Draft

TURLOCK IRRIGATION DISTRICT HARDING AND NIELSON FISH BARRIER PROJECTS

Initial Study/Mitigated Negative Declaration

Prepared for
Turlock Irrigation District

July 2019

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ENVIRONMENTAL CHECKLIST

Initial Study

1.	**Project Title:**	Turlock Irrigation District Harding and Nielson Fish Barrier Projects
2.	**Lead Agency Name and Address:**	Turlock Irrigation District 333 E. Canal Drive Turlock, CA 95381
3.	**Contact Person and Phone Number:**	Philip Govea (209) 8833447
4.	**Project Location:**	Stanislaus and Merced Counties
5.	**Project Sponsor's Name and Address:**	Same as above
6.	**General Plan Designation(s):**	Agriculture
7.	**Zoning:**	General Agriculture

8. Description of Project: See Project Description

9. Surrounding Land Uses and Setting: See Project Description

10. Other public agencies whose approval is required: See Table 1-1

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

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

Environmental Factors Potentially Affected

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

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial study:

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

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

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

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

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

Phil Govea — 7/30/19

Signature — Date

Signature — Date

CHAPTER 1
Project Description

1.1 Introduction and Background

The proposed Harding and Nielson Drain fish barrier Projects (proposed Projects) would include installation of two fish barriers. The fish barriers would be placed at two existing culvert drains in order to prevent fall run Chinook Salmon from entering the Turlock Irrigation District's (TID's) canal system via the Harding Drain Culverts and Nielson Drain Culverts. The following discussion provides a summary of background and process information relevant to the proposed Projects.

1.1.1 Existing Facilities

Owned and operated by TID, the Harding and Nielsen Drains consist of several thousand feet of open channel, earthen ditches that convey drainage water to the San Joaquin River. The Harding Drain is located directly west of the City of Turlock along Harding Road, and the Nielson Drain is located directly west of the City of Hilmar at the convergence of TID's Lateral 6 and Lateral 7 canals.

In the 1950's, the State of California, in coordination with the United States Army Corps of Engineers (USACE), decided to construct levees along the San Joaquin River for flood protection and land reclamation. Recognizing that the levees would disrupt TID's ability to convey water through the Harding and Nielsen Drains to the river, the levee project included culverts and pumping facilities that would maintain TID's right to drain. Culverts are pipelines that convey water by gravity through structures, such as flood control levees.

The Harding Drain currently has two parallel 48-inch diameter corrugated metal culverts passing through the flood control levee to the San Joaquin River, hereinafter referred to as the Harding Drain Culverts. The Nielson Drain has two parallel 42-inch diameter corrugated metal culverts passing through the flood control levee to the Hilmar Drain Extension leading to the San Joaquin River, hereinafter referred to as the Nielson Drain Culverts. The Harding Drain Culverts are each approximately 155-feet in length and the Nielson Drain Culverts are each approximately 95-feet in length. All of the culverts have flapper valves attached to the outlet end of the pipeline as well as slide gates installed in a vertical corrugated metal stand pipe located approximately at the midpoint of each pipeline. The slide gates are used as shutoff valves to prevent water from the San Joaquin River from gravity feeding back into the open channel drains on the land side of the river levee when the river water elevation rises high enough to achieve a nearly static water level with the drains. In such an event, each site has a pumping station that is utilized when the slide gates are closed to facilitate continued drainage

of water through the levee into the river. Entrances to the culverts have vertical concrete headwalls and the culvert exits project outward from the toe of the levee embankments. The Harding Drain Culverts discharge into an approximately 100-foot long cove off of the main channel of the San Joaquin River. The Nielson Drain Culverts discharge into an approximately 100-foot long cove off of the Hilmar Drain Extension, which is a reclamation drain that flows approximately 3,900 more feet to the main channel of the San Joaquin River.

1.2 Project Location

The proposed Projects are located adjacent to a federal levee along the San Joaquin River in central Stanislaus County and northern Merced County as shown in **Figure 1-1** and **Figure 1-2**. The proposed Projects are located in rural areas and primarily surrounded by agriculture with the San Joaquin River to the west.

The Harding Drain Project site is located in central Stanislaus County adjacent to the intersection of South Carpenter Road and West Harding Road where the Harding Drain meets the San Joaquin River. The nearest paved road is South Carpenter Road with access to the Project site provided by a dirt road off of South Carpenter Road, and a gravel road on top of the levee. The Harding Drain Culverts are located in the levee on the eastern side of the San Joaquin River.

The Nielson Drain Project site is located where the Nielson Drain meets the Hilmar Drain Extension in northern Merced County, just south of the border with Stanislaus County. The nearest paved road is Central Avenue with access to the Project site provided by the dirt road on top of the drain levee. The Nielson Drain Culverts are located in the levee on the eastern side of the Hilmar Drain Extension.

1.3 Project Objective

The objective of the proposed Projects is to prevent central valley fall run Chinook Salmon from entering the TID canal system via the Harding Drain Culverts and Nielson Drain Culverts during their spawning season, which is from September 1 to February 28, annually (hereinafter referred to as spawning season).

1.4 Proposed Project

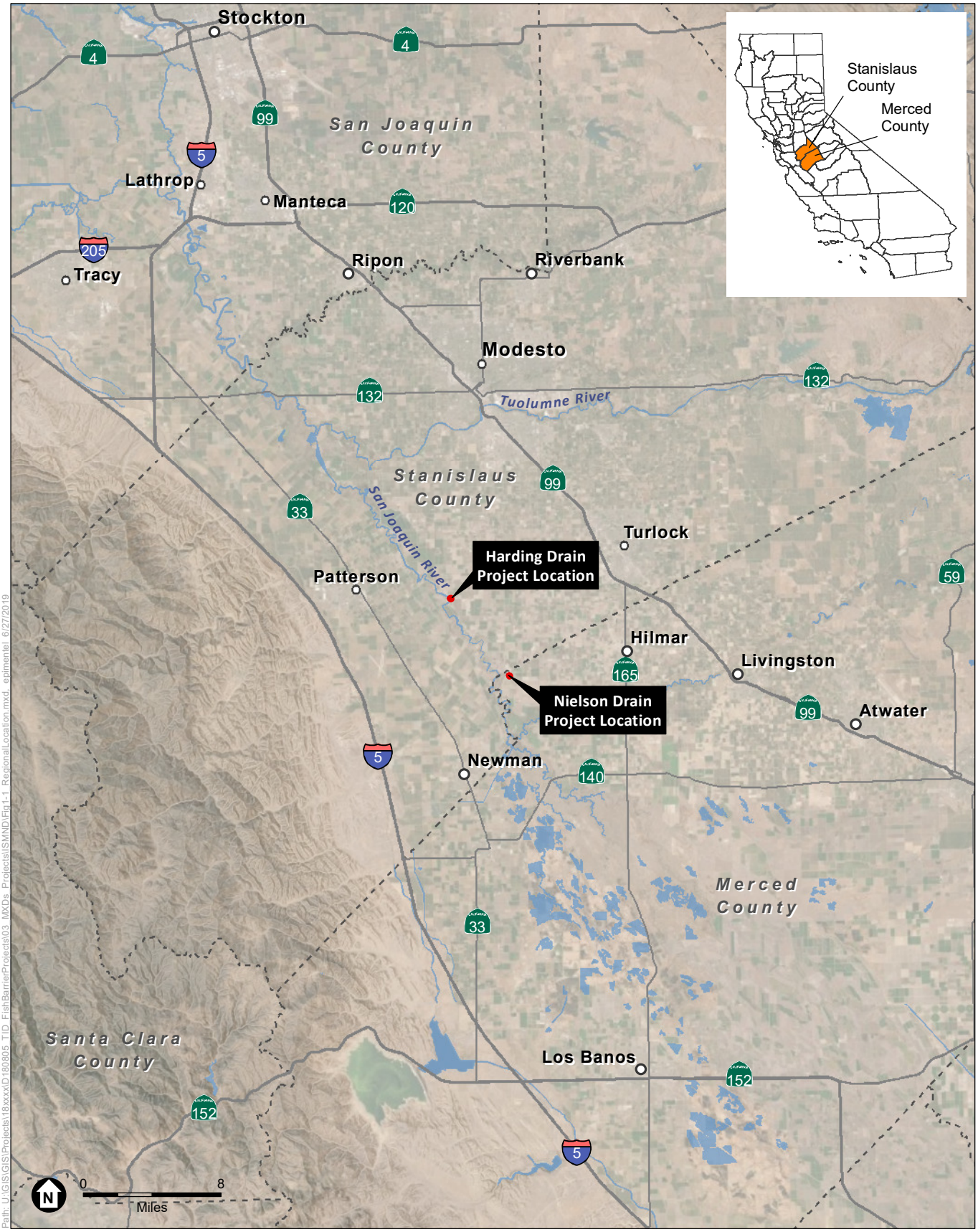
1.4.1 Fish Barriers

The proposed Projects include placing two fish barriers on the river side of the levees to prevent fall run Chinook Salmon from entering TID's canal system via the Harding Drain Culverts and Nielson Drain Culverts during the spawning season. These barriers will only be in place during the spawning season.

The barrier at the Harding Drain Project site will be a metal picket fence with removable sections to allow for cleaning/maintenance, including periodic vegetation and debris removal.

The barrier at the Nielson Drain Project site may be a swinging picket weir or a metal picket fence with removable sections. The swinging picket weir is a hinged picket fence hanging over a long crested weir. As debris pass over the weir, the picket fence is allowed to swing outwards to pass the debris while still blocking passage over the weir. Alternately, the barrier at the Nielson Drain Project site may be a metal picket fence with removable sections and motorized rotating trash screens on the upstream side to prevent vegetation and debris from plugging the picket fence.

Site preparation for both proposed Projects includes vegetation removal to facilitate the work.



SOURCE: Esri, 2018; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 1-1
Regional Location

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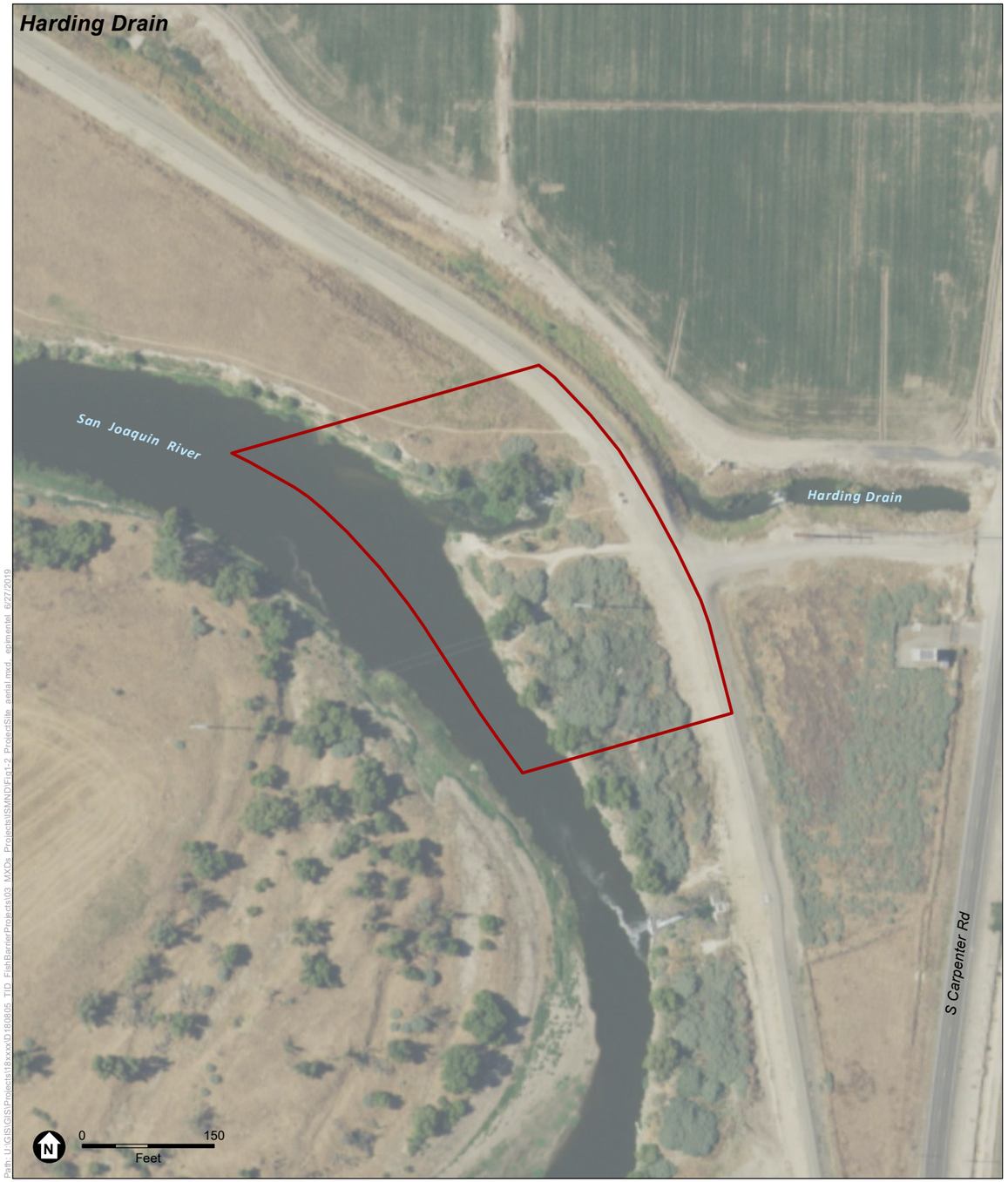

Path: U:\GIS\GIS\Projects\18xxxx\D180805_TID_FishBarrierProjects\03_MXDs_Projects\SMND\Fig1-2_ProjectSite_aerial.mxd, epimentel 6/27/2019

SOURCE: USDA, 2016; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 1-2
Project Site

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At the Harding Drain Project site only, construction of concrete lining in the area between the culvert outlets and the new fish barrier as well as a permanent vehicle access path is needed to facilitate construction and on-going maintenance. It is assumed that a permanent vehicle path will not be constructed for the Nielson Drain Project site, as the existing levee slope is sufficient to allow for construction and maintenance access.

1.5 Responsible Agencies, Permits, and Approvals

Table 1-1 summarizes the potential permits and/or approvals that may be required prior to construction of the proposed Projects.

TABLE 1-1
REGULATORY REQUIREMENTS, PERMITS, AND AUTHORIZATIONS FOR PROJECT FACILITIES

Agency	Type of Approval
Federal Agencies	
United States Army Corps of Engineers	Clean Water Act Section 404 Nationwide Permit; Rivers and Harbors Act Section 408 Permission
United States Fish and Wildlife Service/National Marine Fisheries Service	Federal Endangered Species Act Section 7 Consultation
State Agencies	
California Department of Fish and Game	Section 1600 Streambed Alteration Agreement
Central Valley Regional Water Quality Control Board	Clean Water Act Section 401 Water Quality Certification; NPDES General Permit for Stormwater Discharge Associated with Construction; General Order for Dewatering and Other Low Threat Discharges to Surface Waters Permit
Central Valley Flood Protection Board	Encroachment Permit
Cal OSHA	Construction or Excavation Permit
Local Agencies	
N/A	N/A

1.6 Construction Process and Schedule

The following text provides an overview of construction processes and schedules relevant to the proposed Projects.

1.6.2 Construction Site Preparation, Staging, and Equipment

To facilitate isolation of the Project sites from the San Joaquin River and dewatering for construction, temporary coffer dams will be constructed on the river side of the levee at each proposed Project site and the levee slide gate shut off valves will be closed to prevent upstream drainage from entering the construction area. Dewatering will be accomplished with drainage pumps moving any residual or seepage water from the construction area to adjacent ground on the landside of the levee. Construction of the temporary coffer dams may include the use of a vibratory pile driver to drive steel sheet piles or the use of an excavator to create temporary berms

using imported soil, depending on seepage conditions. Sediment/turbidity curtains will be deployed to protect water quality on the San Joaquin River side of the work activities.

The fish barrier base installation for the proposed Project sites will include construction of a cast-in- place or precast reinforced concrete footing placed below-grade and extending above-grade to provide a foundation for the wall. Soil conditions may require use of a pile driver to install piles to support the concrete footing. The wall itself will be made up of precast concrete blocks or cast-in-place concrete and vertical steel columns anchored to the footing to support a series of steel picket fence panels. Construction of the fish barrier base may include an excavator to dig trenches, a small bulldozer to level ground, a vibratory pile driver and a forklift to transport driven piles if required, a flatbed truck to provide material to erect forms, concrete delivery trucks, and a concrete pumping truck. Alternately if soil conditions allow, an excavator will dig the trenches and a precast foundation will be purchased and delivered on a flatbed truck to the site and placed using a crane.

The fish barrier at the Harding Drain Project site will consist of vertical precast concrete block walls or cast-in-place concrete walls flanking an opening containing galvanized steel I-beams acting as supports for galvanized steel picket fence panels. The fence panels will be inserted between the steel columns such that they span between the column webs and rest against the flanges of the I-beams. The steel columns will be bolted to the foundation at the base using precast high strength anchor bolts. This arrangement will allow for the steel picket fence panels to be lifted out through the top of the assembly for maintenance. Construction of this portion of the project will require a crane for lifting concrete blocks and steel components into place for installation and a flatbed truck to deliver components.

The fish barrier at the Nielson Drain Project site may consist of a cast in place reinforced concrete box surrounding the existing drain outlet, with a long crested weir located on the downstream side of the box. If this alternative is used, the concrete walls and long crested weir will be formed in place and poured using a concrete pumper truck. A galvanized steel beam and walkways will be positioned above the weir using a crane. Wire mesh will be hung from the beam down in front of the concrete weir. The wire mesh will have a rubber J-Seal frame for edge protection. Bypass gates will be installed in the weir to allow water to pass unimpeded through the box when necessary. Alternatively, the fish barrier may be constructed with galvanized steel picket fences similar to those proposed for the Harding Drain Project site. If this alternative is used, there would also be motorized rotating trash screens installed inside the box structure upstream of the picket fences to pass vegetation and debris and prevent them from clogging the picket fence. Power for the motorized rotating trash screens would be provided overhead from the existing service drop located adjacent to the pump station on the land side of the levee. Construction of this alternative would require an electrical line truck as well as similar equipment to that already mentioned.

Construction of the permanent vehicle access path at the Harding Drain Project site will include use of a small bulldozer and dump trucks to deliver any required imported soil to widen the existing paths on the abutments. It is assumed that a permanent vehicle path will not be

constructed for the Nielson Drain, as the existing levee slope is sufficient to allow for construction and maintenance access.

At the Handing Drain Project site, the area of the cove upstream of the fish barrier will be regraded and a wire mesh reinforced concrete lining will be installed up to the level of the adjacent embankments. Construction of this lining will require a small bulldozer and an excavator for regrading activities, a concrete pumper truck and a roller screed for lining placement. In addition, rock riprap will be placed on the downstream side of the fish screen foundation to mitigate scour.

Specific equipment to be used in support of construction of the proposed Projects would be based on requirements specified by the construction contractor who would complete proposed Project construction. However, TID anticipates that the following or similar types of equipment would be used on site:

- Excavator
- Bulldozer
- Dump Trucks
- Vibratory Pile Driver
- Forklift
- Crane
- Flat Bed Truck
- Concrete Pumper Truck
- Concrete Delivery Trucks
- Roller Screed

1.6.3 Anticipated Construction Schedule

Construction of the proposed Project is anticipated to require four weeks at each site for a total of eight weeks.

The sequential major construction activities associated with the construction of the proposed Projects are as follows:

- Mobilize construction equipment and materials
- Clear and grub site
- Construction of coffer dams
- Excavation for fish barrier foundation
- Installation of fish barrier foundation
- Installation of fish barrier walls, gates, walkways and screen panels
- Installation of upstream liner at the Harding Drain Project site

1.7 Project Operations and Maintenance

On-going maintenance for the Harding Drain fish barrier will be conducted from a quarterly to a monthly basis, and includes the use of an excavator to dredge the concrete lined area upstream of the fish barrier and a boom truck to remove the fish barrier panels for cleaning. During the spawning season, the fish screen will be monitored on a weekly basis and cleaned as necessary to maintain flow conditions. Given the size of the screen, it is anticipated that cleaning will be required 1-2 times per year and that it can be done when the screens are removed in March and reinstalled at the end of August. There will need to be periodic inspection and crack or buckle repair of the upstream concrete lined area as well as cleaning and resetting or replacement of any downstream riprap placed as erosion protection for the screen. In addition, periodic vegetation abatement would be conducted to keep the area around the fish barrier clear.

Operations of the Harding Drain fish barrier will involve a boom truck to remove or insert the picket fence panels when 1) river levels require the levee shutoff gates to be closed or opened, 2) when cleaning is required, or 3) at the beginning and end of the spawning season.

On-going maintenance for the Nielson Drain fish barrier includes monthly maintenance visits to manually brush the hanging screen. Or, if the alternative picket fence with rotating trash screen is installed, maintenance will include weekly visits to monitor and maintain the motorized equipment and manually brush clean all of the screens. There will need to be periodic inspection and cleaning or replacing downstream rip rap placed as erosion control around the foundation. In addition, periodic vegetation abatement would be conducted to keep the area around the fish barrier clear.

Operations of the Nielson Drain fish barrier will require that, in the event of large flows into the Nielson Drain during flood years, the bypass slide gates in the weir will be opened to allow for maximum capacity of the drain. The bypass slide gates will be closed as soon as flows return to normal. This procedure is needed to prevent upstream field inundation. At the end of the spawning season the bypass slide gates will be opened until the start of the next spawning season.

Alternately, if the motorized rotating trash screens and picket fences are installed, operations of the Nielson Drain fish barrier will involve a crane to remove the rotating trash screens and picket fences in March at the end of the spawning season and to reinstall the rotating trash screens and picket fences in August before the next spawning season begins.

1.8 Resources Not Considered in Detail

The following resource topics were not considered in detail because no impact would occur under any of these categories.

Agriculture and Forestry Resources

The proposed Project sites are located on the river side of the levee along the San Joaquin River and are not located on lands currently is agricultural use, or designated as Prime Farmland, Unique Farmland, or Farmland of Statewide importance, or zoned as Farmland, forest land,

timberland, or timberland zoned Timberland Production. Therefore, no impact related to agriculture and Forest Resources would occur.

Land Use and Planning

The proposed Project sites are located on the river side of the levee along the San Joaquin River in rural Stanislaus and Merced Counties. The proposed Projects are not located within a city or community and would be consistent with existing land uses, plans, policies, or regulations. Therefore, no impacts related to Land Use and Planning would occur.

Mineral Resources

The proposed Projects are located on a levee and would not result in the loss of availability of a known mineral resource or affect a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. There would be no impact to mineral resources.

Population and Housing

The proposed Projects would result in the construction and operation of fish barriers in order to prevent fall run Chinook Salmon from entering TID's canal system via the Harding Drain Culverts and Nielson Drain Culverts. The proposed Projects do not involve new homes. Construction would be short-term and not require additional workers outside of the existing work force. Operation of the proposed Projects would be accomplished by existing TID workers. The proposed Projects are located on a levee and would not displace any housing or people. Therefore, no impacts related to Population and Housing would occur.

Public Services

The proposed Projects would not result in the construction of any new facilities or population that would generate a need for new or physically altered government facilities. Therefore, there would be no change in the demand for police and fire protection and community amenities such as schools and parks or that which currently exists and no impact would occur.

Recreation

The proposed Projects would not increase the demand for recreation facilities, as the Projects propose construction and operation of fish barriers in order to prevent fall run Chinook Salmon from entering TID's canal system via the Harding Drain Culverts and Nielson Drain Culverts. The proposed Projects do not include recreational facilities or require the construction or expansion of recreational facilities. Therefore, no impact would result from the proposed Projects.

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CHAPTER 2
Environmental Checklist

Aesthetics

Issues (and Supporting Information Sources):		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	**AESTHETICS —** Except as provided in Public Resources Code Section 21099, would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

Aesthetic or visual resources include the "scenic character" of a particular region and site. Scenic features can include both natural features, such as vegetation and topography, and manmade features (e.g. historic structures). Areas that are more sensitive to potential effects are usually readily observable, such as land found adjacent to major roadways and hilltops.

Visual Environment

The Project sites are located in a federal levee along the San Joaquin River in central Stanislaus County and northern Merced County. The areas are generally flat and primarily utilized for agriculture and/or dairy production. The Diablo Range, a subdivision of the Pacific Coast Ranges, can be seen in the west. Interstate 5 (I-5) is an officially designated scenic highway in the areas where it passes through both Stanislaus County and Merced County. I-5 lies to the west of both Project sites (over 7 miles from the Harding Drain and over 8 miles from the Nielson Drain) (Caltrans 2011).

The Harding Drain Project site is located in an area bounded by agricultural uses on the north, east, and south sides. The agricultural lands consist of row crops. The San Joaquin River lies immediately adjacent to the Project site to the west. The San Joaquin River is contained within levees on the east and west, the eastern one is the location of the Harding Drain. An industrial

facility, Darling International Inc., lies approximately 500 feet to the east of the Project site. The facility is renders, recycles and recovers material for production of jet fuels, tires, and commercial products

The Nielson Drain Project site is also bounded by row crops to the north, east, and south. The Nielson Drain is located on the Hilmar drain in northern Merced County approximately 3,600 feet upstream of the San Joaquin River, just south of the border with Stanislaus County.

Discussion

a) **No Impact.** There are no designated scenic vistas or notable geographic features identified in the vicinity of the Project sites in the Stanislaus County General Plan or the Merced County General Plan; as a result, the proposed Projects would have no impact on a scenic vista (Stanislaus County 2016 and Merced County 2013).

b) **No Impact.** A review of the current California Department of Transportation (Caltrans) Map of Designated Scenic Routes indicates that there is one officially designated state scenic highway in the area of the proposed Projects. I-5 runs through both Stanislaus and Merced Counties; however, the interstate is over 7 miles west of the Harding Drain Project site and over 8 miles west of the Nielson Drain Project site and neither Project would be visible by travelers on I-5 and would not affect the scenic quality of the landscape or intrude upon the traveler's enjoyment of the view. Therefore, the proposed Projects would result in no impact.

c) **Less than Significant.** Construction of the proposed Projects would result in temporary changes to local visual conditions, such as grading, clearing of vegetation, and the presence of equipment in the Project areas. These impacts would be temporary in nature and would not extend beyond the anticipated 8 weeks of construction activity. Given the relatively short-term nature of these construction-related activities, construction-related visual impacts are considered less-than-significant.

Completion of the proposed Projects would result in some permanent visual changes to the Project areas, including two fish barriers on the river side of the levees. However, these changes are consistent with the existing agricultural nature of the area which includes canals and canal gates. In addition, these fish barriers would be installed at the foot of the levees decreasing their visibility from the surrounding area. For these reasons, visual impacts from the proposed Projects are considered a less-than-significant impact.

d) **No Impact.** Construction of the proposed Projects would occur during the daytime and would not require nighttime lighting. The proposed Projects do not propose any new light sources or reflective surfaces that would represent potential sources of glare. Therefore, the proposed Projects would have no impact to aesthetics due to new sources of light and glare.

References

California Department of Transportation (Caltrans), 2011. California Scenic Highway Mapping System, Tuolumne County. Available: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Accessed May 24, 2019.

Merced County, 2013. 2030 Merced County General Plan, Final EIR. October, 2013.

Stanislaus County, 2016. Stanislaus County General Plan 2015. August 2016.

Air Quality

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
II.	**AIR QUALITY —** Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d)	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

General Climate and Meteorology

The Project sites are located in unincorporated Stanislaus and Merced Counties in the northern portion of the San Joaquin Valley Air Basin (SJVAB). The SJVAB is defined by the Sierra Nevada in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Strait where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley thus could be considered a "bowl" open only to the north.

The SJVAB has an inland Mediterranean climate averaging over 260 sunny days per year. The valley floor experiences warm, dry summers and cool wet winters. Summer high temperatures often exceed 100 degrees Fahrenheit, averaging in the low 90s in the northern valley and high 90s in the south. In the entire SJVAB, high daily temperature readings in summer average 95 degrees Fahrenheit. Over the last 30 years, the SJVAB averaged 106 days per year of 90 degrees Fahrenheit or hotter, and 40 days per year of 100 degrees Fahrenheit or hotter. The daily summer temperature variation can be as much as 30 degrees Fahrenheit.

In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a maritime influence to the SJVAB. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the valley. Winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45 degrees Fahrenheit.

Criteria Air Pollutants

Concentrations of criteria air pollutant are used as indicators of ambient air quality conditions. Source types, health effects, and future trends associated with each air pollutant are described

below along with the most current attainment area designations and monitoring data for the Project areas and vicinity.

Ozone

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gas (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide

Ambient carbon monoxide (CO) concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the proposed Project region have no problem meeting the CO State and federal standards. CO measurements and modeling were important in the early 1980's when CO levels were regularly exceeded throughout California. In more recent years CO measurements and modeling results have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles, and improvements in fuels.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown gas that is a by-product of combustion processes. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Automobiles and industrial operations are the main sources of NO_2 which is an air quality concern because it acts a respiratory irritant and is a precursor of ozone. NO_2 is a major component of the group of gaseous nitrogen compounds, commonly referred to as NO_x, which NO_x are produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, NO_x emitted from fuel combustion

are in the form of nitric oxide (NO) and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NO_x emitted from the source.

Sulfur Dioxide

Sulfur Dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. Concentration rather than duration of exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter.) PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope 2006). The California Air Resources Board (CARB) has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year (CARB 2002).

Lead

Ambient lead concentrations meet both the federal and state standards in the Project areas. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The proposed Project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. TACs are regulated differently than criteria air pollutants at both federal and state levels. At the federal level these airborne substances are referred to as Hazardous Air Pollutants (HAPs). The state list of TACs identifies 243 substances and the federal list of HAPs identifies 189 substances.

The CARB identified diesel particulate matter (DPM) as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways and rail lines with diesel locomotive operations. The risk from DPM as determined by the CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, the CARB estimated the average statewide cancer risk from DPM at 540 in one million (CARB 2009). This calculated cancer risk values from ambient air exposure can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the National Cancer Institute (NCI 2012).

Odorous Emissions

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors,

as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the odor source will mitigate odor impacts.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. Reasons for greater sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality because people usually stay home for extended periods of time. The closest sensitive receptor to the Harding Drain is a residence located approximately 1,700 feet to the south. The closest sensitive receptor to the Nielson Drain is a residence located approximately 3,000 feet to the north.

Discussion

a) **Less than Significant.** The applicable air quality plan is the *2016 Ozone Plan for 2008 8-hour Ozone Standard* (SJVAPCD 2016) and *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards* (SJVAPCD 2018). The current SJVAPCD set of rules and regulations represents all feasible control measures for SJVAPCD sources. The SJVAPCD plans to achieve the California Ambient Air Quality Standards (CAAQS) and NAAQS by the earliest practicable date as a result of local reductions. Exceedance of the SJVAPCD's current adopted thresholds of significance for criteria pollutant emissions would conflict with or obstruct the implementation of the *2016 Ozone Plan for 2008 8-hour Ozone Standard* and *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards.*

The proposed Projects would result in an increase in criteria pollutant emissions generated by employee trips during maintenance activities. However, the increase in employee trips is not expected to be substantially greater than what currently exists. The increased mobile source emissions at the Project sites are expected to result in a marginal increase in criteria pollutant emissions and would not conflict with or obstruct the implementation of the *2016 Ozone Plan for 2008 8-hour Ozone Standard* and *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards.*

As described later under impact b, Project emissions of NO_x (ozone precursor) would not be expected to exceed the SJVAPCD significance threshold during the duration of construction activities. The construction of the proposed Projects would be short-term and temporary and the increase in criteria pollutant emissions from off- and on-road equipment exhaust would not conflict with the applicable air quality plans. Since construction emissions are not expected to exceed the SJVAPCD or General Conformity *de minimums* thresholds for NO_x, this impact would result in a less-than-significant impact.

b) **Less than Significant.** The source of construction-related pollutant emissions would include on-road worker trips and haul trip and off-road equipment. Construction activities

are anticipated to be 8 weeks in total, and would not generate large amounts of pollutant emissions.

Since the proposed Projects would only require minimal use of off-road equipment and there would be minimal worker and haul trips to the Project sites, construction of the proposed Projects is not expected to result in the emissions of NOx, PM_{10} or $PM_{2.5}$ that would exceed the San Joaquin Valley Air Pollution Control District (SJVAPCD) significance threshold.

Since construction activates would occur within drainage areas and there would only be minimal soil disturbance, it is expected that the proposed Projects would generate limited amounts of fugitive dust emissions during construction. In addition, construction would be completed within 8 weeks and PM_{10} and $PM_{2.5}$ exhaust emissions generated during the construction of the proposed Projects would result in a less-than-significant impact.

The proposed Projects would result in vehicle trips during maintenance activities. However, employee trips required for periodic maintenance to clean the barriers would not be significantly more than to those generated under existing operations, and would result in negligible increases in emissions. Therefore, this impact would result in a less-than-significant impact.

c) **Less than Significant.** Construction of the proposed Projects would take approximately 8 weeks to complete. Due to this relatively short period of exposure, TACs generated during construction would not be expected to result in concentrations causing significant health risks. In addition, construction related activities associated with the proposed Projects would only require the minimal use of off-road equipment known to generate large amounts of TAC emissions. Therefore, health risks associated with construction of the proposed Projects would be less than significant.

Normal operation of the proposed Projects would consist of periodic maintenance to clean the barriers and/or remove portions of the barriers for cleaning. Operation of the Harding Drain fish barrier would involve using a boom truck to remove the picket fence panels when river levels require maintenance crews to close the levee shutoff gates. The boom truck would need to return and replace the picket fence panels when the levee shutoff gates are reopened.

Operation of the Nielson Drain fish barrier would be determined by which type of fish barrier is installed. If the hanging screen design is selected, on-going maintenance for the Nielson Drain would include monthly maintenance visits to manually brush the hanging screen. Or, if the alternative picket fence with rotating trash screen is installed, maintenance will include weekly visits to monitor and maintain the motorized equipment and manually brush clean all of the screens. However, employee trips required for periodic maintenance to clean the barriers would not be significantly more than to those generated under existing operations. As a result, exposure of sensitive receptors to substantial TAC emissions from the proposed Projects would be less than significant.

d) **Less than Significant.** Construction of the proposed Projects would last for approximately 8 weeks total (approximately four weeks at each site) and on-site diesel powered equipment would only operate intermittently, up to approximately 8 hours per day. The use of on-site diesel powered equipment can produce odorous exhaust, but equipment use at either of the Project sites would be temporary and potential odors would not affect a substantial number of people in the vicinity of the Project sites given the rural nature of the Project sites. Therefore, construction of the proposed Projects would not create objectionable odors that would affect a substantial number of people and odor impacts would result in a less-than-significant impact.

As a general matter, the types of land use development that pose potential odor problems include wastewater treatment plants, refineries, landfills, composting facilities and transfer stations. Since the proposed Projects would consist of a fish barriers and no uses known to pose potential odor problems would occupy the Project sites, operation of the proposed Projects would not create objectionable odors that would affect a substantial number of people. Impact would be less than significant.

References

California Air Resources Board (CARB), 2002 (May 3). *Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates*.

———, 2009. The California Almanac of Emissions and Air Quality – 2009 Edition. Chapter 5, Toxic Air Contaminant Emissions, Air Quality and Health Risk.

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National Cancer Institute (NCI), 2012. Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity, Both Sexes: 18 SEER Areas, 2007-2009 (Table 1.14). Available: https://seer.cancer.gov/archive/csr/1975_2009_pops09/results_merged/topic_lifetime_risk_diagnosis.pdf. Accessed June 3, 2019.

Biological Resources

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

Data Sources/Methodology

Biological resources within the Project site were identified by an ESA biologist through field reconnaissance and an aquatic resources delineation conducted in May 2019. Prior to the survey, a review of pertinent literature and database queries were conducted for the proposed Project sites and surrounding area. The survey was conducted on foot and existing habitat types, plants, and wildlife species within and adjacent to the proposed Project sites were recorded. The biological survey focused on identifying and delineating habitat for special-status plant and wildlife species, although general habitat conditions were noted and incidental species observations were recorded. The survey included a floristic survey of all vascular plants observed. A formal aquatic resource delineation was also conducted (ESA 2019).

Habitats present at the Project site were compared to the habitat requirements of the regionally occurring special-status species and used to determine which of these species had the potential to occur at or adjacent to the proposed Project sites. Potentially jurisdictional wetlands and other waters of the U.S. were delineated according to methods outlined in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE

2008). Plant nomenclature follows *The Jepson Manual: Vascular Plants of California (Second Edition)* (Baldwin et al. 2012).

The primary sources of data referenced for this section include the following:

- United States Fish and Wildlife Service (USFWS) list of Federal Endangered and Threatened Species that occur in the Project areas (USFWS 2019a) (see **Appendix A**);
- USFWS Critical Habitat for Threatened and Endangered Species (online mapping program) (USFWS 2018b);
- California Natural Diversity Database (CNDDB), Rarefind 5 computer program (v5.2.14) (California Department of Fish and Wildlife [CDFW] 2019a) (see **Appendix A**);
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (v8-03 0.39) (CNPS 2019) (see **Appendix A**);
- CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2019b);
- CDFW Special Animals List (CDFW 2018); and
- *Harding and Nielson Drain Fish Barrier Projects Aquatic Resources Delineation* (ESA 2019) (see **Appendix B**).

Regional Setting

Regionally, the Project site is located in the bottom of the San Joaquin Valley, near the San Joaquin River. The surrounding area is dominated by agriculture. Near the Project areas there is a floodplain with scattered riparian trees and riparian scrub between the levees of the San Joaquin River.

Environmental Setting

The portion of the Project areas at the Harding Drain is located near the intersection of South Carpenter Road and West Harding Road in Stanislaus County. This portion of the Project areas includes portions of the San Joaquin River, the Harding Drain, and a levee. This portion of this Project area is on sections 25 and 36 of Township 5 South, Range 8 East of the Crows Landing, California U.S. Geological Survey (USGS) 7.5-minute series quadrangle. The approximate centroid of the Project areas is 37º 23′ 52.39″ North, 120º 58′ 20.49″ West. Topography in the area is flat except for slopes next to the Harding Drain and the San Joaquin River. Elevation within this portion of the Project areas ranges from approximately 40–60 feet. Aerial imagery and topographic maps of the proposed Projects of the Project areas are in **Figures 2** and **3** of the Aquatic Resources Delineation Report (see **Appendix B**), respectively.

The portion of the Project areas at the Nielson Drain is located about 0.7 mile west of Central Avenue, in Merced County, near the Merced/Stanislaus County boundary. This portion of the Project areas includes portions of the Nielson Drain and a levee. This portion of the Project areas is on section 22 of Township 6 South, Range 9 East of the Hatch, California U.S. Geological Survey (USGS) 7.5-minute series quadrangle. The approximate centroid of this Project area is 37º 23′ 52.00″ North, 120º 58′ 21.07″ West. Topography in the area is flat except for slopes next to

the Nielson Drain and Hilmar Drain. Elevation within this portion of the Project areas ranges from approximately 60–70 feet.

Vegetation/Habitat Types

Vegetation communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. The uplands in both components of the Project areas consist of riparian along the edge of waterways, and disturbed areas farther upslope. Representative photographs of the habitat types are in **Exhibit B** of the Aquatic Resources Delineation Report (Appendix B).

Riparian

A band along the waterways in both components of the Project areas is dominated by scattered willows (*Salix* sp.) and Fremont cottonwoods (*Populus fremontii*). The understory vegetation below the riparian trees is similar to the ruderal/disturbed vegetation described below.

Ruderal/Disturbed

Uplands in the Project areas consist of dirt roads and road shoulders, constructed slopes between the dirt roads and waterways (**Photograph 1** in **Exhibit B in** Appendix B). Vegetation at the Harding Drain Project area is dominated by big saltbush (*Atriplex lentiformis*), slender wild oat (*Avena barbata*), and soft chess (*Bromus hordeaceus*). Vegetation at the Neilson Drain Project area is dominated by milk thistle (*Silybum marianum*), stinging nettle (*Urtica dioica*), and summer mustard (*Hirschfeldia incana*).

Aquatic Resources

The aquatic resources delineation identified 2.07 acres of aquatic resources within the Project areas. These include:

- Harding Drain (0.28 acre)
- San Joaquin River (1.04 acres)
- Nielson Drain (0.13 acre)
- Fresh Emergent wetland (0.61 acre)

Aquatic communities and habitats were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* ("Cowardin Classification") (FGDC 2013). Details of the aquatic resources within the Project areas are in **Table 1** of the Aquatic Resources Delineation Report. **Figure 6** of the Aquatic Resources Delineation Report shows the location and extent of the aquatic features. Representative photographs of the aquatic features are in **Exhibit B** of the Aquatic Resources Delineation Report (Appendix B). The Aquatic Resources Spreadsheet is in **Exhibit C** of the Aquatic Resources Delineation Report (Appendix B).

The federal government regulates waters of the U.S., including many wetlands, under the Clean Water Act (CWA). Rivers, creeks, intermittent and ephemeral channels, ponds, and lakes are typical examples of waters of the U.S. The federal government defines wetlands in Section 404 of the CWA as "areas that are inundated or saturated by surface or ground water at a frequency and

duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b] and 40 CFR 230.3). Under normal circumstances, the federal definition of wetlands requires three wetland identification parameters be present: wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to other waters of the U.S. The U.S. Army Corps of Engineers (USACE) is the responsible agency for regulating wetlands under Section 404 of the CWA, while the U.S Environmental Protection Agency (EPA) has overall responsibility for the CWA. The CDFW does not normally have direct jurisdiction over wetlands unless they are subject to regulation under Streambed Alteration Agreements or they support state-listed species; however, CDFW has trust responsibility for wildlife and habitats pursuant to California law.

Harding Drain

The Harding Drain flows as a result of agricultural runoff. Water in the Harding Drain enters the eastern boundary of the Project area through two culverts under the San Joaquin River levee. Each culvert has a flap-gate on the water-side of the levee. The culverts outfall into a cut on the bank of the San Joaquin River (Photographs 2 and 3 in Exhibit B of Appendix B). Water flows into the San Joaquin River approximately 120 feet to the west. Historical topographic maps back to 1916 were reviewed (USGS 2019). There is no indication that the Harding Drain is a re-aligned naturally-occurring channel. Its route does not follow a natural drainage pattern on older topographic maps where the natural topography is still evident. Downstream of the culverts, the ordinary high water mark (OHWM) of the Harding Drain is the same elevation as the San Joaquin River and there is no barrier between them.

San Joaquin River

In the Project area, the San Joaquin River receives flow from the Harding Drain (Photographs 2 and 4 in Appendix B). The OHWM of the San Joaquin River was identified in the field based on destruction of terrestrial vegetation and scour.

Nielson Drain

The Nielson Drain flows as a result of agricultural runoff. Water in the Nielson Drain enters the eastern portion of the Project area through two culverts under a levee. Each culvert has a flap-gate on the water-side of the levee. The culverts outfall into a cut on the bank of the Hilmar Drain (Photographs 5, 6, and 7 in Appendix B). Water flows into the Hilmar Drain approximately 120 feet to the west. Historical topographic maps back to 1918 were reviewed (USGS 2019). There is no indication that the Nielson Drain is a re-aligned naturally-occurring channel. Its route does not follow a natural drainage pattern on older topographic maps where the natural topography is still evident.

Downstream of the culverts, the OHWM of the Nielson Drain is the same elevation as the Hilmar Drain and there is no barrier between them. The OHWM of the Nielson Drain was identified in the field based on destruction of terrestrial vegetation and scour. The Nielson Drain, downstream of the culverts, was excavated in the OHWM of the Hilmar Drain. The reach of Hilmar Drain in the Project area is a natural drainage.

The Hilmar Drain flows into the San Joaquin River about 0.75 mile downstream of the Project area. The reach of the Hilmar Drain next to the Project area is a naturally-occurring water based on review of contour lines and mapped waters on the Hatch 1973 USGS 7.5-minute quad and the Mitchell School 1918 USGS 7.5-minute quadrangle (USGS 2019).

Emergent Wetland

Emergent wetland, dominated by tule (*Schoenoplectus* sp.) and cattail (*Typha* sp.), occurs next to the Nielson and Hilmar Drains in the Project areas (Photographs 8 and 9 in Exhibit B of Appendix B). The emergent wetland was inundated during the fieldwork.

Sensitive Natural Community

A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, state, or federal agencies. Most sensitive natural communities are given special consideration because they perform important ecological functions, such as maintaining water quality and providing essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species and therefore are considered sensitive from a botanical standpoint. CEQA may identify the elimination of such communities as a significant impact.

Sensitive natural communities include: a) areas of special concern to federal, state, or local resource agencies; b) areas regulated under Section 404 of the CWA; c) areas protected under Section 402 of the CWA; and d) areas protected under state and local regulations and policies. Habitat types on the Project site that would be considered sensitive by regulatory agencies include waters of the U.S. (Harding Drain, San Joaquin River, Nielson Drain, and emergent wetland) and riparian.

Wildlife Movement Corridors

Wildlife movement corridors are considered an important ecological resource by various agencies (CDFW and USFWS) and under CEQA. Movement corridors may provide favorable locations for wildlife to travel between different habitat areas such as foraging sites, breeding sites, cover areas, and preferred summer and winter range locations. They may also function as dispersal corridors allowing animals to move between various locations within their range. Topography and other natural factors, in combination with urbanization, can fragment or separate large open-space areas. Areas of human disturbance or urban development can fragment wildlife habitats and impede wildlife movement between areas of suitable habitat. This fragmentation creates isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations, and can adversely affect genetic and species diversity. Movement corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange between separate populations.

Both components of the proposed Project areas are along riparian areas that may serve as wildlife movement corridors, the San Joaquin River and the Hilmar Drain. These areas may serve as

wildlife movement corridors because they have natural habitats and native vegetation, and relatively few artificial barriers to wildlife movement.

Special-status Species

Special-status species are regulated under the state and federal Endangered Species Acts or other regulations or are species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are classified under the following categories:

1. Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (50 Code of Federal regulations [CFR] 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]);

2. Species that are candidates for possible future listing as threatened or endangered under the federal Endangered Species Act (61 FR 40, February 28, 1996);

3. Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 California Code of Regulations [CCR] 670.5);

4. Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);

5. Animal species of special concern to CDFW;

6. Animals fully protected under Fish and Game Code (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);

7. Species that meet the definitions of rare and endangered under CEQA. CEQA Section 15380 provides that a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists (State CEQA Guidelines, Section 15380); and

8. Plants considered by CNPS and CDFW to be "rare, threatened or endangered in California" (California Rare Plant Rank [CRPR] 1A, 1B, and 2 in CNPS 2018).

A list of special-status species that have the potential to occur within the vicinity of the Project site was compiled based on data contained in the California Natural Diversity Database (CNDDB) (CDFW 2019a), the USFWS list of Federal Endangered and Threatened Species that Occur in or may be Affected by the proposed project (USFWS 2018a), and the CNPS Inventory of Rare and Endangered Plants (CNPS 2018). A list of special-status species, their general habitat requirements, and an assessment of their potential to occur at the Project site is provided below in **Table BIO-1**. In addition, the analysis below includes consideration of nesting birds regulated by the federal Migratory Bird Treaty Act (MBTA) or State Fish and Game Code.

The "Potential to Occur" categories are defined as follows:

- **Unlikely**: The Project site does not support suitable habitat for a particular species and/or the Project site is outside of the species known range.

- **Low Potential**: The Project site only provides limited and low quality habitat for a particular species. In addition, the known range for a particular species may be outside of the immediate Project areas.

- **Medium Potential**: The Project site and/or immediate Project areas provides suitable habitat for a particular species.

- **High Potential**: The Project site and/or immediate Project areas provide ideal habitat conditions for a particular species and/or known populations occur in the immediate Project areas or within the Project site.

- **Present**: The species was observed during the biological surveys within the Project areas.

The analysis below includes consideration of special-status species categorized as present, or with a medium or high potential to occur.

Critical Habitat

Critical habitat is defined in Section 3(5)A of the Federal Endangered Species Act as the specific portions of the geographic area occupied by the species in which physical or biological features essential to the conservation of the species are found and that may require special management considerations or protection. Specific areas outside of the geographic area occupied by the species may also be included in critical habitat designations upon a determination that such areas are essential for the conservation of the species.

The San Joaquin River in the Harding Drain portion of the Project areas is critical habitat for steelhead. There is no other critical habitat in the Project areas.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Invertebrates			
Branchinecta conservatio Conservancy fairy shrimp	FE/--/--	Inhabits large vernal pools.	Unlikely. There are no vernal pools.
Branchinecta longiantenna Longhorn fairy shrimp	FE/--/--	Inhabits small, shallow vernal pools and swales in alkali soils or rock outcrops.	Unlikely. There are no vernal pools.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/--/--	Inhabits elderberry shrubs, typically in riparian habitats.	Unlikely. There are no elderberry shrubs.
Branchinecta lynchi Vernal pool fairy shrimp	FE/--/--	Inhabits vernal pools or other areas capable of ponding water seasonally.	Unlikely. There are no vernal pools.
Lepidurus packardi Vernal pool tadpole shrimp	FE/--/--	Inhabits vernal pools or other areas capable of ponding water seasonally.	Unlikely. There are no vernal pools.
Fish			
Mlopharodon conocephalus Hardhead	--/CSC/--	Hardhead are often found at low to mid elevations in relatively undisturbed habitats of larger streams with high water quality (clear, cool).	Low. May migrate through Project site during years of high flows.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Pogonichthys macrolepidotus Sacramento splittail	--/CSC/--	Splittail spawn in shallow water over flooded vegetated habitat with a detectable water flow. Splittail larvae and juveniles remain in riparian or annual vegetation along shallow edges on floodplains.	Low: Lack of shallow water riparian habitat.
Oncorhynchus mykiss irideus Steelhead – Central Valley DPS	FT/--/--	Inhabits aquatic Sacramento/San Joaquin flowing waters	High. Migratory route in the mainstem of the San Joaquin River.
Oncorhynchus tshawytscha Central Valley Chinook salmon, fall/late fall-run	SC/CSC/--	Anadromous species using riverine, estuarine, and saltwater habitat. Adult migration occurs mainly from October through December but has been observed as late as June. Primary juvenile outmigration occurs from January through May.	High. Migratory route in the mainstem of the San Joaquin River.
Oncorhynchus tshawytscha Central Valley spring-run Chinook salmon	FT/--/--	Anadromous species using riverine, estuarine, and saltwater habitat. Adult migration potentially occurs from March through May. Juvenile outmigration occurs from November through April.	High. Migratory route in the mainstem of the San Joaquin River.
Acipenser medirostris Green sturgeon	FT/CSC/--	Green sturgeon are an anadromous species, migrating from the ocean to freshwater to spawn. They exist in the Sacramento River system, as well as in the Eel, Mad, Klamath, and Smith rivers in the northwest portion of California.	Low. Project site outside designated critical habitat and only rare observations in the San Joaquin River.
Cottus gulosus Riffle Sculpin	SC/--/--	Riffle sculpins live in permanent, cool, headwater streams where riffles and rocky substrates predominate.	Unlikely. Habitat not suitable.
Lampetra tridentata Pacific Lamprey	SC/--/--	Adults need clean, gravelly riffles in permanent streams to spawn successfully. Ammocoetes live in silty backwaters and eddies with muddy or sandy substrate into which they burrow.	Low. Lack of shallow water riparian habitat.
Lampetra hubbsi Kern Brook Lamprey	--/CSC	Principal habitats of Kern brook lamprey are silty backwaters of large rivers in foothill regions. In summer, ammocoetes are usually found in shallow pools along edges of run areas with minimal flow.	Low. Lack of shallow water riparian habitat.
Lampetra ayresii River Lamprey	--/CSC	Adults need clean, gravelly riffles in permanent streams to spawn successfully. Ammocoetes live in silty backwaters and eddies with muddy or sandy substrate into which they burrow.	Low. Lack of shallow water riparian habitat.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Amphibians			
Ambystoma californiense California tiger salamander	FT/CT/--	Lives in vacant or mammal-occupied burrows (e.g., California ground squirrel, valley pocket gopher), occasionally other underground retreats, throughout most of the year; in grassland, savanna, or open woodland habitats.	Unlikely. There is no suitable breeding habitat in or near the Project areas and there are no extant populations nearby.
Rana boylii Foothill yellow-legged frog	--/CSC/-- Candidate	Found in partially shaded, permanent, slow-moving streams or channels with rocky or muddy bottoms and open, sunny banks within chaparral, open woodland, and forest.	Unlikely. The Project areas are outside the range and there is no suitable habitat.
Rana draytonii California red-legged frog	FT/--/--	Typically found in or within 91 meters (300 feet) of aquatic habitat. Breed in quiet, slow moving streams, ponds, or marsh communities with emergent vegetation or dense riparian vegetation. May disperse up to two miles between suitable aquatic habitat.	Unlikely. The Project areas are outside the range.
Spea hammondii Western spadefoot	--/CSC, SCT/--	This species lives in a wide range of habitats; lowlands to foothills, grasslands, open chaparral, pine-oak woodlands. It prefers shortgrass plains, sandy or gravelly soil (e.g., alkali flats, washes, alluvial fans). Breeds in temporary rain pools and slow-moving streams (e.g., areas flooded by intermittent streams). Spends most of the year buried underground in burrows (California Herps 2017).	Unlikely. There are no vernal pool complexes, other suitable breeding areas, or known records nearby.
Reptiles			
Emys marmorata Western pond turtle	--/CSC/--	Found in agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	**Present**. Western pond turtle was observed at the Nielson Drain. The San Joaquin River and Harding Drain also provide habitat. The Project areas do not have nesting habitat due to steep levee slopes and mostly dense vegetation and compacted soils.
Gambelia sila Blunt-nosed leopard lizard	FE/CE, CFP/--	This species inhabits semiarid grasslands, alkali flats, low foothills, canyon floors, large washes, and arroyos, usually on sandy, gravelly, or loamy substrate, sometimes on hardpan. It is common where there are abundant rodent burrows, rare or absent in dense vegetation or tall grass.	Unlikely. The Project areas are outside the range and there is no suitable habitat.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Masticophis flagellum ruddocki San Joaquin coachwhip	--/CSC/--	Occurs in open, dry, treeless areas, including grassland and saltbush scrub. Takes refuge in rodent burrows and under shaded vegetation (California Herps 2017).	Low. There are small open grassy areas, but the nearby areas are dominated by agricultural land use, and there are no known records nearby.
Thamnophis gigas Giant garter snake	FT/CT/--	Requires adequate water early spring through mid-fall to provide adequate permanent water to maintain dense populations of food organisms; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) upland habitat with grassy banks and openings in waterside vegetation for basking; and (4) higher elevation upland habitats for cover and refuge from flood waters during the snake's inactive season in the winter (from USFWS 1999). Known from Amador, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Sacramento, San Joaquin, Solano, Yolo, and Yuba counties (Nature Serve 2017).	Low. The Project areas are provides some potential habitat, but there are no known records or extant populations nearby.
Birds			
Agelaius tricolor Tricolored blackbird	--/CSC/-- Candidate (nesting colony)	Nests in dense blackberry, cattail, tules, bulrushes, sedges, willow, or wild rose within freshwater marshes. Nests in large colonies (up to thousands of individuals).	**High**. Emergent wetland provides potential nesting habitat, and there are multiple known records in the area.
Aquila chrysaetos Golden eagle	--/CFP/-- (nesting and wintering)	Open and semi-open areas up to 12,000 feet in elevation. Builds stick nests on cliffs, in trees, or on man-made structures.	Low. There is no nesting habitat. Foraging habitat is low-quality and very limited.
Athene cunicularia Burrowing owl	--/CSC/-- (burrowing sites and some wintering sites)	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat. The burrows are found in dry, level, open terrain, including prairie, plains, desert, and grassland with low height vegetation for foraging and available perches, such as fences, utility poles, posts, or raised rodent mounds.	**Medium**. No suitable burrows occur in the Project areas, but may occur in the nearby vicinity.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Buteo swainsoni Swainson's hawk	--/CT/--	Nest peripherally to valley riparian systems and within lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow trees, ranging in height from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. This species is known from Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Inyo, Kern, Kings, Lassen, Los Angeles, Madera, Merced, Modoc, Mono, Napa, Placer, Plumas, Sacramento, San Bernardino, San Joaquin, San Luis Obispo, Siskiyou, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba counties.	**Medium**. No potential Swainson's hawk nests were observed. The trees are not large or dense enough to provide high-quality nesting habitat, but nests could become established in the future.
Haliaeetus leucocephalus Bald eagle	FD/CFP, CE/--	Breeding habitat most commonly includes areas within 2.5 miles (4.0 kilometers) of coastal areas, bays, rivers, lakes, and reservoirs. Nests usually are in tall trees or on pinnacles or cliffs near water.	Low. There is no nesting habitat.
Lanius ludovicianus Loggerhead shrike	--/CSC/--	Nests in isolated shrubs and trees and woodland edges of open habitats; forages in grasslands, agricultural fields, and low scrub habitats. Known from Alameda, Butte, Contra Costa, Fresno, Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Stanislaus, and Tulare counties (Nature Serve 2017).	**Medium**. Trees and shrubs in the Project areas provide potential nesting habitat. There are no known records nearby.
Melospiza melodia Song sparrow ("Modesto" population)	--/CSC/--	Brushy, shrubby, and deep grassy areas along watercourses and seacoasts; marshes (cattail, bulrush, and salt); and, mostly in the northern and eastern portions of range, forest edge, bogs, brushy clearings, thickets, hedgerows, gardens, brushy past.	**Medium**. Emergent wetland in the Project areas could provide potential nesting habitat. There are no known records nearby.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Vireo bellii pusillus Least Bell's vireo	FE/CE/--	Inhabits dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak, in arid regions but often near water; moist woodland, bottomlands, woodland edge, scattered cover, and hedgerows in cultivated areas (Nature Serve 2017). Nesting occurs in southwestern California, from Santa Barbara County southward (mainly in San Diego and Riverside counties), and from northwestern Baja California south to at least Cataviña (USFWS 2006). The range during the nonbreeding season includes the Cape region of Baja California, with stragglers in southern California (Ehrlich et al. 1992).	Unlikely. The Project areas are outside the range.
Mammals			
Antrozous pallidus Pallid bat	--/CSC/--	Inhabits oak woodland, savannah, and riparian habitats. Roosts in crevices and hollows in trees, rocks, cliffs, bridges, and buildings.	Low. The trees in the Project areas are not large enough to have suitable hollows.
Corynorhinus townsendii Townsend's big-eared bat	--/CSC/--	Uses caves, buildings, and tree cavities for day roosts. Maternity and hibernation colonies typically are in caves and mine tunnels.	Low. The trees in the Project areas are not large enough to have suitable hollows.
Lasiurus blossevillii Western red bat	--/CSC/--	Found in cismontane woodland, lower montane coniferous forest, riparian forest, riparian woodland.	Low. The trees in the Project areas are not large enough to likely support western red bat.
Sylvilagus bachmani riparius Riparian brush rabbit	FT/CT/--	Riparian forest with a dense shrub layer; dense thickets (e.g., wild rose, willows, blackberries) close to the San Joaquin River	Unlikely. The Project areas are outside the range.
Taxidea taxus American badger	--/CSC/--	Prefers open areas and may also frequent brushlands with little ground cover. When inactive, occupies underground burrows.	Low. No suitable burrows were observed and there are no known records nearby, but could occur in the surrounding area.
Vulpes macrotis mutica San Joaquin kit fox	FE/CT/--	Habitat includes alkali sink, valley grassland, and woodland, in valleys and adjacent gentle foothills. Multiple underground dens in dry soils are used throughout the year.	Low. No suitable burrows were observed and there are no known records nearby, but could occur in the surrounding area.
Plants			
Astragalus tener var. *tener* Alkali milk-vetch	--/--/ 1B	Annual herb found on alkaline substrate in playas, valley and foothill grassland (adobe clay) and vernal pools from 3 to 197 feet (1 to 60 meters). Known from Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, Santa Clara, San Francisco, San Joaquin, Solano, Sonoma, Stanislaus, and Yolo counties (CNPS 2019).	Unlikely. Alkaline soils are present, but there are no clay substrates, playas, or vernal pools, and there was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Atriplex cordulata var. *cordulata* Heartscale	--/-- /1B	Annual herb found on saline or alkaline soils on chenopod scrub, meadows and seeps, and valley and foothill grassland that are occasionally sandy from 0 to 1,837 feet (0 to 560 meters) (CNPS 2019). Blooms April through October.	Unlikely. There was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.
Atriplex minuscula Lesser saltscale	--/--/ 1B	Annual herb found on alkaline sandy soils in chenopod scrub, playas, and valley and foothill grassland from 49 to 656 feet (15 to 200 meters). Blooms May through October. Known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties (CNPS 2019).	Unlikely. There was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.
Atriplex persistens Vernal pool smallscale	--/--/ 1B	Annual herb found in vernal pools, which are occasionally alkaline, from 33 to 377 feet (10 to 115 meters). Blooms June through October. Known from Colusa, Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties (CNPS 2019).	Unlikely. There are no vernal pools.
Atriplex subtilis Subtle orache	--/--/ 1B	Annual herb found in alkaline soils in valley and foothill grassland from 131 to 328 feet (40 to 100 meters) (CNPS 2019). Blooms June through September. Jepson (2019) describes the habitat as saline depressions.	Low. Alkaline upland soils are present, but they are levee slopes and do not pond water or become seasonally saturated. There was substantial past ground disturbance from levee construction.
Blepharizonia plumosa Big tarplant	--/--/ 1B	Annual herb found in clay in valley and foothill grassland from 98 to 1,657 feet (30 to 505 meters). Blooms July through October. Known from Alameda, Contra Costa, San Joaquin, Solano, and Stanislaus counties (CNPS 2019).	Unlikely. There are no clay soils.
Caulanthus lemmonii Lemmon's jewelflower	--/--/ 1B	Annual herb found on alkaline sandy soils in chenopod scrub, playas, and valley and foothill grassland from 49 to 656 feet (15 to 200 meters). Blooms May through October. Known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties (CNPS 2019).	Unlikely. There was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.
Centromadia parryi ssp. *parryi* Pappose tarplant	--/--/1B.2	Annual herb often found on alkaline soils in chaparral, coastal prairie, meadows and seeps, marshes and swamps that are occasionally of coastal salt, and valley and foothill grassland that are occasionally vernally mesic from 0 to 420 meters. Blooms May through November.	Unlikely. There was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Chloropyron molle ssp. hispidum Hispid salty bird's-beak	--/--/ 1B	Annual hemiparasitic herb found on alkaline soils in meadows and seeps, playas, and valley and foothill grassland from 3 to 509 feet (1 to 155 meters). Blooms June through September. Known from Alameda, Fresno, Kern, Merced, Placer and Solano counties (CNPS 2019). Jepson (2019) describes the habitat as saline marshes and flats.	Low. The wetland in the Project areas are freshwater. Soils are alkaline, but there was substantial past ground disturbance from levee construction.
Eryngium racemosum Delta button-celery	--/CE /1B	Annual to perennial herb found occasionally in vernally mesic clay depressions in riparian scrub habitat from 10 to 98 feet (3 to 30 meters). Blooms June through October. Known from Calaveras, Contra Costa, Merced, San Joaquin, and Stanislaus counties (CNPS 2019).	Unlikely. There are no suitable clay depressions.
Eryngium spinosepalum Spiny-sepaled button-celery	--/--/ 1B	Annual to perennial herb found in valley and foothill grassland and vernal pools from 262 to 3,199 feet (80 to 975 meters (CNPS 2019). Blooms April through June.	Unlikely. There are no vernal pools or vernal pool landscapes. The plant was not observed during a botanical survey during the evident and identifiable period.
Eschscholzia rhombipetala Diamond-petaled California poppy	--/--/ 1B	Annual herb found usually on alkaline, clay substrate in valley and foothill grassland from 0 to 3,199 feet (0 to 975 meters). Blooms from March to April. Known from Alameda, Contra Costa, Colusa, San Joaquin, San Luis Obispo, and Stanislaus counties (CNPS 2019).	Unlikely. There are no clay soils.
Extriplex joaquinana San Joaquin spearscale	--/--/ 1B	Annual herb found on alkaline soils in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland from 3 to 2,739 feet (1 to 835 meters). Blooms April through October. Known from Alameda, Contra Costa, Colusa, Fresno, Glenn, Merced, Monterey, Napa, San Benito, Santa Clara, San Joaquin, San Luis Obispo, Solano, Tulare, and Yolo counties (CNPS 2019).	Unlikely. There was substantial past ground disturbance from levee construction. The plant was not observed during a botanical survey during the evident and identifiable period.
Navarretia nigelliformis ssp. radians Shining navarretia	--/--/ 1B.2	Annual herb found in clay, cismontane woodland, valley and foothill grassland, and vernal pools. (CNPS 2019). Blooms April through July. Jepson (2019) describes the habitat as vernal pools and clay depressions.	Unlikely. There are no vernal pools or clay depressions. The plant was not observed during a botanical survey during the evident and identifiable period.
Navarretia prostrata Prostrate vernal pool navarretia	--/--/ 1B.1	Annual herb found in mesic coastal scrub, meadows, seeps, valleys, foothill grasslands, and vernal pools. (CNPS 2019). Blooms April through July.	Unlikely. There are no vernal pools. The plant was not observed during a botanical survey during the evident and identifiable period.

TABLE BIO-1
REGIONALLY OCCURRING SPECIAL-STATUS SPECIES

Scientific Name **Common Name**	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential to Occur in the Project Areas**
Puccinellia simplex California alkali grass	--/--/ 1B	Annual herb found on alkaline, vernally mesic areas, within sinks, flats, and lake margins in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools from 7 to 3,051 feet (2 to 930 meters) (CNPS 2019). Blooms March through May.	Unlikely. The plant was not observed during a botanical survey during the evident and identifiable period.
Sagittaria sanfordii Sanford's arrowhead	--/--/1B.2	Perennial rhizomatous emergent herb found in marshes and swamps, occasionally in assorted shallow freshwater, from 0 to 650 meters. Blooms May through October.	Unlikely. The plant was not observed during a botanical survey during the evident and identifiable period.
Sphenopholis obtusata Prairie wedge grass	--/--/ 2B	Perennial herb found in mesic soils in cismontane woodland and meadows and seeps from 984 to 6,562 feet (300 to 2,000 meters). Blooms April through July. Known from Amador, Fresno, Inyo, Mono, Riverside, San Bernardino, San Diego, Stanislaus, and Tulare counties (CNPS 2019).	Unlikely. The plant was not observed during a botanical survey during the evident and identifiable period.

STATUS CODES:

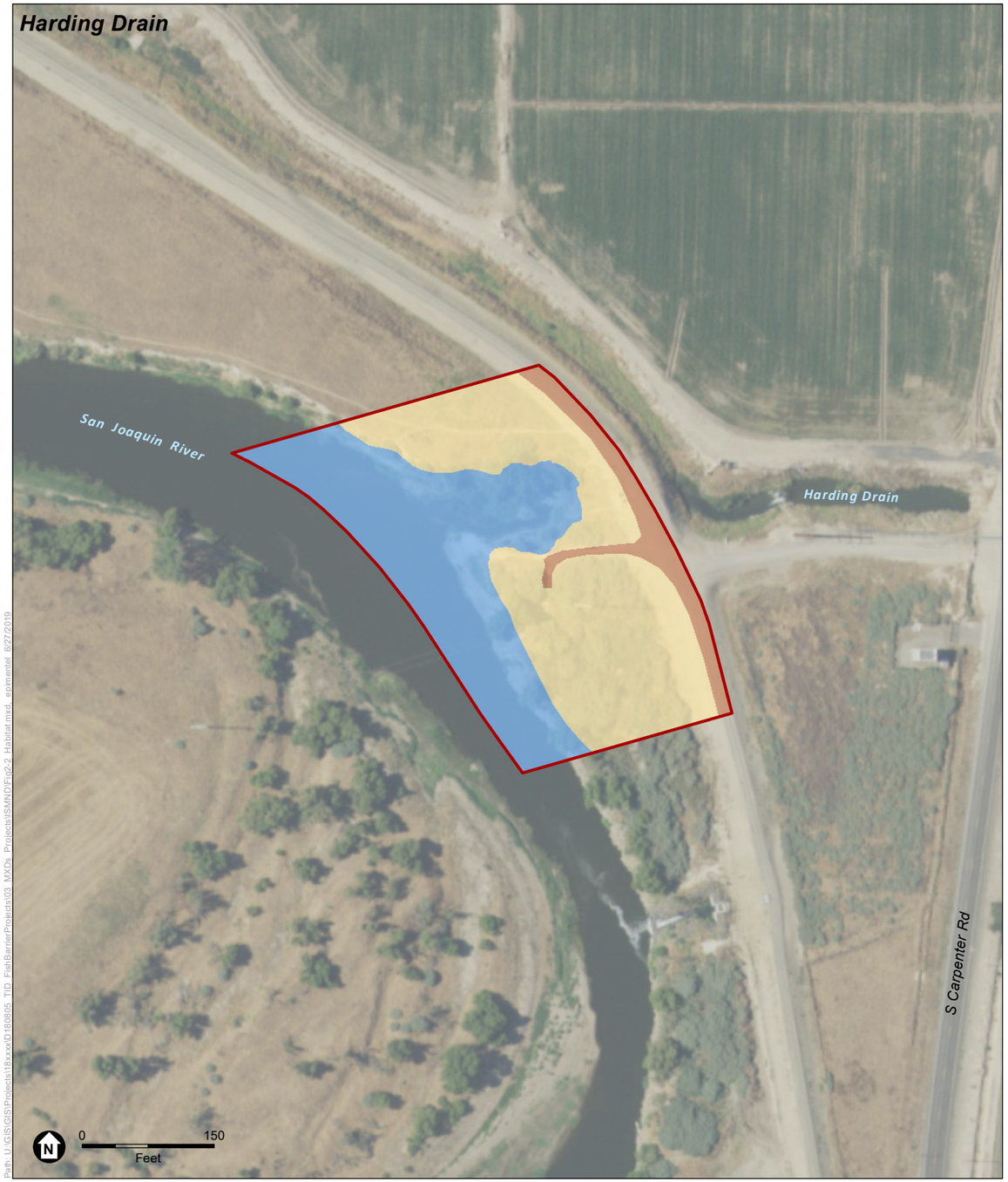
FEDERAL (U.S. Fish and Wildlife Service):
BEPA = Bald Eagle Protection Act
FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FC = Candidate for Federal Listing

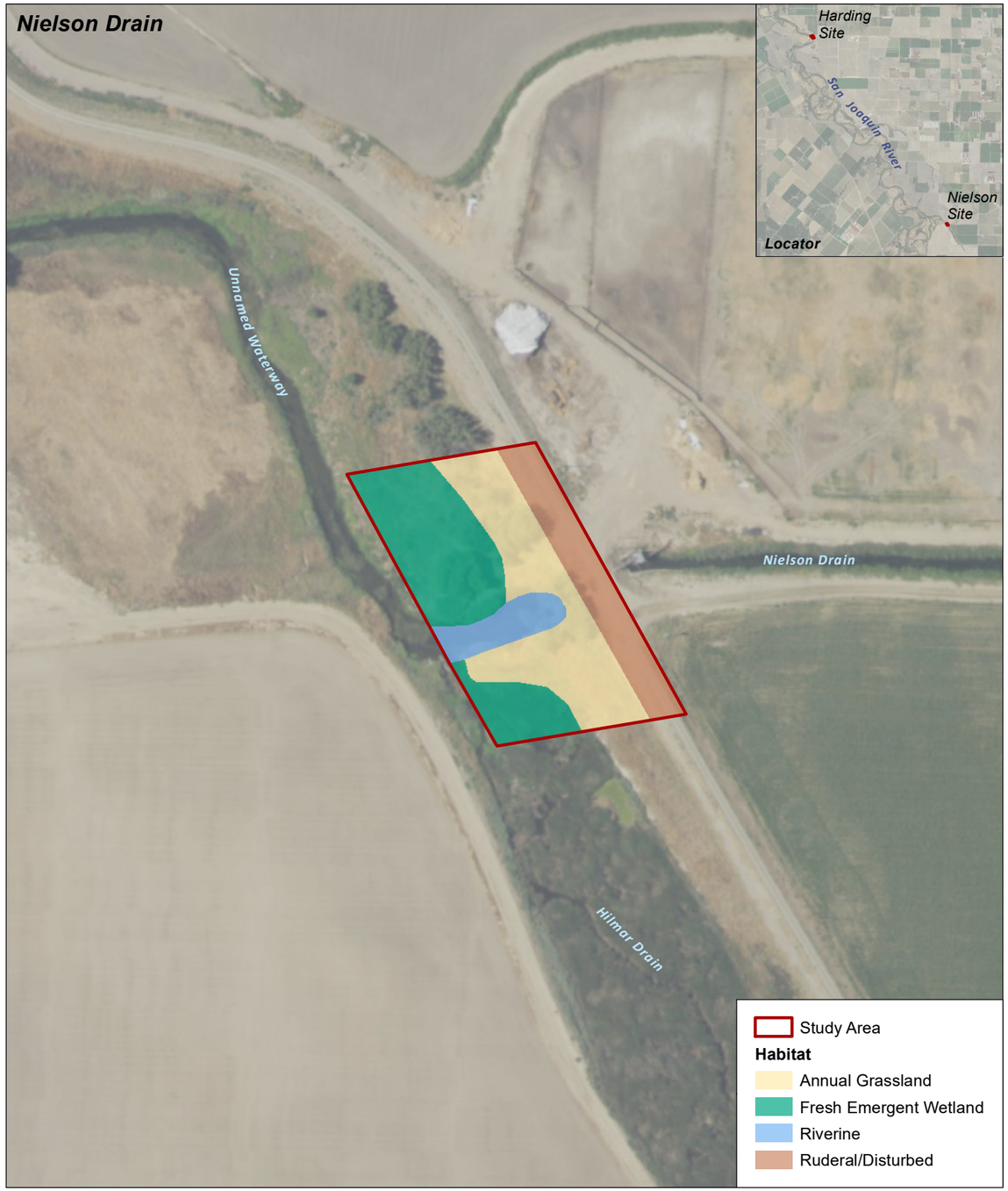
STATE (California Department of Fish and Wildlife):
SE = Listed as Endangered by the State of California
ST = Listed as Threatened by the State of California
SCT = Candidate for State Listing (Threatened)
CSC = California species of special concern
CFP = California fully protected bird species

California Native Plant Society (CNPS):
Rank 1A = Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B = Plants rare, threatened, or endangered in California and elsewhere
Rank 2A = Plants presumed extirpated in California but common elsewhere
Rank 2A = Plants rare, threatened, or endangered in California but more common elsewhere
Rank 3 = Plants about which more information is needed
Rank 4 = Plants of limited distribution

CNPS Code Extensions
.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 = Fairly threatened in California (20-80% occurrences threatened)
.3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known)

SOURCE: CNPS 2018; CDFW 2018a; USFWS 2018a





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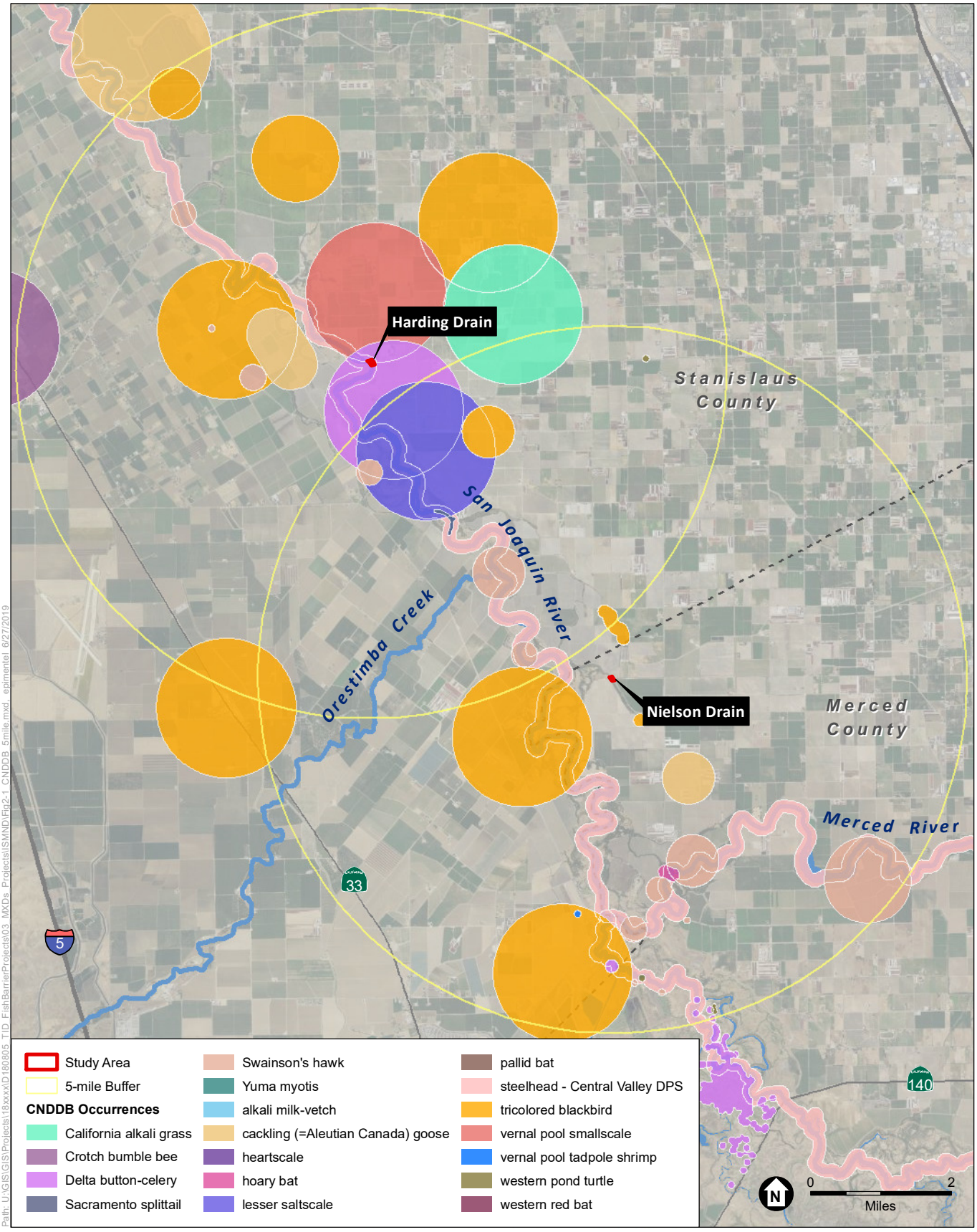
SOURCE: USDA, 2016; CDFW, 2014; ESA, 2019

Turlock Irrigation District Fish Barrier Projects

Figure 2-1
Habitat Map

ESA



SOURCE: Esri, 2018; CDFW, 2019; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 2-2
CNDDB Occurrences

ESA

Discussion

a) **Less than Significant with Mitigation Incorporated.** Special-status species and their habitats that may be affected either directly or indirectly through implementation of the proposed project are California Central Valley steelhead, Central Valley Fall/Late Fall-Run Chinook Salmon, Central Valley Spring-Run Chinook Salmon, North American green sturgeon, riffle sculpin, hardhead, Sacramento splittail, Pacific lamprey, Kern Brook lamprey, river lamprey, western pond turtle, nesting birds regulated by the MBTA and State Fish and Game Code, tricolored blackbird, burrowing owl, Swainson's hawk, loggerhead shrike, and song sparrow.

Special Status-Fish

Construction of the fish barriers could cause temporary impacts to special-status fish species and their habitat. Suitable habitat for a number of special-status fish occurs on the Project sites. Based on a review of available databases and literature 10 special-status fish species were determined to have the potential to occur on the Project site (see Table BIO-1). Potential impacts include spills or seepage of hazardous materials, and sedimentation and turbidity due to ground disturbance. Additional impacts associated with underwater noise and vibration, and loss of riparian habitat could also occur; each of these impacts are described below.

The proposed cofferdams would be installed using a vibratory pile driver, which generate relatively low underwater noise levels and is not likely to cause physical injury to special-status fish species. Because of the timing of in-water construction (June 1 through September 1), most special-status fish are not present in the areas affected by elevated sound levels from pile-driving activities. The habitat at the drains is of relatively poor condition, with limited in-water or overwater habitat features typically associated with rearing habitat. As a result, the areas surrounding the drains are expected to be used primarily as transient, migratory corridors. For most species with migratory life stages that have the potential to be present, only a small portion of the population is expected to be exposed to the increased underwater sound levels because these increases generally would occur outside of peak migration periods.

The upstream adult migration of several special-status fish may coincide with these in-water pile-driving activities, including fall-run, late fall-run, steelhead, and pacific lamprey. Adult and juvenile Chinook salmon, sturgeon, splittail, and lamprey may be able to move away from the area affected by the underwater sound.

No spawning occurs in this area, so no egg or fry life stages of Chinook salmon or steelhead would be affected, and no egg or larvae life stages of sturgeon or lamprey would be affected. Overall, there could be instances of take and/or disruption of behavior or migration during fish barrier construction, but underwater noise thresholds would be exceeded when the fewest fish, and therefore the lowest potential for effects, would occur.

Riparian habitat provides structure (through Shaded Riverine Aquatic (SRA) habitat) and food for fish. Shade decreases water temperatures, and low overhanging branches can provide sources of food by attracting terrestrial insects. As riparian areas mature and banks erode, the vegetation sloughs off into the rivers. This process creates structurally complex habitat consisting of Instream Woody Material (IWM) that offers refugia from predators, decreases water velocities, and provides habitat for aquatic invertebrates. For these reasons, many fish species are attracted to SRA habitat, particularly emigrating juvenile anadromous salmonids.

A band along the waterways in areas surrounding the proposed Project sites is dominated by scattered willows (*Salix* sp.) and Fremont cottonwoods (*Populus fremontii*). The understory vegetation below the riparian trees is similar to the ruderal/disturbed vegetation described below. The value of SRA habitat in the proposed Project areas is likely minimal for fish. In addition, construction activities of the proposed Projects only involve removal of two red willow (*Salix laevigata*) trees at the Nielson Drain, and two red willow trees and one Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) tree at the Harding Drain. Implementation of **Mitigation Measure BIO-4** would mitigate the impact to less than significant.

Use of heavy equipment and storage of materials is required for the construction of the fish screen intake and outfall structure. As a result, if not properly contained, contaminants (e.g., fuels, lubricants, hydraulic fluids, concrete) could be introduced into the water system, either directly or through surface runoff. Contaminants may be toxic to fish or cause altered oxygen diffusion rates and acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival.

The implementation of **Mitigation Measures BIO-1 and BIO-4** would minimize short-term impacts of construction activities on special-status fish species. Therefore, the proposed Projects would have a less-than-significant impact on special-status fish species associated with construction.

The installation of fish barriers at the Harding and Nielson drains would not affect the amount of drainage released to the San Joaquin River from the TID canal system. When comparing the proposed Projects to existing conditions, impacts from the entrainment of special-status fish species would be expected to be beneficial due to the presence of fish barriers which would prevent special-status fish mortality by preventing them from entering the TID canal system Therefore, the proposed Projects would result in a beneficial impact on special-status fish species associated with long-term operations.

Western Pond Turtle

Western pond turtle was in the Nielson Drain during fieldwork on May 10, 2019. Western pond turtle could also occur in the Harding Drain/San Joaquin River portion of the Project areas. The Project areas do not have nesting habitat due to steep levee slopes and mostly dense vegetation and compacted soils, but western pond turtle could occur in the water or along the water margin at any time of year. In-water work and de-watering

activities could directly impact individual western pond turtles. Implementation of **Mitigation Measure BIO-2** would mitigate the impact to less than significant.

Special-Status Birds and Nesting Birds Regulated by the MBTA and Fish and Game Code

Under MBTA most bird species and their nests and eggs are protected from injury or death. California Fish and Game Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs.

Portions of the proposed Project sites and the immediate vicinity have the potential to support nesting birds. Direct impacts on nesting birds or their habitat could occur during initial project activities such as clearing and grubbing. Nesting birds could be adversely affected if active nesting, roosting, or foraging sites are either removed or exposed to a substantial increase in noise or human presence during project activities. The impact would be less-than-significant if construction activities occur during the non-breeding season (i.e., from September 1 through January 31). However, construction activities conducted during the breeding season between February 1 and August 31 could affect nesting birds adversely and result in a potentially significant impact. Implementation of **Mitigation Measure BIO-3** would mitigate the impact to less-than-significant.

Mitigation Measures

Mitigation Measure BIO-1: Minimize loss of habitat and risk and take of special-status fish species. The following measures shall be implemented to minimize impacts from loss of habitat and risk of take of special-status fish:

- Impacts to habitat conditions (e.g., changes in flows potentially resulting in decreased flows in the tributaries, increases in temperature, increases in pollutant concentration, change in recirculation/recapture rates and methods, decrease in floodplain connectivity, removal of riparian vegetation, decreased in quality rearing habitat) must be analyzed in consultation with NMFS.

- Before implementation of site-specific actions, the action agency shall conduct an education program for all TID and contracted employees relative to the Federally listed species that may be encountered within the Project areas of the action, and required practices for their avoidance and protection. A NMFS appointed representative shall be identified to employees and contractors to ensure that questions regarding avoidance and protection measures are addressed in a timely manner.

- Disturbance of riparian vegetation will be avoided to the greatest extent practicable.

- Stockpiling of materials, including portable equipment, vehicles and supplies, such as chemicals, shall be restricted to the designated construction staging areas, exclusive of any riparian and wetland areas.

- A qualified biological monitor will be present during all construction activities, including clearing, grubbing, pruning, and trimming of vegetation at each job site

during construction initiation, midway through construction, and at the close of construction to monitor implementation of conservation measures and water quality.

- In-channel construction activities that could affect designated critical habitat for anadromous salmonids will be limited to the low-flow period between June 1 and September 1 to minimize potential for adversely affecting Federally listed anadromous salmonids during their emigration period.

- Construction BMPs for off-channel staging, and storage of equipment and vehicles, will be implemented to minimize the risk of contaminating the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate.

- A spill prevention plan will be prepared describing measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering the San Joaquin River or contaminating riparian areas adjacent to the river itself. In addition to a spill prevention plan, a cleanup protocol will be developed before construction begins and shall be implemented in case of a spill.

- If individuals of listed species are observed present within a project area, NMFS must be notified. NMFS personnel shall have access to construction sites during construction, and following completion, to evaluate species presence and condition and/or habitat conditions.

- If bank stabilization activities should be necessary, then such stabilization shall be constructed to minimize predator habitat, minimize erosion potential, and contain material suitable for supporting riparian vegetation.

Mitigation Measure BIO-2: Western Pond Turtle. A pre-construction survey shall be conducted for work that disturbs ground in or within 10 feet of waters of the U.S., including wetlands. The survey shall be conducted immediately prior to the ground-disturbing work. If no western pond turtles are found, work may proceed. If western pond turtles are found, work may not proceed until they have left the work area.

Mitigation Measure BIO-3: Special-Status Birds and Nesting Birds Regulated by the MBTA and Fish and Game Code. For construction activities during the nesting season (February 1 to August 31), a pre-construction survey shall be conducted for active nests within 100 feet of the Project site for all regulated bird species, within 650 feet for burrowing owl and other birds of prey, and within 0.5 mile for Swainson's hawk. Outside of the proposed Project sites the survey shall be conducted with binoculars from publicly accessible areas. The survey shall be conducted by a qualified biologist no more than seven days prior to the start of construction.

If no active nests are identified during the pre-construction survey, no further mitigation is necessary. If construction activities begin prior to February 1, it is assumed that no birds will nest in the Project sites during active construction activities and no pre-construction surveys are required. If at any time during the nesting season construction stops for a period of two weeks or longer, pre-construction surveys shall be conducted prior to construction resuming.

If active nests of specified birds are found within the distances above, then TID shall either wait until the nests are not active to start construction, or prepare a plan for avoidance of impacts and submit the plan to CDFW. The plan shall identify measures to avoid disturbance to the active nests. Depending on the conditions specific to each nest, and the relative location and rate of construction activities, it may be feasible for construction to occur as planned. Appropriate measures may include restricting construction activities, or having a qualified biologist with stop-work authority monitor the nest for evidence that the behavior of the parents has changed during construction.

b) **Less than Significant with Mitigation Incorporated.** The proposed Projects will remove riparian trees during clearing and grubbing, and will result in temporary and permanent impacts to the Harding Drain and Nielson Drain (considered waters of the U.S.).

Riparian

The proposed Projects are expected to remove two red willow (*Salix laevigata*) trees at the Nielson Drain, and two red willow trees and one Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) tree at the Harding Drain. Implementation of **Mitigation Measure BIO-4** would mitigate the impact to less than significant.

Harding and Nielson Drains

The proposed Projects will result in both temporary and permanent impacts to the Harding and Nielson Drains, waters of the U.S., as a result of the fish barriers themselves and associated construction work. The proposed Projects could result in up to 0.41 acre of fill (both temporary and permanent) of waters of the U.S. The proposed Projects may result in less depending on final design of the fish barriers and construction methods. Implementation of **Mitigation Measure BIO-5** would mitigate the impact to less than significant.

Mitigation Measures

Mitigation Measure BIO-4: Riparian Trees. The Project proponent shall prepare an on-site tree replacement plan. The plan shall include replacement of removed trees at least at a 1:1 ratio. The plan shall be submitted to CDFW as an attachment to an application for a 1600 Streambed Alteration Agreement (see Mitigation Measure BIO-5 below).

Mitigation Measure BIO-5: Waters of the U.S. Prior to construction, the Project proponent shall obtain a Section 404 (Clean Water Act) permit for impacts to waters of the U.S from the USACE, a 1600 Streambed Alteration Agreement from the CDFW, and a Section 401 permit from CVRWQCB and shall comply with all conditions of permits received. All areas with temporary impacts shall be restored immediately post-construction. In association with either or both permits, compensatory mitigation for permanent impacts to waters of the U.S may be required. The Project proponent shall compensate for the unavoidable loss of waters of the U.S at a ratio of 1:1 in order to ensure no net loss of habitat. USACE mitigation guidelines emphasize on-site mitigation preference, but in the case that on-site mitigation is not available, the Project proponent shall either:

- Purchase mitigation credits from a USACE-approved mitigation bank, or
- Mitigate on-site for unavoidable losses, or
- Prepare a plan to implement mitigation at an off-site location in accordance with the Corps' mitigation requirements.

c) **No Impact.** The Project sites have a fresh emergent wetland regulated by the federal CWA and the State Porter-Cologne Water Quality Control Act. The proposed Projects avoid the fresh emergent wetland, and will not result in any action that hydrologically interrupts water flow into or out of the wetland. The proposed Projects will have no impact to wetlands.

d) **No Impact.** The proposed Projects will not interfere with the movement of wildlife or fish. For fish, the purpose of the proposed Projects is to prevent special-status fish mortality by preventing them from entering the TID canal system. The proposed Projects will not result in any barriers to movement of upland wildlife. The proposed Projects will have no impact to wildlife movement.

e) **No Impact.** Stanislaus County and Merced County do not have a tree ordinance. The proposed Projects are consistent with policies in the Stanislaus County (2015) General Plan Conservation/Open Space Element and the Merced County (2013) General Plan Natural Resources Element that generally promote the conservation and improvement of riparian areas for wildlife. The proposed Projects will have no impact to local policies or ordinances for biological resources.

f) **No Impact.** There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other local conservation plans covering the proposed Projects or the Project areas. The proposed Projects will have no impact.

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Cultural Resources

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
IV.	**CULTURAL RESOURCES —** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Setting

ESA conducted a records search for the Project areas at the Central California Information Center (CCIC), California State University, Stanislaus on June 23, 2019 (File No. 11084IN). The records search included a ½ mile radius of the Project areas, and was completed in order to: 1) determine whether known cultural resources have been recorded within the vicinity of the proposed Projects; 2) assess the likelihood of unrecorded cultural resources based on historical references, and, 3) review the distribution of environmental settings of nearby site locations. Additional sources reviewed during the records search included historic maps, the Directory of Properties in the Historic Property Data File for Merced and Stanislaus County, the National Register of Historic Places, the California Register of Historical Resources (California Register), the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992). Records search results were negative for historical and archaeological resources within the Project areas and a ½-mile radius.

ESA conducted a pedestrian archaeological surface survey of the proposed Project areas on May 23, 2019. The survey covered construction areas and proposed staging areas for both aspects of the Project. Intensive pedestrian survey methods, consisting of walking 15-meter transects and inspecting the ground surface, were used. Ground visibility varied significantly throughout the Project areas, from 0-20% in areas of dense vegetation (medium-tall grasses) along the slopes adjacent to the canal and roads, to 50-95% in roads and exposed patches at the proposed staging areas. The existing physical landscape was characterized as agricultural land with adjacent irrigation canals. No surface-visible archaeological resources were identified during the field survey.

Discussion

a) **No Impact.** CEQA Guidelines Section 15064.5 requires the lead agency to consider the effects of a project on historical resources. A significant impact would occur if the project would cause a substantial adverse change through physical demolition, destruction, relocation, or alteration of the resource. A historical resource is defined as any building, structure, site, or object listed in or determined to be eligible for listing in the California Register, or determined by a lead agency to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural

annals of California. This section addresses architectural and structural resources. Archaeological resources that are potentially historical resources according to CEQA Guidelines Section 15064.5, are addressed in section b) below.

No historical resources were identified during the field survey and during background research. There are no buildings or structures in the proposed Project areas and the proposed Projects are in an area heavily disturbed by historic-era and modern agriculture. The Harding and Neilson Drains are not historic-era canals or waterways. Therefore, no impact to historical resources is anticipated as a result of the proposed Projects.

b) **Less than Significant with Mitigation Incorporated.** This section discusses archaeological resources, both as historical resources according to CEQA Guidelines Section 15064.5, as well as unique archaeological resources, as defined in PRC Section 21083.2(g). A significant impact would occur if the project would cause a substantial adverse change to an archaeological resource through physical demolition, destruction, relocation, or alteration of the resource.

No archaeological resources were identified as a result of the pedestrian survey. The archaeological sensitivity of the Project areas is low for surface-visible deposits. The archaeological sensitivity for the Harding Drain aspect of the Project is low. For the Nielson Drain aspect of the Project, the archaeological sensitivity for buried deposits is high for undisturbed sediment; however, the majority of the Project area has experienced a large degree of ground disturbance from historic-period and modern agriculture, and drain construction and use. As such, the archaeological sensitivity is considered low.

As the proposed Projects would involve ground-disturbing activities, there is the remote chance that previously unrecorded archaeological material could be encountered during construction activities. While unlikely, if any previously unrecorded archaeological resources were identified during Project ground disturbing activities and were found to qualify as an historical resource per CEQA Guidelines Section 15064.5 or a unique archaeological resource, as defined in PRC Section 21083.2(g), any impacts to the resource resulting from the Project could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing **Mitigation Measure CUL-1: Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources**, which requires that work halt in the vicinity of a find until a qualified archaeologist can inspect the find and make further recommendations.

c) **Less than Significant with Mitigation Incorporated**. Through a records search and background research, no human remains are known to exist within the proposed Project areas and there is a low potential to uncover human remains during Project ground-disturbing activities.

While unlikely, if any previously unknown human remains were encountered during ground disturbing activities, any impacts to the human remains resulting from the Project could be potentially significant. Any such potential significant impacts would be reduced to a less than significant level by implementing **Mitigation Measure CUL-2**:

Inadvertent Discovery of Human Remains, which requires the County coroner be contacted and, if the remains are determined to be Native American, the Native American Heritage Commission be contacted to assign a Most Likely Descendant.

Mitigation Measures

Mitigation Measure CUL-1: Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources. Should archaeological resources or human remains be inadvertently discovered during any ground-disturbing work associated with Projects construction, the following procedures should be implemented:

If prehistoric or historic-period archaeological resources are encountered by construction personnel during Projects construction, all construction activities within 100 feet shall halt until a qualified archaeologist, defined as one meeting the SOIS for Archeology, or the onsite archaeological monitor(s) can assess the significance of the find. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, hand stones, or milling slabs); battered stone tools, such as hammer stones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse.

If it is determined that the Projects could damage a historic property, as defined by the NHPA, construction shall cease in an area determined by the archaeologist until a mitigation plan has been prepared and implemented to the satisfaction of the qualified archaeologist, TID and USACE, and, if the resource is prehistoric, interested Native American representatives. The mitigation plan shall recommend preservation in place, as a preference, or, if preservation in place is not feasible, data recovery through excavation. If preservation in place is feasible, this may be accomplished through one of the following means: (1) modifying the construction plan to avoid the resource; (2) incorporating the resource within open space; (3) capping and covering the resource before building appropriate facilities on the resource site; or (4) deeding the resource site into a permanent conservation easement.

If preservation in place is not feasible, a qualified archaeologist shall prepare and implement a detailed treatment plan to recover the scientifically consequential information from the resource prior to any excavation at the resource site. The treatment plan shall be prepared in consultation with TID and USACE, and, if the resource is prehistoric, interested Native American representatives. Treatment for most resources would consist of (but would not necessarily be limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Projects. The treatment plan shall include provisions for analysis of data in a regional context, reporting of results within a timely manner, curation of artifacts and data at an approved facility, and dissemination of reports to local and state repositories, libraries, and interested professionals.

Measure CUL-2: Inadvertent Discovery of Human Remains. In the event that human remains are encountered, all ground disturbing activities at that location shall cease immediately. There shall be no further excavation or disturbance of the site, or any

nearby areas reasonably suspected to overlie adjacent human remains, until the County Coroner makes a determination of whether an investigation of the cause of death is required or that the remains are Native American. If the coroner determines that the remains are Native American, then the Native American Heritage Commission in Sacramento shall be contacted within 24 hours (by County coroner), along with the Most Likely Descendant(s) of the deceased Native American (by Native American Heritage Commission), and disposition of the remains shall be in accordance with all applicable laws and regulations.

References

Central California Information Center, (CCIC) File No. 11084IN California Historical Resources Information System at California State University, Stanislaus. On file at ESA, May 23, 2019.

Energy

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
V.	**ENERGY —** Would the project:				
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Discussion

Consistent with Public Resources Code Section 21100(b)(3), this impact analysis evaluates the potential for the project to result in a substantial increase in energy demand and wasteful use of energy during project construction, operation and maintenance. The impact analysis is informed by Appendix G of the CEQA Guidelines. The potential impacts are analyzed based on an evaluation of whether construction energy use estimates for the proposed Projects would be considered excessive, wasteful, or inefficient.

a) **Less than Significant.** Construction of the project would result in fuel consumption from the use of construction tools and equipment, truck trips to haul material, and vehicle trips generated from construction workers commuting to and from the sites. Construction of the proposed Projects is anticipated to only last for 8 weeks.

Construction activities and corresponding fuel energy consumption would be temporary and localized, as the use of diesel fuel and heavy-duty equipment would not be a long-term condition of the proposed Projects. In addition, there are no unusual Project characteristics that would cause the use of construction equipment or haul vehicles that would be less energy efficient compared with other similar construction sites in other parts of the State. In conclusion, construction-related fuel consumption by the proposed Projects would not result in inefficient, wasteful, or unnecessary energy use compared with other construction sites in the region. This impact is considered less-than-significant.

Once construction is complete, the source of operational emissions will be minimal and related to maintenance activities. Because the proposed Project's operational impacts on energy resources are primarily driven by limited maintenance activities, energy use would be negligible. This impact is considered less-than-significant.

b) **Less than Significant.** The transportation sector is a major end-user of energy in California, accounting for approximately 39 percent of total statewide energy consumption in 2014 (U.S. Energy Information Administration 2016). In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 16 billion gallons of gasoline and

more than 3 billion gallons of diesel each year, making California the second largest consumer of gasoline in the world (CEC 2016).

With respect to transportation energy, existing energy standards are promulgated through the regulation of fuel refineries and products, such as the Low Carbon Fuel Standard (LCFS), which mandates a 10 percent reduction in the non-biogenic carbon content of vehicle fuels by 2020. Additionally, there are other regulatory programs with emissions and fuel efficiency standards established by USEPA and the California Air Resources Board (CARB) such as Pavley II/LEV III from California's Advanced Clean Cars Program and the Heavy-Duty (Tractor-Trailer) GHG Regulation. CARB has set a goal of 4.2 million Zero Emissions Vehicles (ZEV) on the road by the year 2030 (CARB 2016). Further, construction sites will need to comply with State requirements designed to minimize idling and associated emissions, which also minimizes use of fuel. Specifically, idling of commercial vehicles and off-road equipment would be limited to five minutes in accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation[1]. Neither Stanislaus County or Merced County have implemented energy actions plans. The proposed Projects are consistent with the State and would not impede progress towards achieving these goals.

In conclusion, the proposed Projects would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency or impede progress towards achieving goals and targets. This impact is considered less-than-significant.

References

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U.S. Energy Information Administration, 2016. California State Profile and Energy Estimates: Consumption by Sector. Available: http://www.eia.gov/state/?sid=CA#tabs-2. Accessed: March 2019.

[1] California Code of Regulations (CCR), 2005. Title 13, Chapter 10, 2485, updated through 2014.

Geology and Soils

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

Environmental Setting

The proposed Projects are located within the Great Valley Geomorphic province. The province includes the area known as the Great Central Valley of California, which extends approximately 400 miles north to south and 50 miles east to west. The Great Central Valley is encompassed by the Coast Ranges (metamorphic), the Klamath Ranges (metamorphic), the Cascade Range (volcanic) and the Sierra Nevada (granitic and metamorphic). The majority of rocks and deposits found within the province are sedimentary. According to the U.S. Geological Survey, sedimentary rocks are formed from pre-existing rocks or pieces of once living organisms. They form from deposits that accumulate on the Earth's surface. Sedimentary rocks often have distinctive layering or bedding.

Several known faults exist within Stanislaus and Merced Counties. They are located in the western part of the counties and in the Diablo Range west of I-5. Surface fault rupture (or disruption at the ground surface as a result of fault activity) and seismic ground shaking are considered primary seismic hazards by the State of California (Stanislaus County 2016). The

Ortigalita and Marsh Creek-Greenville fault zones are the closest active fault zones under the Alquist-Priolo Earthquake Fault Zoning Act in the region. The Ortigalita fault zone is situated approximately 19 miles to the southwest of the Project sites. The Ortigalita Fault is estimated to have an approximately 2.46 percent chance of a Moment Magnitude (Mw) 6.7 or greater earthquake over the next 30 years (WGCEP 2015). The Marsh Creek-Greenville fault zone is situated approximately 26 miles west of the Harding drain and 28 miles west of the Nielson drain. The Marsh Creek-Greenville Fault is estimated to have an approximately 2.79 percent chance of a Moment Magnitude (Mw) 6.7 or greater earthquake over the next 30 years (WGCEP 2015). A designation of active means the fault has shown movement in the last 11,700 years (during the Holocene) and is sufficiently well defined. The Project site is neither located within, nor crosses, a delineated Alquist-Priolo Earthquake Fault Zone (CGS 2010).

The nearest historically active fault (movement in the last 700,000 years) is the San Joaquin 07 (Orestimba) Fault, located approximately 9 miles southwest of the Project sites. The San Joaquin Fault is estimated to have an approximately 0.25 percent chance of a Mw 6.7 or greater earthquake over the next 30 years (WGCEP 2015).

Unlike surface rupture, ground shaking is not confined to the trace of a fault, but rather propagates into the surrounding areas during an earthquake. The intensity of ground shaking typically diminishes with distance from the fault, but ground shaking may be locally amplified and/or prolonged by some types of substrate materials.

The ground-shaking hazard in the county ranges from low to moderate. The ground-shaking hazard is highest in the western side of the county which is closest to active faults as previously described. The ground-shaking hazard progressively decreases across the eastern side of the county as the distance from the active faults increases. (Stanislaus County 2016).

The proposed Projects are located in an area distant from known, active faults and experiences lower levels of shaking less frequently. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could cause strong shaking. Based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10 percent probability in 50 years, the probabilistic peak horizontal ground acceleration values for the Project area is approximately 0.35 g (where g equals the acceleration speed of gravity) (Stanislaus County 2016a). As a point of comparison, probabilistic peak horizontal ground acceleration values for the San Francisco Bay Area range from 0.4 g to more than 0.8 g.

The soil within the Harding Drain Project site is composed entirely of Waukena fine sandy loam (NRCS 2019). Waukena soils are moderately well to somewhat poorly drained with slow to very slow permeability, slow runoff, and slight erosion hazard.

The soil within the Nielson Drain Project site is composed entirely of Foster gravelly fine sandy loam. The eastern side of the Project site is bounded by Fresno loam, slightly saline-alkali soil. Foster soils are poorly or very poorly drained with moderate permeability and ponded to very slow runoff. Erosion hazard is very low. Many areas have altered drainage because of deep

pumping for irrigation (NRCS 2019). Fresno soils are moderately well drained, with very slow permeability and runoff and slight erosion hazard (NRCS 2019).

Slope failure, commonly referred to as landslide, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. The California Geological Survey has not designated any part of Stanislaus or Merced County as a Zone of Required Investigation for landslide hazard (Merced County 2013 and Stanislaus County 2016b). The greatest risk for landslides is in the western portion of the counties within the coast range.

Liquefaction is the process where the soil is transformed to a fluid form during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated and consist of relatively uniform sands that are loose to medium density. As with landslides, the highest potential for liquefaction occurs in the western part of the counties (Merced County 2013 and Stanislaus County 2016b).

Expansive soils are characterized by the ability to undergo significant volume change (shrink and swell) as a result of variation in soil moisture content. Soil moisture content can change due to many factors, including perched groundwater, landscape irrigation, rainfall, and utility leakage. The soils in the proposed Project area have a slight to moderate swell potential.

Subsidence occurs when a large land area settles due to over saturation or extensive withdrawal of ground water, oil, or natural gas. No areas of substantial subsidence have been identified within Stanislaus County, (Stanislaus County 2016b). Merced County has known areas of subsidence in the areas of Los Banos and El Nido; however, the no known subsidence issues have been identified in the area of the Nielson Drain (Merced County 2013).

Discussion

a.i) **No Impact.** The Project site is not located within an Alquist-Priolo earthquake fault zone. Therefore, relative to being located on an active fault, there would be no impact.

a.ii) **Less than Significant.** Earthquakes associated with the active faults in the Project areas may cause strong ground shaking at the Project sites. Movement on the Ortigalita Fault could result in a maximum credible earthquake of 6.70 (WGCEP 2015). The Marsh Creek-Greenville Fault is estimated to have an approximately 2.79 percent chance of a Moment Magnitude (Mw) 6.7 or greater earthquake over the next 30 years (WGCEP 2015). a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10 percent probability in 50 years, the probabilistic peak horizontal ground acceleration values for the Project areas is approximately 0.35 g (where g equals the acceleration speed of gravity) (Stanislaus County 2016).

The proposed Projects would be constructed to industry standards to protect against potential impacts from adverse geological effects associated with seismic activity and

other site-specific soils and geology constraints, including compliance with the California Building Code (CBC) and American Society of Civil Engineers (ASCE) standards. With compliance with CBC and ASCE standards, the impact relative to seismic shaking would be less than significant.

a.iii, iv) **No Impact.** As discussed in the Environmental Setting, the Project areas are not known to be susceptible to landslides or liquefaction. In addition, the proposed Projects would be subject to compliance with the CBC and ASCE standards. Therefore, no impact would occur.

b) **Less than significant.** Soils in the Project areas have a low potential for erosion; however, earthmoving and grading activities associated with construction have the potential to cause erosion. Routine project operations and maintenance activities are not anticipated to result in substantial soil erosion or loss of topsoil. The proposed Projects are less than one acre in size and as such would not be subject to conditions of a Construction General Permit; however, construction BMPs are included as part of **Mitigation Measure BIO-1** and requires minimization of erosion and stormwater runoff, as appropriate. In addition, sediment/turbidity curtains will be deployed to protect water quality on the San Joaquin River side of the work activities. Therefore, impacts associated with soil erosion attributed to project construction would be less-than-significant.

c, d) **Less than Significant.** As described previously, the proposed Project areas contains soils that are not known to have liquefaction potential and have a slight to moderate shrink-swell potential. However, no new buildings or habitable structures would be constructed as part of the proposed Projects. Therefore, there would be no impacts to life or property as a result of the proposed Projects.

e) **No Impact.** The proposed Projects would not include the use of septic tanks or alternative wastewater disposal systems, resulting in no impact.

f) **Less than Significant with Mitigation Incorporated.** Paleontological resources are the fossilized evidence of past life found in the geologic record. Despite the tremendous volume of sedimentary rock deposits preserved worldwide, and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils—particularly vertebrate fossils—are considered to be nonrenewable resources. Because of their rarity, and the scientific information they can provide, fossils are highly significant records of ancient life.

Rock formations that are considered of paleontological sensitivity are those rock units that have yielded significant vertebrate or invertebrate fossil remains (SVP 2010). Both Merced and Stanislaus Counties have a high potential for containing paleontological resources (Stanislaus County 2016 and Merced County 2013). If any previously unrecorded paleontological resources were encountered during project construction and any were found to be a unique paleontological resource, any impacts to the resource

resulting from the Proposed Project/Action could be potentially significant. Any such potential significant impacts would be reduced to a less-than-significant level by implementing Mitigation Measures GEO-1 and GEO-2.

Mitigation Measures

Mitigation Measure GEO-1: A qualified paleontologist, defined as one meeting the SVP Standards (SVP 2010), shall conduct construction worker paleontological resources sensitivity training prior to the start of ground-disturbing activities (including vegetation removal, pavement removal, etc.). The training session shall focus on the recognition of the types of paleontological resources that could be encountered within the Project site and the procedures to be followed if they are found. TID shall retain documentation demonstrating that construction personnel attended the training.

Full-time paleontological resources monitoring shall be conducted for all project ground-disturbing activities at depths that could disturb the Modesto Formation; therefore, the monitoring should occur for ground-disturbing activities at depths of 5 feet or greater. The qualified paleontologist, based on observations of subsurface soil stratigraphy or other factors, may reduce or discontinue monitoring, as warranted, if the qualified paleontologist determines that the possibility of encountering fossiliferous deposits is low. Paleontological resources monitoring shall be performed by a qualified paleontological monitor (or cross-trained archaeological/paleontological monitor) under the direction of the qualified paleontologist. Monitors shall have the authority to temporarily halt or divert work away from exposed fossils in order to recover the fossil specimens. Any significant fossils collected during project-related ground disturbance shall be prepared to the point of identification and curated into an accredited repository with retrievable storage. Monitors shall prepare daily logs detailing the types of activities and soils observed, and any discoveries. The qualified paleontologist shall prepare a final monitoring and mitigation report to be submitted to TID.

Mitigation Measure GEO-2: If construction or other Project personnel discover any potential fossils during construction, regardless of the depth of work or location, work at the discovery location shall cease in a 50-foot radius of the discovery until the qualified paleontologist has assessed the discovery and made recommendations as to the appropriate treatment. If the find is deemed significant, it should be salvaged following the standards of the SVP (SVP 2010) and curated with a certified repository.

References

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Natural Resources Conservation Service (NRCS), 2019. Web Soil Survey. Available: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed May 28, 2019.

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Greenhouse Gas Emissions

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VII. GREENHOUSE GAS EMISSIONS — Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☒	☐	☐

Discussion

a, b) **Less than Significant with Mitigation Incorporated.** SVJAPCD's GHG guidance is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of Best Performance Standards (BPS). Projects are considered to have a less-than-significant cumulative impact on climate change if any of the following conditions are met.

- Comply with an approved GHG reduction plan;
- Achieve a score of at least 29 using any combination of approved operational BPS;
- Reduce operational GHG emissions by at least 29 percent over business-as-usual (BAU) conditions (demonstrated quantitatively).

Since there is currently no adopted GHG reduction plan for Stanislaus County or Merced County, Option 1 (listed above) cannot be applied. Options 2 and 3 both require projects to achieve GHG reductions consistent with the goals of Assembly Bill (AB) 32, which is to reduce statewide GHG emissions to 1990 levels by 2020 (equivalent to a 29 percent reduction over BAU conditions). However, since the publication of the SVJAPCD's GHG guidance in 2009, the California Supreme Court considered the CEQA issue of determining the significance of GHG emissions in its decision, *Center for Biological Diversity v. CDFW and Newhall Land and Farming* (CBD vs. CDFW). The Court questioned a common CEQA approach to GHG analyses for development projects that compares project emissions to the reductions from BAU that will be needed statewide to reduce emissions to 1990 levels by 2020, as required by AB 32. The court upheld the BAU method as valid in theory, but concluded that the BAU method was improperly applied in the case of the Newhall project because the target for the project was incorrectly deemed consistent with the statewide emission target of 29 percent below BAU for the year 2020. In other words, the court said that the percent below BAU target developed by the AB 32 Scoping Plan is intended as a measure of the GHG reduction effort required by the State as a whole, and it cannot necessarily be applied to the impacts of a specific project in a specific location. The Court provided some guidance to evaluating the cumulative significance of a proposed land use project's GHG emissions, but noted that none of the approaches could be guaranteed to satisfy CEQA for a particular project. The Court's suggested "pathways to compliance" include:

- Use a geographically specific GHG emission reduction plan (e.g., climate action plan) that outlines how the jurisdiction will reduce emissions consistent with State reduction targets, to provide the basis for streamlining project-level CEQA analysis, as described in CEQA Guidelines Section 15183.5.

- Utilize the Scoping Plan's BAU reduction goal, but provide substantial evidence to bridge the gap between the statewide goal and the project's emissions reductions;

- Assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce GHG emissions from particular activities; as an example, the Court points out that projects consistent with a Senate Bill 375 Sustainable Communities Strategy may need to re-evaluate GHG emissions from cars and light trucks.

- Rely on existing numerical thresholds of significance for GHG emissions, such as those developed by an air district.

In light of the Newhall decision and the reliance of the SVJAPCD's GHG guidance on statewide percentage reduction of GHG emissions by 2020, assessment of potential GHG emission impacts under CEQA is assessed herein using a two-fold approach:

1. Does the proposed project include reasonably feasible measures (i.e., BPS) to reduce GHG emissions; and

2. Although not strictly applicable to projects within the SJVAB, would the project emissions exceed the Bay Area Air Quality Management District GHG mass emission (or bright line) threshold of 1,100 MT CO_2e/year.

As previously discussed, operational GHG emissions for the proposed Projects would be generated primarily from on-road vehicular traffic for maintenance trips. However, employee trips required periodically for routine inspection and maintenance would not be significantly more than those generated under current operations. These trips would result in negligible GHG emissions. Since the fish barriers would not be powered, long-term operation of the proposed Projects would not require the use of an on-site diesel powered generator, which is known to generate GHG emissions. Therefore, operation of the proposed Projects would result in a less-than-significant impact.

Given the short period of construction, total GHG emissions from project construction amortized over a 30-year period were would be well below 1,100 MT of CO_2e/year. Construction of the proposed Projects would not result in a cumulatively considerable increase in GHG emissions. However, to be consistent with the intent of the SJVAPCD's GHG guidance, available BPS would be implemented as part of **Mitigation Measure GHG-1** to further minimize this impact.

Mitigation Measure

Mitigation Measure GHG-1: The Project applicant and/or its contractor shall implement the following best performance standards for construction emissions (AEP 2016):

1. Use alternatively fueled vehicles and equipment, including electrification as well as alternative fuels where reasonably available and certified for use in construction equipment and vehicles (e.g., biodiesel blends, renewable diesel, etc.);

2. Reduce worker trips through organized ride sharing, where appropriate; and

3. Use local sources of construction materials when economically feasible.

References

Association of Environmental Professionals (AEP), 2016 (October 18). *Final White Paper Beyond 2020 and Newhall, A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*. Page 36.

Hazards and Hazardous Materials

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

Environmental Setting

The proposed Project areas are within Stanislaus and Merced Counties and are adjacent to the San Joaquin River. The closest school, which is a sensitive receptor, to the proposed Harding Drain, is Walnut Grove School, approximately 5 miles northwest. The closest school to the proposed Nielson Drain is Hurd Barrington Elementary School in Newman, approximately 6 miles to the southwest.

Hazardous Materials

Materials and waste may be considered hazardous if they are poisonous (toxicity), can be ignited by open flame (ignitability), corrode other materials (corrosivity), or react violently, explode or generate vapors when mixed with water (reactivity). The term "hazardous material" is defined in law as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.[2] In some cases, past uses can result in spills or leaks of hazardous materials to the ground, resulting in soil and groundwater contamination. The use, storage, transportation and

[2] State of California, Health and Safety Code, Chapter 6.95, Section 25501(o).

disposal of hazardous materials are subject to numerous federal, State and local laws and regulations.

Information about hazardous materials sites in the proposed Project area was collected by conducting a review of the California Environmental Protection Agency's (CalEPA) Cortese List Data Resources (Cortese List) and the State Water Resources Control Board's GeoTracker list. The Cortese List includes data resources that provide information regarding the facilities or sites identified as meeting the Cortese List requirements. The Cortese List is updated at least annually, in compliance with California regulations (California Code Section 65964.6(a)(4)) and includes federal superfund sites, State response sites, non-operating hazardous waste sites, voluntary cleanup sites, and school cleanup sites. The GeoTracker list shows Underground Storage Tanks (UST). Based on a review of the Cortese List conducted in May 2019, no listed sites are located within 1 mile of the proposed Project sites (DTSC 2019).

Fire Suppression

Both Project sites are located within a Local Responsibility Area (LRA) where Stanislaus County and Merced County are responsible for fire suppression for the Project areas within their respective counties. The California Department of Forestry and Fire Protection (CAL FIRE) has determined that within the LRA, Stanislaus and Merced Counties haave mostly Moderate or Unzoned Fire Hazard Severity Zones (MFHSZ) (CAL FIRE 2007a and 2007b). The Project sites are located in Unzoned Fire Hazard Severity Zones and adjacent to areas zoned LRA Moderate (CAL FIRE 2007a and 2007b).

Discussion

a, b) **Less than Significant with Mitigation Incorporated.** During the construction phase, project construction equipment and materials would include fuels, oils and lubricants, cement and concrete, which are all commonly used in construction. The routine use or an accidental spill of hazardous materials used in construction could result in inadvertent releases, which could adversely affect construction workers, the public, and the environment.

Construction activities would be required to comply with numerous hazardous materials regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials into the environment, including stormwater and downstream receiving water bodies, including the San Joaquin River. Contractors would be required to prepare and implement Hazardous Materials Business Plans (HMBPs) that would require that hazardous materials used for construction be used properly and stored in appropriate containers with secondary containment, as needed, to contain a potential release. Individually, the proposed Projects are less than one acre in size and as such would not be subject to conditions of a Construction General Permit. **Mitigation Measure BIO-1** requires implementation of construction BMPs for off-channel staging, and storage of equipment and vehicles to minimize the risk of contaminating the waters of the San Joaquin River by spilled

materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. A spill prevention plan will also be prepared as part of **Mitigation Measure BIO-1**. The spill prevention plan will describe measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering the San Joaquin River or contaminating riparian areas adjacent to the river itself. In addition to a spill prevention plan, a cleanup protocol will be developed before construction begins and shall be implemented in case of a spill. Lastly, the transportation of hazardous materials would be regulated by the U.S. Department of Transportation, Caltrans, and the California Highway Patrol. Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of an accidental release.

During operations after project construction has been completed, routine maintenance would also include limited use of equipment that would use fuels, oils, and/or lubricants. BMPs could be required as part of the 401 Water Quality Standards Certification. The required compliance with the numerous laws and regulations discussed above that govern the transportation, use, handling, and disposal of hazardous materials would limit the potential for creation of hazardous conditions due to the use or accidental release of hazardous materials, and would render this impact less-than-significant.

c) **No Impact.** There are no schools located within one-quarter mile of the proposed Project sites. Therefore, relative to schools, there would be no impact.

d) **No Impact.** As discussed previously, based on a review of the Cortese List conducted in May 2019, no listed sites are located within 1 mile of the proposed Project sites (DTSC 2019). Therefore, relative to being located on a listed hazardous materials site, there would be no impact.

e) **No Impact.** No public airports or public use airports are located within 2 miles of the proposed Project sites. Therefore, relative to airport safety hazards, there would be no impact.

f) **No Impact.** The construction activity and the staging of equipment and materials for the proposed Projects would on the river side of the levee along the San Joaquin River, which would not require road closures or lane restrictions. Therefore, the proposed Projects would have no impact on emergency response and evacuation plans.

g) **Less than Significant.** The Project sites are located in Unzoned Fire Hazard Severity Zones and adjacent to areas zoned LRA Moderate (CAL FIRE 2007a and 2007b). The proposed Project sites do not have dense vegetation. In addition, the San Joaquin River and the Hilmar Drain Extension run through the Project areas, further reducing fire risk. The proposed Project would reduce vegetation at the Project sites. The addition of the Fish barriers would not result in structures that could catch fire. Therefore, relative to wildland fires, the impact would be less than significant.

References

California Department of Forestry and Fire Protection (CalFire), 2007a (September). Fire Hazard Severity Zones in SRA, Stanislaus County.

California Department of Forestry and Fire Protection (CalFire), 2007b (September). Fire Hazard Severity Zones in SRA, Merced County.

California Department of Toxic Substances Control (DTSC), 2019. DTSC's Hazardous Waste and Substances Site List – Site Cleanup (Cortese List). Available: www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm. Accessed May 28, 2019.

Hydrology and Water Quality

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

Surface Water Hydrology

The San Joaquin River Hydrologic Region is in California's Central Valley, which is generally the northern portion of the San Joaquin Valley, including the Project site. The region is south of the Sacramento River Hydrologic Region and north of the Tulare Lake Hydrologic Region. The region includes approximately half of the Delta. The San Joaquin River Basin has an average annual runoff of approximately 4 million acre-feet (MAF) (DWR 2014).

The proposed Projects are both located within the San Joaquin River Hydrologic Region. Both Projects are located within a federal levee which runs along the San Joaquin River.

San Joaquin River

The San Joaquin River is the principal river of the region, running through Stanislaus County from south to north, and all other streams are tributary to it. The major tributaries of the San Joaquin River include the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. The San Joaquin, Stanislaus, and Tuolumne Rivers are the largest

surface water features that have their origins in the Sierra Nevada. The San Joaquin River and its tributaries eventually drain to the Delta.

Sacramento-San Joaquin Delta

The Delta receives runoff from a watershed that includes more than 40 percent of the State's land area. The Sacramento and San Joaquin Rivers converge at the western end of the Delta near Suisun Bay.

In an average water year like 2000, the largest source of water was the Sacramento River, which transported a little more than 21 MAF into the Delta. Additional flows from the San Joaquin River and eastside tributaries such as the Mokelumne and Cosumnes Rivers contributed just over 3.9 MAF, with precipitation directly on the Delta adding about another million acre-feet. Freshwater flows in the Delta are typically much smaller than those caused by tidal flows. In addition to precipitation-derived runoff, Pacific Ocean tides move into and out of the Delta twice a day. Tidal rise and fall varies with location, from less than a foot in the eastern Delta to more than 5 feet in the western Delta (DWR 2014).

Water Quality

San Joaquin River

The water quality of the San Joaquin River is affected by agricultural return flows during the dry season, and these return flows frequently transport pesticides, nutrients and sediment from agricultural areas into the south Delta. In addition, many pesticides are applied during the dormant spray season, typically November to January, and can be transported to water bodies during rainfall events. The San Joaquin River from the Merced River to the Tuolumne River is impaired on State's 2012 303(d) list for: alpha-BHC (benzenehexachloride or alpha-HCH), ammonia, arsenic, bifenthrin, boron, cadmium, chloropyrifos, copper, dichlorodiphenyldichloroethylene, dichlorodiphenyltrichloroethane, diazinon, dieldrin, electrical conductivity (EC), Escherichia coli (E. coli), group A pesticides, lead, lindane/gamma hexachlorocyclohexane, malathion, mercury, molybdenum, nickel, nitrate (NO_3), dissolved oxygen (DO), potential of hydrogen (pH), selenium, water temperature, zinc, and an unknown toxicity. (USEPA 2019.)

Groundwater Hydrology and Water Quality

In the San Joaquin River Hydrologic Region, there are 11 alluvial groundwater basins and subbasins. The proposed Projects are both located within the San Joaquin Valley Basin and the Turlock subbasin (DWR 2004). The Project sites are along the western edge of the subbasin.

DWR described the characteristics of the Turlock Subbasin in its Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Turlock Subbasin (2006):

> *The Turlock Subbasin (Basin Number 5-22.03) has a total surface area of 347,000 acres (542 square miles). It lies between the Tuolumne and Merced rivers and is bounded on the west by the San Joaquin River and on the east by crystalline basement rock of the Sierra Nevada foothills. The northern, western, and southern boundaries are shared with the Modesto, Delta-Mendota, and Merced Groundwater subbasins, respectively. Similar to the Modesto Subbasin,*

> *groundwater flow is primarily to the southwest, following the regional dip of basement rock and sedimentary units. Based on recent groundwater measurements, a paired groundwater mound and depression appear beneath the city of Turlock and to its east, respectively.*
>
> *The groundwater in this subbasin is predominately of the sodium-calcium bicarbonate type, with sodium bicarbonate and sodium chloride types at the western margin and a small area in the north-central portion. TDS values range from 100 to 8,300 mg/L, with a typical range of 200 to 500 mg/L. The Department of Health Services reports TDS values in 71 wells ranging from 100 to 930 mg/L, with an average value of 335 mg/L. EC values range from 168 to 1,000 µmhos/cm, with a typical range of 244 to 707 µmhos/cm. There are localized areas of hard groundwater, nitrate, chloride, boron, and DBCP. Some sodium chloride type water of high TDS is found along the west side of the subbasin.*

The Project areas are characterized by a shallow groundwater that is heavily influenced by the San Joaquin River table. In general, groundwater levels at the Project sites are expected to rise and fall with respect to water levels in the San Joaquin River. Measured groundwater depth is approximately 20 feet below existing ground surface at both Project sites (DWR 2019).

Flood Control and Flood Management Facilities

Flood risks in the Sacramento-San Joaquin Valley are among the highest in the nation. In order to address this risk, the Central Valley Flood Protection Act of 2008 directed DWR to prepare the Central Valley Flood Protection Plan (CVFPP) for Central Valley Flood Protection Board (CVFPB) adoption. It lays out a strategy to prioritize the state's investment in flood management over the next three decades, as well as strategies to promote multi-benefit projects and to integrate and improve ecosystem functions associated with flood risk reduction projects. The CVFPP also incorporates information about system wide and regional flood management needs, advancements in the best available science, and new policy considerations.

The CVFPB is the State regulatory agency responsible for ensuring that appropriate standards are met for the construction, maintenance, and protection of the flood control system that protects life, property, and wildlife habitat in California's Central Valley from the effects of flooding. The San Joaquin River in the vicinity of the Project site is located with the Sacramento-San Joaquin Drainage District under the jurisdiction of the CVFPB.

Dams on the Tuolumne and Stanislaus Rivers help to regulate the rivers and reduce the risk of flooding in the County. An extensive network of levees also exists along the rivers, including along the San Joaquin River, in order to protect surrounding buildings and agricultural operations. Despite these measures to control flood flows, major flooding occurs along the San Joaquin River, as well as along portions of the Tuolumne River, Stanislaus River, and tributaries (Stanislaus County 2016). Damaging floods occurred in the Project areas in 1937-38, 1950-51, 1952, 1955-56, 1962-63, 1982-83, 1986, 1995, 1996-97 and 1998.

Discussion

a, b, e) **Less than Significant with Mitigation Incorporated.** Construction of the proposed Projects would involve the use of heavy equipment, including but not limited to: excavation, grading, earthmoving, stockpiling of spoils, installation of conveyance pipelines and facilities, pile driving, and placement of rip rap. Even though erosion potential for soils in the Project sites are generally low, construction activities have the potential to cause increased rates of erosion that could increase turbidity in the San Joaquin River adjacent to the project sites. In addition, the use of heavy machinery during construction could result in the potential accidental release of fuels, oils, solvents, hydraulic fluid, and other construction-related fluids to the environment, thereby degrading water quality.

As described previously, soils in the Project areas have a low potential for erosion; however, earthmoving and grading activities associated with construction have the potential to cause erosion. Routine project operations and maintenance activities are not anticipated to result in substantial soil erosion or loss of topsoil. The proposed Projects are less than one acre in size and as such would not be subject to conditions of a Construction General Permit. As discussed previously, **Mitigation Measure BIO-1** requires implementation of construction BMPs for off-channel staging, and storage of equipment and vehicles to minimize the risk of contaminating the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. A spill prevention plan will also be prepared as part of Mitigation Measure BIO-1. The spill prevention plan will describe measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering the San Joaquin River or contaminating riparian areas adjacent to the river itself. In addition, sediment/turbidity curtains will be deployed to protect water quality on the San Joaquin River side of the work activities.

Construction of the fish barriers would include installation of a cofferdam at each site to facilitate construction of the fish barriers within the drainages. Following installation of the cofferdam, the area inside the cofferdam would be dewatered. The contractor would be responsible for selecting the appropriate range of groundwater levels and equipment for the dewatering system used during construction, based on site conditions. Dewatering will be accomplished with drainage pumps moving any residual or seepage water from the construction area to adjacent ground on the land side of the levee.

Water from dewatering activities would be discharged area to adjacent ground on the land side of the levee in accordance with regulatory permits. Management of dewatering activities in accordance with the General Order for Dewatering and Other Low Threat Discharges to Surface Waters Permit would minimize the risk of impacting the water quality of receiving waters. Therefore, this impact is considered less-than-significant.

Routine operation and maintenance activities associated with the proposed Projects, such as cleaning barriers, would require removing the picket fencing or screen and there would

be no significant increase in sediment or other potential pollutants discharged into receiving waters. As a result, impacts to water quality associated with operation and maintenance activities would be less-than-significant.

c.i-iv) **No Impact.** The proposed Projects would not alter the existing drainage pattern of the area. Installation of the two fish barriers would prevent fall run Chinook Salmon from entering the TID canal system via the Harding Drain Culverts and Nielson Drain Culverts and would not result in a change in the amount or location of drainage. At the Harding Drain, a concrete lining would be installed between the culvert outlets and the new fish barrier. This concrete lining would not change the amount or location of drainage and would reduce erosion and siltation. As described previously, the proposed Projects would not result in substantial erosion or siltation on- or off-site post-construction. Installation of the fish barriers would not change the amount or location of drainage going from the TID canal system to the San Joaquin River. There would be no impact.

d) **No Impact.** The proposed Projects would place two fish barriers on the river side of the levee to prevent fall run Chinook Salmon from entering TID's canal system via the Harding Drain Culverts and Nielson Drain Culverts. The barrier at the Harding Drain site will be a metal picket fence with removable sections to allow for cleaning/maintenance, including periodic vegetation and debris removal. The barrier at the Nielson Drain site will be a swinging picket weir or a metal picket fence. The swinging picket weir is a hinged picket fence hanging over a long crested weir. As debris pass over the weir the picket fence is allowed to swing outwards to pass the debris while still blocking passage over the weir. Alternately, the barrier at the Nielson Drain site may be a metal picket fence with removable sections and rotating trash screens on the upstream side to prevent vegetation and debris from plugging the picket fence. As such, the barriers would not utilize any hazardous materials during operation. Periodic cleaning and maintenance would occur, but hazardous materials would not be stored on site and would not be exposed to potential flood. Therefore, no impact would occur in relation to the potential risk of release of pollutants due to Project inundation.

References

California Department of Water Resources (DWR), 2004 (February). California's Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Modesto Subbasin.

California Department of Water Resources (DWR), 2006 (January). California's Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Turlock Subbasin.

California Department of Water Resources (DWR), 2014 (October 30). California Water Plan Update 2013.

California Department of Water Resources (DWR), 2019. Groundwater Information Center Interactive Map Application Available: https://gis.water.ca.gov/app/gicima/. Accessed on June 3, 2019.

Stanislaus County, 2016. Stanislaus County General Plan and Airport Land Use Compatibility Plan Update, Draft Program Environmental Impact Report. April, 2016

U.S. Environmental Protection Agency (EPA), 2019. Final 2012 California Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report). Available: www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml. Accessed June 3, 2019.

Noise

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

Environmental Setting

Sound is mechanical energy transmitted by pressure waves through a medium such as air, while noise is defined as unwanted sound. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hertz[3] (Hz) and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).[4]

Effects of Noise on People

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

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

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

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise"

3 Hertz is a unit of frequency equivalent to one cycle per second

4 All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- In carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- outside of the laboratory, a 3-dBA change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is non-linear, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary "point" sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans 2013). Noise from large construction sites would have characteristics of both "point" and "line" sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration (FTA 2006). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

Existing Ambient Noise Environment

The noise environment in the area surrounding the project site is characterized by rural roadways, rural agricultural noise, and scattered residences. It includes low-volume traffic noise from tractors, large trucks, and other farm equipment, both on and off-road passenger vehicles. The

ambient noise environment in the vicinity of the Project site was estimated using a relationship population density and ambient noise determined during a research program by the EPA. The EPA determined that residents in rural or other non-urban areas are estimated to be exposed to outdoor ambient noise levels ranging from 35 to 50 dBA Ldn[5] (EPA 1974). Since the area surrounding the Project site can be categorized as rural or other non-urban area, it is assumed that ambient noise levels would range between 35 and 50 dBA Ldn.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive. Sensitive receptor land uses in the vicinity of the proposed Projects include residences. The closest sensitive receptor to the Harding Drain is a residence located approximately 1,700 feet to the south. The closest sensitive receptor to the Nielson Drain is a residence located approximately 3,000 feet to the north

Discussion

a) **Less than Significant.** For assessment of temporary construction noise impacts, construction activities that could occur outside of the Stanislaus County construction exempt hours would constitute a significant impact. Chapter 10.46 of the Stanislaus County Code limits construction noise to 75 dBA at any receiving property line between the hours of 7 p.m. and 7 a.m. Implementation of this code requirement will limit construction noise to a level determined to be acceptable by the County. The noise impact of construction activity is therefore considered to be less-than-significant.

Onsite construction activities would only occur within the County's construction exempt hours and would not result in a violation of the County's noise standards. In addition, construction activities would only occur during the daytime hours, when the existing ambient is at its highest (e.g., traffic noise noise); no nighttime hours as defined by the City's Municipal Code would occur and the activities would be limited in duration. This would result in a less-than-significant impact.

The proposed Projects are located in rural areas adjacent to land in agricultural use. Normal activities in the Project areas includes low-volume traffic noise from tractors, large trucks, and other farm equipment, both on and off-road passenger vehicles.

Normal operation of the fish barriers would consist of periodic maintenance to clean the barriers and/or remove portions of the barriers for cleaning. Operation of the Harding Drain fish barrier would involve bring out a boom truck to remove the picket fence

[5] Also abbreviated DNL, it is a 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

panels when river levels require maintenance crews to close the levee shutoff gates. The boom truck would need to return and replace the picket fence panels when the levee shutoff gates are reopened.

Operation of the Nielson Drain fish barrier would be determined by which type of Fish Barrier is installed. If the hanging screen design is selected, on-going maintenance for the Nielson Drain fish barrier would include monthly maintenance visits to manually brush the hanging screen. Or, if the alternative picket fence with rotating trash screen is installed, maintenance will include weekly visits to monitor and maintain the motorized equipment and manually brush clean all of the screens.

Operation of the Nielson Drain fish barrier will require that, in the event of large flows during flood years into the Nielson Drain, the bypass slide gates in the weir will be opened to allow for maximum capacity of the drain. The bypass slide gates will be closed as soon as flows return to normal. This is to prevent upstream field inundation.

Alternately, if the rotating trash screens and picket fences are installed, operations of the Nielson Drain fish barrier will involve bringing out a crane to remove the rotating trash screen and picket fences in March at the end of the spawning season and to reinstall the screen and picket fences in August before the next season begins.

The Project areas have existing conditions of ambient noise from rural agricultural noise, and scattered residences. Operation of the proposed Projects would not involve noise that differs from what is currently experienced under existing conditions. Consequently, it is expected that there would be no permanent substantial noise increases from the proposed Projects over existing conditions, nor would noise levels generated by maintenance activities exceed the County's exterior noise standards at the nearest sensitive receptor. Therefore, this impact would be less-than-significant.

b) **Less than Significant.** Since the operation of the proposed Projects would not include any activities that would generate significant levels of vibration, it is not anticipated that the operation of the proposed Projects would expose the nearest sensitive receptor or structure to vibration levels that would result in annoyance. Therefore, only vibration impacts from onsite construction activities are evaluated.

For adverse human reaction, the analysis applies the "strongly perceptible" threshold of 0.9 inch/second peak particular velocity (PPV) for transient sources. For risk of architectural damage to historic buildings and structures, the analysis applies a threshold of 0.12 inch/second PPV (Caltrans 2013b). A threshold of 0.3 inch/second PPV is used to assess damage risk for all other buildings. There are no historic structures in the vicinity of proposed Projects that could be adversely affected by Project construction-related vibration.

The potential use of a vibratory pile driver during proposed Project construction would be expected to generate the highest vibration levels during construction. Vibration levels for impact pile drivers are typically 104 VdB or 0.644 inches/second peak particle velocity

(PPV) at 25 feet, which is a typical estimate for a wide range of soil. Under typical propagation conditions, vibration levels at residences 1,700 feet from the pile driving activities, which represents the location of the nearest receptor, would be well below the FTA threshold of 72 VdB for human annoyance and 0.20 in/sec PPV for building damage. Therefore, this impact would be less-than-significant.

c) **No Impact.** No private airstrips or public airport or public use airports are located within 2 miles of the proposed Project sites. Therefore, the proposed Projects would not expose people working in the proposed Project areas to excessive noise levels and there would be no impact.

References

California Department of Transportation (Caltrans), 2013. *Technical Noise Supplement to the traffic Noise Analysis Protocol*. September 2013.

Federal Transit Administration (FTA), 2006. *Transit Noise and Vibration Impact Assessment.* May 2006.

Transportation

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

Environmental Setting

Highways

The Harding Drain is located approximately 8 miles east of I-5 and 11 miles west of State Route 99 (SR 99). The Nielson Drain is located approximately 9 miles east of I-5 and approximately 12 miles east of SR 99.

County Roadways/Traffic Types

As described previously, the proposed Projects are located in a rural area. The roadways immediately around the Project sites are primarily classified as local streets with two lanes. South Carpenter Road borders the Harding Drain Project site on the east. Crows Landing Road is the largest roadway in the area of the Harding Drain. It is classified as a Principal Arterial by Stanislaus County (Stanislaus County 2016). The roadways immediately adjacent to the Nielson Drain Project site are dirt roads. The closest paved road is Central Avenue, approximately 3,800 feet to the east which is classified as a Minor Collector by Merced County (Merced County 2013).

Airports

The nearest airport to the Harding Drain Project site is the NASA Crows Landing Airport, approximately 5 miles to the southwest. The nearest airport to the Nielson Drain Project site is the Ahlem Farms Airport, approximately 2.5 miles to the southeast.

Discussion

a) **Less than Significant.** Proposed Project construction would temporarily generate increases in vehicle trips by workers and vehicles on area roadways. There could be a minimal increase in truck trips for construction; however, due to the scale of the Projects and length of construction period, it is anticipated that there would not be a significant reduction in the capacity of local roads used to access the Project sites. Project operation would require regular but infrequent maintenance trips for barrier cleaning and would only result in a marginal increase in vehicle trips. Because the increase in traffic during

construction would be minimal, there would be no decreased LOS. Therefore, this impact is considered less-than-significant.

b) **Less than Significant.** Section 15064.3 of the CEQA Guidelines establishes specific considerations for evaluating a project's transportation impacts. The CEQA Guidelines identify vehicle miles traveled (VMT), which is the amount and distance of automobile travel attributable to a project, as the most appropriate measure of transportation impacts. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Construction of the proposed Projects would last for approximately one month and utilize existing construction crews. Operation of the proposed Projects would not add a substantial amount of VMT to the Project areas. In addition, VMT per capita is projected to decrease for both Stanislaus and Merced Counties. Therefore, the proposed Projects would be expected to have a less than significant impact to VMT.

c) **Less than Significant.** Trucks accessing the Project sites would use the local rural roadways. Based on the low number of anticipated construction trips in relation to traffic volumes on local roadways and their limited duration, construction activities would result in a less-than-significant impact with regard to hazards and incompatible uses. Construction of the proposed Projects would not result in new design features on roads in the area. Further, the proposed Projects would not result in in potential traffic safety hazards for vehicles, bicyclists and pedestrians on public roadways due to the intermittent and temporary construction activities. Therefore, the proposed Projects would result in a less-than-significant impact with regard to hazards and incompatible uses.

d) **Less than Significant.** Temporary construction staging would not block or interfere with emergency response vehicles. Increases in traffic volumes on local roadways providing access to the Project sites could cause intermittent and temporary slowdowns in traffic flow during construction, although operational conditions are not expected to deteriorate access on local roadways as a result of project-generated truck trips. For these reasons, the proposed Projects would not result in inadequate emergency access and the impact would be less-than-significant.

References

Merced County, 2013. 2030 Merced County General Plan. December 10, 2013.

Stanislaus County, 2016. Stanislaus County General Plan and Airport Land Use Compatibility Plan Update, Draft Program Environmental Impact Report. April, 2016

Tribal Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XII. TRIBAL CULTURAL RESOURCES —				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources. Code Section 5020.1(k), or	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Setting

ESA conducted a records search for the Project areas at the CCIC, California State University, Stanislaus on May 23, 2019 (File No. 11084IN). Records search results were negative for tribal cultural resources within the Project areas and the ½ mile radius. Background research indicates possible ethnographic village sites within 2 miles of the Project areas; however, there is no evidence that these locations extend near to the vicinity of the Project areas.

ESA conducted a pedestrian archaeological surface survey of the proposed Project areas on May 23, 2019. The survey covered construction areas and proposed staging areas for both aspects of the Project areas. No surface-visible tribal cultural resources were identified during the field survey.

ESA contacted the Native American Heritage Commission (NAHC) on May 21, 2019 to request of a search of the NAHC's Sacred Lands File (SLF) and a list of Native American representatives who may have interest in the Projects. The NAHC replied to ESA on May 29, 2019. A record search by the NAHC of the SLF was completed on May 29, 2019 with negative results. Additionally, the NAHC included a list of Native American representatives who may be interested in the Projects. ESA provided TID with a template consultation letter and the NAHC list of Native American representatives to conduct formal consultation according to the requirements of PRC 21080.3.1. To date, no responses from any of the Native American representatives has been received by TID.

Discussion

a.i and a-ii) **Less than Significant with Mitigation Incorporated.** Tribal cultural resources are: (1) sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are listed, or determined to be eligible for listing in the California Register, or local register of historical resources, as defined in PRC Section 5020.1(k); or, (2) a resource determined by the lead CEQA agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). For a cultural landscape to be considered a tribal cultural resource, it must be geographically defined in terms of the size and scope of the landscape (PRC Section 21074[b]). Also, a historical resource, as defined in PRC Section 21084.1, unique archaeological resource, as defined in PRC Section 21083.2(g), or non-unique archaeological resource, as defined in PRC Section 21083.2(h), may also be a tribal cultural resource.

No tribal cultural resources are known to exist at the Project areas. Pedestrian archaeological surface survey results were negative for tribal cultural resources. Geoarchaeological analysis suggests that the Foster series soil type located at the Nielson Drain Project area dates to the late Holocene to early historic-period. Rosenthal and Meyer determined a very high potential for buried archaeological deposits for Foster series soil types (Rosenthal and Meyer 2004: Appendix D). However, the high potential for presence of buried archaeological deposits is offset in locations of the Project area with previously disturbed sediment, where the potential significance for any archaeological deposits is low due to a lack of integrity from the ground disturbance. The archaeological survey determined that all of the surface sediments in the Nielson Drain aspect of the Project area have been disturbed from historic-period and modern activities (associated with drain construction and use). As such, the archaeological sensitivity of the Nielson Drain aspect of the Project is considered low.

Due to ground disturbance anticipated during the Project implementation, if any previously unrecorded archaeological resource were identified during ground-disturbing construction activities and were found to qualify as a tribal cultural resource pursuant to PRC Section 21074(a)(1) (determined to be eligible for listing in the California Register or in a local register of historical resources), any impacts to the resource resulting from the project could be potentially significant. Any such potential significant impacts would be reduced to a less than significant level by implementing **Mitigation Measure CUL-1**. **Inadvertent Discovery of Archaeological Resources or Tribal Cultural Resources**, by ensuring that work halt in the vicinity of a find until a qualified archaeologist can make an assessment and provide additional recommendations if necessary, including contacting Native American tribes (refer to Cultural Resources). While unlikely, if any previously unknown human remains were encountered during ground disturbing activities, any impacts to the human remains resulting from the Project could be potentially significant. Any such potential significant impacts would be reduced to a less than significant level by implementing **Mitigation Measure CUL-2**: **Inadvertent Discovery of Human Remains**, which requires the County coroner be contacted and, if the remains are

determined to be Native American, the NAHC be contacted to assign a Most Likely Descendant.

References

Central California Information Center, (CCIC) File No. 11084IN California Historical Resources Information System at California State University, Stanislaus. On file at ESA, May 23, 2019.

Rosenthal, Jeffrey S., and Jack Meyer, *Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways, Volume III: Geoarchaeological Study, Landscape Evolution and the Archaeological Record of Central California*, prepared by Far Western Anthropological Research Groups, Inc. for Caltrans District 10, 2004.

Utilities and Service Systems

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

Discussion

a, b, c, d) **No Impact.** The proposed Projects propose to install fish barriers at the Harding and Nielson Drains and does not include or require the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities as a result of the proposed Projects. The proposed Projects would also not require additional water supplies or expanded wastewater treatment capacity. Construction of the proposed Projects will comply with all the wastewater requirements of the CVRWQCB (refer to the Hydrology and Water Quality section for more information), as well as all federal, state, and local statutes and regulations related to solid waste. Therefore, there would be no impact.

e) **Less than Significant.** The proposed Projects would generate minimal waste from temporary construction activities and vegetation removal. The Fink Road Sanitary Landfill is a Class III landfill for nonhazardous municipal solid waste in the project vicinity; the facility is owned by Stanislaus County and operated by the Stanislaus County Department of Environmental Resources. As of March 1, 2017, the Fink Road Sanitary Landfill, the sole permitted landfill in the county, had a permitted capacity of 14,640,000 cubic yards, a remaining capacity of 7,184,701 and is permitted through 2023 (CalRecycle 2019). The landfill that serves the Project areas has the capacity to accept waste generated by the proposed Projects. Therefore, the proposed Projects would result in a less-than-significant impact.

References

California Department of Resources Recycling and Recovery (CalRecycle), 2019. Facility/Site Summary Details: Fink Road Landfill (50-AA-0001). Available: https://www2.calrecycle.ca.gov/swfacilities/Directory/50-AA-0001. Accessed May 30, 2019.

Mandatory Findings of Significance

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

Discussion

a) **Less than Significant with Mitigation Incorporated.** Per the impact discussions above, the potential of the proposed Projects to substantially degrade the environment is less-than-significant with incorporated mitigation measures. As described in this Initial Study, the proposed Projects have the potential for impacts related to biological resources, cultural resources, geology and soils, and greenhouse gas emissions. However, these impacts would be avoided or reduced to a less-than-significant level with the incorporation of avoidance and mitigation measures discussed in each section.

b) This section provides a description of other actions in the area and a discussion of the cumulative impacts of those projects, in combination with the previously identified effects of the proposed project. CEQA Guidelines Section 15355 states that "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."

   a) The individual effects may be changes resulting from a single project or a number of separate projects.

   b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The past, present and reasonably foreseeable future conditions of the Project sites and vicinity were considered for the cumulative analysis.

Aesthetics. Completion of the proposed Projects would result in some permanent visual changes to the Project areas from the installation of the fish barriers. Adding fish barriers to the existing drains would not result in significant aesthetics impacts. The fish barriers would be consistent with the rural agricultural nature of the existing setting. Further, these changes would be below the top of the levees and would not be easily visible from the adjacent area. As such, cumulative impacts to aesthetics would be less-than-significant.

Agricultural and Forest Resources. The proposed Projects would have no impact to agricultural and forest resources and thus does not contribute to cumulative impacts.

Air Quality and Greenhouse Gas Emissions. A number of individual projects in the area of the proposed Projects may be under construction simultaneously with the proposed Projects. Depending on construction schedules and actual implementation of projects in and around Stanislaus and Merced Counties, generation of fugitive dust and pollutant emissions during construction may result in short-term air pollutants, which would contribute to short-term cumulative air quality impacts. However, each individual project would be subject to SJVAPCD rules, regulations, and other mitigation requirements during construction. For cumulative impacts to air quality and greenhouse gas emissions see the Air Quality and Greenhouse Gas Emissions sections above. The thresholds used consider the contribution of other projects within the air basin. Additionally, greenhouse gas emissions are considered cumulative in nature because it is unlikely that a single project would contribute significantly to climate change.

Biological Resources, Cultural Resources, Tribal Cultural Resources, Geology/Soils/ Seismicity, and Hazards and Hazardous Materials. The proposed Project's impacts for these environmental issues would be limited to the Project sites, and any significant impacts have been reduced to a less-than-significant level by incorporating proposed mitigation measures. Thus, the proposed Projects would not contribute to cumulative impacts for these topics.

Energy. Construction of the proposed Projects would result in fuel consumption from the use of construction tools and equipment, truck trips to haul material, and vehicle trips generated from construction workers commuting to and from the sites. This impact would be temporary and localized. Operation impacts to energy are not anticipated. Construction-related fuel consumption by the project would not result in inefficient, wasteful, or unnecessary energy use compared with other construction sites in the region.

Hydrology and Water Quality. Implementation of the proposed Projects would not result in an increase in the amount of storm water generated in the Project sites. The proposed Projects are less than one acre in size and as such would not be subject to conditions of a Construction General Permit. Mitigation measures require implementation of construction BMPs for off-channel staging, and storage of equipment and vehicles to

minimize the risk of contaminating the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. A spill prevention plan will also be prepared as part of mitigation measures. In addition, sediment/turbidity curtains will be deployed to protect water quality on the San Joaquin River side of the work activities. Therefore, cumulative impacts would be less than significant.

Land Use and Land Use Planning. The proposed Projects would have no impact on land use and land use planning; therefore, it would not contribute to cumulative land use issues.

Mineral Resources. The proposed Projects would have no impact on mineral resources and thus does not contribute to cumulative impacts.

Noise. The project's noise impacts are anticipated to be minor and the proposed Projects will comply with the noise standards in the Noise Element of the General Plan. Operation of the proposed Projects would not result in a substantial permanent increase in ambient noise levels in the vicinity of the proposed Projects above levels existing without the proposed Projects. As such, cumulative noise impacts would be less than significant.

Population and Housing. The proposed Projects would have no impact on population growth in the area as the project does not include any new residential or commercial development. The proposed Projects would not result in temporary employment for during construction. The proposed Projects would not result in the permanent creation of a significant number of new jobs that would induce substantial population growth. Therefore, cumulative population and housing impacts would be less-than-significant.

Public Services. No commercial or residential development is proposed as part of the proposed project; therefore, the proposed Projects would not increase demands on fire protection or police services nor affect the response time of these services. Therefore, cumulative public services impacts would be less-than-significant.

Recreation. The proposed Projects would have no impact on recreation and thus does not contribute to cumulative impacts.

Transportation and Traffic. For cumulative impacts see the Transportation and Traffic section above.

Utilities and Service Systems. The proposed Projects does not include wastewater or water supply systems, and would generate a relatively small amount of solid waste per day. The proposed Projects would not require storm water treatment. Therefore, cumulative impacts to utilities and service systems would be less-than-significant.

This Draft Initial Study/Mitigated Negative Declaration found that the proposed Projects and associated activities will potentially impact the environment in the areas of biological resources, cultural resources, and geology and soils, greenhouse gas emissions, tribal

cultural resources. However, these potential impacts will be reduced to a less-than-significant level with implementation of the mitigation measures included in this report, and most impacts are temporary in nature (i.e., would only occur during construction). Other future projects proposed in the region and vicinity may increase impacts identified herein or these proposed Projects may contribute to other impacts; however, these proposed Projects are not anticipated to contribute substantially to any one impact, and the proposed Project's impacts are not anticipated to be cumulatively considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of future projects; resulting in a less-than-significant impact.

c) **Less than Significant with Mitigation Incorporated.** The proposed Projects will not result in any substantial adverse effects to human beings, either directly or indirectly, since each potentially significant impact can be reduced to a less-than-significant level with the implementation of the mitigation measures provided in this document. No other substantial adverse effects to human beings are anticipated as a result of these Projects, resulting in a less-than-significant impact.

Appendix A
Species Lists

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind

Query Summary:
Quad IS (Westley (3712152) OR Brush Lake (3712151) OR Ceres (3712058) OR Patterson (3712142) OR Crows Landing (3712141) OR Hatch (3712048) OR Orestimba Peak (3712132) OR Newman (3712131) OR Gustine (3712038))

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	952	34	None	Candidate Endangered	G2G3	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Ambystoma californiense	California tiger salamander	Amphibians	AAAAA01180	1188	3	Threatened	Threatened	G2G3	S2S3	null	CDFW_WL-Watch List, IUCN_VU-Vulnerable	Cismontane woodland, Meadow & seep, Riparian woodland, Valley & foothill grassland, Vernal pool, Wetland
Antrozous pallidus	pallid bat	Mammals	AMACC10010	416	1	None	None	G5	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub, Upper montane coniferous forest, Valley & foothill grassland
Aquila chrysaetos	golden eagle	Birds	ABNKC22010	321	1	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Cismontane woodland, Coastal prairie, Great Basin grassland, Great Basin scrub, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous forest, Valley & foothill grassland
Ardea herodias	great blue heron	Birds	ABNGA04010	155	1	None	None	G5	S4	null	CDF_S-Sensitive, IUCN_LC-Least Concern	Brackish marsh, Estuary, Freshwater marsh, Marsh & swamp, Riparian forest, Wetland
Astragalus tener var. tener	alkali milk-vetch	Dicots	PDFAB0F8R1	65	5	None	None	G2T1	S1	1B.2	null	Alkali playa, Valley & foothill grassland,

												Vernal pool, Wetland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	1984	3	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex cordulata var. cordulata	heartscale	Dicots	PDCHE040B0	66	3	None	None	G3T2	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland
Atriplex minuscula	lesser saltscale	Dicots	PDCHE042M0	52	1	None	None	G2	S2	1B.1	null	Alkali playa, Chenopod scrub, Valley & foothill grassland
Atriplex persistens	vernal pool smallscale	Dicots	PDCHE042P0	41	3	None	None	G2	S2	1B.2	null	Vernal pool, Wetland
Atriplex subtilis	subtle orache	Dicots	PDCHE042T0	24	1	None	None	G1	S1	1B.2	BLM_S-Sensitive	Valley & foothill grassland
Blepharizonia plumosa	big tarplant	Dicots	PDAST1C011	53	5	None	None	G1G2	S1S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Valley & foothill grassland
Bombus caliginosus	obscure bumble bee	Insects	IIHYM24380	181	1	None	None	G4?	S1S2	null	IUCN_VU-Vulnerable	null
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	234	2	None	None	G3G4	S1S2	null	null	null
Branchinecta conservatio	Conservancy fairy shrimp	Crustaceans	ICBRA03010	43	2	Endangered	None	G2	S2	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta longiantenna	longhorn fairy shrimp	Crustaceans	ICBRA03020	20	1	Endangered	None	G1	S1S2	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	767	2	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Branta hutchinsii leucopareia	cackling (=Aleutian Canada) goose	Birds	ABNJB05035	19	7	Delisted	None	G5T3	S3	null	null	Artificial standing waters, Sacramento/San Joaquin standing waters, Valley & foothill grassland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2473	33	None	Threatened	G5	S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland
Caulanthus lemmonii	Lemmon's jewelflower	Dicots	PDBRA0M0E0	86	1	None	None	G3	S3	1B.2	BLM_S-Sensitive, SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Pinon & juniper woodlands, Valley & foothill grassland
Ceratochrysis menkei	Menke's cuckoo wasp	Insects	IIHYM71050	2	1	None	None	G1	S1	null	null	null
Chloropyron molle ssp. hispidum	hispid salty bird's-beak	Dicots	PDSCR0J0D1	35	2	None	None	G2T1	S1	1B.1	BLM_S-Sensitive	Alkali playa, Meadow & seep, Wetland
Cismontane Alkali Marsh	Cismontane Alkali Marsh	Marsh	CTT52310CA	4	1	None	None	G1	S1.1	null	null	Marsh & swamp, Wetland
Coastal and	Coastal and	Marsh	CTT52410CA	60	2	None	None	G3	S2.1	null	null	Marsh & swamp,

Valley Freshwater Marsh	Valley Freshwater Marsh											Wetland
Corynorhinus townsendii	Townsend's big-eared bat	Mammals	AMACC08010	628	1	None	None	G3G4	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	Broadleaved upland forest, Chaparral, Chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, Lower montane coniferous forest, Meadow & seep, Mojavean desert scrub, Riparian forest, Riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, Upper montane coniferous forest, Valley & foothill grassland
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Insects	IICOL48011	271	3	Threatened	None	G3T2	S2	null	null	Riparian scrub
Egretta thula	snowy egret	Birds	ABNGA06030	20	1	None	None	G5	S4	null	IUCN_LC-Least Concern	Marsh & swamp, Meadow & seep, Riparian forest, Riparian woodland, Wetland
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1362	9	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Eremophila alpestris actia	California horned lark	Birds	ABPAT02011	94	3	None	None	G5T4Q	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marine intertidal & splash zone communities, Meadow & seep
Eryngium racemosum	Delta button-celery	Dicots	PDAPI0Z0S0	26	5	None	Endangered	G1	S1	1B.1	null	Riparian scrub, Wetland
Eryngium spinosepalum	spiny-sepaled button-celery	Dicots	PDAPI0Z0Y0	108	3	None	None	G2	S2	1B.2	null	Valley & foothill grassland, Vernal pool, Wetland
Eschscholzia rhombipetala	diamond-petaled California poppy	Dicots	PDPAP0A0D0	12	1	None	None	G1	S1	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden	Valley & foothill grassland
Extriplex joaquinana	San Joaquin spearscale	Dicots	PDCHE041F3	127	2	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland
Falco mexicanus	prairie falcon	Birds	ABNKD06090	460	1	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern,	Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran

											USFWS_BCC-Birds of Conservation Concern	desert scrub, Valley & foothill grassland
Great Valley Valley Oak Riparian Forest	Great Valley Valley Oak Riparian Forest	Riparian	CTT61430CA	33	1	None	None	G1	S1.1	null	null	Riparian forest
Haliaeetus leucocephalus	bald eagle	Birds	ABNKC10010	327	1	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Lower montane coniferous forest, Oldgrowth
Lanius ludovicianus	loggerhead shrike	Birds	ABPBR01030	109	2	None	None	G4	S4	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Desert wash, Joshua tree woodland, Mojavean desert scrub, Pinon & juniper woodlands, Riparian woodland, Sonoran desert scrub
Lasiurus blossevillii	western red bat	Mammals	AMACC05060	128	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_H-High Priority	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland
Lasiurus cinereus	hoary bat	Mammals	AMACC05030	238	2	None	None	G5	S4	null	IUCN_LC-Least Concern, WBWG_M-Medium Priority	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest
Lavinia symmetricus ssp. 1	San Joaquin roach	Fish	AFCJB19021	8	1	None	None	G4T3Q	S3	null	CDFW_SSC-Species of Special Concern	Aquatic, Sacramento/San Joaquin flowing waters
Lepidurus packardi	vernal pool tadpole shrimp	Crustaceans	ICBRA10010	325	2	Endangered	None	G4	S3S4	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
Linderiella occidentalis	California linderiella	Crustaceans	ICBRA06010	438	1	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
Lytta moesta	moestan blister beetle	Insects	IICOL4C020	12	2	None	None	G2	S2	null	null	Valley & foothill grassland
Masticophis flagellum ruddocki	San Joaquin coachwhip	Reptiles	ARADB21021	95	1	None	None	G5T2T3	S2?	null	CDFW_SSC-Species of Special Concern	Chenopod scrub, Valley & foothill grassland
Melospiza melodia	song sparrow ("Modesto" population)	Birds	ABPBXA3010	92	1	None	None	G5	S3?	null	CDFW_SSC-Species of Special Concern	null
Mylopharodon conocephalus	hardhead	Fish	AFCJB25010	32	1	None	None	G3	S3	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Klamath/North coast flowing waters, Sacramento/San Joaquin flowing waters
Myotis yumanensis	Yuma myotis	Mammals	AMACC01020	265	1	None	None	G5	S4	null	BLM_S-Sensitive,	Lower montane coniferous

											IUCN_LC-Least Concern, WBWG_LM-Low-Medium Priority	forest, Riparian forest, Riparian woodland, Upper montane coniferous forest
Navarretia nigelliformis ssp. radians	shining navarretia	Dicots	PDPLM0C0J2	103	1	None	None	G4T2	S2	1B.2	BLM_S-Sensitive	Cismontane woodland, Valley & foothill grassland, Vernal pool, Wetland
Navarretia prostrata	prostrate vernal pool navarretia	Dicots	PDPLM0C0Q0	60	1	None	None	G2	S2	1B.1	null	Coastal scrub, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Fish	AFCHA0209K	31	3	Threatened	None	G5T2Q	S2	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Perognathus inornatus	San Joaquin Pocket Mouse	Mammals	AMAFD01060	126	1	None	None	G2G3	S2S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Cismontane woodland, Mojavean desert scrub, Valley & foothill grassland
Pogonichthys macrolepidotus	Sacramento splittail	Fish	AFCJB34020	15	1	None	None	GNR	S3	null	AFS_VU-Vulnerable, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered	Aquatic, Estuary, Freshwater marsh, Sacramento/San Joaquin flowing waters
Puccinellia simplex	California alkali grass	Monocots	PMPOA53110	71	2	None	None	G3	S2	1B.2	null	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool
Rana boylii	foothill yellow-legged frog	Amphibians	AAABH01050	2366	3	None	Candidate Threatened	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, USFS_S-Sensitive	Aquatic, Chaparral, Cismontane woodland, Coastal scrub, Klamath/North coast flowing waters, Lower montane coniferous forest, Meadow & seep, Riparian forest, Riparian woodland, Sacramento/San Joaquin flowing waters
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1516	1	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable	Aquatic, Artificial flowing waters, Artificial standing waters, Freshwater marsh, Marsh & swamp, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Sagittaria sanfordii	Sanford's arrowhead	Monocots	PMALI040Q0	126	1	None	None	G3	S3	1B.2	BLM_S-Sensitive	Marsh & swamp, Wetland
Spea hammondii	western spadefoot	Amphibians	AAABF02020	818	7	None	None	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-	Cismontane woodland, Coastal scrub,

											Species of Special Concern, IUCN_NT-Near Threatened	Valley & foothill grassland, Vernal pool, Wetland
Sphenopholis obtusata	prairie wedge grass	Monocots	PMPOA5T030	19	1	None	None	G5	S2	2B.2	null	Cismontane woodland, Meadow & seep, Wetland
Sycamore Alluvial Woodland	Sycamore Alluvial Woodland	Riparian	CTT62100CA	17	1	None	None	G1	S1.1	null	null	Riparian woodland
Sylvilagus bachmani riparius	riparian brush rabbit	Mammals	AMAEB01021	16	1	Endangered	Endangered	G5T1	S1	null	null	Riparian forest
Taxidea taxus	American badger	Mammals	AMAJF04010	588	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Thamnophis gigas	giant gartersnake	Reptiles	ARADB36150	366	3	Threatened	Threatened	G2	S2	null	IUCN_VU-Vulnerable	Marsh & swamp, Riparian scrub, Wetland
Valley Sacaton Grassland	Valley Sacaton Grassland	Herbaceous	CTT42120CA	9	1	None	None	G1	S1.1	null	null	Valley & foothill grassland
Valley Sink Scrub	Valley Sink Scrub	Scrub	CTT36210CA	29	1	None	None	G1	S1.1	null	null	Chenopod scrub
Vireo bellii	least Bell's	Birds	ABPBW01114	497	2	Endangered	Endangered	G5T2	S2	null	IUCN_NT-	Riparian forest,

pusillus	vireo										Near Threatened, NABCI_YWL-Yellow Watch List	Riparian scrub, Riparian woodland
Vulpes macrotis mutica	San Joaquin kit fox	Mammals	AMAJA03041	1017	10	Endangered	Threatened	G4T2	S2	null	null	Chenopod scrub, Valley & foothill grassland

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

20 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712152, 3712151, 3712058, 3712142, 3712141, 3712048, 3712132 3712131 and 3712038;

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 tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun,Aug,Sep,Oct	1B.2	S2	G2
Atriplex subtilis	subtle orache	Chenopodiaceae	annual herb	Jun,Aug,Sep(Oct)	1B.2	S1	G1
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Caulanthus lemmonii	Lemmon's jewelflower	Brassicaceae	annual herb	Feb-May	1B.2	S3	G3
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.1	S1	G2T1
Clarkia breweri	Brewer's clarkia	Onagraceae	annual herb	Apr-Jun	4.2	S4	G4
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Navarretia prostrata	prostrate vernal pool navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3

Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Sphenopholis obtusata	prairie wedge grass	Poaceae	perennial herb	Apr-Jul	2B.2	S2	G5

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 23 April 2019].

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United States Department of the Interior

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In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-1751
Event Code: 08ESMF00-2019-E-05611
Project Name: TID fish Barrier

April 23, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1751

Event Code: 08ESMF00-2019-E-05611

Project Name: TID fish Barrier

Project Type: SPILL / RELEASE

Project Description: Fish Barrier

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.46424810922693N121.02859123215484W

Counties: Stanislaus, CA

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. 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.

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: 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. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: 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. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: 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. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix B
Aquatic Resources Delineation

HARDING AND NIELSON DRAIN FISH BARRIER PROJECTS

Aquatic Resources Delineation

Prepared for
Turlock Irrigation District

June 2019

ESA

HARDING AND NIELSON DRAIN FISH BARRIER PROJECTS

Aquatic Resources Delineation

Prepared for
Turlock Irrigation District

June 2019

2600 Capitol Avenue
Suite 200
Sacramento, CA 95816
916.564.4500
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180805.00

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CHAPTER 1
Introduction

This report has been prepared to document the results and conclusions of an aquatic resources delineation field survey conducted for the Harding and Nielson Drain Fish Barrier Projects (Projects). The Projects are in the San Joaquin Valley near the San Joaquin River (**Figure 1**). The study area is located at two discrete sites. The Harding Drain is located at the point where two culverts convey water from the Harding Drain into the San Joaquin River. The Nielson Drain is located at the point where two separate culverts convey water from the Nielson Drain into the Hilmar Drain. On behalf of the Turlock Irrigation District (TID), Environmental Science Associates (ESA) investigated the extent of aquatic resources in the study area that potentially meet the criteria for waters of the U.S.

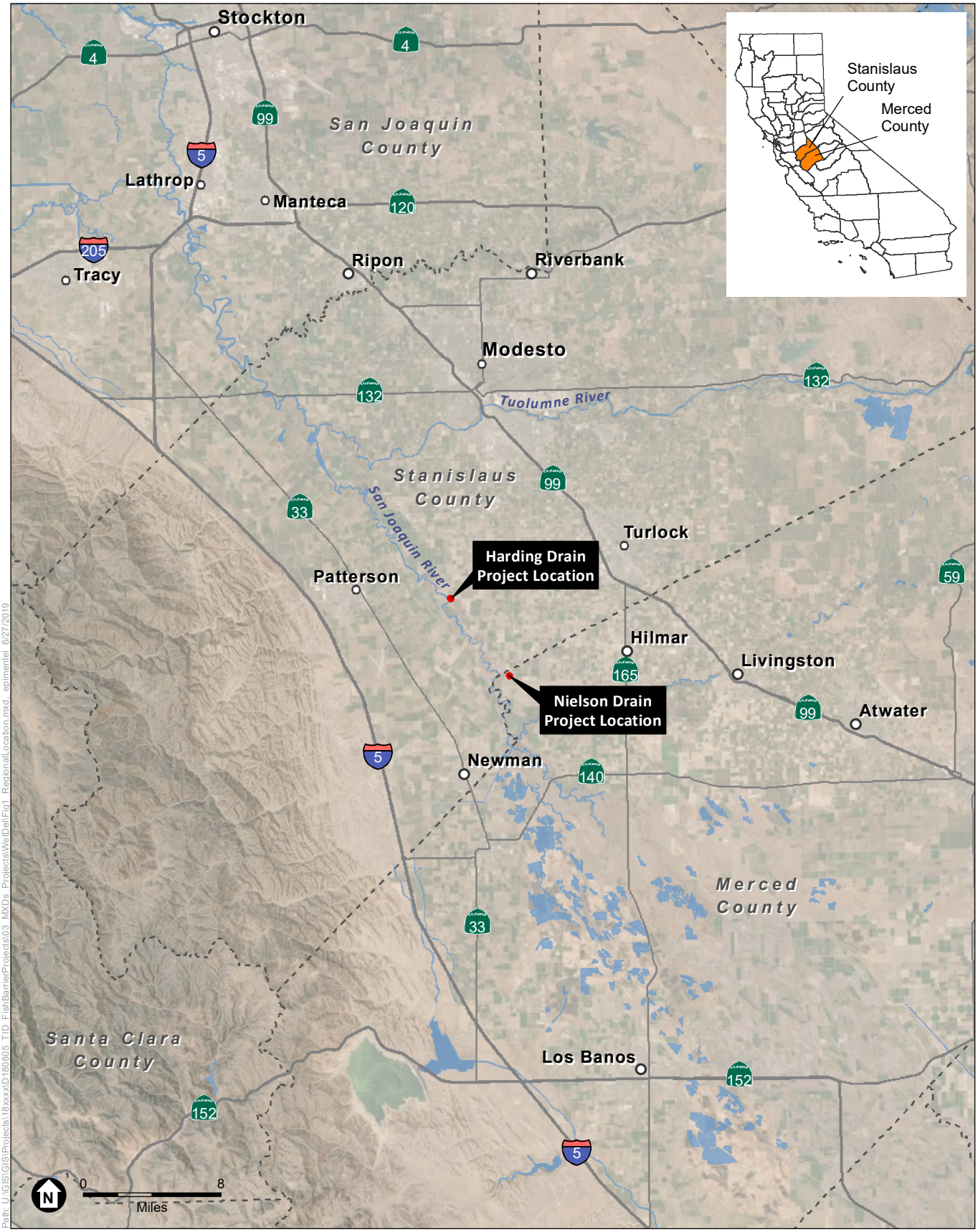
This report documents the boundaries of the aquatic features within the study area using field data and the best professional judgment of ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and verification in writing by the U.S. Army Corps of Engineers (USACE).

1.1 Purpose

The purpose of this investigation is to describe and delineate all potential wetlands and other waters of the U.S. within the study area that may be subject to Section 404 of the Clean Water Act. Information from this report may be used in preparing permit applications for future actions proposed in the study area.

1.2 Location

The portion of the study area at the Harding Drain is located near the intersection of South Carpenter Road and West Harding Road in Stanislaus County. This portion of the study area includes portions of the San Joaquin River, the Harding Drain, and a levee. This portion of the study area is on Sections 25 and 36 of Township 5 South, Range 8 East of the Crows Landing, California U.S. Geological Survey (USGS) 7.5-minute series quadrangle. The approximate centroid of this portion of the study area is 37º 23′ 52.39″ North, 120º 58′ 20.49″ West. Topography in the area is flat except for slopes next to the Harding Drain and the San Joaquin River. Elevation within this portion of the study area ranges from approximately 40 to 60 feet. Aerial imagery and topographic maps of the study area are in **Figures 2** and **3**, respectively.

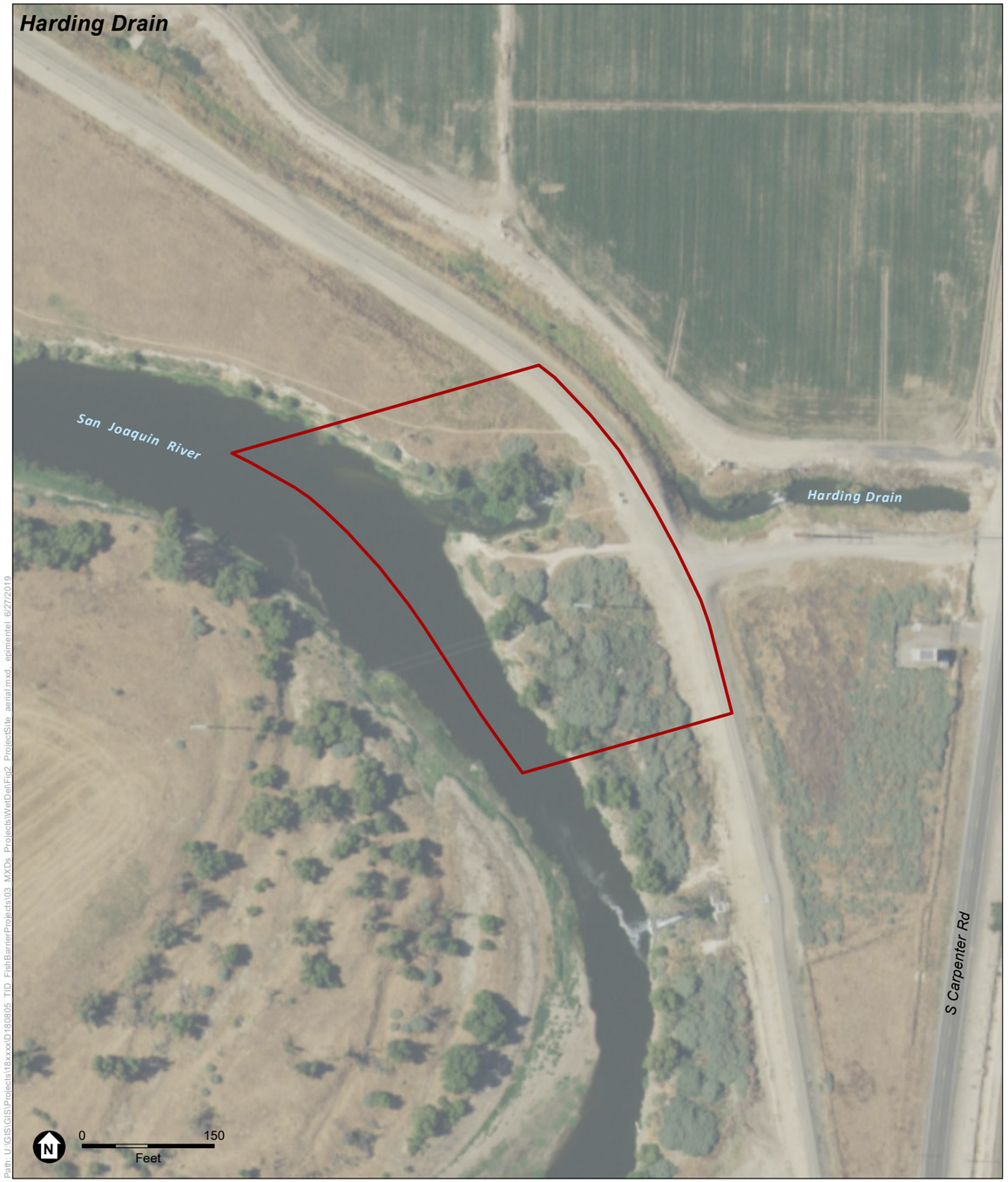


SOURCE: Esri, 2018; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 1
Regional Location

ESA



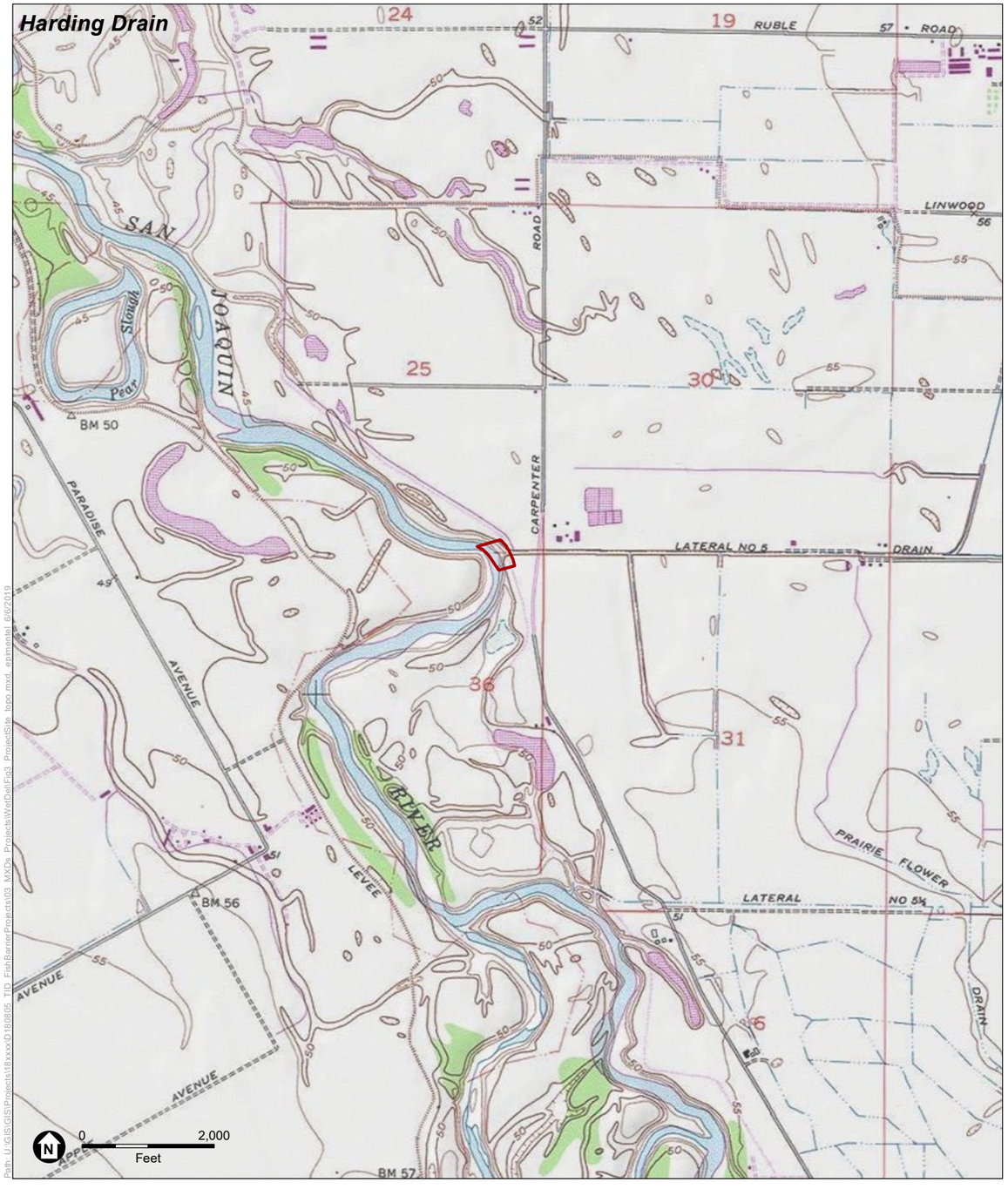
Path: U:\GIS\GIS\Projects\18xxxx\D180805_TID_FishBarrierProjects\03_MXDs_ProjectsWetDelt\Fig2_ProjectSite_aerial.mxd_ ebimentel 6/27/2019

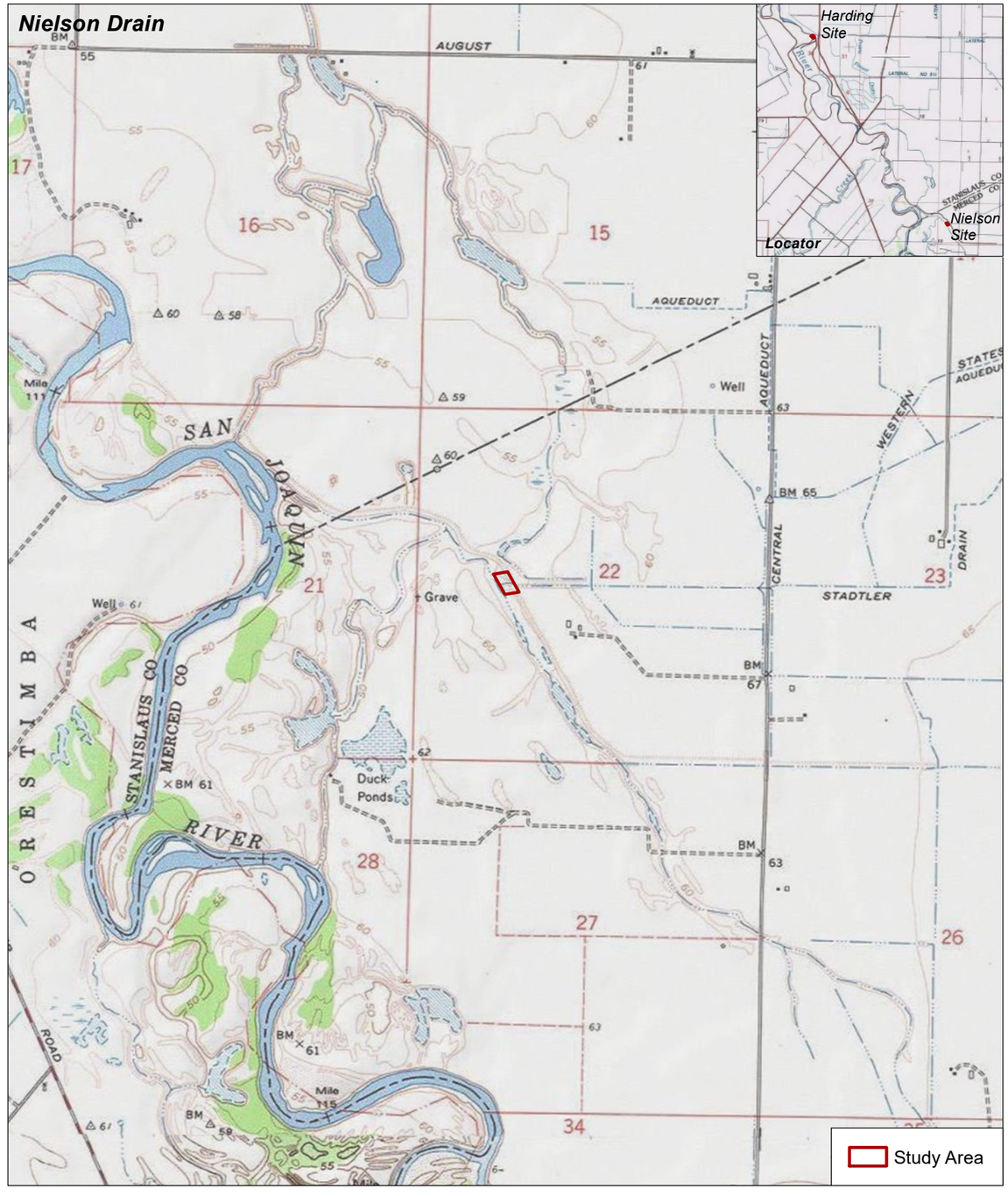
SOURCE: USDA, 2016; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 2
Project Site

ESA





SOURCE: USGS 7.5' Topographic Quadrangle (Crows Landing, 1952; Hatch, 1962); ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 3
Topographic Map

ESA

The portion of the study area at the Nielson Drain is located approximately 0.7 mile west of Central Avenue, in Merced County, near the Merced/Stanislaus County boundary. This portion of the study area includes portions of the Nielson Drain and a levee. This portion of the study area is on Section 22 of Township 6 South, Range 9 East of the Hatch, California U.S. Geological Survey (USGS) 7.5-minute series quadrangle. The approximate centroid of this portion of the study area is 37º 23′ 52.00″ North, 120º 58′ 21.07″ West. Topography in the area is flat except for slopes next to the Nielson Drain and Hilmar Drain. Elevation within this portion of the study area ranges from approximately 60 to 70 feet. Aerial imagery and topographic maps of the study area are in Figures 2 and 3, respectively.

1.3 Responsible Parties

The applicant is:

Turlock Irrigation District
901 North Broadway Avenue
P.O. Box 949
Turlock, CA 95381-0949

The point of contact for regulatory permitting is:

Ms. Kelly Bayne, Senior Biologist
Environmental Science Associates
2600 Capitol Avenue, Suite 200
Sacramento, CA 95816
(916) 564-4500
kbayne@esassoc.com

1.4 Directions to Study Area

Directions to the Harding Drain portion of the study area from Sacramento:

- Take Highway 99 South.
- Take the North Carpenter Road exit.
- Turn right and travel south on North Carpenter Road for 13.8 miles until reaching the Harding Drain.

Directions to the Nielson Drain portion of the study area from Sacramento:

- Take Highway 99 South.
- Take the West Main Street exit in Turlock.
- Turn right and travel west on West Main Street for about 4.8 miles to Central Avenue.
- Turn left on Central Avenue and drive about 6.6 miles to an unnamed dirt road next to the Hilmar Drain.
- Turn right onto the unnamed dirt road and drive 1 mile to the Nielson Drain.

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CHAPTER 2
Regulatory Setting

2.1 2015 Clean Water Rule

In 2015, the USACE and the Environmental Protection Agency (EPA) issued the Clean Water Rule detailing the process for determining Clean Water Act (CWA) jurisdiction over waters of the United States (WOTUS). The rule is currently in effect in California and 21 other states. The 2015 Clean Water Rule includes a detailed process for determining which areas may be subject to jurisdiction under the CWA, and broadly classifies features into three categories: those that are jurisdictional by rule (Category A below), those that are excluded by rule (Category C below), and those features that require a "significant nexus test" (Category B below) to determine jurisdictional status.

The significant nexus test includes consideration of hydrologic and ecologic factors. For circumstances such as those described in Category B below, the significant nexus test would take into account physical indicators of flow (evidence of an ordinary high water mark [OHWM]), if a hydrologic connection to a Traditional Navigable Water (TNW) exists, and if the aquatic functions of the water body have a significant effect (more than speculative or insubstantial) on the chemical, physical, and biological integrity of a TNW. The USACE and EPA will apply the significant nexus standard to assess the flow characteristics and functions of a potential WOTUS to determine if it significantly affects the chemical, physical, and biological integrity of the downstream TNW.

2015 Clean Water Rule Key Points Summary

Category A: The USACE and EPA will assert jurisdiction over the following waters (jurisdictional by rule):

- TNWs.
- Interstate waters and wetlands.
- Territorial seas.
- Impoundments of waters (reservoirs, etc.).
- Tributaries with the following attributes:
  - Contributes flow to a TNW.
  - Contain bed, banks, and OHWM.
  - Can be natural, man-altered, or man-made.
  - Can have constructed breaks (culverts, pipes, etc.) or natural breaks.

- Waters "adjacent" to TNW and their tributaries, including:
  - Waters that are bordering, contiguous, or neighboring a TNW, interstate water, territorial sea, impoundment or tributary. Includes waters separated from other ''waters of the United States'' by constructed dikes or barriers, natural river berms, beach dunes or similar.
  - Waters within 100 feet of the OHWM of a TNW, interstate water, territorial sea, impoundment or tributary.
  - Waters within the 100-year floodplain and within 1,500 feet of a TNW, interstate water, territorial sea, impoundment or tributary.
  - Waters within 1,500 feet of the high tide line or OHWM of a TNW or territorial sea.

Category B: The USACE and EPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW unless excluded by rule (significant nexus test):

- Vernal pools that have a significant nexus to a TNW or territorial sea.
- Waters within the 100-year floodplain of a TNW, interstate water or territorial sea.
- Waters within 4,000 feet of the high tide line or OHWM of a TNW, interstate water, territorial sea, impoundment or tributary.

Category C: The USACE and EPA will not assert jurisdiction over the following features (excluded by rule):

- Waste treatment facilities including basins and percolation ponds.
- Prior converted cropland.
- The following types of ditches:
  - Ephemeral ditches that are not a relocated tributary or excavated in a tributary.
  - Intermittent ditches that are not a relocated tributary, excavated in a tributary, or drain wetlands.
  - Ditches that do not flow, either directly or through another water, into a TNW, interstate waters, territorial sea.
- Artificially irrigated areas that would revert to upland.
- Artificial, constructed lakes and ponds created in dry land such as stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, cooling ponds
- Swimming pools or reflecting pools in dry land.
- Small ornamental waters created in dry land.
- Water-filled depressions created in dry land from mining or construction activities including pits for fill, sand, or gravel.

- Erosional features including gullies and rills that are not tributaries, non-wetland swales and constructed grass waterways.
- Puddles.
- Groundwater.
- Stormwater control features created in dry land.
- Wastewater recycling structures created in dry land including detention and retention basins, groundwater recharge basins, percolation ponds and water distributary structures.

Significant Nexus

The EPA and the USACE have defined the significant nexus standard as follows:

1. A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters; and

2. Significant nexus includes consideration of hydrologic and ecologic factors including:

    a. Volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary,

    b. Proximity to the traditional navigable water,

    c. Size of the watershed,

    d. Average annual rainfall,

    e. Average annual winter snow pack,

    f. Potential of tributaries to carry pollutants and flood waters to traditional navigable waters,

    g. Provision of aquatic habitat that supports a traditional navigable water,

    h. Potential of wetlands to trap and filter pollutants or store flood waters, and

    i. Maintenance of water quality in traditional navigable waters.

Traditional Navigable Water

Navigable waters of the United States are defined in 33 CFR § 329.4 as "…those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity."

Traditional navigable waters include all of the "navigable waters of the United States" as defined in 33 CFR § Part 329.4 as well as by numerous decision of the federal courts; those water bodies

the USACE has determined are a navigable water of the U.S. pursuant to 33. CFR § 329.14; plus all other waters that are navigable-in-fact. The definition of "navigable-in-fact" comes from a long line of court cases originating with Daniel Ball, 77 U.S. 557 (1870).

2.2 Ordinary High Water Mark (OHWM)

Federal regulations define the OHWM as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas". Under Section 404 of the Clean Water Act (CWA), the OHWM defines the lateral extent of federal jurisdiction in non-tidal waters of the U.S. in the absence of adjacent wetlands.

CHAPTER 3
Methodology

3.1 Pre-field Review

Prior to conducting fieldwork, the following background tasks were performed:

- Review of Crows Landing and Hatch, California U.S. Geologic Survey (USGS) 7.5-minute topographic quadrangle maps;
- Review of color aerial photography for vegetative, topographic, and hydrographic signatures (Google, Inc., 2019);
- Review of the online soils mapper (NRCS, 2019a) for information about soils and geomorphology;
- Review of the National Hydric Soils List (NRCS, 2019b) to determine if any soils mapped within the study area are considered hydric at the level of soil series; and
- Review of the National Wetlands Inventory (U.S Fish and Wildlife Service [USFWS], 2019).

3.2 Field Survey Methods

The aquatic resources delineation was conducted within the study area by ESA biologist Kelly Bayne on May 10, 2019. The delineation used the "Routine Determination Method" as described in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), hereafter called the "1987 Manual." The 1987 Manual was used in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE, 2008a), hereafter called the "Arid West Supplement." For areas where the 1987 Manual and the Arid West Supplement differ, the Arid West Supplement was followed. In addition, the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE, 2008b) was referenced to assist in identifying the lateral limits of the stream channels in the study area.

Three positive parameters must normally be present for an area to be considered a wetland: 1) a dominance of wetland vegetation, 2) presence of hydric soils, and 3) presence of wetland hydrology. ESA assessed presence or absence of positive indicators for wetland vegetation, soils, and hydrology per the 1987 Manual and Arid West Supplement guidelines. Data points were recorded on Arid West wetland delineation forms (**Exhibit A**).

At each data point, a visual assessment of the plant cover by species within a 6-foot radius was made. Dominant species were assessed using the recommended "50/20" rule per the Arid West Supplement. Plants were identified to species using *The Jepson Manual: Vascular Plants of*

California, second edition (Baldwin et al., 2012). The *Arid West 2016 Regional Wetland Plant List* (Lichvar et al., 2016) was used to determine the wetland indicator status of all plants. Soils at each data point were characterized by color, texture, organic matter accumulation, and the presence or absence of hydric soil indicators. Color was described using the *Munsell Soil Color Book* (Munsell Color, 2015). Presence of wetland hydrology was determined at each data point by presence of one or more of the primary and/or secondary indicators, per guidance of the Arid West Supplement.

For "other waters of the U.S." to be considered jurisdictional, these features must exhibit a defined bed and bank and an OHWM. Drainages with obvious bed and banks and OHWM were characterized by noting vegetation, geomorphology (e.g., incision), and hydrologic characteristics, and by measuring representative channel bank cross-sections to obtain OHWM. Representative channel cross-section OHWM was recorded in the field and used to map stream channels in geographic information system (GIS), along with high-resolution aerial photographs and detailed topographic data.

3.3 Mapping and Acreage Calculations

All features, including sample points, wetland boundaries, and channel courses were recorded using a Global Positioning System (GPS) unit (Trimble GeoXT) with real-time differential correction and an instrument-rated mapping accuracy of +/- 1 meter. Boundaries of wetlands were demarcated in the field using GPS by walking the margin of the wetland and taking points at set intervals.

In the office, data from sample points and wetland/channel boundaries were downloaded from the GPS unit and mapped using GIS software on an overlay of both topography and geo-referenced aerial photography. GPS-determined wetland/channel boundaries and data points were visually confirmed. Acreage of wetland and waterway polygons, and the length of linear features were determined using ArcGIS.

3.4 Limitations

No problems or limitations were encountered.

CHAPTER 4
Setting

4.1 Climate

The climate in the region consists of cool, wet winters and hot, dry summers. Approximately 12-17 miles north of the study area in Modesto, the mean annual precipitation is 13.11 inches and mean annual temperatures range from an average maximum temperature of 74.6 degrees Fahrenheit to an average minimum temperature of 48.4 degrees Fahrenheit (Western Regional Climate Center, 2019; NWSFO, 2019). Precipitation from July 1, 2018 through April 30, 2019 totaled 12.06 inches, which is 97 percent of the average annual rainfall for that period (NWSFO, 2019). Land use surrounding the study area is characterized primarily by agriculture.

4.2 Soils

The soil map (**Figure 4**) indicates three soil mapping units and water in the study area (NRCS, 2019a). Water is not contain a soil description. A brief description of each primary soil series is provided below. All colors refer to moist soil. All three soil mapping units have listed hydric components where the necessary landforms occur (depressions, flood-plains, and fan remnants; NRCS 2019b).

Waukena fine sandy loam, moderately saline-alkali, 0 to **1 percent slopes.** Waukena soils occur on shallow basins in valley plains with an irregular or hummocky surface. They are moderately well to somewhat poorly drained, with slow to very slow permeability and slow runoff. Natural vegetation typically consists of salt and alkali tolerant herbs. A typical profile of Waukena fine sandy loam has:

0 to 10 inches	Dark gray (10YR 5/1, 4/1) mildly alkaline fine sandy loam
10 to 39 inches	Light olive brown (2.5Y 5/4) very strongly alkaline sandy clay loam
39 to 60 inches	Grayish brown (2.5Y 5/2) very strongly alkaline stratified fine sandy loam and clay loam

Foster gravelly fine sandy loam, 0–1% slopes. Foster soils occur on flood plains and nearly-level alluvial fans. They are poorly or very poorly drained, with moderate permeability and very slow runoff. Natural vegetation consists of grasses, rushes/sedges, and riparian trees. A typical profile of Foster sandy loam has:

0 to 9 inches	Very dark gray (10YR 3/1) slightly alkaline sandy loam
9 to 30 inches	Dark grayish brown or grayish brown (2.5Y 4/2, 5/2) moderately alkaline sandy loam
30 to 60 inches	Olive gray (5Y 4/2) moderately alkaline loamy sand

Fresno loam, slightly saline-alkali, 0–1% slopes. Fresno soils occur on nearly level valley plains with hummocky microrelief. They are moderately well-drained, with very slow permeability and runoff, and commonly support vernal pools when undisturbed. Natural vegetation consists of alkaline-tolerant herbs and shrubs. A typical profile of Fresno fine sandy loam has:

0 to 12 inches	Grayish brown (2.5Y 5/2) very strongly alkaline fine sandy loam
12 to 18 inches	Grayish brown (2.5Y 5/2) very strongly alkaline sandy clay loam
18 to 24 inches	Grayish brown (2.5Y 5/2) very strongly alkaline strongly-cemented lime-silica hardpan
24 to 60 inches	Light brownish gray (2.5Y 6/2) very strongly alkaline stratified loam and fine sandy loam

4.3 Hydrology

Drainage in both components of the study area consists entirely of runoff through the Harding and Nielson Drains. The Harding Drain drains into the San Joaquin River. The Nielson Drain drains into the Hilmar Drain. The Hilmar Drain drains into the San Joaquin River about 0.75 mile further downstream. The regional drainage in the vicinity of the study area is shown in **Figure 5**.

4.4 Vegetation/Habitat Types

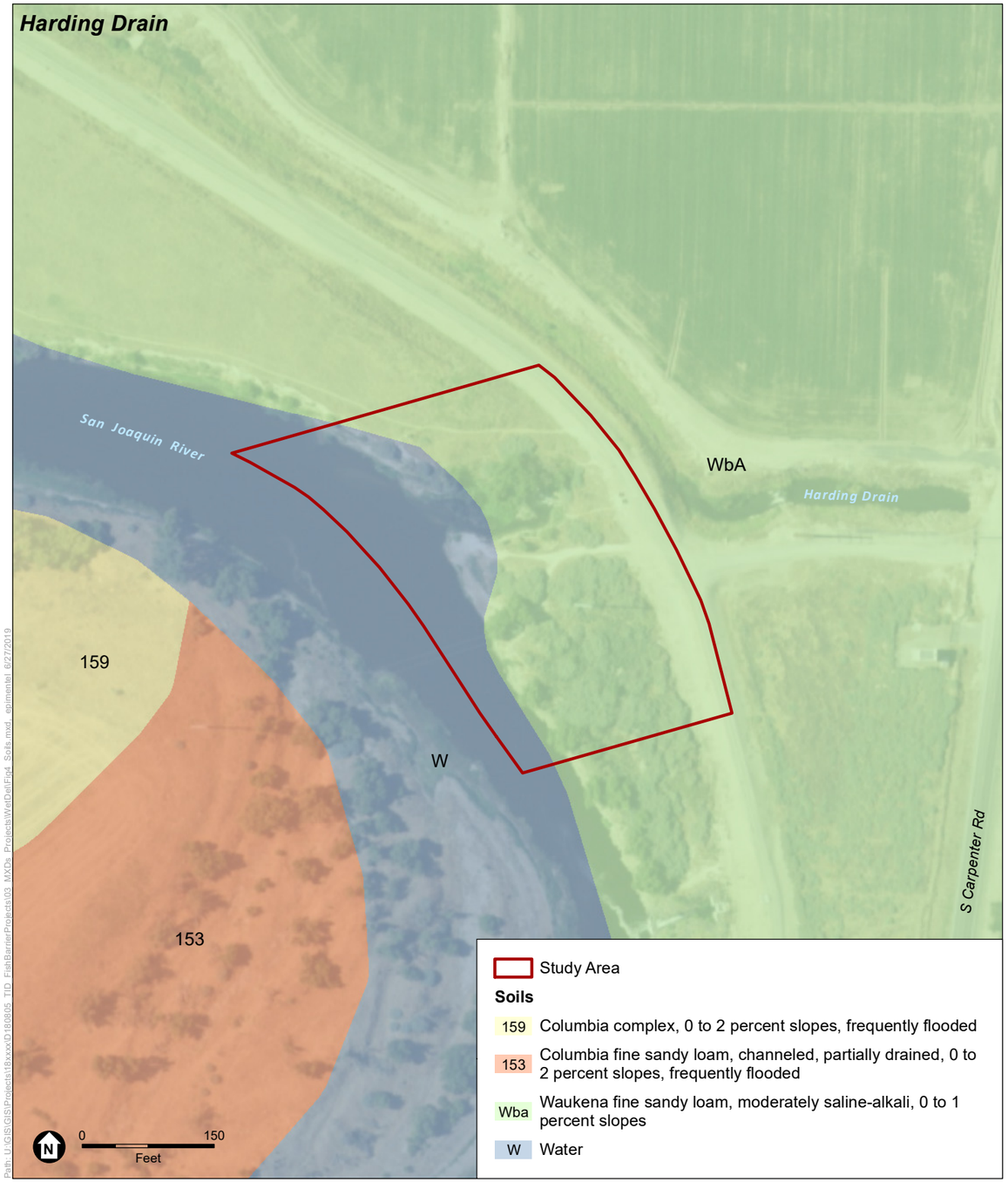
Vegetation communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. The uplands in both components of the study area consist of riparian along the edges of the waterways, and disturbed areas farther upslope. Vegetation in aquatic resources is discussed in Chapter 5. Representative photographs of the habitat types are in **Exhibit B**.

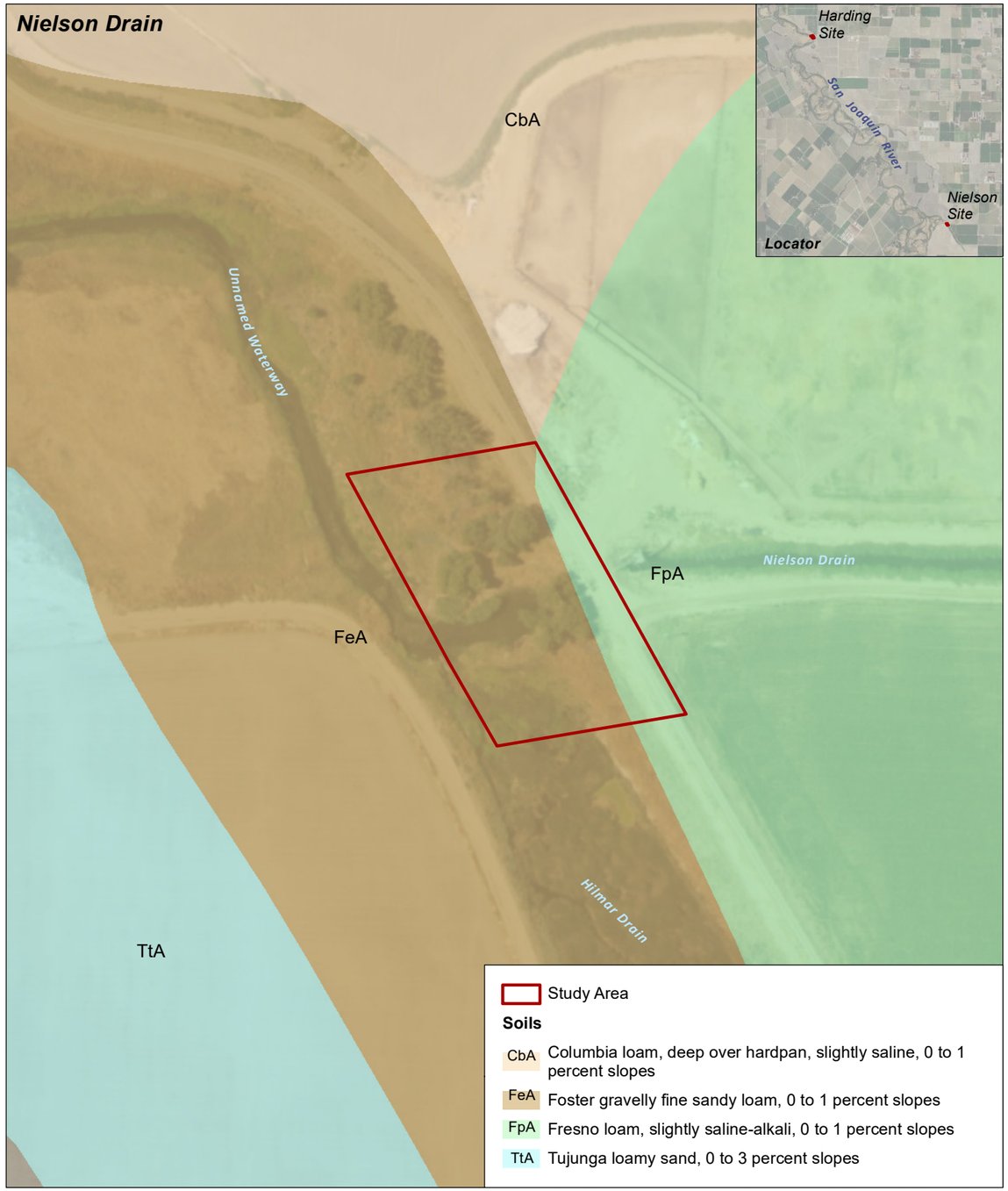
Riparian

A band along the waterways in both components of the study area is dominated by scattered willows (*Salix* sp.) and Fremont cottonwoods (*Populus fremontii*). The understory vegetation below the riparian trees is similar to the ruderal/disturbed vegetation described below.

Ruderal/Disturbed

Uplands in the study areas consist of dirt roads and road shoulders and constructed slopes between the dirt roads and the waterways (**Photograph 1** in **Exhibit B**). Vegetation at the Harding Drain study area is dominated by big saltbush (*Atriplex lentiformis*), slender wild oat (*Avena barbata*), and soft chess (*Bromus hordeaceus*). Vegetation at the Neilson Drain study area is dominated by milk thistle (*Silybum marianum*), stinging nettle (*Urtica dioica*), and summer mustard (*Hirschfeldia incana*).





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SOURCE: USDA, 2016; NRCS, 2018; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 4
Soils

ESA

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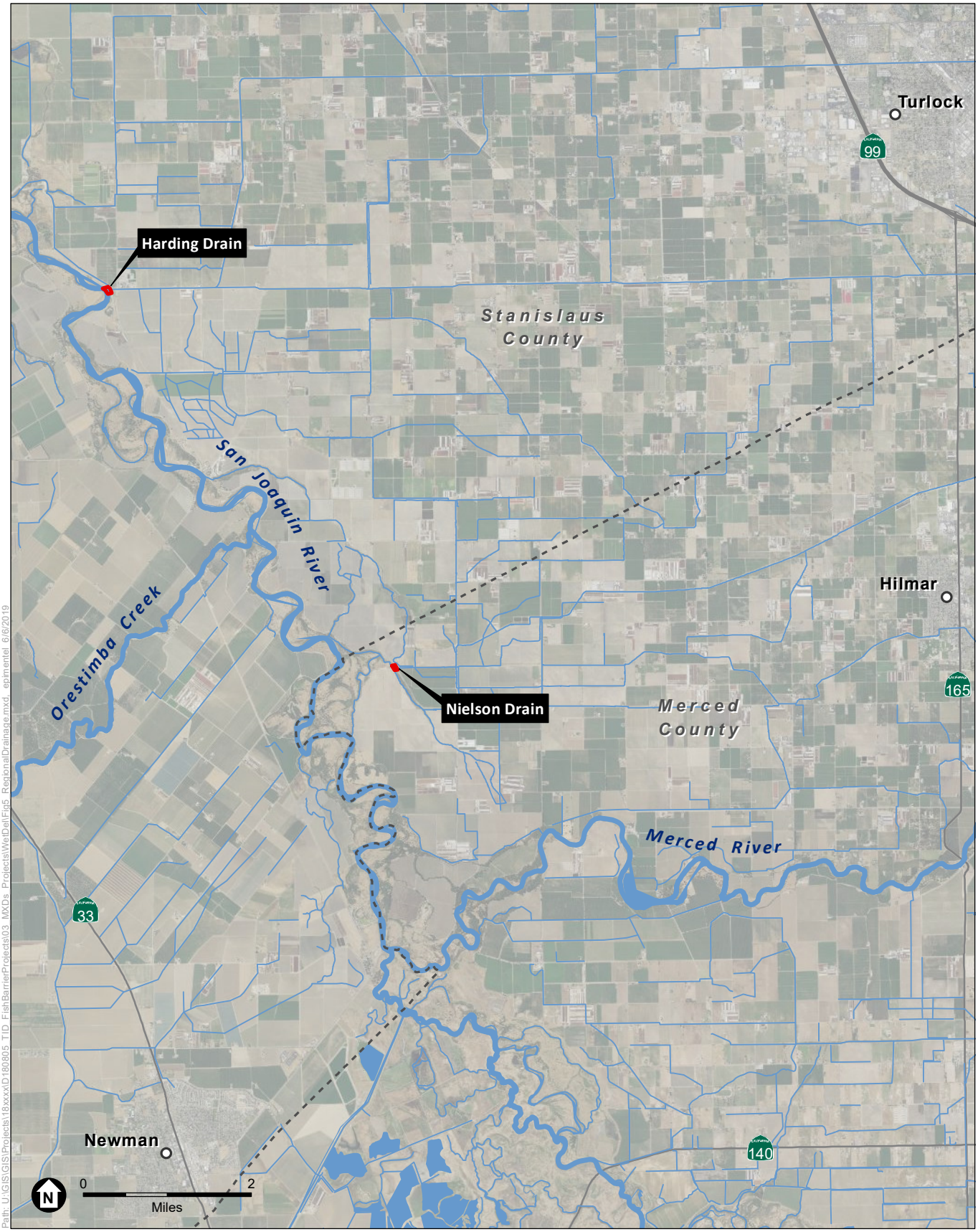

SOURCE: Esri, 2018; ESA, 2019

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 5
Regional Drainage

ESA

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CHAPTER 5
Results

5.1 Aquatic Resources

The aquatic resources delineation identified 2.07 acres of aquatic resources within the study area. These include:

- Harding Drain (0.28 acre) (riverine)
- San Joaquin River (1.04 acres) (riverine)
- Nielson Drain (0.13 acre) (riverine)
- Fresh Emergent wetland (0.61 acre)

Aquatic communities and habitats were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* ("Cowardin Classification") (FGDC, 2013). Details of the aquatic resources within the study area are in **Table 1**. **Figure 6** shows the location and extent of the aquatic features. Representative photographs of the aquatic features are in **Exhibit B**. The Aquatic Resources Spreadsheet is in **Exhibit C**.

TABLE 1
AQUATIC RESOURCES WITHIN THE STUDY AREA

Aquatic Feature	Applicable 2015 Waters of the U.S. Rule Classification (Cowardin Classification)	Acres[1]	Linear Feet
Waters			
Harding Drain	33 CFR 328.3(a)(5) – Tributary (R2UBH)	0.28	132
San Joaquin River	33 CFR 328.3(a)(1) – Commerce (Traditionally Navigable Water) (R2UBH)	1.04	498
Nielson Drain	33 CFR 328.3(a)(5) – Tributary (PEM1C)	0.13	146
	Waters Subtotal:	**1.45**	**776**
Wetlands			
Fresh Emergent Wetland (FEW-1)	33 CFR 328.3(a)(6) – Adjacent (PEM1C)	0.45	--
Fresh Emergent Wetland (FEW-2)	33 CFR 328.3(a)(6) – Adjacent (PEM1C)	0.16	--
	Wetlands Subtotal:	**0.61**	**--**
	Total:	**2.07**	**776**

NOTES:
[1] Acreages were calculated to the nearest hundredth.

SOURCE: ESA, 2019

5.1.1 Harding Drain

The Harding Drain flows as a result of agricultural runoff. Water in the Harding Drain enters the eastern boundary of the study area through two culverts under the San Joaquin River levee. Each culvert has a flap-gate on the water-side of the levee. The culverts outfall into a cut on the bank of the San Joaquin River (Photographs 2 and 3 in Exhibit B). Water flows into the San Joaquin River approximately 120 feet to the west. Historical topographic maps back to 2016 were reviewed (USGS, 2019). There is no indication that the Harding Drain is a re-aligned naturally-occurring channel. Its route does not follow a natural drainage pattern on older topographic maps where the natural topography is still evident.

Downstream of the culverts, the OHWM of the Harding Drain is the same elevation as the San Joaquin River and there is no barrier between them. The National Wetland Inventory identifies the area downstream of the culverts as riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH). The OHWM of the Harding Drain was identified in the field based on destruction of terrestrial vegetation and scour.

The Harding Drain, downstream of the culverts, is a waters of the U.S. It meets the criteria as a tributary under the 2015 Clean Water Rule §33 CFR 328.3(a)(5) because it contributes flow to the San Joaquin River and has a bed and banks and an OHWM. Man-made waters may qualify as tributaries per the federal definition at §33 CFR 328.3(c)(3). The Harding Drain, downstream of the culverts, was excavated in the OHWM of the San Joaquin River.

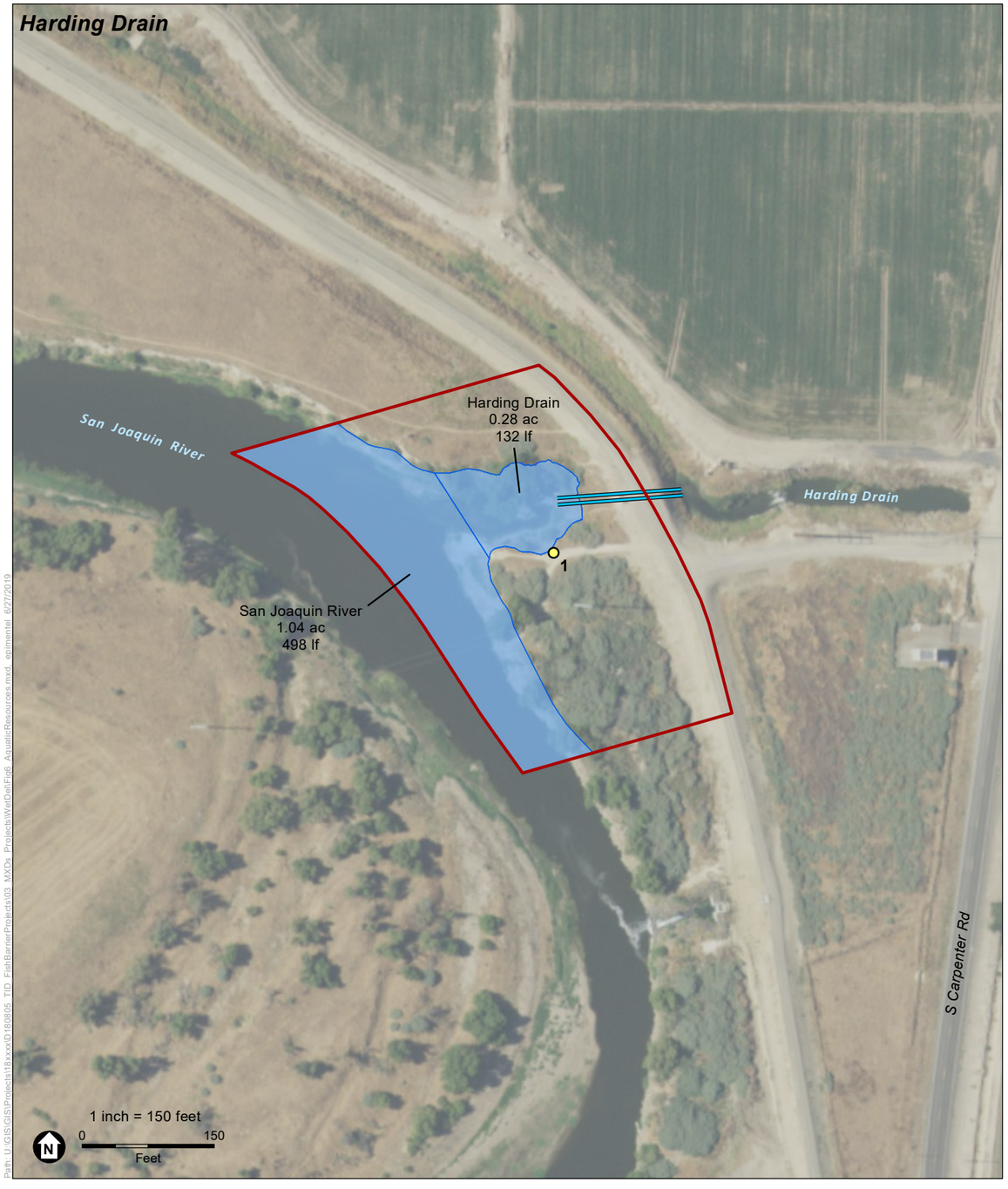
5.1.2 San Joaquin River

In the study area, the San Joaquin River receives flow from the Harding Drain (Photographs 2 and 4 in Exhibit B). The National Wetland Inventory identifies this reach of the San Joaquin River as riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH). The OHWM of the San Joaquin River was identified in the field based on destruction of terrestrial vegetation and scour.

The San Joaquin River is a waters of the U.S. It meets the criteria under the 2015 Clean Water Rule §33 CFR 328.3(a)(1) because it is susceptible to use in interstate of foreign commerce.

5.1.3 Nielson Drain

The Nielson Drain flows as a result of agricultural runoff. Water in the Nielson Drain enters the eastern portion of the study area through two culverts under a levee. Each culvert has a flap-gate on the water-side of the levee. The culverts outfall into a cut on the bank of the Hilmar Drain (Photographs 5, 6, and 7 in Exhibit B). Water flows into the Hilmar Drain approximately 120 feet to the west. Historical topographic maps back to 1918 were reviewed (USGS, 2019). There is no indication that the Nielson Drain is a re-aligned naturally-occurring channel. Its route does not follow a natural drainage pattern on older topographic maps where the natural topography is still evident.



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SOURCE: USDA, June 21, 2016; ESA, 2019

Delineated by Kelly Bayne on May 10, 2019.
Map prepared by Eryn Pimentel on June 6, 2019.

ESA

Turlock Irrigation District Harding And Nielson Fish Barrier Projects

Figure 6
Aquatic Resources Delineation

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Downstream of the culverts, the OHWM of the Nielson Drain is the same elevation as the Hilmar Drain and there is no barrier between them. The National Wetland Inventory identifies the Nielson Drain downstream of the culverts as palustrine, emergent, persistent, seasonally flooded (PEM1C). The OHWM of the Nielson Drain was identified in the field based on destruction of terrestrial vegetation and scour.

The Nielson Drain, downstream of the culverts, is a waters of the U.S. It meets the criteria as a tributary under the 2015 Clean Water Rule §33 CFR 328.3(a)(5) because it contributes flow to the San Joaquin River and has a bed and banks and an OHWM. Man-made waters may qualify as tributaries per the federal definition at §33 CFR 328.3(c)(3). The Nielson Drain, downstream of the culverts, was excavated in the OHWM of the Hilmar Drain. The reach of Hilmar Drain in the study area is a natural drainage.

The Hilmar Drain flows into the San Joaquin River about 0.75 mile downstream of the study area. The reach of the Hilmar Drain next to the study area is a naturally-occurring water based on review of contour lines and mapped waters on the Hatch 1973 USGS 7.5-minute quad and the Mitchell School 1918 USGS 7.5-minute quadrangle (USGS 2019).

5.1.4 Emergent Wetland

Emergent wetland, dominated by tule (*Schoenoplectus* sp.) and cattail (*Typha* sp.), occurs next to the Nielson and Hilmar Drains in the study area (Photographs 8 and 9 in Exhibit B). The emergent wetland is identified as palustrine, emergent, persistent, seasonally flooded (PEM1C) downstream of the Nielson Drain culverts, and as palustrine, emergent, persistent, semi-permanently flooded (PEM1F) upstream of the culverts. The emergent wetland was inundated during the fieldwork.

The emergent wetland is a waters of the U.S. It meets the criteria under the 2015 Clean Water Rule §33 CFR 328.3(a)(6) because it is adjacent to (bordering) the Hilmar Drain.

5.2 Conclusions

A total of 2.07 acres of aquatic resources occur in the study area. All of the aquatic resources meet criteria of waters of the U.S.

This report documents the aquatic resources boundary delineation and the best professional judgment of ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and preliminary jurisdictional determination in writing by the USACE.

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CHAPTER 6
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Exhibit A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TID Fish Barrier - Harding Drain City/County: Stanislaus Sampling Date: 05/10/2019

Applicant/Owner: Tisdale Irrigation District State: CA Sampling Point: 1

Investigator(s): Kelly Bayne Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): <1

Subregion (LRR): C Lat: 37.464267 Long: -121.032749 Datum:

Soil Map Unit Name: NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Datapoint taken above the ordinary high water mark if the river

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 3 m)			
1. Atriplex lentiformis	30	Yes	FAC
2. Avena barbata	20	Yes	UPL
3. Lepidium latifolia	15	No	
4. Bromus hordeaceus	20	Yes	FACU
5.			
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species	x 3 =	0
FACU species	x 4 =	0
UPL species	x 5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5 Y 3/3	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compaction

Depth (inches): 3

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TID Fish Barrier - Harding Drain City/County: Stanislaus Sampling Date: 05/10/2019

Applicant/Owner: Tisdale Irrigation District State: CA Sampling Point: 2

Investigator(s): Kelly Bayne Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): <1

Subregion (LRR): C Lat: 37.397670 Long: -120.972631 Datum:

Soil Map Unit Name: NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Datapoint taken above the ordinary high water mark if the Hillmar Drain

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix sp.	30	Yes	FAC
2.			
3.			
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 3 m)			
1. Silybum marianum	60	Yes	UPL
2. Urtica dioica	20	Yes	FAC
3. Hirschfeldia incana	20	Yes	UPL
4.			
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species 50	x 3 =	150
FACU species	x 4 =	0
UPL species 80	x 5 =	400
Column Totals: 130 (A)		550 (B)

Prevalence Index = B/A = 4.230769231

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5 YR 3/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compaction

Depth (inches): 12

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Exhibit B
Study Area Photographs

Photograph 1
View of the Harding Drain portion of the study area. The San Joaquin River is in the background. The Harding Drain is on the right.

Photograph 2
Flow from Harding Drain is outfalling from the two culverts with flap gates, just below the water surface (arrows). The San Joaquin River is in the background.

Photograph 3
View of the Harding Drain in the study area. The levee is in the background.

Photograph 4
View looking downstream at the confluence of the Harding Drain and the San Joaquin River. The San Joaquin River is on the left.

Photograph 5
View of the culvert outfalls of the Neilson Drain.

Photograph 6
View looking downstream from near the Neilson Drain culvert outfalls.

Photograph 7
View looking towards the culvert outfalls of the Neilson Drain.

Photograph 8
View looking upstream of the Hilmar Drain and emergent wetland.

Photograph 9
View looking downstream of the Hilmar Drain and emergent wetland.

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Exhibit C
Aquatic Resources

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
Harding Drain	CALIFORNIA	R2UB		Area	0.28	ACRE	A5	37.46423700	-121.03321500
San Joaquin River	CALIFORNIA	R2UB		Area	1.04	ACRE	A1	37.46422500	-121.03355800
Nielson Drain	CALIFORNIA	R2UB		Area	0.13	ACRE	A5	37.39776000	-120.97262200
Fresh Emergent Wetland 1	CALIFORNIA	PEM		Area	0.45	ACRE	A6BOHWM	37.39781900	-120.97284500
Fresh Emergent Wetland 2	CALIFORNIA	PEM		Area	0.16	ACRE	A6BOHWM	37.39751900	-120.97272300