessed at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables on August 20, 2020.

APPENDIX G

Water Quality Documentation

G1 Sediment Sampling Analytical Results (Blackburn Consulting, Inc. 2020)

G2 Summary of Sampling Results

G3 Water Quality Monitoring Plan for the Yuba City Boat Ramp Sediment Removal Project (ECORP 2020)

Water Quality Monitoring Plan

Yuba City Boat Ramp Sediment Removal Project

Sutter and Yuba Counties, California

Prepared for:

Sutter Butte Flood Control Agency

November 3, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

1.0 INTRODUCTION 3
1.1 Purpose and Background 3
1.2 Project Location 3
1.3 Project Description 6
1.3.1 Dredging Methods 6
1.3.2 Dewatering Operations 6
1.4 Construction Schedule 6
2.0 WATER QUALITY MONITORING 7
2.1 Discharges Associated with In-Water Work Activities 7
2.1.1 Water Quality Parameters to be Monitored 7
2.1.2 Water Quality Monitoring Locations 8
2.2 Discharges Associated with Dewatering Activities 9
2.2.1 Representative Sample 9
2.2.2 Water Quality Monitoring Location 12
2.2.3 Water Quality Parameters to be Monitored During Discharge 13
3.0 REPORTING 13
3.1 Discharges Associated with In-Water Work Activities 13
3.2 Discharges Associated with Dewatering Activities 13
4.0 REFERENCES 14

LIST OF TABLES

Table 1. Water quality sample method and frequency for in-water construction activities. 7
Table 2. Beneficial Uses of Feather and Yuba Rivers 10
Table 3. Screening Levels for Tier 1B Wastewater 11

LIST OF FIGURES

Figure 1. Yuba City Boat Ramp Location and Vicinity 4
Figure 2. Project Components 5

LIST OF ACRONYMS AND ABBREVIATIONS

CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
cy	Cubic yards
DO	Dissolved oxygen
EPA	Environmental Protection Agency
mg/L	Milligrams per liter
mL/L	Milliliters per liter
MUN	Municipal and Domestic Supply
NRCS	Natural Resources Conservation Service
NTU	Nephelometric turbidity unit
PCBs	Polychlorinated biphenyls
Plan	Water Quality Monitoring Plan
Project	Yuba City Boat Ramp Sediment Removal Project
SBFCA	Sutter Butte Flood Control Agency
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WQC	Water Quality Certification
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

1.1 Purpose and Background

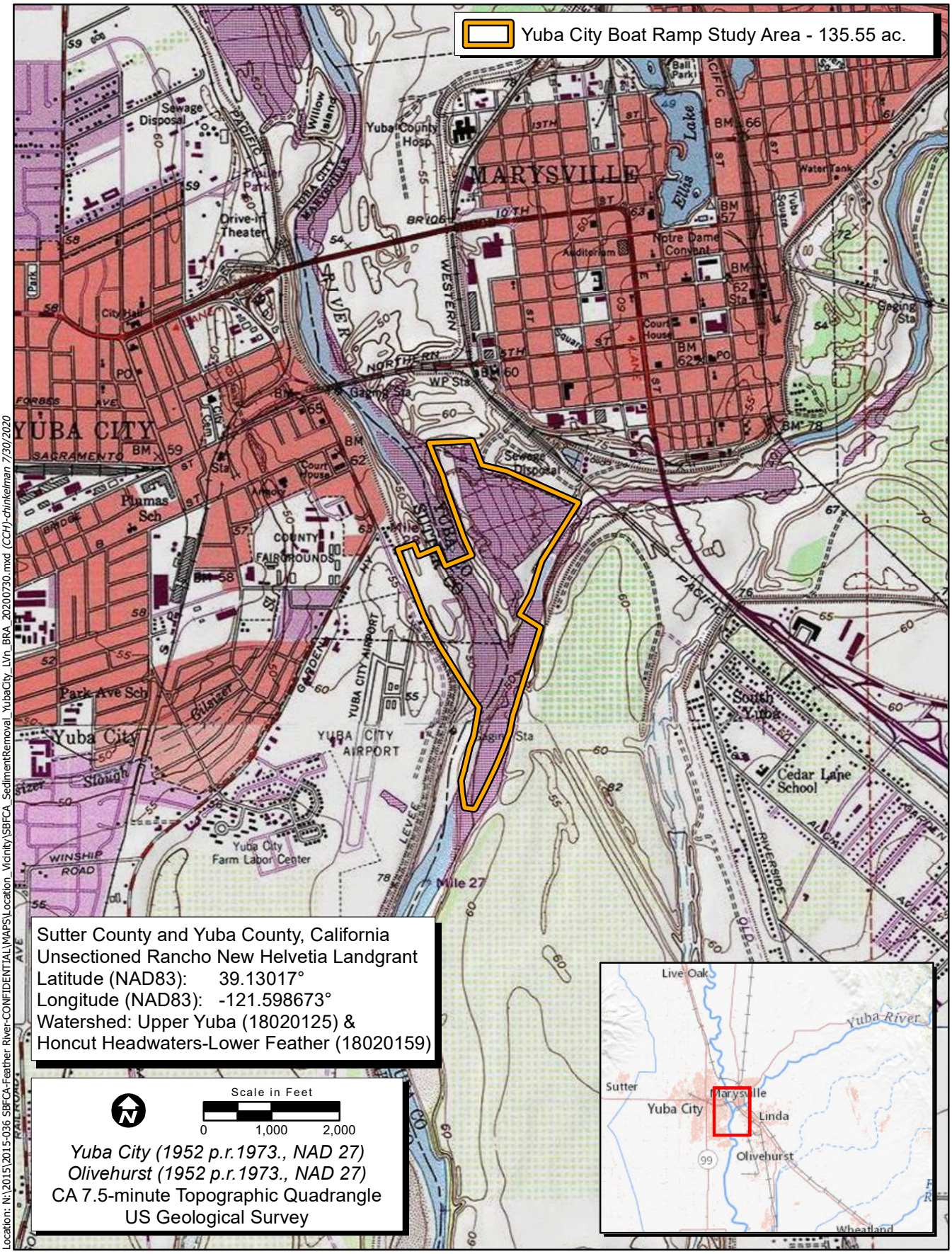
The purpose of this Water Quality Monitoring Plan (Plan) is to provide the Central Valley Regional Water Quality Control Board (CVRWQCB) and U.S. Army Corps of Engineers (USACE) with proposed protocols for monitoring water quality during dredging and dewatering of dredged materials during the Sutter Butte Flood Control Agency's (SBFCA's) Yuba City Boat Ramp Sediment Removal Project (Project). SBFCA proposes to conduct dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 1).

The Project is needed to remove sediment that has accumulated at the Yuba City Boat Ramp and the confluence of the Yuba and Feather rivers, exacerbated by the 2017 Oroville Dam Spillway incident. This has hampered recreational users and public safety as it has affected emergency vessel launching capabilities at the boat ramp. The Project has received funding from the California Natural Resource Agency through Proposition 68 to remove sediment for safety and to restore recreation access to the Feather River as part of restoration, protection and development of river parkways in accordance with the California River Parkways Grant Program. Restoring river access and fish passage conditions at the Project will also have regional economic benefits, as guided and private fishing (heavily curtailed by river and launch conditions) bring commerce to local restaurants, hotels, and other businesses.

This Plan addresses monitoring of surface water quality in the Feather River near the Yuba River confluence during dredging operations. SBFCA is currently considering several options for dewatering and disposal of the dredged material. Under these alternatives, dredged material will be dewatered either on land or within tanks or basins, and decanted filtered water will be discharged back to the Feather or Yuba rivers within the Project boundary. Sediment analyses will be performed on the dredged material under a separate monitoring plan to conduct final waste characterization prior to disposal. Initial sampling of sediment in the Project area indicates that the dredged material would not pose a significant risk to human health or the environment.

1.2 Project Location

The Project is located in a portion of unsectioned Rancho New Helvetia Land grant lands within the "Olivehurst, California" and "Yuba City, California" 7.5-minute quadrangles (U.S. Geological Survey [USGS] 1952a, photo revised 1973 and 1952b, photo revised 1973, respectively). The approximate center of the Yuba City location is 39.13017° latitude, -121.598673° longitude within the Honcut Headwaters-Lower Feather watershed (Hydrologic Unit Code #18020159, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016) (Figure 1. *Yuba City Boat Ramp Location and Vicinity*).



Location: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Location_Vicinity\SBFCA_SedimentRemoval_YubaCity_LVn_BRA_20200730.mxd (CCH)-dhinkelman 7/30/2020

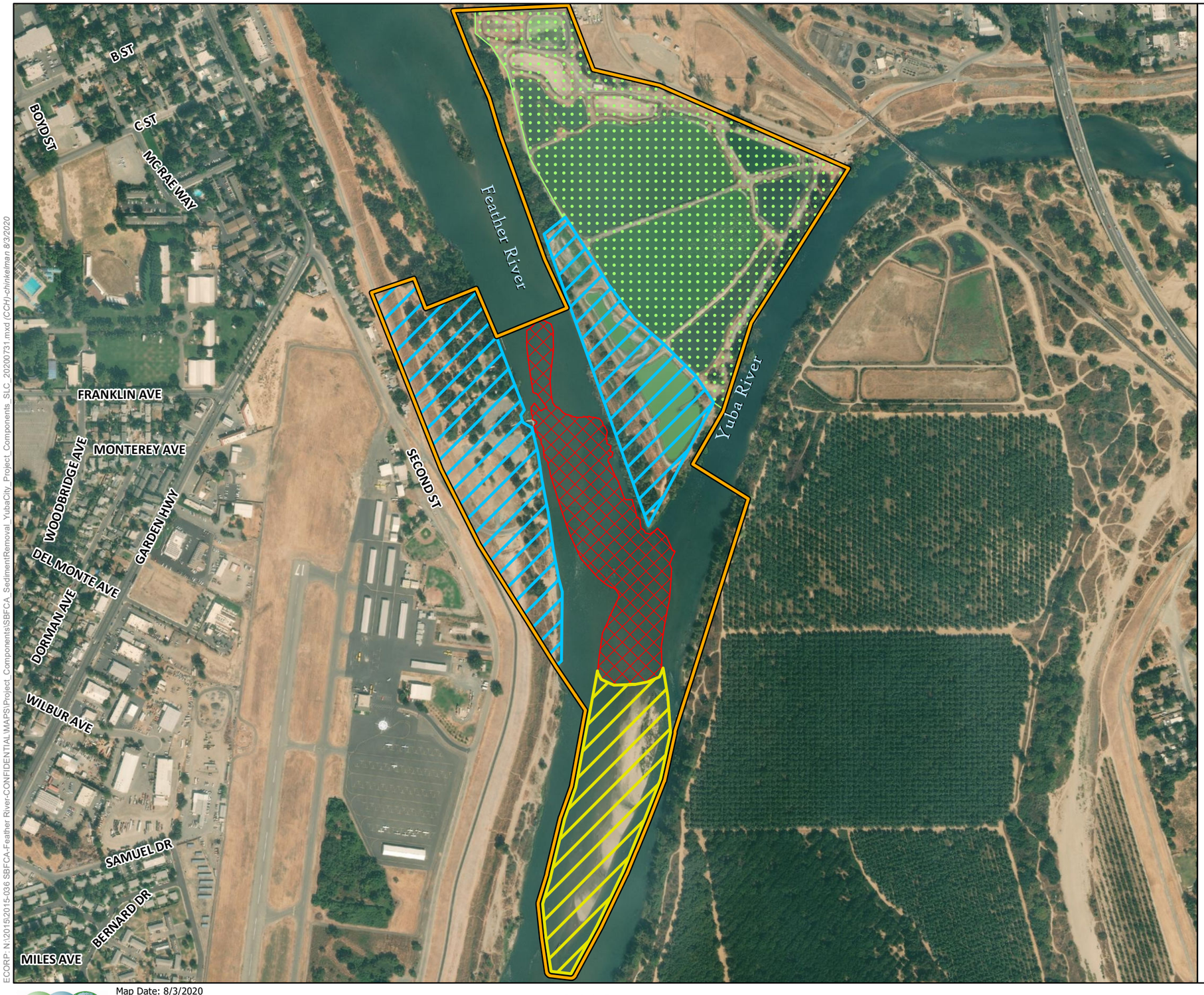
Map Date: 7/30/2020

Sources: ESRI, USGS, Peterson Brustad

Figure 1. Yuba City Boat Ramp Location and Vicinity

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

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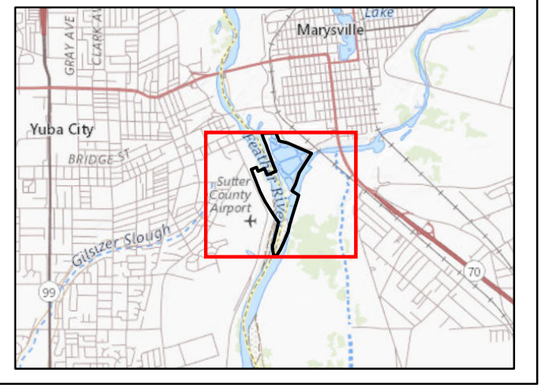
Map Features

- Yuba City Boat Ramp Study Area - 135.55 ac.

Project Components

- Dredging Area
- Future Dredging Area
- Potential Disposal Location
- Potential Staging/Access/Dewatering Areas

Sources: ESRI, USGS, Maxar (2018), Peterson Brustad



ECORP: N:\2015\2015-036 SBFCA-Feather River-CONFIDENTIAL\MAPS\Project_Components\SBFCA_SedimentRemoval_YubaCity_Project_Components_SLC_20200731.mxd (CCH)-chinkelman 8/3/2020

Map Date: 8/3/2020

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Scale in Feet
0 560

Figure 2. Project Components

2015-036.10 Yuba City Boat Ramp Sediment Removal Project

1.3 Project Description

The Project consists of maintenance dredging of the confluence of the Yuba River and Feather River, including the Yuba City Boat Ramp (Figure 2. *Project Components*). Approximately 315,600 cubic yards (cy) of dredged material would be removed within an ±28-acre area and may occur over two phases. Phase 1 includes the removal of approximately 65,600 cy of dredged material within a ±14.41-acre Dredging Area as part of restoration, protection and development of river parkways in accordance with the California River Parkways Grant Program. Phase 2 includes an additional approximately 250,000 cy within a ±14.40-acre Future Dredging Area immediately downstream to further restore fish passage and improve conveyance at the confluence of the Yuba and Feather rivers to be funded by other sources. The timing of Phase 2 will depend on availability of funding and may occur concurrently with Phase 1.

1.3.1 Dredging Methods

Two potential dredging methods are being evaluated for the Project: hydraulic dredging and mechanical dredging, depending upon the results of the hydrographic and geophysical surveys of the area proposed to be dredged. Hydraulic dredging involves a barge with suction to remove sediment from the river bottom and pumping the material to shore. Mechanical dredging involves a barge with equipment to excavate the sediment from the river bottom, storage of the dredged material on a transport barge, and subsequent transfer of the material from the transport barge to shore.

1.3.2 Dewatering Operations

Dredged material will be placed on land within empty wastewater ponds at the Marysville Wastewater Treatment Plant (WWTP) via a discharge pipeline or via mechanical equipment. The existing wastewater ponds serve as existing confined basins within which water would be decanted from the dredged material and evaporative drying of the dredged material would take place. Progressive surface trenching will be used to mechanically manipulate the dredged material to speed evaporative drying. Settling basins will also be used to clean water drained from sediment before it is discharged back into the Feather River.

Phase 2 dredged material would be dewatered in the Marysville WWTP North Ponds as well if funding is received in time for use of the Marysville WWTP site. If Phase 2 dredged material cannot be dewatered at the Marysville WWTP, dredged material would be placed into fractionation tanks or other temporary dewatering basins staged at the Yuba City Boat Ramp facility, either via a discharge pipeline or mechanical equipment, where water would be decanted from the dredged material. Fractionation tanks would be manifolded together in series and decanted water would be routed to a filtration system, stored, and tested. It is anticipated that filtered water would then be disposed of either to land or disposed of back into the Feather River.

1.4 Construction Schedule

Dredging operations and dewatering activities are proposed to be limited to between June 15 and October 15 to align with work windows to avoid impacts to special-status fish species. The remainder of the construction period would be dedicated to pre-construction surveys, mobilization and demobilization

activities, and completion of the transfer of dewatered dredged material to the City of Marysville for spread of the material over the 46-acre North Ponds area.

Completion of Phase 1 of the Project is anticipated to occur in in 2021, with Phase 2 being completed in the following year(s). It is assumed that nighttime operations may be required for the Project.

2.0 WATER QUALITY MONITORING

Water quality monitoring will be performed:

1. during all in-water work activities and
2. for discharge of decanted water from dewatering of the dredged materials.

2.1 Discharges Associated with In-Water Work Activities

Monitoring will be performed on all days that in-water work activities occur or whenever Project-related discharges are made to the river due to in-water work activities, including dredging, work associated with site preparation, and debris removal, as described below.

2.1.1 Water Quality Parameters to be Monitored

The following water quality parameters will be measured during in-water work activities:

- Turbidity;
- Settleable solids;
- Dissolved oxygen (DO);
- pH;
- Water temperature; and
- Visible construction-related pollutants (e.g., oil, grease, foam, fuel, petroleum products, and construction-related excavated, organic, or earthen materials).

These parameters will be sampled using the type and sampling frequencies identified in Table 1.

Table 1. Water quality sample method and frequency for in-water construction activities.

Water Quality Parameter	Unit of Measurement	Sample Method	Minimum Sampling Frequency
Turbidity	NTU	Grab	Every 4 hours
Settleable Solids	mL/L	Grab	Every 4 hours
Dissolved Oxygen (DO)	mg/L/% saturation	Grab	Every 4 hours
pH	Standard Units	Grab	Every 4 hours
Water temperature	°C/°F	Grab	Every 4 hours
Visible Construction-related Pollutants	Observation	Visual Inspections	Continuously throughout the construction period

Measurements of turbidity (in nephelometric turbidity units [NTU]), dissolved oxygen (DO), pH, and water temperature will be made using a handheld multi-parameter water quality meter (e.g., Horiba U-50). These measurements will be made by staff trained in the proper use and maintenance of the instrument. The instrument will be calibrated prior to each monitoring event in accordance with the manufacturer's recommendations. Sampling personnel will maintain onsite a calibration and maintenance log for any meters used for these grab samples.

Grab samples will be collected from the water column at approximately mid-depth. On all days of in-water work activities, grab samples will be collected prior to commencement of in-water work to establish a baseline, every four hours during in-water work, and upon completion of in-water work for the day. To the extent possible, the sampling start time will be varied each day such that samples will be collected at different times to better represent natural variability of the receiving waters (i.e., Feather and Yuba rivers).

Settleable solids will be collected and analyzed by field staff using the Hach Company (2015) Method 8165 direct measurement methodology for solids and settleable matter. Briefly, water samples will be collected from the Feather River at each station in clean glass or plastic bottles and labeled with the sample collection station, date, and time. Samples will be refrigerated or kept on ice for no more than 24 hours prior to analysis. The samples will be allowed to come to room temperature and thoroughly mixed (e.g., by shaking) immediately prior to analysis. Samples will be poured into an Imhoff cone to the 1-L mark and left to sit untouched for 45 minutes to become stable. The cone will be twisted back and forth several times to remove materials on the sloped side of the Imhoff cone and left to sit untouched for another 15 minutes. The amount of settleable matter (in mL/L) will be determined by reading the graduated scale on the Imhoff cone at the top of the solids layer and recorded on a data sheet.

Visual inspections for construction-related pollutants will be conducted continuously throughout all in-water and sediment dewatering/surface water discharge activities to determine if these activities are causing a visible film or water surface coating of oils, greases, waxes, or other construction-related materials in the surrounding waters. Any such visual observations will be noted and photo-documented for inclusion in the water quality monitoring reports.

2.1.2 Water Quality Monitoring Locations

Measurements and sample collections for these water quality parameters will be made throughout the in-water work period at representative locations upstream (i.e., unaffected by dredging and other Project-related in-water activities) and downstream of the project boundary in the Feather River at the following stations:

Station	Description
R-1	In an area unaffected by the dredging operation and not to exceed 300 feet upstream from the upstream edge of the overall Project boundary.
R-2	Within 300 feet downstream of the downstream edge of the overall Project boundary.

The Project boundary encompasses the sediment dredging area and any points of discharge of decanted water from the sediment dewatering to the Feather or Yuba rivers. As such, the water quality monitoring stations will be used to evaluate any potential Project-related water quality impacts associated with dredging, transport, and dewatering of dredged soils If effluent associated with land-based dewatering of the dredged materials (see Section 2.2 below) is discharged to the Yuba River adjacent to the Marysville WWTP, additional monitoring stations will be established in the Yuba River 300 feet upstream (i.e., R-1b) and 300 feet downstream (i.e., R-2b) of the point(s) of discharge into the Yuba River to monitor the potential water quality impacts during active discharge of return water.

Measurements and water sample collections will be made at the R-2 station(s) first, followed by the R-1 station(s) to prevent the potential for sediment resuspended at R-1 during measurements to affect the R-2 measurements. All measurements and water sample collections will be made at mid-channel at approximately the same distance from each bank as the most recent dredging activity. To the extent possible, samples will be collected from the shore to avoid entering the water and potentially disturbing benthic sediments, thereby increasing the potential for resuspending sediments and increasing turbidity and/or settleable solids concentrations in the water column. If collection of samples from the shoreline is not possible, the sampling personnel will collect grab samples at the R-2 station first followed by the R-1 station to avoid creation of a sediment plume that could affect downstream samples. At each sampling station, the sampling personnel will approach the sampling station from downstream and collect samples by facing upstream to avoid sampling portions of the water column that have been disturbed by wading or boating.

2.2 Discharges Associated with Dewatering Activities

Discharges associated with dewatering of dredged materials on land at the Marysville WWTP (i.e., return water) are assumed to be prohibited. Monitoring that will be performed for discharges of decanted water from tanks or basins is described in more detail below.

Although the Section 401 Water Quality Certification (WQC) issued for the Project by the CVRWQCB will govern monitoring and reporting, the Proposed monitoring below is intended to comply with CVRWQCB's *General Waste Discharge Requirements (WDR) for Limited Threat Discharges to Surface Water (Order R5-2016-0076-01) (Limited Threat Order)* which applies to this type of discharge.

2.2.1 Representative Sample

Under the Limited Threat Order, collection and analysis of a representative sample of the wastewater is required first to determine what Tier discharge the wastewater falls under as defined as follows in the Order:

Tier 1: Clean or relatively pollutant-free wastewaters that pose little or no threat to water quality.

Tier 1A. Discharges of less than 0.25 million gallons per day (MGD) or less than 4 months in duration (or as determined by the Executive Officer); or

Tier 1B. Discharges greater than or equal to 0.25 MGD and greater than or equal to 4 months in duration (or as determined by the Executive Officer).

Tier 2: Wastewater that may contain toxic organic constituents, volatile organic compounds (VOCs), petroleum fuel pollution constituents, pesticides, inorganic constituents, chlorine, and other chemical constituents for which treatment technologies are well-established to eliminate constituents that pose a threat to water quality and that require treatment prior to discharge.

Given the results of initial sediment sampling in the Project area, it is expected that wastewater generated from dewatering would likely qualify as a Tier 1B discharge. However, as required by the Limited Threat Order, a representative wastewater sample will be collected, analyzed, and compared with screening levels for the constituents in Table I-1 of Appendix I of the Limited Threat Order to determine the Tier of discharge. If results exceed Tier 1B screening thresholds, the wastewater must be categorized as Tier 2 wastewater.

Screening levels vary depending upon the beneficial uses of the water bodies. Beneficial uses for the Feather and Yuba rivers in the Project area are shown in Table 2.

Table 2. Beneficial Uses of Feather and Yuba Rivers

Feather River	Yuba River
Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.	
Agricultural Supply (AGR) for Irrigation - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.	**Agricultural Supply (AGR) for Irrigation and Stock Watering** - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.
	Industrial Process Supply (PRO) - Uses of water for industrial activities that depend primarily on water quality.
	Hydropower Generation (POW) - Uses of water for hydropower generation.
Water Contact Recreation (REC-1) including Canoeing and Rafting - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.	**Water Contact Recreation (REC-1) including Canoeing and Rafting** - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
Non-contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.	**Non-contact Water Recreation (REC-2)** - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
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. (Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use	**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. (Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use

Table 2. Beneficial Uses of Feather and Yuba Rivers	
Feather River	**Yuba River**
designations will be considered COLD water bodies for the application of water quality objectives).	designations will be considered COLD water bodies for the application of water quality objectives).
Migration of Aquatic Organisms (MIGR) for Warm and Cold Water Species - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)	**Migration of Aquatic Organisms (MIGR) for Warm and Cold Water Species** - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)
Spawning, Reproduction, and/or Early Development (SPWN) for Warm and Cold Water Species - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)	**Spawning, Reproduction, and/or Early Development (SPWN) for Warm and Cold Water Species** - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. (Warm: Striped bass, sturgeon, and shad; Cold (Salmon and steelhead)
Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.	**Wildlife Habitat (WILD)** - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

The Feather River has a beneficial use of Municipal and Domestic Supply (MUN), therefore, MUN screening levels apply to the Project. Additional sampling and analyses for pollutants causing impairment under the federal Clean Water Act (CWA) section 303(d) List, is also required under the Limited Threat Order. The Lower Feather River, from the Lake Oroville Dam to the confluence of the Sacramento River including the Project area, is on the Category 5 303(d) list of impaired water bodies for chlorpyrifos, Group A pesticides, mercury, polychlorinated biphenyls (PCBs), and other unknown toxicity (USEPA 2020). Group A Pesticides include one or more of the following compounds: dieldrin, endrin, alpha-chlordane, gamma-chlordane, cis-Nonachlor, trans-Nonachlor, oxychlordane, heptachlor, and heptachlor epoxide. The Lower Yuba River is on the Category 5 303(d) list for copper and mercury (USEPA 2020). A Category 5 list contains water bodies that have listed pollutants that still require the development of a Total Maximum Daily Load.

Therefore, a representative wastewater sample will be collected prior to construction by collecting a sediment sample from the Project area, analyzing the elutriate, and comparing results with screening levels for the constituents in Table 3.

Table 3. Screening Levels for Tier 1B Wastewater
Constituent/Parameter1
Biochemical Oxygen Demand (5-day @ 20°C)
Total Suspended Solids (TSS)
Dissolved Oxygen (DO)
Hardness

Table 3. Screening Levels for Tier 1B Wastewater
pH
Temperature
Electrical Conductivity (EC) (aka Specific Conductance)
Total Dissolved Solids (TDS)[3]
Unionized Ammonia Nitrogen, Total (as N)
California Toxics Rule (CTR) Priority Pollutants[4]:
Metals (EPA Method 6010/7471 for Mercury)
Cyanide, Total (as CN)
Asbestos
2,3,7,8-TCDD (Dioxin)
Volatile organic compounds (VOCs) (EPA Method 8260)
Semi-volatile organic compounds (SVOCs) (EPA Method 8270)
Organochlorine pesticides (EPA Method 8080)
Organophosphate pesticides (including chlorpyrifos) (EPA Method 8141B)
PCBs (Aroclors) (EPA Method 8081)

Notes:
1 Constituents/Parameters shall be analyzed using the analytical methods described in 40 Code of Federal Regulations Part 136 and in accordance with the General Monitoring Provisions contained in section I of the Monitoring and Reporting Program (Attachment C) of the Limited Threat Order).
2 MUN = Municipal and Domestic Supply Beneficial Use.
4 Table I-3 of Appendix I of Limited Threat Order
3 Screening level is based on Total Suspended Solids (TSS); Both organic and inorganic particles of all sizes can contribute to the suspended solids concentration. TSS are particles that are larger than 2 microns found in the water column; particles smaller than 2 microns (average filter size) is considered a dissolved solid

Because chronic toxicity tests on the effluent will be required during discharge per the Limited Threat Order requirements, baseline chronic toxicity tests are also recommended on the receiving water in the Project area. Specifically, the following chronic toxicity tests with the shall be run on a laboratory control and 100 percent receiving water sample (i.e., serial dilutions not required) in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002:

- The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
- The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
- The green alga, *Selenastrum capricornutum* (growth test).

2.2.2 Water Quality Monitoring Location

Regular water quality monitoring will be performed on the decanted water discharged to the Feather and/or Yuba rivers as a result of the dewatering process for dredged material. For Tier 1B discharges, water quality monitoring must be performed on the wastewater effluent as defined below:

EFF-001 *A location where a representative sample of the effluent discharged at Discharge Point 001 can be collected prior to discharging to surface water. Discharge Point 001 is the first discharge point. Monitoring requirements and effluent limitations apply to all discharge points if there are multiple discharge points.*

Additional monitoring at receiving water locations would be required if the wastewater is categorized as a Tier 2 discharge.

2.2.3 Water Quality Parameters to be Monitored During Discharge

The frequency and constituents that must be analyzed in the effluent will be set by the CVRWQCB in the Section 401 WQC issued for the Project depending upon the results of the analysis on the representative wastewater sample discussed in Section 2.2.1 above. Sampling frequency could be on a weekly, monthly, or quarterly basis.

In addition to analytical testing, annual chronic toxicity testing of the decanted water will be required per the Limited Threat Order requirements. Specifically, the following chronic toxicity tests shall be run on a laboratory control and 100% receiving water sample (i.e., serial dilutions not required) in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002:

- The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
- The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
- The green alga, *Selenastrum capricornutum* (growth test).

3.0 REPORTING

3.1 Discharges Associated with In-Water Work Activities

All water quality measurements will be recorded on data sheets and scanned or saved electronically for subsequent reporting, as required in the CVRWQCB Section 401 WQC. Reports will provide water quality analytical results in a tabular format such that the sampling dates, locations, constituents, and analytical results are readily discernable and clearly identify compliance or non-compliance with the 401 WQC requirements, once issued. Reports will be prepared and submitted in accordance with the instructions provided in the 401 WQC, once issued.

3.2 Discharges Associated with Dewatering Activities

Results of the sampling and analysis must be reported with, or during the processing of, the application for the Section 401 WQC. Water quality monitoring results performed during discharge of decanted water from the dewatering process will be performed as Self-Monitoring Reports in accordance with the requirements of the Section 401 WQC, once issued.

4.0 REFERENCES

Hach Company. 2015. Solids, Settleable Matter, Direct Measurement, Method 8165. DOC3165.53.01202. Edition 8. August.

NRCS, USGS, and USEPA. 2016. Watershed Boundary Dataset for California. Available online: http://datageteway.nrcs.usda.gov. Accessed September 21, 2016.

USEPA . 2020. California 2014-2016 CWA Section 303(d) List of Impaired Waters. Region IX. April 6, 2018. Accessed at https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml?wbid=CAR5192200019980817161057 on September 1, 2020.

_____. 2002. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October.

USGS. 1952a "Olivehurst, California" 7.5-minute Quadrangle. Photorevised 1973. U.S. Department of the Interior.

_____. 1952b "Yuba City, California" 7.5-minute Quadrangle. Photorevised 1973. U.S. Department of the Interior.

APPENDIX H

Persons and Agencies Contacted

City Manager
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526 C Street
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Yuba City, CA 95993

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Council Member
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Yuba City, CA 95993

Diana Langley
Interim City Manager
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Yuba City, CA 95993

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California Government
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Litza Lopez-Ramos
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West Sacramento, CA 95691

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Michael Brune
Executive Director
Sierra Club
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Oakland, CA 94612

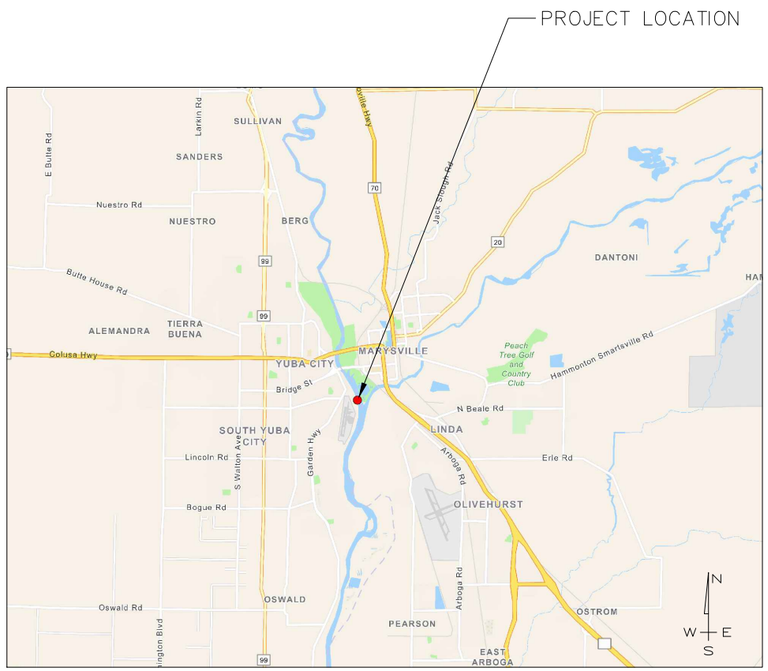
Chris Wood
President and Chief Executive Officer
Trout Unlimited
1777 N. Kent Street, Suite 100
Arlington, VA 22209

APPENDIX I

65% Design Drawings for Phase 1

YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

COUNTY OF SUTTER
STATE OF CALIFORNIA

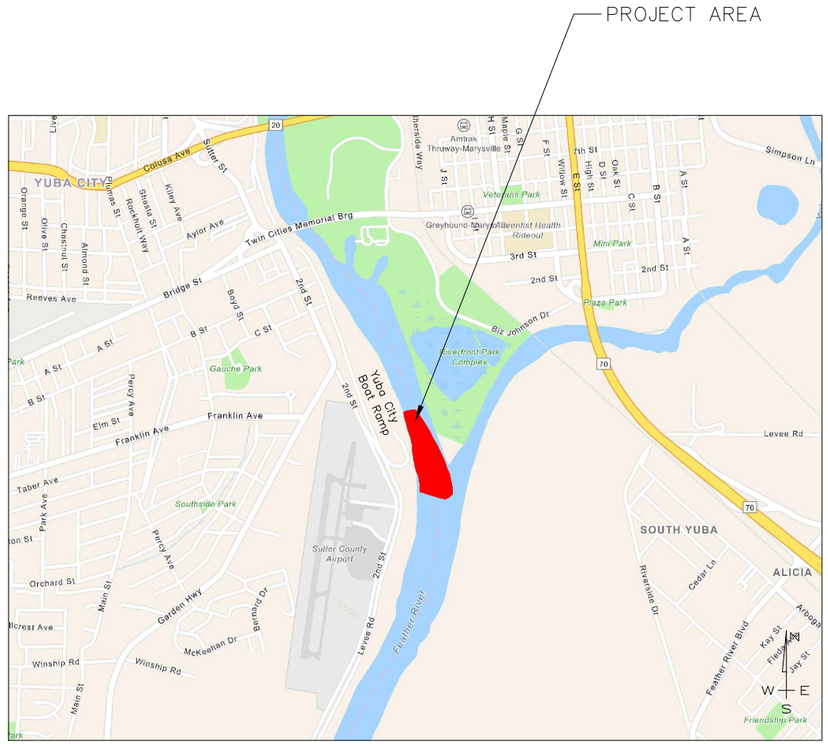


VICINITY MAP
NTS

INDEX OF DRAWINGS

GENERAL
G1 TITLE SHEET
G2 ABBREVIATIONS, SYMBOL LEGEND, AND CONSTRUCTION NOTES
G3 PROJECT CONTROL PLAN

CIVIL
C1 STAGING AND SEDIMENT DISPOSAL PLAN
C2 EXISTING CONDITIONS (MAY 2020)
C3 DREDGING PLAN
C4 PROPOSED CROSS SECTIONS 1
C5 PROPOSED CROSS SECTIONS 2
C6 PROPOSED CROSS SECTIONS 3
C7 PROPOSED CROSS SECTIONS 4



LOCATION MAP
NTS

MICHAEL BESSETTE
EXECUTIVE DIRECTOR,
SUTTER BUTTE FLOOD CONTROL AGENCY

DATE

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: AS NOTED

DATE: OCTOBER 2020

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 — R.C.E. NO. — 12/31/21 — EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 — R.C.E. NO. — 12/31/21 — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA

PRELIMINARY

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SUTTER BUTTE FLOOD CONTROL AGENCY

SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

TITLE SHEET

SHEET G1

SHEET 1 OF 10

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ABBREVIATIONS

BMP	BEST MANAGEMENT PRACTICE
CA	CALIFORNIA
CDEC	CALIFORNIA DATA EXCHANGE CENTER
CY	CUBIC YARD
(E)	EXISTING
EG	EXISTING GRADE
EXP	EXPIRATION
FG	FINISHED GRADE
FT	FEET
HWY	HIGHWAY
ID	IDENTIFICATION
ISMND	INITIAL STUDY / MITIGATED NEGATIVE DECLARATION
MISC	MISCELLANEOUS
NAVD	NORTH AMERICAN VERTICAL DATUM
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NO	NUMBER
NTS	NOT TO SCALE
PBI	PETERSON BRUSTAD INC.
PE	PROFESSIONAL ENGINEER
PH	PHONE NUMBER
RCE	REGISTERED CIVIL ENGINEER
RD	ROAD
REV	REVISION
SBFCA	SUTTER BUTTE FLOOD CONTROL AGENCY
SF	SQUARE FEET
ST	STREET
STA	STATION
TYP.	TYPICAL
WWTP	WASTE WATER TREATMENT PLANT

SITE PLAN SYMBOLOGY

EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

PROPOSED MAJOR CONTOUR

PROPOSED MINOR CONTOUR

SECTION LINE

CONSTRUCTION LIMITS

HAUL ROUTE

DECOMMISSIONED MARYSVILLE WASTEWATER TREATMENT NORTH PONDS

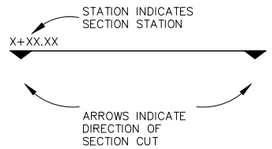
STAGING AREA 1

STAGING AREA 2

ELDERBERRY BUSH LOCATION AND PROTECT IN PLACE 20' RADIUS



NORTH ARROW



SECTION CUT MARKER

SECTION SYMBOLOGY

EXISTING GRADE

FINISHED GRADE

PROPOSED CUT

GENERAL NOTES

CONSTRUCTION NOTES:

1. THE EXISTING TOPOGRAPHY AND LOCATIONS OF EXISTING STRUCTURES, FEATURES, AND TREES AS SHOWN ON THE DRAWINGS ARE BASED ON SURVEY PREPARED BY MHM SURVEYING DATED MAY 20, 2020 AND ARE NOT GUARANTEED.
2. UNLESS OTHERWISE NOTED, ALL EXISTING PAVEMENT, UTILITY LINES AND OTHER IMPROVEMENTS DAMAGED OR UNDERMINED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE RECONSTRUCTED OR REPLACED BY THE CONTRACTOR AT CONTRACTOR'S OWN EXPENSE TO MATCH EXISTING CONDITIONS.
3. IF ANY STRUCTURES OR TREES OBSTRUCT CONSTRUCTION OPERATIONS, CONTACT THE ENGINEER BEFORE PROCEEDING.
4. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS DURING CONSTRUCTION, DEWATERING, AND EXCAVATION TO PREVENT DAMAGE TO EXISTING UTILITIES. CONTRACTOR SHALL BE HELD LIABLE IN THE EVENT OF ANY DAMAGE AND HELD RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES NOT SHOWN ON THE DRAWINGS BUT MADE KNOWN TO THE CONTRACTOR. REPAIR OF DAMAGE TO UTILITIES OR STRUCTURES THAT ARE NOT SHOWN ON THE DRAWINGS SHALL BE ACCOMPLISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS AND WITH THE CONCURRENCE OF THE ENGINEER.
5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST SEVEN (7) DAYS PRIOR TO THE START OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR CONFLICTS FOUND IN THE FIELD PRIOR TO OR DURING CONSTRUCTION AND SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THESE DISCREPANCIES OR CONFLICTS HAVE BEEN RESOLVED.
7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY FINDINGS OF HISTORICAL SIGNIFICANCE AND SHALL STOP WORK WITHIN THE IMMEDIATE VICINITY. WORK SHALL RESUME UPON APPROVAL FROM THE ENGINEER AND/OR STATE HISTORIC PRESERVATION OFFICE.
8. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING PASSAGE ALONG THE FEATHER RIVER ACCESSIBLE AT ALL TIMES. CONTRACTOR SHALL SCHEDULE CONTRACTOR'S WORK TO MINIMIZE INTERFERENCE WITH THE USE OF THE RIVER.
9. THE CONTRACTOR SHALL CONDUCT CONTRACTOR'S CONSTRUCTION OPERATIONS WITH DUE REGARD TO THE CONVENIENCE AND SAFETY OF THE PUBLIC AT ALL TIMES. NO MATERIALS OR EQUIPMENT SHALL BE STORED WHERE THEY WILL INTERFERE WITH THE SAFE PASSAGE OF PUBLIC TRAFFIC.
10. STORAGE OF FUEL OR OIL IS NOT PERMITTED ON THE PROJECT SITE. MAINTENANCE OF EQUIPMENT ON THE PROJECT SITE IS NOT PERMITTED UNLESS APPROVED BY THE ENGINEER.
11. DISPOSAL OF DREDGED MATERIALS SHALL BE CONDUCTED STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS.
10. MEASUREMENT FOR PAYMENT FOR HAULING WILL BE BY THE CUBIC YARD AND WILL BE THE NUMBER OF CUBIC YARDS HAULED. MEASUREMENT SHALL BE MADE BY ANALYSIS AND COMPARISON OF THE CONTRACTOR PROVIDED PRE- AND POST-CONSTRUCTION BATHYMETRIC SURVEYS OF THE FEATHER RIVER. PAYMENT FOR DREDGING SHALL NOT EXCEED CONTRACTED AMOUNT WITHOUT APPROVAL FROM THE ENGINEER.

PUBLIC HEALTH, SAFETY AND CONVENIENCE:

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT CONTRACTOR'S OWN EXPENSE, SHALL INSTALL BMPS IF NECESSARY TO KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST AND NUISANCE. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH AND FEATHER RIVER AIR QUALITY MANAGEMENT DISTRICT. THE COUNTY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANING AND REMOVAL OF ALL SILT AND DEBRIS GENERATED BY CONTRACTOR'S WORK AND DEPOSITED AND ACCUMULATED WITHIN DOWNSTREAM WATERWAYS, DITCHES, AND DRAIN PIPES AND ON PUBLIC AND PRIVATE ROADWAYS. THE CONTRACTOR AGREES TO REIMBURSE THE OWNER FOR ALL COST EXPENDED IN PERFORMANCE OF THE ABOVE WORK IF REQUIRED FOR PUBLIC HEALTH AND SAFETY OR MADE NECESSARY BY NON-PERFORMANCE BY THE CONTRACTOR.

EXCAVATION NOTES:

1. DREDGING QUANTITY: 62,500 CUBIC YARDS.
2. ALL ELEVATIONS ARE IN REFERENCE TO NAVD 88.

ENVIRONMENTAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH ALL CONDITIONS OF ANY PERMITS RELATED TO THE PROJECT INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
   - 1.1. U.S. ARMY CORPS OF ENGINEERS
   - 1.2. STATE DEPARTMENT OF HEALTH: NPDES, IS/MND, 401 WATER QUALITY CERTIFICATION
   - 1.3. COUNTY OF SUTTER, DEPARTMENT OF PUBLIC WORKS
   - 1.4. CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
   - 1.5. REGIONAL WATER QUALITY CONTROL BOARD
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN THE SPECIFICATIONS.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ESTABLISH A BASELINE TURBIDITY VALUE DOWNSTREAM OF THE SEDIMENT REMOVAL. THE TURBIDITY MEASUREMENTS SHALL BE IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICES PLAN.
4. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL INSTALL TURBIDITY CURTAINS TO REDUCE SEDIMENT DISCHARGE AND TURBIDITY FROM ADVANCING DOWNSTREAM. THE TURBIDITY CURTAIN SHALL BE A TYPE 2 TURBIDITY CURTAIN OR APPROVED EQUAL. IF ANY PORTION OF THE TURBIDITY CURTAIN IS DAMAGED, DREDGING WORK SHALL BE SUSPENDED UNTIL THE CURTAIN IS REPAIRED AND REINSTALLED.
5. DREDGED MATERIAL WILL HAVE A HIGH WATER CONTENT AND CANNOT BE TRANSPORTED TO THE DISPOSAL SITE UNTIL EXCESS WATER HAS BEEN REMOVED IN ACCORDANCE WITH THE SPECIFICATIONS.
6. WHEN DREDGING OPERATIONS ARE COMPLETED, THE CONTRACTOR SHALL REMOVE THE TURBIDITY CURTAINS AND RESTORE THE AREA TO ITS ORIGINAL STATE.
7. THE CONTRACTOR SHALL PREPARE AND MAINTAIN A SITE SPECIFIC BMP PLAN APPROVED BY THE ENGINEER AT THE JOB SITE. THE BMP PLAN SHALL BE SITE SPECIFIC AND REFLECT THE CONTRACTOR'S METHOD OF OPERATIONS AND REMEDIAL WORK.

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: OCTOBER 2020

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP

DRAWN BFL

CHECKED KBB

DAVID MURBACH, P.E.	C54419	12/31/21
PROJECT ENGINEER	R.C.E. NO.	EXP. DATE
CHRISTOPHER FRITZ, P.E.	C75004	12/31/21
PROJECT MANAGER	R.C.E. NO.	EXP. DATE

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SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

ABBREVIATIONS, SYMBOL LEGEND, AND CONSTRUCTION NOTES

SHEET G2

SHEET 2 OF 10

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CONTROL POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
1689	2175413.91	6672248.77	MONUMENT IN WELL
1694	2175183.87	6672887.97	M7
1366	2174912.86	6673012.52	AUTO0001
1693	2174581.8	6673831.17	M6
1277	2174560.63	6673884.09	C-1
1279	2173727.48	6673366.17	B-1
1692	2173722.37	6674225.14	M5
3	2173621.05	6674279.23	K 1435

HORIZONTAL OFFSET TABLE			
POINT ID	NORTHING	EASTING	DESCRIPTION
A	2174163.72	6675093.07	BEGIN ALIGNMENT
B	2173072.33	6675455.51	STA OFFSET 21+50
C	2171952.42	6675469.9	STA OFFSET 32+70
D	2170333.46	6675021.2	END ALIGNMENT

NOTES: LIMITS OF WORK WITHIN STATION 10+40 AND STATION 32+55

65% NOT FOR CONSTRUCTION

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REV	DATE	BY	DESCRIPTION

SCALE: 1"=200'

DATE: OCTOBER 2020

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 R.C.E. NO. — 12/31/21 EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 R.C.E. NO. — 12/31/21 EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER K. FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA

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Fax 916-608-2232

SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

PROJECT CONTROL PLAN

SHEET G3

CONSTRUCTION LIMITS POINT TABLE		
POINT ID	NORTHING	EASTING
A	2174560.668	6676497.668
B	2173215.93	6675992.991
C	2171732.325	6675748.103
D	2172051.871	6675319.168
E	2172621.95	6675557.055
F	2172683.03	6675406.189
G	2172800.52	6675271.986
H	2173415.503	6675013.76
I	2174065.7	6675065.498
J	2174618.93	6675184.919
K	2174711.484	6675265.954
L	2174202.567	6675592.998
M	2174008.551	6675825.011
N	2174260.674	6676138.381
O	2174628.497	6676410.359
P	2174621.762	6676483.37
Q	2174951.877	6676657.246
R	2175138.427	6676714.197
S	2175128.579	6676761.298

NOTES:
1) DECOMMISSIONED MARYSVILLE WASTEWATER TREATMENT POND VOLUMES REPRESENT MAXIMUM WATER STORAGE VOLUME IN MAY 2020.
2) TEMPORARY EARTHWORK IS ALLOWED TO INCREASE STORAGE CAPACITY IN STAGING AREAS 1 AND 2
3) STAGING AREA 2 (13 ACRES) AVAILABLE FOR CONTRACTOR USE AFTER JUNE 30, 2021
4) STAGING AREA 1 (3 ACRES) AVAILABLE FOR CONTRACTOR USE FOR DURATION OF CONSTRUCTION
5) PROTECT IN PLACE ALL ELDERBERRY BUSHES PER THE SPECIFICATIONS.
6) DEWATER SEDIMENT TO A MAXIMUM MOISTURE CONTENT OF 20% AND STOCKPILE WITHIN PONDS 4, 6, AND 8 FOR USE BY THE CITY OF MARYSVILLE.

DECOMMISSIONED MARYSVILLE WWTP PONDS
PONDS AVAILABLE FOR STOCKPILING
STAGING AREA 1
STAGING AREA 2
ELDERBERRY BUSH

EXISTING ACCESS ROAD
BIZ JOHNSON DRIVE
POND 1 16,000 CY
POND 2 14,000 CY
STAGING AREA 2 SEE NOTES 2 & 3
SEE NOTE 6
YUBA RIVER
SEE NOTE 5
POND 2A 157,900 CY
POND 4 22,100 CY
POND 8 54,000 CY
POND 1A 171,700 CY
POND 3A 9,900 CY
POND 6 19,500 CY
POND 11 1,400 CY
POND 10 1000 CY
POND 7 15,800 CY
STAGING AREA 1 SEE NOTES 2 & 4
POND 5 8,300 CY
POND 3C 9,200 CY
POND 3B 26,800 CY
POND 5A 7,400 CY
SEE NOTE 1
FEATHER RIVER
EXISTING ACCESS ROAD TO BE IMPROVED FOR PROJECT USE BY CONTRACTOR
LIMITS OF DREDGING
CONSTRUCTION LIMITS
SECOND STREET
YUBA CITY BOAT RAMP

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: 1"=150'
DATE: OCTOBER 2020
WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — C54419 — 12/31/21
PROJECT ENGINEER — R.C.E. NO. — EXP. DATE

CHRISTOPHER FRITZ, P.E. — C75004 — 12/31/21
PROJECT MANAGER — R.C.E. NO. — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA
PRELIMINARY

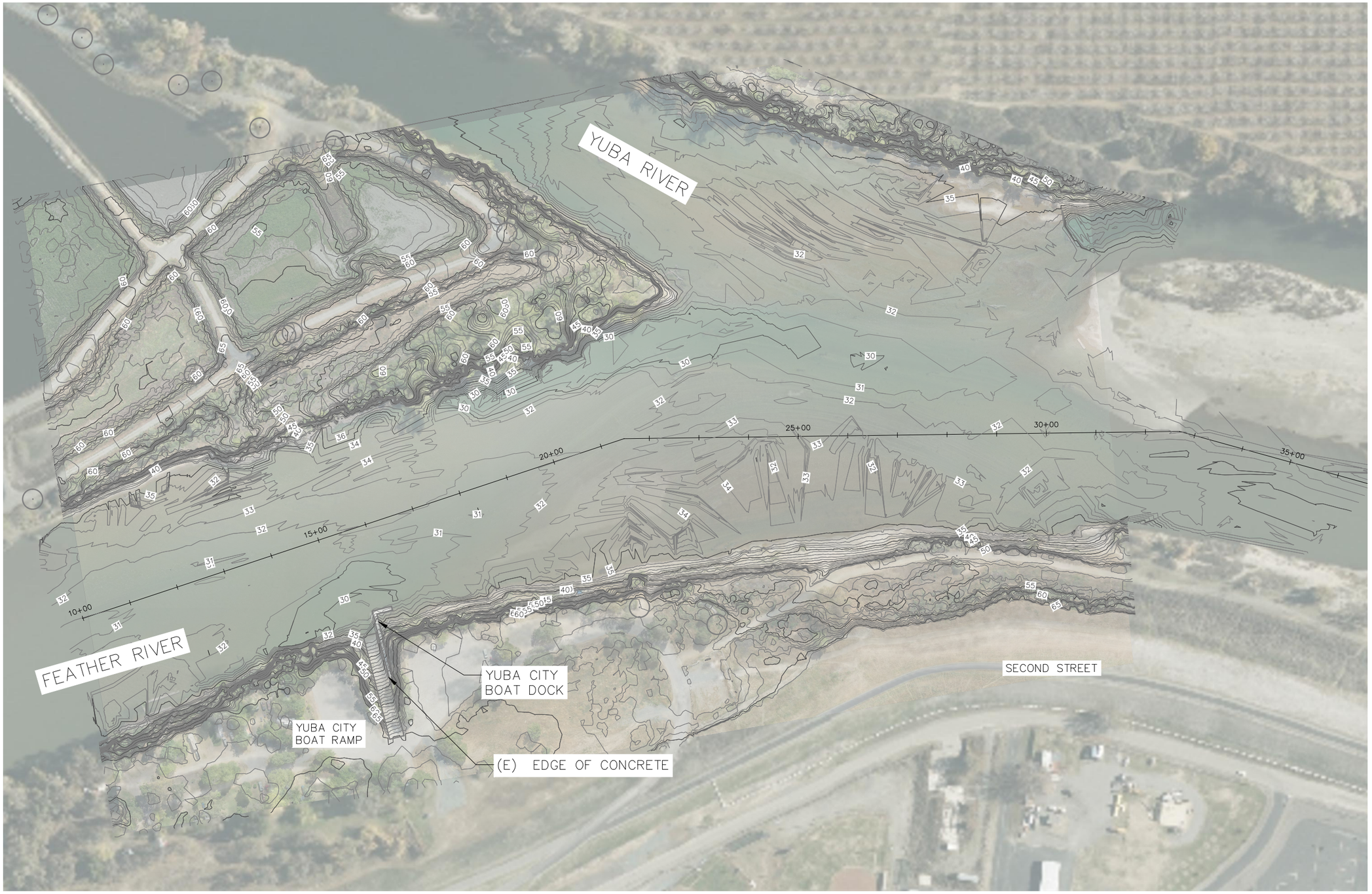
PBI
80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

STAGING AND SEDIMENT DISPOSAL PLAN

SHEET C1
SHEET 4 OF 10

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N E S W

NOTE:

1) PER CALIFORNIA DEPARTMENT OF WATER RESOURCES' CDEC GAGE, "YUB", TYPICAL WATER SURFACE ELEVATIONS RANGE FROM 35' TO 37' AT THE GAGE (39.13857, -121.60629). HIGH WATER SURFACE ELEVATION IS 65'.

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: 1"=100'

DATE: OCTOBER 2020

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 — R.C.E. NO. — 12/31/21 — EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 — R.C.E. NO. — 12/31/21 — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER B. FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA

PRELIMINARY

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80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

SUTTER BUTTE FLOOD CONTROL AGENCY

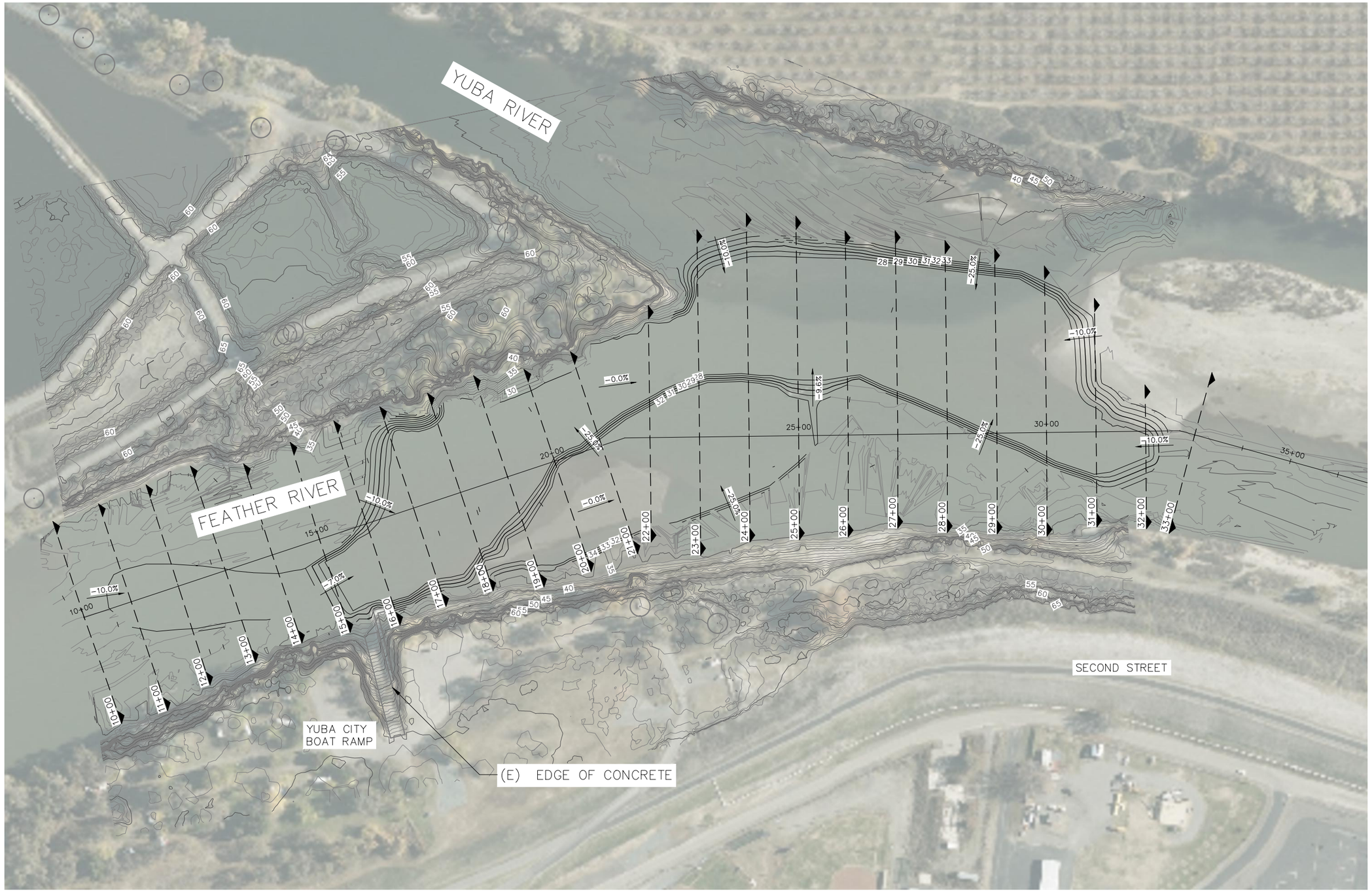
SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

EXISTING CONDITIONS (MAY 2020)

SHEET C2

SHEET 5 OF 10

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N E S W

NOTE:

1) SEE SHEETS C4–C7 FOR CROSS SECTIONS.
2) REMOVE ALL SEDIMENT FROM BOAT RAMP
3) SEDIMENT REMOVAL VOLUME IS 62,500 CY.
4) REMOVE DOCK PRIOR TO CONSTRUCTION ACTIVITIES AND REINSTALL TO PRE–PROJECT CONDITIONS AFTER CONSTRUCTION. DOCK SHALL BE PROTECTED FROM ANY DAMAGE DURING CONSTRUCTION.

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: 1"=100'

DATE: OCTOBER 2020

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. PROJECT ENGINEER	C54419 R.C.E. NO.	12/31/21 EXP. DATE
CHRISTOPHER FRITZ, P.E. PROJECT MANAGER	C75004 R.C.E. NO.	12/31/21 EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER KENNETH FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA

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80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

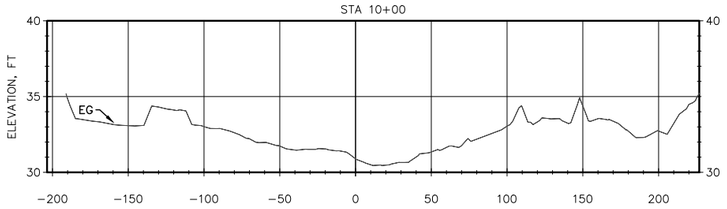
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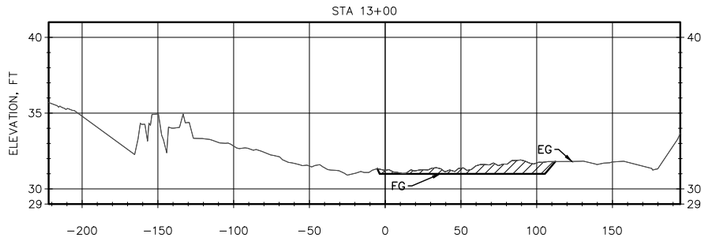
SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

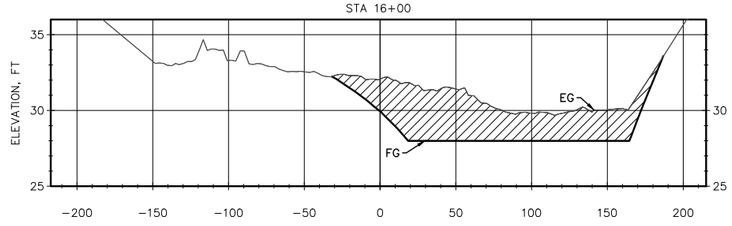
DREDGING PLAN

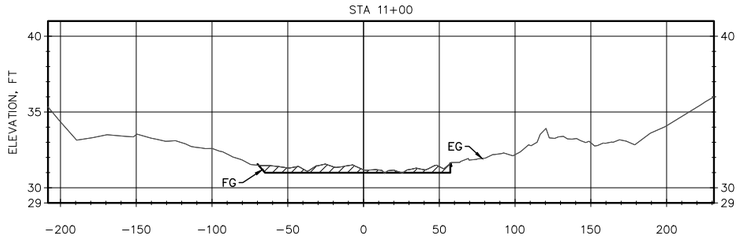
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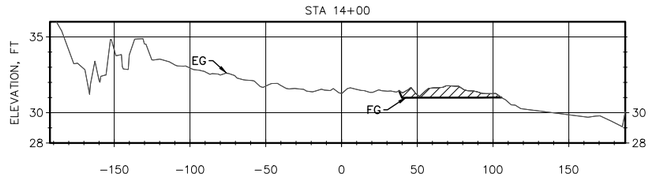
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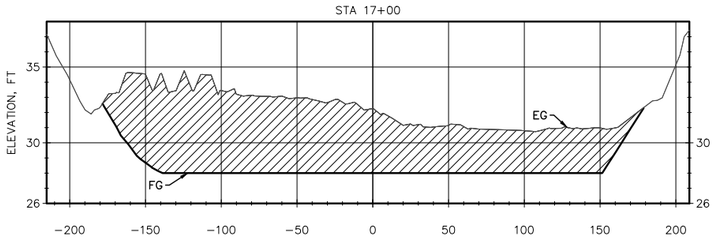


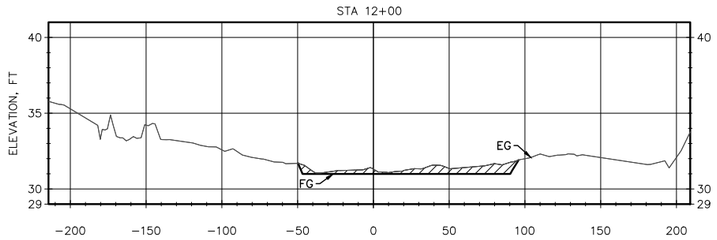


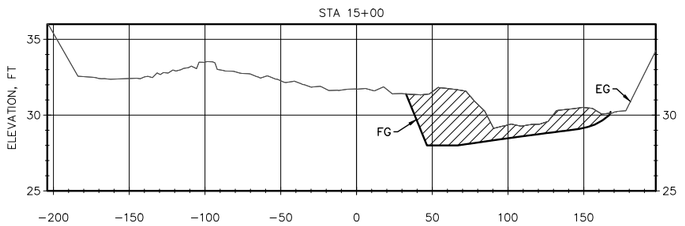


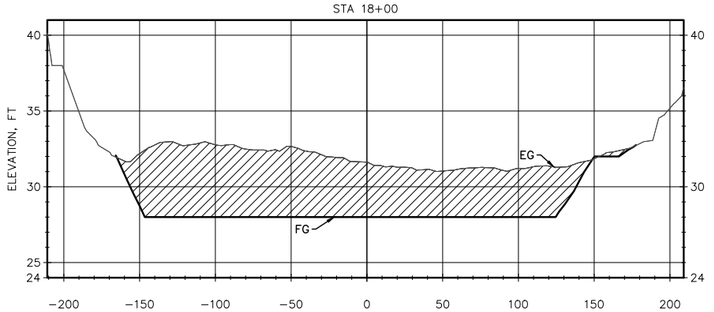












HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=5'

NOTES:
1) CROSS SECTIONS INDICATE THE EXISTING CONDITIONS AT THE TIME OF SURVEY– MAY 2020
2) CONTRACTOR TO CUT ONLY. NO FILL INCLUDED IN THIS PROJECT.

65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: AS NOTED

DATE: OCTOBER 2020

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 — R.C.E. NO. — 12/31/21 — EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 — R.C.E. NO. — 12/31/21 — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER R. FRITZ No. C75004 Exp. 12/31/21 CIVIL STATE OF CALIFORNIA

PRELIMINARY

PBI
80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

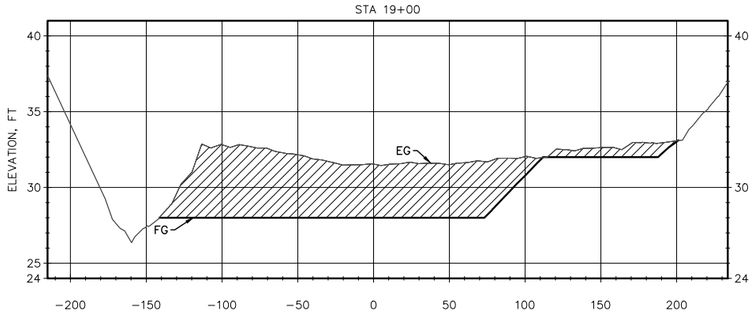
SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

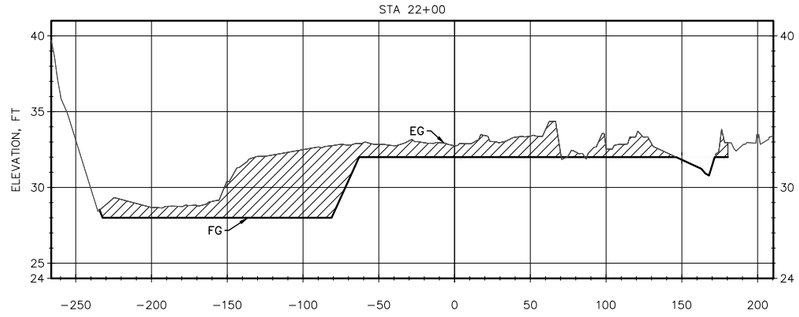
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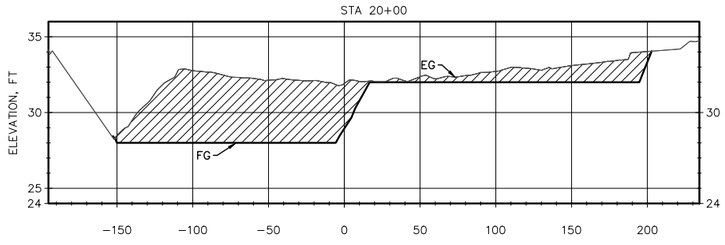
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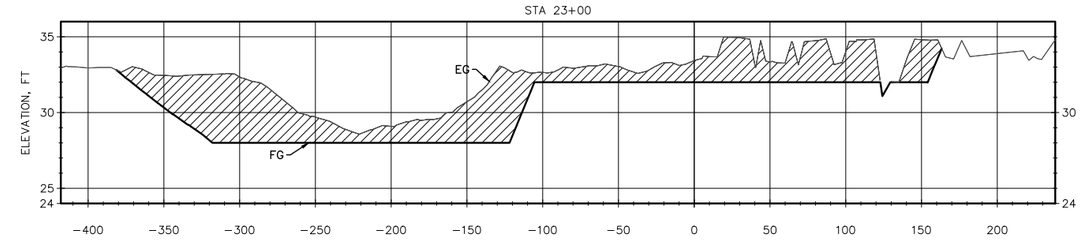
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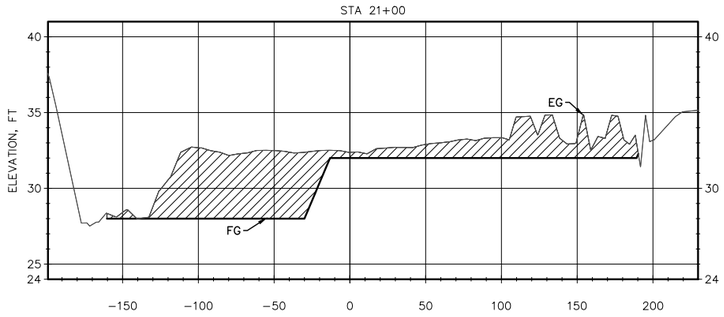
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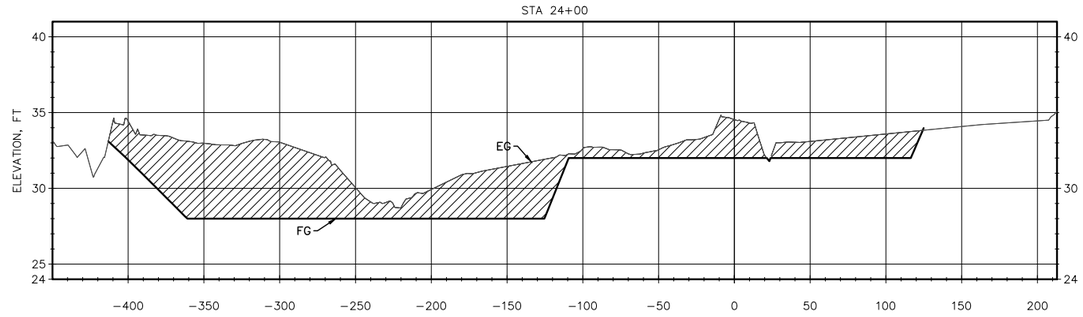












HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=5'

NOTES:

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65% NOT FOR CONSTRUCTION

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DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 — R.C.E. NO. — 12/31/21 — EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 — R.C.E. NO. — 12/31/21 — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER R. FRITZ CIVIL STATE OF CALIFORNIA Exp. 12/31/21 PRELIMINARY

PBI
80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

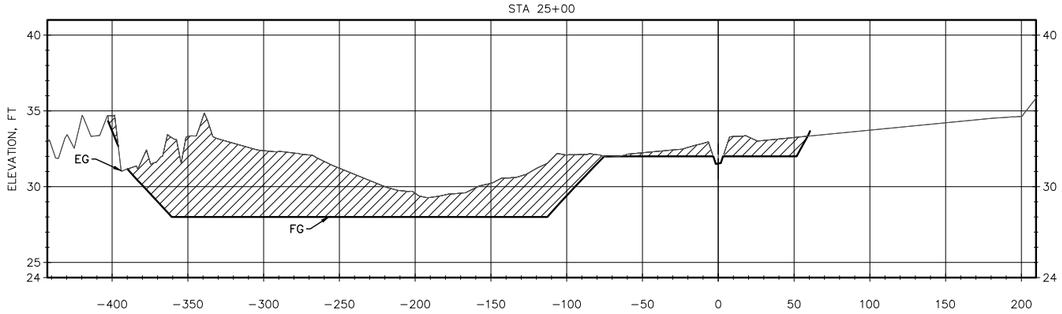
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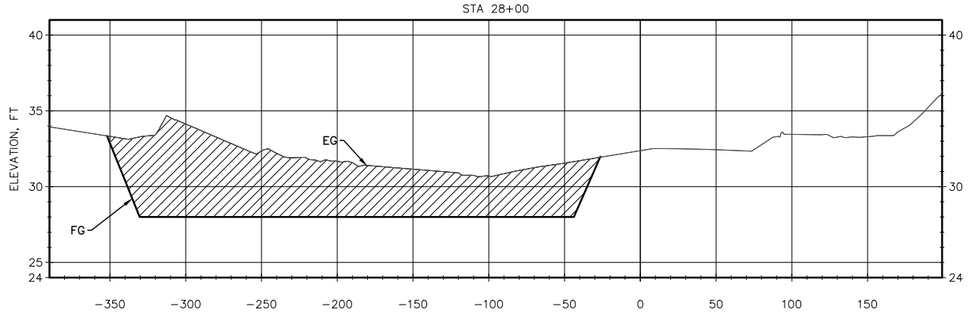
SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

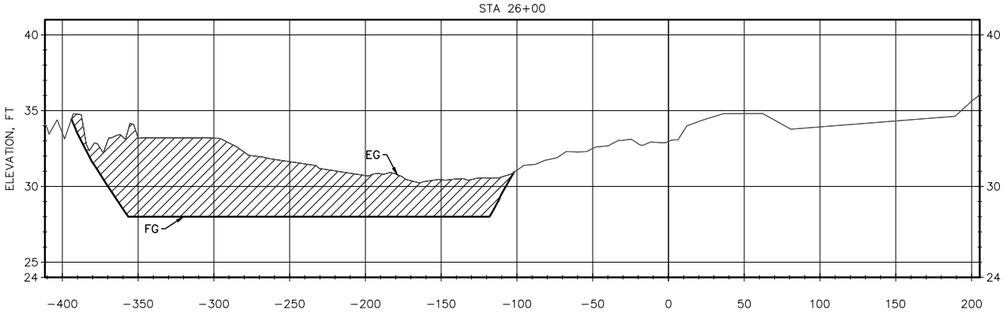
PROPOSED CROSS SECTIONS 2

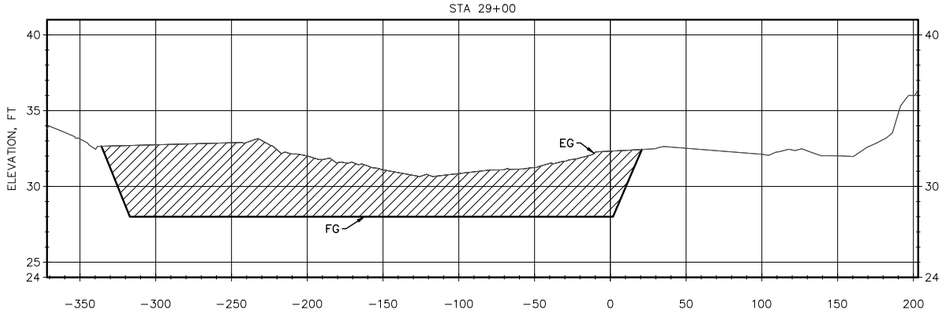
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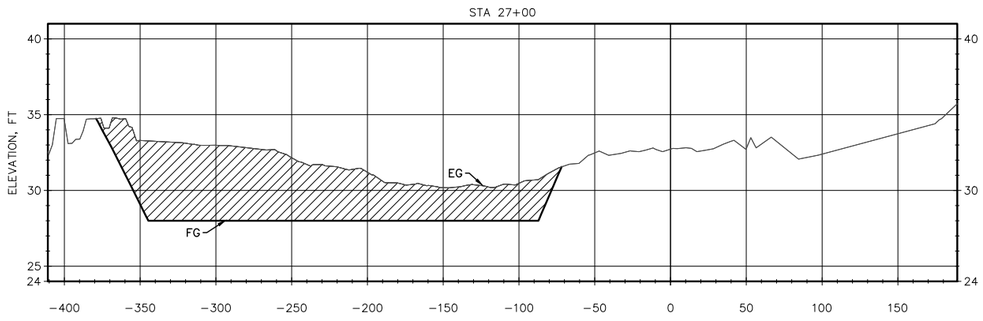
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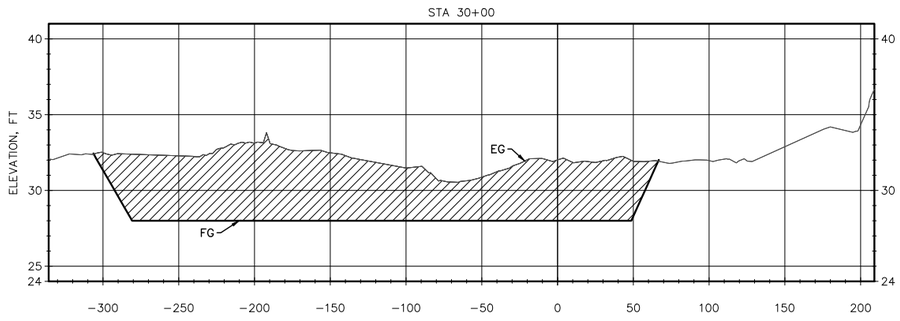












HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=5'

NOTES:
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65% NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION

SCALE: AS NOTED

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WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. PROJECT ENGINEER	C54419 R.C.E. NO.	12/31/21 EXP. DATE
CHRISTOPHER FRITZ, P.E. PROJECT MANAGER	C75004 R.C.E. NO.	12/31/21 EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER K. FRITZ CIVIL STATE OF CALIFORNIA Exp. 12/31/21

PRELIMINARY

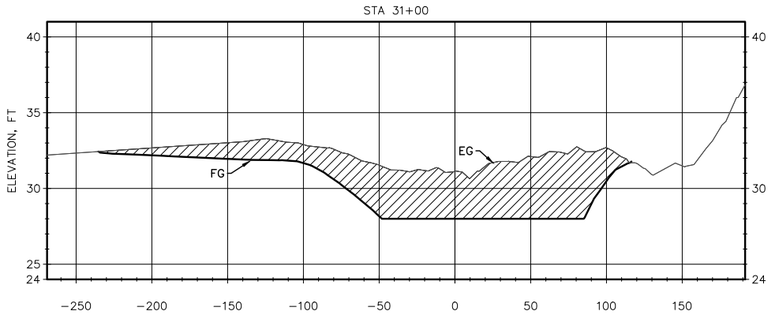
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80 Blue Ravine Rd. Suite 280
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PH. 916-608-2212
Fax 916-608-2232

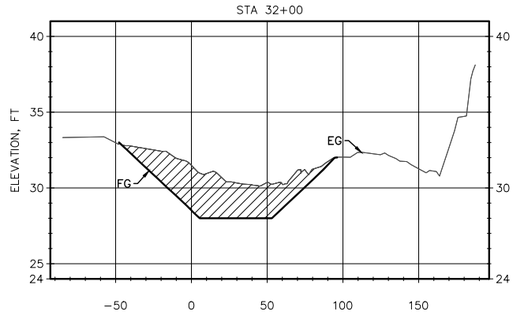
SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

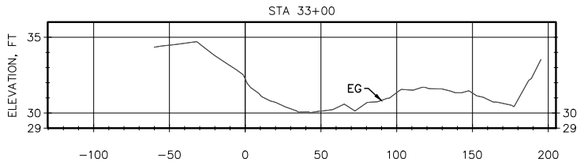
PROPOSED CROSS SECTIONS 3

SHEET C6

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HORIZONTAL SCALE 1"=50'
VERTICAL SCALE 1"=5'

NOTES:
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65% NOT FOR CONSTRUCTION

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REV	DATE	BY	DESCRIPTION

SCALE: AS NOTED

DATE: OCTOBER 2020

WARNING
0 1/2 1
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DESIGNED BLJ / SAP
DRAWN BFL
CHECKED KBB

DAVID MURBACH, P.E. — PROJECT ENGINEER — C54419 — R.C.E. NO. — 12/31/21 — EXP. DATE

CHRISTOPHER FRITZ, P.E. — PROJECT MANAGER — C75004 — R.C.E. NO. — 12/31/21 — EXP. DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER B. FRITZ No. C75004 CIVIL STATE OF CALIFORNIA Exp. 12/31/21

PRELIMINARY

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80 Blue Ravine Rd. Suite 280
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

SUTTER BUTTE FLOOD CONTROL AGENCY

SUTTER BUTTE FLOOD CONTROL AGENCY
YUBA CITY BOAT RAMP SEDIMENT REMOVAL PROJECT

PROPOSED CROSS SECTIONS 4

SHEET C7

APPENDIX J

Site Photographs



View looking east from the Yuba City Boat Launch.



View looking north from south of the boat launch.



View of the riparian corridor along Feather River.



View of Feather River from a walking trail.