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Zimmerman, C.E., G.W. Edwards, and K. Perry. 2009. Maternal origin and migratory history of steelhead and rainbow trout captured in rivers of the Central Valley, California. *Transactions of the American Fisheries Society* 138(2): 280-291

Mitigation:

EC-2. Adaptive Construction Approach to Protect Elderberry Plants, Monitor Survival, and Mitigate for Loss.

To avoid direct mortality to VELB from crushing by heavy equipment or through destruction of their elderberry shrub habitat during construction, elderberry plants shall be clearly marked prior to construction and intrusion into the prescribed 20-foot buffer zone shall be avoided, as possible. If any mortality of elderberry shrubs occurs, USFWS shall be consulted immediately and appropriate mitigation will be implemented.

EC-3. Monitor for Fish and Wildlife to Prevent Impacts.

Pre-construction surveys shall be conducted by qualified wildlife biologists, who shall determine the use of the Project Area by special status wildlife species. Surveys shall focus on identification of potential American badger (*Taxidea taxus*) dens and other potential wildlife species within the construction footprint and a minimum 500 ft (152.4 m) buffer around the construction footprint. If American badger dens are located within the construction footprint or buffer area, CDFW shall be consulted prior to initiation of construction for further instruction on methods to avoid direct impacts to American badger. Pre-construction surveys shall also determine the use of the Project construction footprint by San Joaquin kit fox (*Vulpes macrotis mutica*). These surveys shall focus on identification of potential, atypical, active, and natal kit fox dens. If potential kit fox dens are located within the construction or buffer area, a minimum of five consecutive nights of camera/scent stations and track stations shall be placed by the den entrances in order to determine if the den is in use by kit fox. If active or natal dens are confirmed, CDFW and USFWS shall be consulted for further instructions on methods to avoid direct impacts to this species.

Protocol-level surveys shall also be implemented for other state and federally-listed species including Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), bald eagle (*Haliaeetus leucocephalus*), yellow-breasted chat (*Icteria virens*), Chinook Salmon, CCV steelhead, and western pond turtle (*Actinemys marmorata*). This includes pre-construction surveys conducted no more than 10 days before Project implementation by qualified wildlife and fisheries biologists. A minimum no-disturbance buffer of 250 feet around active nests of non-listed bird species; a 500-foot no-disturbance buffer around migratory bird species; and a half mile buffer for nest of listed species and fully protected species (including Swainson's hawk, white-tailed kite and bald eagle) shall be established until breeding season is over or young have fledged. If such a buffer cannot be reasonably accomplished, CDFW shall be consulted. Fish surveys shall be conducted by a qualified biologist and if spawning salmon are observed within the construction

footprint, construction shall cease and CDFW and USFWS contacted immediately to determine the appropriate course of action.

EC-4. Protect and Compensate for Native Trees.

Native trees, such as Fremont Cottonwood, willows, and alder, with a dbh of 6 in (15.2 cm) or greater shall be protected with 30-ft (9.1-m), 10-ft (3-m), and 10-ft (3-m) buffers, respectively. Native trees shall be marked with flagging if close to the work area to prevent disturbance. To compensate for the removal of riparian shrubs and trees during Project implementation, the plans shall identify tree and shrub species to be planted, how, where, and when they would be planted, and measures to be taken to ensure a minimum performance criteria of 70% survival of planted trees. Irrigation shall not be used, as the return of inundation to the floodplain is expected to promote survival and growth of native riparian species. The tree plantings shall be based on native tree species compensated for in the following manner:

- Oaks having a dbh of 3 – 5 in (7.6 – 12.7 cm) shall be replaced in-kind, at a ratio of 3:1, and planted during the winter dormancy period in the nearest suitable location to the area where they were removed. Oaks with a dbh of greater than 5 in shall be replaced in-kind at a ratio of 5:1.
- Riparian trees (i.e., willow, cottonwood, poplar, alder, ash, etc.) and shrubs shall be replaced in-kind within the Project boundary, at a ratio of 3:1, and planted in the nearest suitable location to the area where they were removed.

EC-5. Work Outside of Critical Periods for Special Status Species.

To avoid impacts to special status species, all ground disturbing activities shall be conducted during the period of 15 July through 15 November. No in-stream work would be conducted after 15 October to avoid impacts to spawning Chinook Salmon. Nesting birds and raptors are protected under the MBTA and CDFG Code, and trees and shrubs within the Project Area likely provide nesting habitat for songbirds and raptors. If construction activities occur during the potential breeding season (February through August) a qualified biologist shall conduct surveys for active nests and/or roosts within a ½ mile radius of the Project Area no more than 10 days prior to the start of construction. A minimum no disturbance buffer shall be delineated around active nests (size of buffer will depend on species encountered) until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival.

EC-6. Monitor for Bats to Prevent Impacts.

The Project construction shall occur outside the critical period for bats (after 15 July). Before any ground disturbing activities, a qualified biologist shall survey for the presence of associated habitat types for the bat species of concern. If bats are present, the biologist shall apply a minimum 300 ft (91.4 m) no-disturbance buffer around roosting bats, maternity roosts or winter hibernacula until all young bats have fledged.

EC-7. Monitor Water Quality and Prevent Impacts

During in river work, turbidity and total suspended solids shall be monitored with intermittent grab samples from the river, and construction curtailed if turbidity exceeds criteria established by the Regional Water Quality Control Board in its Clean Water Act §401 Water Quality

Certification for the Project. Specifically, sampling shall be performed immediately upstream from the Project Area and approximately 300 feet downstream of the active work area during construction.

Activities shall not cause in surface waters:

- a) turbidity to exceed 2 NTU's where natural turbidity is less than 2 NTU;
- b) where natural turbidity is between 1 and 5 NTUs, increases exceeding 1 NTU;
- c) where natural turbidity is between 5 and 50 NTUs, increase exceeding 20 percent;
- d) where natural turbidity is between 50 and 100 NTUs, increases exceeding 10 NTUs;
- e) where natural turbidity is greater than 100 NTUs, increase exceeding 10 percent.

Activities shall not cause settleable material to exceed 0.1 ml/L in surface waters as measured in surface waters downstream from the Project Area. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 as measured in surface waters downstream from the Project Area.

The Project shall not discharge petroleum products into surface water. The Central Valley Water Board shall be notified immediately of any spill of petroleum products. During gravel processing, gravel shall be cleaned prior to placement within the riverbed in a manner that removes any fine-grained sediment (< 6mm size fraction) (fines) that could potentially contain concentrations of mercury. Daily fines samples shall be collected from processed material and analyzed for total mercury. Borrow areas shall be re-graded to ensure the areas do not become potential mercury methylation spots. Fines separated from gravel shall not re-enter the Merced River. New shallow water areas shall have continuous flow and shall not become stagnant. Floodplains shall be revegetated to minimize transport of any mercury-containing sediment, as described in Project BMP's.

Sediment fencing shall be used along the river corridor to capture floating materials or sediments mobilized during construction activities and prevent water quality impacts. Stream bank impacts shall be isolated and minimized to reduce bank sloughing. Banks shall be stabilized with revegetation following Project activities, as appropriate.

A SWPPP shall be developed as part of the BMPs. All pertinent staff shall be trained on and familiarized with these plans. Copies of the plans and appropriate spill prevention equipment referenced in them shall be made available onsite and staff shall be trained in its use. Spill prevention kits shall be in close proximity to construction areas, and workers trained in their proper use.

EC-8. Use Clean Equipment and Biodegradable Lubricants.

All equipment shall be clean and use biodegradable lubricants and hydraulic fluids. All equipment working within the stream channel shall be inspected daily for fuel, lubrication, and coolant leaks; and, for leak potentials (e.g. cracked hoses, loose filling caps, stripped drain plugs). Vehicles shall be fueled and lubricated in a designated staging area located outside the stream channel and banks. Clean gravels shall be added to the river using the front-end loaders. Front-end loaders shall be

wheeled (rubber tire) to minimize impacts. Construction specifications shall require that any equipment used in or near the river is properly cleaned to prevent any hazardous materials from entering the river, and containment material shall be available onsite in case of an accident. Spill prevention kits shall be located close to construction areas, with workers trained in its use. Contracted construction managers shall regularly monitor construction personnel to ensure environmental compliance.

EC-9. Prevent Spread of New Zealand Mudsnaails and other Aquatic Invasive Species

New Zealand mudsnails (*Potamopyrgus antipodarum*), an introduced species, has been identified in numerous rivers of the Central Valley, including in the Merced River. To minimize the chance that the snails may be transported and spread to other water bodies on equipment, construction specifications shall require that equipment be steam cleaned immediately after the work is completed and before being used in other water bodies. An Invasive Species Risk Assessment and Planning (ISRAP) protocol shall be developed, and all appropriate staff shall be trained as to its purpose and implementation before construction begins. The ISRAP shall be used to prevent the spread of invasive species during Project construction.

EC-10. Reduce Impacts from Noise.

To mitigate noise related impacts, the Project shall require all contractors to comply with the following operational parameters:

- restrict construction activities to time periods between 7:00 am and 5:00 pm when there is the least potential for disturbance;
- locate the sorting station away from edge of property and adjacent homes; and

install and maintain sound-reducing equipment and muffled exhaust on all construction equipment.

V. Cultural Resources	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource which is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of a unique archaeological resources (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Disturb or destroy a unique paleontological resource or site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Discussion:</p> <p>a) As part of the preparation for the Project, a cultural resource study was conducted by Horizon Water and Environment (HWE 2018). Compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 United State Code [USC] § 470f [2008]) is required, whereby any federal undertaking must “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.” The implementing regulations for Section 106 are found under 36 Code of Federal Regulations (CFR) § 800, as amended (2001). Cultural resources may also be considered separately under the National Environmental Protection Act (42 USC) Section 4321-4327, whereby federal agencies are required to consider potential environmental impacts and appropriate EC’s for projects with federal involvement. Also, impacts to cultural resources are considered if the resource is “significant” or “important” or “unique archaeological resource” under the provisions of CEQA Sections 15064.5 and 15126.4. The policies of the Merced County General Plan (Merced County 2013) also apply to the Project. Cultural resources are addressed under the Recreation and Cultural Resources Element of the general plan. The purpose of the Cultural, Archeological, and Historical Resources goal (RCR-2) is to “Protect and preserve the cultural, archeological, and historic resources of the County in order to maintain its unique character.” Even with these measures undertaken, it is possible that during construction activities unknown cultural resources could be unearthed.</p> <p>No known historic properties would be affected by the Project and no historical resources, as defined by CEQA, would be impacted by the Project. The Project boundary does not contain any</p>				

buildings or structures; therefore, there are no human built architectural resources that could be impacted. However, if any objects of cultural significance are unearthed during the construction process, work would be halted until a qualified archeologist can assess the significance of the new find (see **EC-11- Inadvertent Discoveries of Objects of Cultural Significance**). If human remains are unearthed during the construction process, the Project team would comply with the California Health and Safety Code Section 7050.5, which states that no further disturbance shall occur until the County Coroner has investigated the situation following the Public Resource Code Section 5097.98. With this EC in place, the Project is expected to have a **less than significant impact** on historical resources.

b) No cultural resources considered to be historic properties or historical resources were recorded in the Project Area as a result of the records search and field survey. However, the Project's construction activities would include grading and excavation of areas, primarily dredge tailings, covered by cobble and gravel. Subsurface cultural objects could be unearthed during the grading and excavation activities which is a potentially significant impact. If any objects with potential cultural significance are unearthed during the construction process, work would be halted within the vicinity of the inadvertent discovery until a qualified archeologist (and Native American representative if the find is potentially pre-historic) can assess the significance of the new find (see **EC-11- Inadvertent Discoveries of Objects of Cultural Significance**) and prescribe measures to reduce potential impacts to be **less than significant**. The final disposition of archaeological, historical, and paleontological resources recovered on State lands under the jurisdiction of the State Lands Commission must be approved by the Commission.

c) No known unique paleontological resources, sites, or unique geological features are present within the Project Area. Therefore, **no impact** is expected.

d) No potential burial grounds were determined to be present in the Area of Potential Effects during the records search and field survey. As discussed in impact 3.5-2, construction activities for the Project would include excavation and grading which have the potential to unearth subsurface human remains which is a potentially significant impact. If human remains are unearthed during the construction process, work would be halted within the vicinity of the human remains, the Coroner contacted, and **EC-11 - Inadvertent Discoveries of Objects of Cultural Significance** would be implemented. This EC would reduce potential impacts to a **less than significant** level. The Project would comply with the California Health and Safety Code Section 7050.5, which states that no further disturbance shall occur until the County Coroner has investigated the situation following the Public Resource Code Section 5097.98.

Documentation:

Horizon Water and Environment, LLC. 2018. Cultural Resources Assessment Report. Merced River Habitat Restoration Project #4: Gage 52. Prepared for Merced Irrigation District. August 2018.

Merced County. 2013. 2030 Merced County General Plan. 10 December 2013. Available: <https://www.co.merced.ca.us/100/General-Plan>.

Mitigation:

EC-11. Inadvertent Discoveries of Objects of Cultural Significance

If any objects of cultural significance are unearthed during the construction process, work shall be halted immediately until a qualified archeologist can assess the significance of the new find. If human remains are unearthed during the construction process, the Project team shall comply with the California Health and Safety Code Section 7050.5, which states that no further disturbance shall occur until the County Coroner has investigated the situation following the Public Resource Code Section 5097.98.

VI. Energy	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

a) Energy consumption during project construction would be minimal and restricted to that required for operating heavy machinery to move material to construct the floodplain and for gravel enhancement. The impact would be **less than significant**.

b) The project would not interfere with a state or local plan for renewable energy or energy efficiency. There would be **no impact**.

Documentation:

None required.

Mitigation:

None Required.

VII. Geology and Soils	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Discussion:</p> <p>a) The Project Area is in the Great Valley geomorphic province of California. This geomorphic province consists of deep marine basins filled with large volumes of sediment eroded during the Jurassic to Quaternary periods from the western Sierra Nevada Range and eastern Coast Range. The Project Area consists of bedrock and alluvial cobbles, gravels, and sand deposited by the Merced River which have been altered and disturbed by dredge mining.</p> <p>The nearest active fault is the San Andreas Fault which is located approximately 70 miles west of the Project Area in foothills of the eastern slope of the Coastal Range. The Bear Mountain faults are approximately 15 miles east of the Project Area and are considered inactive (Miller and Paterson 1991). No active faults or Earthquake Fault Zones are located within or adjacent to the Project area.</p>				

The Project Area is in an area of relatively low seismic risk and is not within an earthquake fault zone or landslide and liquefaction zone. The Project would not construct new structures or facilities. Therefore, the Project is not expected to expose people or structures to earthquake and related hazards. Therefore, the Project would have **no impact**.

b) The Project Area is primarily dredge tailings piles, which are composed of cobble and gravel. The Project design includes excavating and sorting tailings piles to create floodplain areas and to acquire gravel and cobble for in-channel habitat features including spawning riffle rehabilitation/enhancement. In addition, side channels would be excavated in select areas within the Project boundary. The excavation of tailings piles, floodplain areas, and side channels would remove approximately 65,000 yd³ with 38,500 yd³ of material returned to the channel to create habitat features and spawning riffles. Approximately 26,500 yd³ of fine sediment (sediment smaller than gravel) obtained from sediment sorting would be placed in select upland areas to enhance riparian vegetation recruitment and growth. These activities are not expected to substantially increase soil erosion or the loss of topsoil. The Project would increase the floodplain width within the Project Area, which is expected to reduce water velocity, and therefore erosion, within the Project boundary. The Project is expected to result in a gain in fine sediment, which enhances riparian vegetation recruitment and growth. The Project features and associated riparian vegetation are expected to capture and recruit fine sediment. Therefore, the impact is **less than significant**.

c) The Project will not occur on strata or soil that is unstable or would become unstable as a result of the Project. Soils in the Project Area are predominantly tailings piles composed of gravel and cobble, which are stable and well drained. A review of a map of expansive soils in California (Olive et al. 1989) indicated that the Project will not occur on expansive soil. Therefore, there would be **no impact**.

d) The Project is not located on expansive soil creating substantial risks to life or property. **No impact** is expected.

e) The Project does not require sewers, septic tanks, or alternative wastewater disposal systems. **No impact** is expected.

f) The Project would not result in the loss of a unique geologic feature. **No impact** is expected.

Documentation:

Miller, R.B. and S.R. Paterson. 1991. Geology and tectonic evolution of the Bear Mountains fault zone, Foothills terrane, central Sierra Nevada, California. *Tectonics*, 10(5), pp.995-1006.

Olive, W.W., A.F. Chleborad, C.W. Frahme, J. Schlocker, R.R. Schneider, and R.L. Shuster. 1989. Swelling clays map of the conterminous United States. U.S. Geological Survey.

Mitigation:

No mitigation required.

VIII. Greenhouse Gas Emissions	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Discussion:</p> <p>a) The construction activities from the Project would emit greenhouse gases from the earth moving equipment and mobile sediment screening plant. Using the California Emissions Estimator Model (CalEEMod), the Project’s estimated CO_{2e} emissions are 199.96 metric tons (220.42 tons) per year for a total of 399.92 metric tons (440.84 tons) over the 2 years of the Project (CAPCOA 2017). However, the implementation of the Project also has the potential to store a significant amount of carbon through an increase in the quality and quantity of riparian vegetation (Sellheim et al. 2016, Matzek et al. 2015, Gorte 2009) and salmon (Merz and Moyle 2006) and macroinvertebrate production (Duffy and Kahara 2011). Over the life of the Project, a substantial amount of carbon would likely be sequestered in tree production alone. CalEEMod was used to estimate carbon sequestration assuming a conservative estimate of the following tree production 20 years post-project resulting from the Project: 25 Fremont Cottonwoods (12 cm dbh) and 50 alders (12 cm dbh). This amount of tree production would result in a substantial amount of carbon sequestration; approximately 67.26 metric tons (74.14 tons) of CO_{2e} (CalEEMod). Carbon sequestration by tree production onsite would offset approximately 17% of the Project’s GHG emissions. The Project’s estimated emissions of 399.92 metric tons (440.84 tons) over the 2 years of the Project are below the significance threshold of 1,100 metric tons (1213 tons) of CO_{2e} therefore the GHG emissions are less than significant.</p> <p>b) The Project does not conflict with an applicable plan adopted for the purpose of reducing greenhouse gas emissions. No impact is expected.</p> <p>Documentation:</p> <p>California Air Pollution Control Officers Association (CAPCOA). 2017. California Emissions Estimator Model (CalEEMod). CalEEMod Version 2016.3.2. Accessed January 11, 2018. http://www.caleemod.com.</p> <p>Duffy, W.G. and S.N. Kahara. 2011. Wetland ecosystem services in California’s Central Valley and implications for the Wetland Reserve Program. Ecological Applications 23(3): S18-S30.</p>				

Gorte, R.W. 2009. Carbon sequestration in forests. DIANE Publishing.

Matzek, V., C. Puleston, and J. Gunn. 2015. Can carbon credits fund riparian forest restoration? Restoration ecology, 23(1): 7-14.

Sellheim, K.L., M. Vaghti, and J.E. Merz. 2016. Vegetation recruitment in an enhanced floodplain: Ancillary benefits of salmonid habitat enhancement. Limnologica-Ecology and Management of Inland Waters 58:94-102.

Mitigation:

No mitigation required.

IX. Hazards and Hazardous Materials	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion:

a) Materials and waste are considered hazardous if they are poisonous, ignitable, corrosive, or reactive. California law (Health and Safety Code 6.95, Section 25501(o)) defines “hazardous material” 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. Soils having concentrations of contaminants that are higher than acceptable levels as a result of past spills or leaks must be handled and disposed as hazardous waste during excavation, transportation, and disposal. The characteristics that would cause soil to be classified as hazardous waste are found in the California Code of Regulations, Title 22, Section 66261.20-24.

The California Environmental Protection Agency’s (EPA) Cortese List is used to comply with CEQA requirements in providing information about the location of hazardous materials release sites (EPA 2018). The Cortese List data resources were searched to determine if any hazardous waste facilities or sites are located within or near the Project Area. The Cortese List data resources are the following: list of hazardous waste and substance sites from the Department of Toxic Substances Control (DTSC) EnviroStor database, list of leaking underground storage tank sites from the Water Board geo tracker database, list of solid waste disposal sites identified by Water Board with waste constituents above hazardous waste levels outside the waste management unit, list of active Cease and Desist Orders and Cleanup and Abatement Orders from the Water Board, and list of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code as identified by DTSC. The Cortese List data resources were searched in July 2018 with no listed sites being located within 0.5 miles of the Project Area (EPA 2018).

The heavy equipment and vehicles used for Project construction would use potentially hazardous substances including diesel, gasoline, oil, grease, hydraulic fluid, and solvents. These hazardous substances are similar or identical to those used in heavy equipment and vehicles for other construction projects in Merced County. All equipment that is used within the Merced River’s stream corridor would be properly cleaned before being transported to the Project Area to prevent release of any hazardous materials into the river, riparian areas, wetlands, or other sensitive areas. Oil and grease used in equipment would be vegetable based, or another material that does not affect beneficial uses. All equipment working within the stream corridor would be inspected daily for fuel, lubrication, and coolant leaks and for leak potentials. All equipment would be free of fuel, lubrication, and coolant leaks before working. All equipment would be stored in staging areas which are within the dredge tailings and away from the river, riparian areas, wetlands, or other riparian areas. A Spill Prevention and Response Plan would be prepared for the Project and spill prevention kits would be kept close to construction areas and workers would be trained in their use. A search (July 2018) of the Cortese List data resources determined that the Project Area is not on a list of hazardous sites compiled pursuant to Government Code Section 65962.5 (EPA 2018). Therefore, the Project would have a **less than significant** impact.

b) The Project does not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. Therefore, the Project would have **no impact**.

c) The Project Area is not within one-quarter mile of an existing or proposed school. The nearest school is the Snelling-Merced Falls Elementary School which is approximately three miles west of

the Project Area. In addition, emissions resulting from the Project would be limited to diesel and gasoline engine exhaust and fugitive dust. The Project construction would occur outside in a rural area such that all diesel and gasoline engine exhaust is expected to dissipate rapidly and not reach concentrations that are hazardous to public health. Fugitive dust would be controlled through periodic wetting of access roads and work areas as necessary. The Project Area is not located within an airport land use plan or within two miles of a public airport or private airstrip. The nearest public airport to the Project Area is Merced County's Castle Airport which is approximately 14 miles southwest with the next nearest public airport being the Turlock Municipal Airport which is approximately 18 miles west. Therefore, the Project would have **no impact**.

d) The Project Area is not 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 not create a significant hazard to the public or the environment. Therefore, the Project would have **no impact**.

e) There are no public airports or private airstrips near the Project Area. The nearest public airport is Merced County's Castle Airport being approximately 14 miles away with the next nearest public airport being the Turlock Municipal Airport which is approximately 18 miles away. Therefore, the Project would have **no impact**.

f) Traffic created implementing the Project would include the mobilization and demobilization of heavy equipment (loaders, excavator, articulated haulers, and mobile screen plant) for each of the two construction seasons (15 July to 15 November) it would take to complete the Project. Once the heavy equipment is onsite, it would travel within the Project Area using temporary access roads and be stored at the staging area. It is possible that in the middle of one of the construction seasons that heavy equipment may need to be transported via public roads from the staging area on the north side to the south side of the Merced River or vice versa. Additional traffic on public roads during Project implementation would be limited to daily trips for personnel and service and supply vehicles. No sediment would be imported or exported from the Project Area, resulting in limited driving of heavy trucks on public roads as a result of the Project. Construction activities would be conducted and managed to not interfere with emergency response or evacuation plans. The impact on emergency response or evacuation plans would be **less than significant**.

g) The Project construction would create a wildfire ignition risk. However, the majority of the Project Area is comprised of dredge tailings piles which contain minimal vegetation fuel resulting in a low wildfire risk. The dredge tailings piles are essentially fuel breaks which would inhibit the spread of fire. In addition, the majority of vegetation within the Project Area is riparian vegetation which are relatively moist areas with green vegetation resulting in a low ignition risk. If riparian areas do ignite then the wildfire usually spreads slowly as an underburn due to the relatively moist, green vegetation. The Project Area is designated as a moderate fire hazard severity zone (CalFire 2007). Fire extinguishers would be present onsite in vehicles to quickly put out any vegetation that ignites as a result of a spark from heavy equipment. Any tall, dried grass present on the staging areas or temporary access roads would be cleared prior to being used by vehicles or heavy equipment. In the long-term the Project would not alter the existing fire hazard conditions. The Project would result in additional areas of riparian vegetation which have low fire hazard risk.

These additional areas of riparian vegetation would not change the overall wildfire risk. Therefore, the impact of the Project on wildfire risk is **less than significant**.

Documentation:

California Environmental Protection Agency. 2018. Cortese List. Department of Toxic Substances Control. 18 July 2018.

CalFire. 2007. Fire Hazard Severity Zone Maps. Available:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones

Mitigation:

No mitigation required.

X. Hydrology and Water Quality	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Place structures within a 100-year floodplain structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

f) Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion:

a) The existing designated beneficial uses of surface water in the lower Merced River are: municipal and domestic water supply, stock watering, industrial process and service supply, hydropower generation, contact and non-contact recreation, canoeing and rafting, warm and cold freshwater habitat, migration of warmwater and coldwater fishes, migration of warmwater and coldwater aquatic organisms, and wildlife habitat. Water quality is a concern in areas of the county where it has been degraded through contamination.

The lower Merced River below Crocker-Huffman Diversion Dam is listed under Section 303(d) of the Clean Water Act (CWA) as water quality limited for the following pollutants with their listed source in parentheses:

- Water temperature (unknown source)
- Escherichia coli (*E. coli*; unknown source)
- Mercury (resource extraction)
- Chlorpyrifos (agriculture)
- Diazanone (agriculture)
- Group A pesticides (agriculture)
- Unknown toxicity (unknown source)

DO measurements in the lower Merced River generally meet water quality requirements (FERC 2015). DO measurements immediately downstream of Crocker-Huffman Diversion Dam and below Snelling Bridge always met the 8 mg/L objective (FERC 2015). In general, daily average water temperatures at Crocker-Huffman Diversion Dam range from approximately 8 to 17°C annually (FERC 2015). In 2015, at the height of the drought, daily average water temperature at Crocker-Huffman Diversion Dam exceeded 20°C during August and September.

The Project has the potential to effect water quality in the Project Area. Chemical constituents would be limited to those present at the Project Area. The pH would not be changed, and no pesticides would be used or mobilized during Project activities. Salinity and radioactivity would not be changed due to Project activities. Temperature conditions would not be elevated during construction activities; however, temperature may be improved (reduced) by the completed Project due to changes in depths and velocity of water moving through the project site and increased subsurface flow due to gravel augmentation. The dissolved oxygen levels would not be reduced below levels specified in the water quality objectives (CRWQCB 1998). Within the gravel augmentation areas, sub-surface dissolved oxygen levels are likely to improve after Proposed Project implementation because inter-gravel permeability will be improved.

Project construction may temporarily increase or contribute to the amount of suspended sediment and turbidity in the Merced River. Actions likely to temporarily impact turbidity include: creating side channel connections and placing clean gravel and cobble in the river channel to enhance spawning riffles and create gravel bars and other instream habitat features. In-stream construction would be performed in a manner that minimizes sediment discharge. Turbidity associated with

Project construction activities would not exceed turbidity objectives in the San Joaquin River Basin (CRWQCB 1998). Instream construction would be temporarily halted to allow turbidity to decrease when necessary. Where feasible, a silt curtain would be installed in the channel to capture floating material or sediment mobilized during construction activity to minimize water quality impacts. However, a channel-spanning silt curtain is not likely to be possible due to high flow velocities.

To minimize construction related water quality impacts, the Project's proponents would obtain and implement a SWPPP prepared in accordance with National Pollution Discharge Elimination System (NPDES). All access and staging areas would be treated with erosion control measures at the end of each construction season. Erosion control measures would include erosion control fabric, coir logs, and hay or straw spreading. At the end of the Project, native grass mix and riparian vegetation would be planted in select locations including locations disturbed by construction. The contractor would be required to follow all construction BMPs in the SWPPP to minimize water quality impacts. The Project must comply with the water quality and waste discharge requirements of the Central Valley Regional Water Quality Control (CVRWQCB), which would be outlined in the Section 401 Water Quality Certification for the Project. Complying with water quality standards and implementing **EC-7 - Monitor Water Quality and Prevent Impacts** would reduce water quality impacts to **less than significant**. Rehabilitation activities are ultimately expected to result in elevated dissolved oxygen, as turbulence and temperature amelioration, contributing to improve water quality. Improved water quality is among the overall Project objectives.

b) The Merced River is a source of water for and divides the Turlock Groundwater Sub-basin and the Merced Groundwater Sub-basin. The Turlock Groundwater Sub-basin is a 347,000 acre basin between the Tuolumne River to the north, the San Joaquin River to the west, crystalline basement rock of the Sierra Nevada foothills to the east, and the Merced River to the south. Groundwater use is primarily for irrigation of agricultural crops, and some urban and municipal use. The primary source of recharge is mostly percolating excess irrigation water and infiltration of precipitation (TGBA 2008). Groundwater recharge also occurs along the Tuolumne and Merced rivers, and surrounding areas where alluvial deposits allowing rapid percolation are present.

The Merced Groundwater Sub-basin is a 525,440-acre basin bounded by the Merced River to the north, the San Joaquin River to the west, and crystalline basement rock of the Sierra Nevada foothills to the east. The southern boundary stretches westerly along the Madera-Merced County line to the northern boundary of the Sierra Water District, which is followed westerly to the San Joaquin River (AMEC 2008). Groundwater use is primarily for irrigation of agricultural crops, and some urban and municipal use (AMEC 2008). The primary source of recharge is mostly percolating excess irrigation water and infiltration of precipitation (AMEC 2008). Groundwater recharge also occurs along the Merced River, other eastside foothill streams and surrounding areas where alluvial deposits allowing rapid percolation are present. The Project would not deplete groundwater supplies or interfere with groundwater recharge. No net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) would occur because of the Project.

The Project would not reduce groundwater recharge by converting pervious surfaces to impervious surfaces. The creation of floodplain and side channel areas, which inundate more frequently and for longer duration, would likely increase the groundwater recharge within the Project Area. The Project would not pump any groundwater or cause any groundwater to be pumped. Therefore, the Project would have **no impact** with respect to groundwater resources.

c) The drainage pattern would be altered as a result of the Project by the creation of floodplains and seasonal side channels. However, these changes would not increase the flooding risk compared to existing conditions. The results of Environmental Science Associates (ESA) HEC-RAS flood model demonstrate that for the 100-year event, the Project design would, on average, slightly decrease the 100-year flood water surface elevation (WSE) and has no impact on the designated floodway (ESA 2016). The model predicted WSE increases for the 100-year flow at two locations within the Project boundary of 0.18 feet and 0.05 feet. These modest WSE increases are completely contained within the dredge tailings stockpiles on the undeveloped portions of the Project boundary, and occur within a 600 to 1,000-ft reach. Based on the modeling results, the increased WSE should not impact any onsite infrastructure or adjacent properties.

The Project would not increase the area of impermeable surfaces, and erosion and siltation would be minimized by implementing a SWPPP, treating all access and staging areas with erosion control measures at the end of each construction season, and at the end of the Project, planting native grass mix and riparian vegetation in select locations including locations disturbed by the rehabilitation activities. Additionally, the contractor would be required to follow all construction BMPs in the SWPPP to minimize water quality impacts. Implementing the above and **EC-7 - Monitor Water Quality and Prevent Impacts** would reduce erosion and sedimentation impacts to **less than significant**.

d) The Project does not conflict the implementation of another water quality control plan or groundwater management plan. Therefore, **no impact** is expected.

e-f) The Project would not place any housing within a 100-year flood hazard area nor would it place any structures or features that would impede or redirect flood flows. The results of ESA HEC-RAS flood model demonstrate that for the 100-year event, the Project design would, on average, slightly decrease the 100-year flood WSE (ESA 2017). As discussed in Impact 4.3-2, there are modest increases in WSE at two locations within the Project Site but the increased WSE would not any impact any onsite infrastructure or adjacent properties. The Project is modeled to, on average, reduce the 100-year flood risk, therefore the impact is **less than significant**.

Documentation:

AMEC. 2008. Merced groundwater basin groundwater management plan update, Merced County, CA.

California Regional Water Quality Control Board (CRWQCB). 1998. Water quality control plan (basin plan) for the Sacramento River and San Joaquin River basins, 4th Ed. Central Valley Region, Sacramento, CA.

ESA Associates (ESA). 2016. Merced River Channel and Floodplain Restoration Options Analysis Report. Technical memorandum to Merced Irrigation District. 5 October 2016.

ESA. 2017. Merced River Salmon Habitat Restoration Project- Hydraulic Analysis. Technical memorandum to Cramer Fish Sciences. 24 February 2017.

Federal Energy Regulatory Commission (FERC). 2015. Draft Environmental Impact Statement for the Merced River and Merced Falls Hydroelectric Projects (P-2179 and P-2467. Issued March 30, 2015. 514pp. + appendices.

Turlock Groundwater Basin Association (TGBA). 2008. Groundwater Management Plan. 18 March 2008. 68pp. + appendices.

Mitigation:

EC-7. Monitor Water Quality and Prevent Impacts.

During in river work, turbidity and total suspended solids shall be monitored with intermittent grab samples from the river, and construction curtailed if turbidity exceeds criteria established by the Regional Water Quality Control Board in its Clean Water Act §401 Water Quality Certification for the Project. Specifically, sampling shall be performed immediately upstream from the Project Area and approximately 300 feet downstream of the active work area during construction.

Activities shall not cause in surface waters:

- a) turbidity to exceed 2 NTU's where natural turbidity is less than 2 NTU;
- b) where natural turbidity is between 1 and 5 NTUs, increases exceeding 1 NTU;
- c) where natural turbidity is between 5 and 50 NTUs, increase exceeding 20 percent;
- d) where natural turbidity is between 50 and 100 NTUs, increases exceeding 10 NTUs;
- e) where natural turbidity is greater than 100 NTUs, increase exceeding 10 percent.

Activities shall not cause settleable material to exceed 0.1 ml/L in surface waters as measured in surface waters downstream from the Project Area. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 as measured in surface waters downstream from the Project Area.

The Project shall not discharge petroleum products into surface water. The Central Valley Water Board shall be notified immediately of any spill of petroleum products. During gravel processing, gravel shall be cleaned prior to placement within the riverbed in a manner that removes any fine-grained sediment (< 6mm size fraction) (fines) that could potentially contain concentrations of mercury. Daily fines samples shall be collected from processed material and analyzed for total mercury. Borrow areas shall be re-graded to ensure the areas do not become potential mercury methylation spots. Fines separated from gravel shall not re-enter the Merced River. New shallow water areas shall have continuous flow and shall not become stagnant. Floodplains shall be re-

vegetated to minimize transport of any mercury-containing sediment, as described in Project BMP's.

Sediment fencing shall be used along the river corridor to capture floating materials or sediments mobilized during construction activities and prevent water quality impacts. Stream bank impacts shall be isolated and minimized to reduce bank sloughing. Banks shall be stabilized with revegetation following Project activities, as appropriate.

A SWPPP shall be developed as part of the BMPs. All pertinent staff shall be trained on and familiarized with these plans. Copies of the plans and appropriate spill prevention equipment referenced in them shall be made available onsite and staff shall be trained in its use. Spill prevention kits shall be in close proximity to construction areas, and workers trained in their proper use.

XI. Land Use and Planning	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural communities' conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Discussion:				
<p>a) The Project would not divide an established community. The Project would rehabilitate instream and off-channel habitat in the Merced River to improve the quality and quantity of salmonid spawning and rearing habitat within the Project Area. Therefore, there would be no impact.</p>				
<p>b) The general plan and zoning designations of the land within the Project Area allow habitat rehabilitation projects. The Project is consistent with the Merced County General Plan (Merced County 2013), with habitat rehabilitation projects being an allowable use on lands designated as Agricultural. The Project does not conflict with the zoning by Merced County of the land as agricultural exclusive as habitat rehabilitation projects are an accepted use. Implementation of the Project would not conflict with land uses adjacent to the Project Area. Therefore, implementation of the Project would have no impact.</p>				

c) The Project does not include land covered by any habitat conservation plans or natural community conservation plans. Therefore, the Project would have **no impact**.

Documentation:

Merced County. 2013. 2030 Merced County General Plan. 10 December 2013. Available: <https://www.co.merced.ca.us/100/General-Plan>.

Mitigation:

No mitigation required.

XII. Mineral Resources	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource classified MRZ-2 by the State Geologist that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

a) Merced County contains a variety of mineral resources (USGS 2018). Mineral resources found within the vicinity of the Project Area include gold, silver, platinum, iridium, ruthenium, rhodium, palladium, osmium and sand and gravel (USGS 2018). The Snelling District is a gold placer deposit district that is approximately 9 miles long and one-half to one and one-half miles wide extending from Merced Falls to a few miles west of Snelling. The Snelling District was dredge mined for gold, likely multiple times, intermittently from 1907 to 1952 (USGS 2018) leaving behind the tailings piles that are currently present. The Project Area lies entirely within the Snelling District therefore; nearly all gold and other associated mineral resources have been removed from within the Project boundary during the intensive dredge mining activities. The remaining tailings piles are comprised of primarily cobble and gravel with a small component of finer sized sediments making them a potential source of construction aggregate as well as native sediment for salmonid habitat rehabilitation projects. The Project Area is not within a delineated mineral resources recovery site resulting in **no impact**.

b) The Project would impact only a small amount (7.8 acres) of the tailings piles present in the Snelling District (5760 acres), and most of the valuable mineral resources have been removed by historical dredge mining, resulting in **no impact** on mineral resources.

Documentation:

United States Geological Survey (USGS). 2018. Mineral Resources Online Spatial Data. Available: Mrdata.usgs.gov/mrds/. Accessed 21 July 2018.

Mitigation:

No mitigation required.

XIII. Noise	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

a) The Project would operate construction equipment (e.g., rubber-tired front-end loaders, excavators, and articulated haulers, etc.) in the Project Area as part of construction. The construction equipment would generate noise during their operation. The types of construction equipment used for the Project would typically generate noise levels ~75 decibels above the reference noise at a distance of 50 ft (15.2 m). The mobile onsite sediment screening plant would also generate noise levels ~75 decibels above the reference noise at a distance of 50 ft (15.2 m). Construction equipment would be properly equipped and maintained to reduce noise levels. The Project would not expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance (80 decibels maximum for Industry; Merced County General Plan 2013), or applicable standards of other agencies. Vibration would increase during operation of construction equipment, but no construction equipment would be used that is known to cause excessive vibration levels (impact and vibratory pile drivers, vibratory rollers, large bulldozers, hydraulic breakers, and jackhammers). All changes in noise and vibration levels would

occur in a mostly rural and relatively unpopulated area. The impact is still considered potentially significant because there would be increases in noise levels at the Project Area. The impact would be mitigated to a **less than significant** level with implementation of **EC-10 - Reduce Impacts from Noise**.

b-d) The Project would support a temporary increase in noise levels, as material is removed from the site and gravel hauled onto the site and placed into the main channel of the Merced River. These noise levels would be higher than the current ambient noise levels in the area, but would be temporary in nature and not excessive. The maximum noise levels allowed by agricultural activity in the Merced County General Plan are 80 decibels. The Project may create noise at or near this level for a temporary time period (up to four months). The Project would have a limited and temporary impact on noise levels in the immediate area, so the impact of noise is expected to be **less than significant**.

e-f) There is not a public airport within two miles of the Project Area. The Project would have **no impact** on air traffic or airport activity.

Documentation:

Merced County. 2013. 2030 Merced County General Plan. 10 December 2013. Available: <https://www.co.merced.ca.us/100/General-Plan>.

Mitigation:

EC-10. Reduce Impacts from Noise.

To mitigate noise related impacts, the Project shall require all contractors to comply with the following operational parameters:

- restrict construction activities to time periods between 7:00 am and 5:00 pm when there is the least potential for disturbance;
- locate the sorting station away from edge of property and adjacent homes; and install and maintain sound-reducing equipment and muffled exhaust on all construction equipment.

XIV. Population and Housing	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion:

a) The Project Area is in a rural area and does not currently have any houses, businesses, or other structures present. Implementation of the Project would provide temporary employment for several people during Project construction and post-project monitoring. New permanent jobs would not be created that would induce substantial population growth. Implementation of the Project would not indirectly induce population growth. Therefore, there will be **no impact**.

b-c) The Project would occur on mining disturbed, undeveloped land. Implementation of the Project in the Merced River does not displace housing or residents or cause the construction of replacement housing in another location. There will be **no impact**.

Documentation:

No documentation required

Mitigation:

No mitigation required.

XV. Public Services	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

(i)	Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(ii)	Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iii)	Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iv)	Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(v)	Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

- a) The Project has **no impact** on fire protection for the area.
- b) The Project is of limited duration and is located in a rural area. It has **no impact** on police protection for the area.
- c) The Project is not near a school. Therefore, it has **no impact** on schools.
- d) The Project is not near a park. Therefore, it has **no impact** on parks.
- e) The Project has **no impact** on any other public facilities. The Project has no impact on public services.

Documentation:

No documentation required.

Mitigation:

No mitigation required.

XVI. Recreation	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion:

- a) The Project would not improve the public river access within the Project Area or construct any facilities which may increase the public use. Implementation of the Project may enhance the floating experience within the Project Area by increasing the number of riffles and reducing the area of slow, deep pools. However, the Project will not fundamentally change the overall recreational experience of floating on the Merced River, therefore it is expected to result in a negligible increase in recreational use of the river. A slight increase in public use would not result in substantial physical deterioration of Merced ID's newly constructed, managed, non-motorized boating put-in within the Project Area, therefore there will be **no impact**.
- b) Construction activities for the Project would include operation of heavy equipment (front-end loaders and articulated haul trucks) in the channel of the Merced River within the Project Area.

There is a potentially significant impact on public safety to persons floating down the river in the same area where heavy equipment is being operated in the channel. The peak recreational use by river floaters is on weekends and holidays during the summer. Construction activities would not typically occur on weekends or holidays and only occur during the week during normal working hours (7 am to 5 pm) when most people are working as well thereby reducing the potential for interaction between floaters and heavy equipment. In addition, instream activities would only take up to 20 days each construction year. **EC-12 – Signs and construction monitor to warn public of rehabilitation activity** would be implemented for the Project. Signs would be placed at Merced ID's public river access site within the Project Area describing the Project and warning them that heavy equipment would be used instream and to pay attention and be careful. A sign would be placed on the bank approximately 100 feet upstream of instream construction activity within easy view of public floaters warning them of upcoming instream activity and directing them to a side of the channel (if needed). In addition, during all instream construction activity, a construction monitor with a radio would be positioned upstream of the instream construction activity and next to the channel in order to communicate with public floaters as well as over the radio with heavy equipment operators to warn them that a group of floaters is coming down and to temporarily halt instream activity. With implementation of **EC-12 – Signs, construction monitor, and communication to warn public of rehabilitation activity** there would be a **less than significant impact**.

Documentation:

No documentation required.

Mitigation:

EC-12. Signs and construction monitor to warn public of construction activity.

Signs shall be placed at Merced ID's newly constructed access site, a non-motorized boating put-in located within the Project boundary informing the public about the Project and warning them that potentially dangerous heavy equipment is being operated. A highly visible warning sign shall be placed on the bank approximately 100 feet upstream of instream construction activity, informing any individuals floating down the river about the construction activity and directing them to a safe path to avoid construction activity. In addition, during all instream construction activity, a construction monitor with a radio shall be positioned upstream of the instream construction activity and next to the channel to communicate with the public and with heavy equipment operators to ensure safe passage through the construction area.

XVII. Transportation	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including but not limited to level of service standards, and travel demand measures, or other standards, established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Discussion:</p> <p>a-b) The Project would cause a minor, short-term, temporary increase in traffic volume as a result of daily commutes by workers to the Project Area during the construction season and occasional supply deliveries. A few days of additional traffic would occur at the beginning and end of each construction season during transport of heavy equipment to the Project Area during annual mobilization and demobilization. Individual drivers may experience minor delays if they are travelling behind a truck transporting heavy equipment on a two-lane road. The Project's temporary traffic would primarily center on Merced Falls and Robinson roads and their intersection with the dirt access roads. All worker vehicles would be parked and heavy equipment would be stored in staging areas where there would be sufficient room for all of the vehicles and equipment; the Project would not displace any existing parking. Therefore, the Project would have a less than significant impact.</p> <p>c) The Project will not occur within two miles of a public airport or private airstrip and construction workers would not travel to the Project Area via airplane. The Project would not construct any structures or perform activities that would interfere with air traffic patterns. Therefore, the Project would have no impact on air traffic safety.</p>				

d) The Project would not modify any public roads or intersections and no incompatible vehicles would be used. The Project would not interfere with or increase safety risk for pedestrian and bicycle use of public roads. Therefore, there would be **no impact**.

e) The Project would not change the existing emergency access to the Project Area resulting in **no impact**.

f) The Project would not conflict with adopted policies, plans, or programs supporting alternative transportation; therefore, there would be **no impact**.

Documentation:

No documentation required.

Mitigation:

No mitigation required.

XVIII. Tribal Cultural Resources	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource which is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources, or a local register of historic resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of a unique archaeological resources (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Disturb or destroy a unique paleontological resource or site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
See Section V. Cultural Resources.				

XIX. Utilities and Service Systems	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Are sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Has the wastewater treatment provider which serves or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Discussion:</p> <p>a) The Project team would prepare a SWPPP as required to obtain a Storm Water Construction General Permit from the Central Valley Regional Water Quality Control Board. The SWPPP contains BMPs to minimize impacts to surface water quality from erosion or contaminants. The construction contractor would be required to implement the BMPs in the SWPPP to minimize impacts to water quality. With these measures in place, the impact is less than significant.</p> <p>b) The Project does not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Therefore, the Project will have no impact.</p> <p>c) The Project does not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Therefore, the Project will have no impact.</p> <p>d) The Project would comply with Section 401 of the Clean Water Act and obtain certification from the Regional Water Quality Control Board. The Project would maintain water quality in the Project Area. With implementation of the Water Quality Certification requirements, the Project will have a less than significant impact.</p>				

e) The Project does not require increased wastewater treatment capacity or a landfill. The Project has **no impact** on utilities and service systems.

Documentation:

No documentation required.

Mitigation:

No mitigation required.

XX. Wildfire	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

a) The project is in a rural area and there are no adopted emergency response or emergency evacuation plans. There would be **no impact**.

b) The Project construction would create a wildfire ignition risk. However, the majority of the Project Area is comprised of dredge tailings piles which contain minimal vegetation fuel resulting in a low wildfire risk. The dredge tailings piles are essentially fuel breaks which would inhibit the spread of fire. In addition, the majority of vegetation within the Project Area is riparian vegetation which are relatively moist areas with green vegetation resulting in a low ignition risk. If riparian areas due ignite then the wildlife usually spreads slowly as an underburn due to the relatively moist, green vegetation. The Project Area is designated as a moderate fire hazard severity zone (CalFire 2007). Fire extinguishers would be present onsite in vehicles to quickly put out any vegetation that ignites as a result of a spark from heavy equipment. Any tall, dried grass present on the staging areas or temporary access roads would be cleared prior to being used by vehicles or heavy equipment. In the long-term the Project would not alter the existing fire hazard conditions.

The Project would result in additional areas of riparian vegetation which have low fire hazard risk. These additional areas of riparian vegetation would not change the overall wildfire risk. Therefore, the impact of the Project on wildfire risk is **less than significant**.

c) The project would not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. There would be **no impact**.

d) The project would not expose people or structures to significant risks to wildfire. The project would occur in an area comprised primarily of mine tailings and would be of limited duration. Therefore, **no impact** is expected.

Documentation:

California Environmental Protection Agency. 2018. Cortese List. Department of Toxic Substances Control. 18 July 2018.

CalFire. 2007. Fire Hazard Severity Zone Maps. Available:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones

Mitigation:

No mitigation required.

XXI. Mandatory Findings of Significance	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion:

a) The Project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. Limited short-term impacts are expected, but these will be mitigated with implementation of the EC's described above. Therefore, the project would have a **less than significant impact**.

b, c) There would be temporary and minor adverse impacts that would occur within the Project Area during construction; however, the overall improvement to the environment is expected to outweigh these effects. The Project would not contribute to the accumulation of impacts in the watershed. However, cumulative actions to improve stream habitats in the watershed are expected to provide long-term benefits to associated vegetation, wildlife, and fish. Because vegetation communities and wildlife habitats within the Merced River watershed have been substantially modified to suit human land uses and would likely continue to be modified as human populations increase, cumulative benefits from Projects over time may be partially offset with new adverse impacts in the watershed cause by human activities.

Other related activities aimed at salmonid production, enhancement, rehabilitation, and mitigation are being planned and implemented for the Merced River system and Central Valley under

directives of the DWR, CDFW, CVPIA, USFWS AFRP, and Reclamation. These activities include gravel additions, floodplain creation, riparian habitat rehabilitation, and other enhancement actions. The magnitude of cumulative effects under all current and proposed salmonid habitat improvement actions is undetermined at this time, but the impacts are expected to be beneficial.

Together, the Project and other rehabilitation projects and actions would improve environmental quality. Therefore, **no significant cumulative impacts to the environment are expected** if the Project is implemented.

d) The Project would improve the environmental conditions in the area by recovering functioning floodplain habitat. There would be **no impact** to human beings.

Documentation:

No documentation required.

Mitigation:

No mitigation required.

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Appendix A. MID Merced River Restoration Project Cultural Resources Report

Technical Report—Final

CULTURAL RESOURCES ASSESSMENT REPORT
Merced River Habitat Restoration Project #4: Gage 52
August 2018

Prepared for:

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Acronyms and Abbreviations

APE	area of potential effects
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRHR	California Register of Historical Resources
Horizon	Horizon Water and Environment, LLC
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PRC	Public Resources Code
TCR	tribal cultural resource
USC	United States Code
USGS	U.S. Geological Survey

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Executive Summary

The Merced River Restoration Project No. 4 – Gauge 52 (Proposed Project) is designed to restore and enhance ecosystem processes with a primary focus on improving salmonid habitat for spawning, egg incubation, and juvenile rearing to increase natural production of Central Valley (CV) fall-run Chinook Salmon (*Oncorhynchus tshawytscha*) and Rainbow Trout/steelhead (*O. mykiss*) in the lower Merced River. Horizon Water and Environment, LLC (Horizon) was retained by Cramer Fish Sciences to complete a cultural resources assessment in support of the project. This document reports the findings of the cultural resources assessment that was conducted for the proposed Area of Potential Effects (APE). This report documents cultural resources inventory methods and results as required for compliance with federal and California regulations. The study consisted of a literature review to identify any previously recorded cultural resources that could be affected by the proposed project and a field survey to locate any cultural resources that may exist but have not yet been recorded.

The APE contains historic-era gold mining features that are the result of early twentieth century bucket-line dredging in the river. The tailings located at this section of the Merced River have been previously recorded, evaluated, and were determined to be not eligible for inclusion on the National Register of Historic Places and California Register of Historic Places (URS 2006; Kress 2015a, b). No archaeological resources or historic-era resources, other than the mine tailings, were identified during the course of the field survey.

The archaeological inventory was performed based on information obtained at the Central Information Center of the California Historical Resources Information System, as well as on direct observation of site conditions and other information generally available as of January 2018. The conclusions and recommendations herein are, therefore, based on information available up to that point in time. Further information may come to light in the future that could substantially change the conclusions found herein.

Information obtained from these sources in this timeframe is assumed to be correct and complete. Horizon does not assume any liability for findings or lack of findings based upon misrepresentation of information presented to Horizon or for items that are not visible, made visible, accessible, or present at the time of the APE inventory.

1 Introduction

1.1 Location and Setting

The Merced River Habitat Restoration Project #4: Gage 52 (Merced Restoration Project or project) is located along the Merced River, about 3 miles upstream from the Town of Snelling in Merced County (**Figure 1**). The majority of the APE is directly adjacent to the north bank of the current channel of the Merced River along Merced Falls Road (Highway 59), although some access from the south bank is proposed as well (**Figure 2**). The Crocker Huffman diversion dam is approximately ¼ mile east of the eastern project limits.

The project is located west of the Sierra Nevada, along the Merced River. The Merced River is a tributary to the San Joaquin River in the southern portion of California's Central Valley. The river, which drains into a 1,276-square-mile watershed, originates in Yosemite National Park and flows southwest through the Sierra Nevada range before joining the San Joaquin River near Turlock, California. Elevations in the watershed range from 13,000 feet at its crest to 49 feet at the confluence of the San Joaquin River. The climate is typically Mediterranean, with wet winters and dry summers. The topography of the general area contains a variety of landforms including ridges; gentle, moderate, and steep slopes; old floodplains including abandoned stream terraces; and incised drainages. The majority of the 71-acre APE is almost entirely covered in dredger tailing piles consisting largely of bare cobbles.

The APE is largely comprised of cobble fields and training walls constructed of dredge tailings. Soil development is limited and confined to areas where silts have been deposited by the river since the area was last mined. Most of the riparian vegetation present grows from among the cobbles along the base of the training walls or around several large ponds that have been scoured by flooding or excavated into the cobble bed. Woody vegetation consists primarily of white alder, cottonwood, and willow, although elderberry, live oak, walnut, and maple are also present; a few grey pines are scattered within the area, as well. Blackberries, yerba santa, and buttonbush are found scattered on the floodplain and in the riparian understory. Rushes and sedges are found in the ponded areas.

Photographs of the APE are provided in **Appendix A**.

1.2 Project Description

The MID proposes to restore a total of approximately 15 acres of salmonid habitat through the grading of existing dredge tailings on the north and south banks and main channel, and the addition of spawning gravel. The tailings on the north and south banks will be graded to a depth between 1 and 20 feet in elevation to widen the flood plain and increase connectivity with the main channel. A temporary gravel processing plant will be set up on site to sort dredge tailings for use as spawning gravel. This processing plant, associated equipment, and the temporary gravel stock piles will have a footprint measuring approximately 200 feet square. Gravel will be deposited in-stream and manipulated by a rubber-tired front-end loader. This equipment will travel to the gravel placement areas using existing roads as well as driving overland in the flood plain. Access to the north side of the river will be from Merced Falls Road, while access to the south side will be through the Calaveras Trout Farm and Merced River Hatchery. The north access road is currently a two-track dirt road and will require some re-grading and possibly the addition of gravel. The south access road is the gravel access road to the trout farm and fish hatchery and will require no improvements (**Figure 3**).

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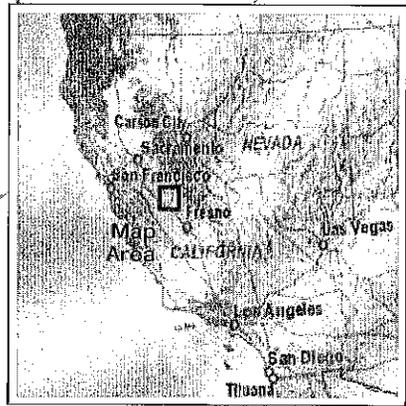
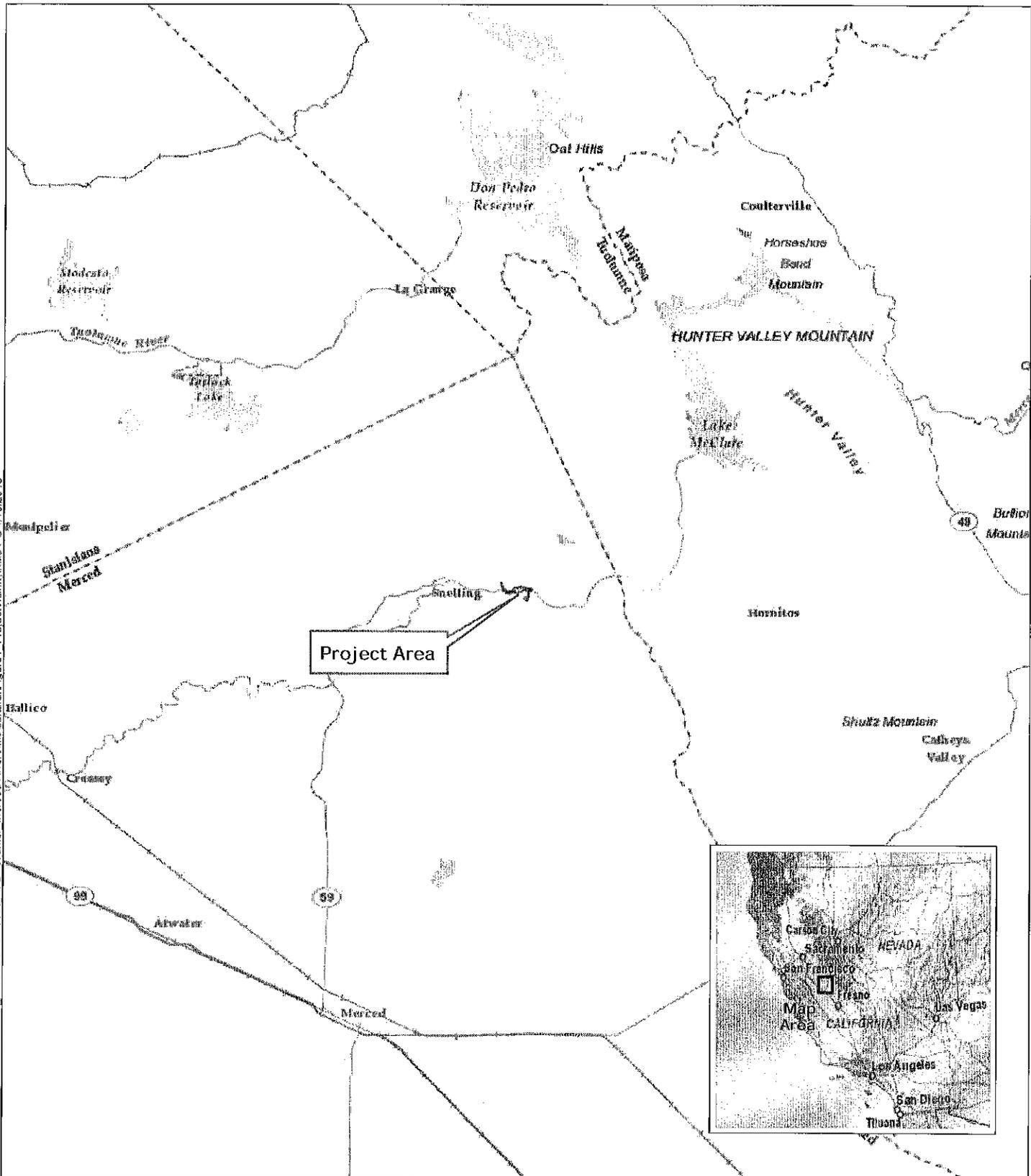
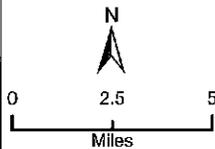


Figure 1
Project Vicinity



County: Merced
7.5' Quad Maps: Snelling, Merced Falls
Township: 5 S
Range: 14 E, 15 E
Sections: 12, 7

UTM Coordinates (Zone 10N, NAD83)
Easting **Northing**
 731435 4155469

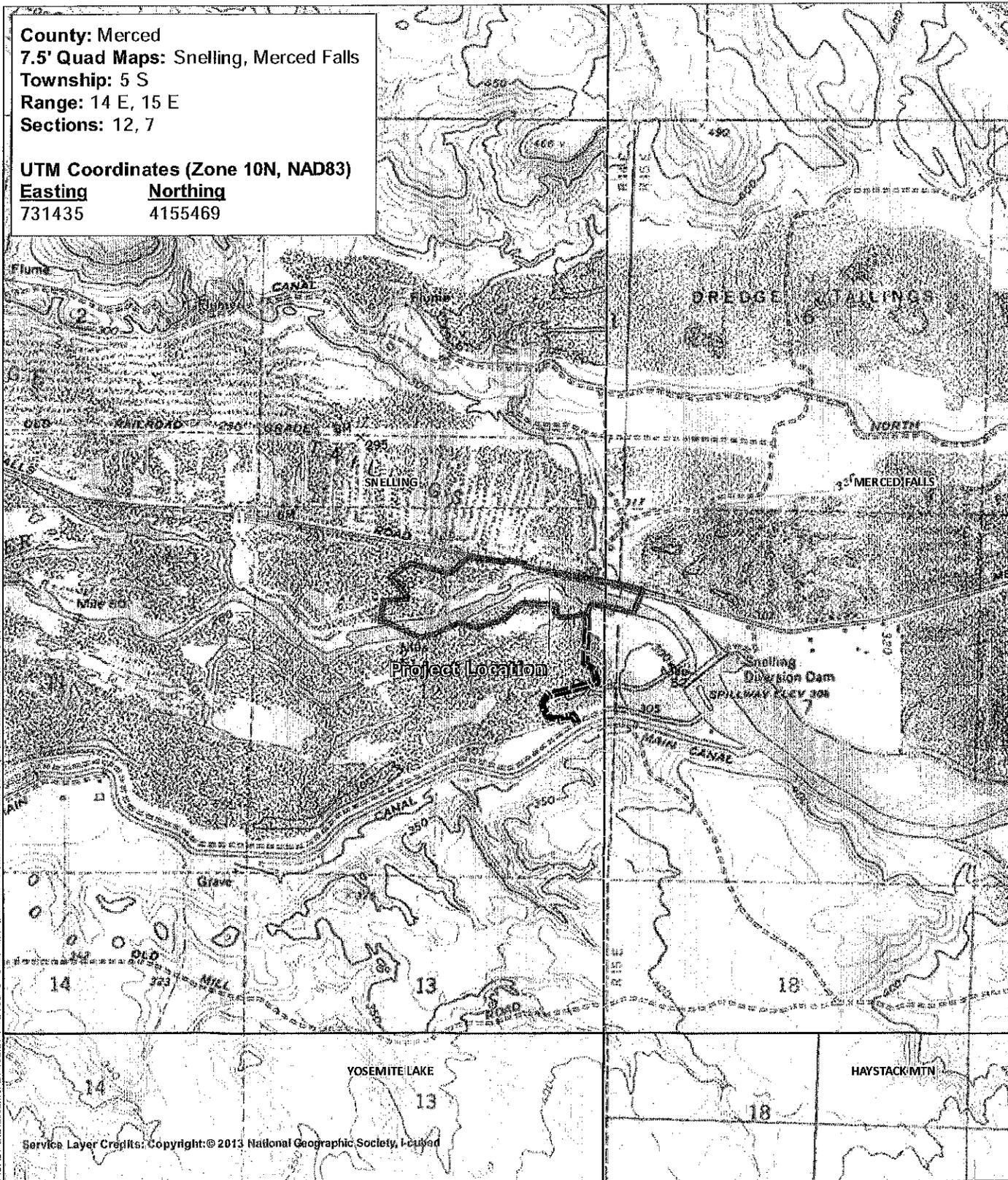
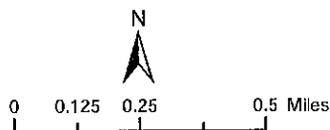
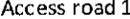
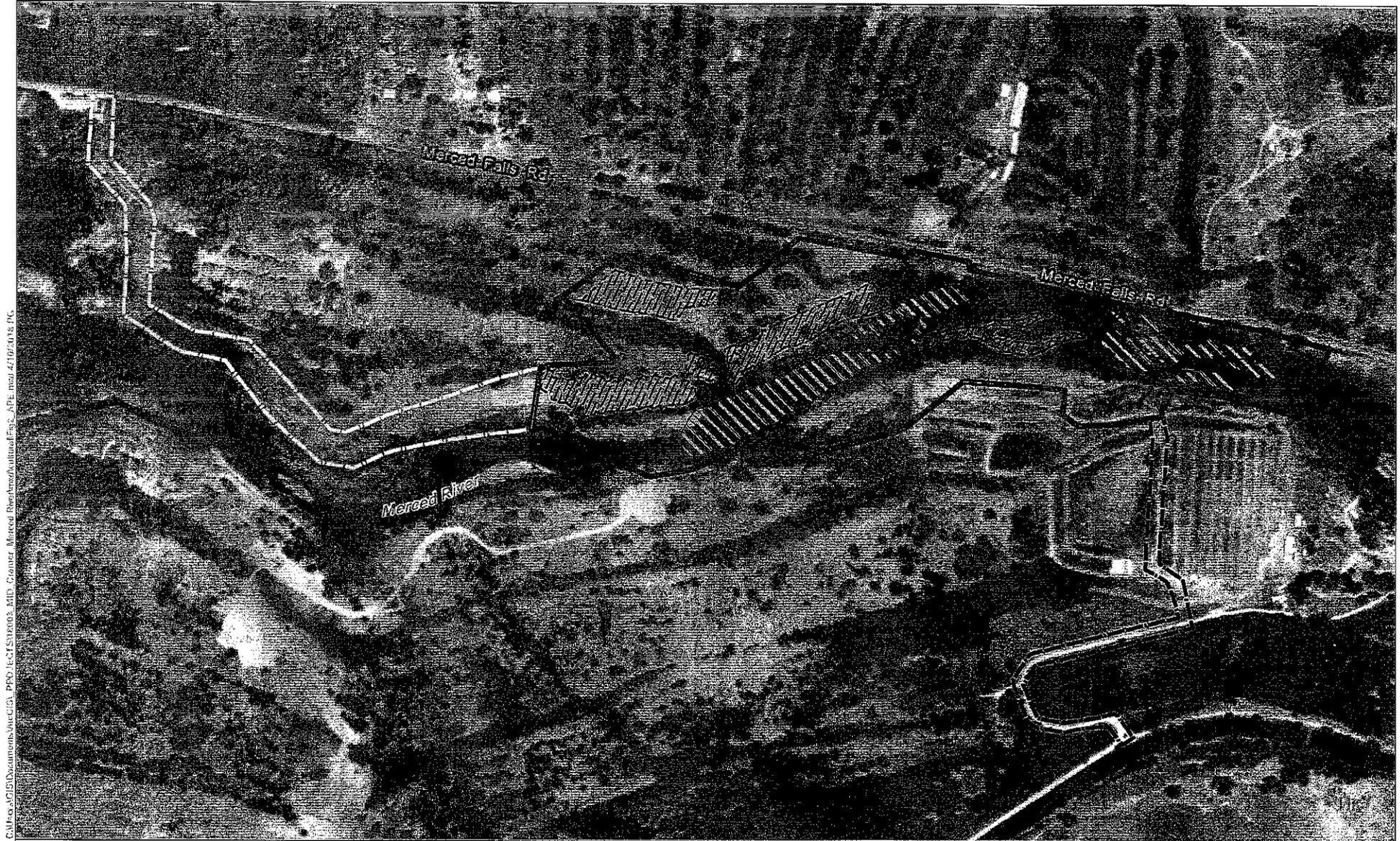


Figure 2

Project Location

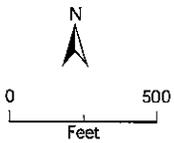


-  Access road 1
-  Access road 2
-  Project boundary
-  USGS Quad Index



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BaseMap Sources: Esri, HERE, Garmin, © OpenStreetMap contributors



Project Activities

-  Floodplain excavation
-  Gravel augmentation

Area of Potential Effects

-  Access road 1
-  Access road 2
-  Project boundary

Figure 3
Area of Potential Effects

1.3 Area of Potential Effects

The APE includes an approximately 71-acre area that includes flood plain and channel restoration activities, access routes, and staging areas on both sides of the river in Section 12, T. 5 S., R. 14 E. and Section 7, T. 5 S., R. 15 E., Mount Diablo Baseline and Meridian, as depicted on the Merced Falls and Snelling 7.5' U.S. Geological Survey topographic quadrangle maps (Figures 2). The project is situated adjacent to the Calaveras Trout Farm and Merced River Hatchery facilities, both of which are immediately downstream from Crocker-Huffman Dam and diversion for the MID Main Canal.

The APE encompasses the areas involved in all phases of the proposed project, as depicted in **Figure 3**. The proposed access roads, which are unimproved existing roads, are also included as part of the APE. The vertical APE is expected to be no more than about 20 feet below the current ground surface within the river channel and among the tailings.

1.4 Regulatory Setting

1.4.1 State of California Regulations

CEQA and State CEQA Guidelines

The proposed project seeks to comply with CEQA (Public Resources Code [PRC] 21000 et seq.) and the CEQA Guidelines (California Code of Regulations [CCR], Title 14, Chapter 3), which determine, in part, whether the project has a significant effect on a unique archaeological resource (per PRC 21083.2) or a historical resource (per PRC 21084.1).

CEQA Guidelines CCR 15064.5 notes that “a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.” Lead agencies are required to identify potentially feasible measures or alternatives to avoid or mitigate significant adverse changes in the significance of a historical resource before such projects are approved. According to the CEQA guidelines, historical resources are:

- Listed in, or determined to be eligible for listing in, the California Register of Historic Places (CRHR) (per PRC 5024.1(k));
- Included in a local register of historical resources (per PRC 5020.1) or identified as significant in a historical resource survey meeting the requirements of PRC 5024.1(g); or
- Determined by a lead state agency to be historically significant.

CEQA Guidelines CCR 15064.5 also applies to unique archaeological resources as defined in PRC 21084.1.

Assembly Bill 52, which went into effect on July 1, 2015, requires, per PRC 21080.3.1, that CEQA lead agencies consult with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if so requested by the tribe, and if the agency intends to release a negative declaration, mitigated negative declaration, or environmental impact report for a project. The bill also specifies, under PRC 21084.2, that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource (TCR) is considered a project that may have a significant effect on the environment. This latter language is scheduled to be added to the CEQA checklist in the near future.

As defined in Section 21074(a) of the PRC, TCRs are:

- (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - a. Included or determined to be eligible for inclusion in the CRHR; or
 - b. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- (2) 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

TCRs are further defined under Section 21074(b) and (c) as follows:

- (b) A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape; and
- (c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms to the criteria of subdivision (a).

Mitigation measures for TCRs must be developed in consultation with the affected California Native American tribe pursuant to the newly chaptered Section 21080.3.2 or according to Section 21084.3. Section 21084.3 identifies mitigation measures that include avoidance and preservation of TCRs and treating TCRs with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource.

The lead State agency for the project will consult with Native American tribes pursuant to PRC 21080.3.1. The results of that consultation are not included in this report.

California Register of Historical Resources

PRC Section 5024.1 establishes the CRHR. This register lists all California properties considered to be significant historical resources. The CRHR includes all properties listed, or determined to be eligible for listing, in the National Register of Historic Places (NRHP), including properties evaluated under Section 106 of the NHPA. The criteria for listing are similar to those of the NRHP. Criteria for listing in the CRHR include resources that:

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

The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and resources that have special considerations.

1.4.2 Federal Regulations

National Historic Preservation Act (54 U.S.C. § 300101 et seq.)

Title 54 U.S.C 304108, also referred to as Section 106 of the National Historic Preservation Act (NHPA), requires that Federal agencies take into consideration possible effects to historic properties during their undertakings. Historic properties are cultural resources that are included or eligible for inclusion, in the National Register of Historic Places. The 36 CFR Part 800 regulations implement Section 106 and outline the procedures necessary for compliance with the NHPA. Compliance with the Section 106 process follows a series of steps that are designed to identify if significant cultural resources are present in the proposed action area of potential effects (APE), and to what level they would be affected by the proposed Federal undertaking.

An undertaking is defined as a “...project, activity or program funded in whole or in part, under the direct or indirect jurisdiction of a federal agency.” This includes projects that are carried out by, or on behalf of, the agency; those carried out with federal assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation, or approval by, a federal agency [Section 301(7) 16 U.S.C. 470w(7)].

A cultural resource is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. Those cultural resources that are listed on, or are eligible for inclusion in, the National Register of Historic Places (NRHP) are referred to as historic properties. The criteria for NRHP eligibility are outlined at 36 CFR Part 60. Other applicable federal cultural resources laws and regulations that could apply include, but are not limited to, the Native American Graves Protection and Repatriation Act (NAGPA), and the Archaeological Resources Protection Act (ARPA).

Compliance with Section 106 of the NHPA (36 CFR Part 800) follows a series of steps that are designed to identify and consult with interested parties, determine the APE, determine if historic properties are present within the APE, and assess the effects the undertaking will have on historic properties. Section 106 requires consultation with Indian Tribes concerning the identification of sites of religious or cultural significance and with individuals or groups who are entitled, or requested, to be consulting parties. The regulations at 36 CFR Part 800.5 require federal agencies to apply the criteria of adverse effect to the historic properties identified within the APE. The criteria of adverse effect, defined at 36 CFR Part 800.5(a)(1), states that:

“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.”

The 36 CFR Part 800 regulations include consultation with the State Historic Preservation Officer (SHPO) to provide an opportunity to comment on, and concur with, the Reclamations’ determinations. If the undertaking would result in adverse effects to historic properties, these adverse effects must be resolved in consultation with the SHPO and other parties identified during the Section 106 process before the undertaking can proceed to implementation.

National Register Criteria for Evaluation

The criteria for evaluation of NRHP eligibility are outlined at 36 CFR Part 60.4. A district, site, building, structure, or object must generally be at least 50 years old to be eligible for consideration as a historic property. That district, site, building, structure, or object must retain integrity of location, design, setting, materials, workmanship, feelings, and association as well as meet one of the following

criteria to demonstrate its significance in American history, architecture, archeology, engineering, and culture. A district, site, building, structure, or object must:

- (A) be associated with events that have made a significant contribution to the broad patterns of history; or
- (B) be associated with the lives of people significant in our past; or
- (C) embody the distinct characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) have yielded, or may be likely to yield, information important in prehistory or history.

A site must have integrity and meet one of the four criteria of eligibility to demonstrate its historic associations in order to convey its significance. A property must be associated with one or more events important in the history or prehistory in order to be considered for listing under Criterion A. Additionally, the specific association of the property, itself, must also be considered significant. Criterion B applies to properties associated with individuals whose specific contributions to the history can be identified and documented. Properties significant for their physical design or construction under Criterion C must have features with characteristics that exemplify such elements as architecture, landscape architecture, engineering, and artwork.

Criterion D most commonly applies to properties that have the potential to answer, in whole or in part, important research questions about human history that can only be answered by the actual physical materials of cultural resources. A property eligible under Criterion D must demonstrate the potential to contain information relevant to the prehistory and history (National Register Bulletin 15).

A district, site, building, structure, or object may also be eligible for consideration as a historic property if that property meets the criteria considerations for properties generally less than 50 years old, in addition to possessing integrity and meeting the criteria for evaluation.

1.5 Personnel

Fieldwork, analysis, and reporting were carried out by the below-listed Horizon professional who meets the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (per Title 48 of the CFR, Section 44716, as amended in 1983). Procedures complied with NHPA Section 106 as set forth in Title 36 of the CFR, Section 800.

- Dean Martorana, M.A. acted as Principal Investigator for the project, conducted the archaeological field survey, and prepared this report. He has more than 17 years' experience as an archaeologist and project manager in cultural resource management, as well as environmental regulatory compliance in California. He completed a master's degree in Anthropology at California State University, Long Beach (2000). He earned a certificate in Geographic Information Systems from San Francisco State University in 2007. He is a Certified Project Manager (URS Project Management Certification, 2014).

2 Project Context

2.1 Environmental Setting

The project is located in the Great Valley geomorphic province at the base of the foothills on the west side of the Sierra Nevada, at an elevation of about 300 feet above mean sea level. As previously described, the majority of the project is located along the north bank of the Merced River, in Snelling, California. The Merced River is one of many large perennial drainages that carry snowmelt from the Sierra Nevada peaks and, eventually, into the Sacramento River, which flows 445 miles through the Sacramento Valley before joining with the San Joaquin River and forming the Sacramento-San Joaquin Delta and entering San Francisco Bay.

The APE is dominated by cobble tailings that are the residue of dredge mining in the Merced River. The depth of the tailings is about 25 to 28 feet (URS 2006:17). As a result, there is little soil development, and vegetation is largely riparian in nature.

2.2 Prehistoric Context

Since the early 1930s, a number of schemes have been set forth by researchers to organize the archaeological data of California into a chronological framework. A scheme that was originally devised for chronologically organizing sites from Central California, the Sacramento Delta, and the northern San Joaquin Valley was refined by Beardsley (1954) and came to be known as the Central California Taxonomic System (Moratto 2004:181). The system relies on identifying certain characteristics such as burial patterns (whether the body is flexed or extended), shell bead types, stone tools, and even where the sites tend to occur (along the San Francisco Bay or inland). These traits and characteristics are used to place a site in a specific time period. The system is still widely used by archaeologists. It organizes the archaeology of the region as follows:

- Paleoindian: earlier than 8,000 years ago
- Early Horizon: 8,000 to 2,500 years ago
- Middle Horizon: 2,500 to 1,100 years ago
- Late Horizon: 1,100 to 200 years ago
- Historic: 200 years ago to modern times

Scholars have debated whether the Early Horizon inhabitants of the Central Valley were culturally related to inhabitants of the San Francisco Bay, or if they developed independently (Bickel 1981; Gerow and Force 1968). The exact dynamics of cultural change and interchange between these two groups is still being unraveled by archaeologists. The earliest dates for human occupation in this region are unknown. Although sites from the Paleoindian period likely exist (dating from 12,000 to 8,000 B.P.), sites from a Central Valley occupation dating from about 7,000 to 6,000 B.P. are thought to be buried under alluvium and are, therefore, not well documented in this part of California (Moratto 2004:214). It has been suggested that the Early Middle Horizon (4,500 to 2,500 years ago), now referred to as the Windmill, is associated with an influx of peoples from outside of California who brought with them an adaptation to river-wetland environments (Moratto 2004:207). Typical Windmill sites are often situated in riverine, marshland, and valley floors, settings that offer a variety of plant and animal resources. These sites often contain burials that are extended ventrally

and oriented to the west. Burial artifacts include a variety of fishing paraphernalia (net weights, spear points, and bone hooks) and large projectile points, as well as large and small mammal remains.

The subsequent Middle Horizon or Berkeley Pattern covers a period from 2,500 to 1,500 years ago in Northern California. This pattern overlaps somewhat with Windmill attributes at the beginning and with late Prehistoric artifacts at the end. Berkeley Pattern sites are much more common and well documented; therefore, they are better understood than the Windmill sites. The sites are distributed in more diverse environmental settings, although a riverine focus is common. As described by Allan et al. (1997:9), sites from this period include deeply stratified midden deposits containing large assemblages of milling and grinding stones for the processing of vegetal resources as well as smaller, lighter projectile points. Further distinguishing traits from earlier patterns include artifacts such as slate pendants, steatite beads, stone tubes, and ear ornaments. A shift in burial patterning is also evident with variable directional orientation, flexed body positioning, and a general reduction in mortuary goods (Fredrickson 1973; Moratto 2004).

Fredrickson (1973) has defined the later prehistoric period, which ranges from 1,500 to 150 years ago, as the Augustine Pattern. The pattern is characterized by intensive hunting, fishing, and gathering, a focus on acorn processing, large population increases, intensified trade and exchange networks, more complex ceremonial and social attributes, and the practice of cremation in addition to flexed burials. As pointed out by Allan et al. (1997:9), certain artifacts also typify the pattern: bone awls for use in basketry manufacture, small notched and serrated projectile points, the introduction of the bow and arrow, occasional pottery, clay effigies, bone whistles, and stone pipes. The Augustine Pattern and the late prehistoric period can be characterized as the apex of Native American cultural development in this part of California.

2.3 Ethnographic Context

The project straddles the boundaries of the Southern Sierra Miwok and Northern Valley Yokuts territories, at the northeastern end of the San Joaquin Valley, near the Merced River. Tribal groups within these territories interacted with each other along those boundaries, and as such the tribal boundaries are not considered permanent. Both ethnographies are discussed briefly below.

The present-day northern San Joaquin Valley represents the lands occupied during prehistoric times by the Northern Valley Yokuts (Wallace 1978), a geographic division of the much larger Yokuts linguistic group, who occupied the entire San Joaquin Valley and adjoining Sierra Nevada foothills (Kroeber 1925). Yokutsan is one of four Penutian linguistic stocks which included Costanoan (Ohlonean); Miwok (Utian); Wintu, Nomlaki, and Patwin (Wintuan); and the Maidu, Nisenan, and Koncow (Maiduan) (Shipley 1978).

In contrast to the typical California cultural grouping known as the tribelet, the Yokuts were organized into "true tribes," in that each had "a name, a dialect, and a territory" (Heizer 1971: 370). Kroeber (1925:474) estimated that as many as 50 Yokuts tribes may have originally existed, but that only 40 were "sufficiently known to be locatable." Each tribe inhabited an area averaging "perhaps 300 square miles" (777 square kilometers), or about the distance one could walk in any direction in half a day from the center of the territory. Some Yokuts tribes only inhabited a single village, while others occupied several (Kroeber 1925: 474-475).

The "Miwok" (alternatively known as the "Miwuk") refer to the people that occupied a vast region of central and northern California, from the Pacific Coast, east through the Sacramento-San Joaquin Delta, and south to the Sierra Nevada. There are six sub-groups of Miwok in Northern California; two

of them are the “Coast Miwok” and the “Eastern Miwok”, which include the Bay Miwok, the Plains Miwok, the Northern Sierra Miwok, the Central Sierra Miwok, and the Southern Sierra Miwok.

The project is within the territory of the Sierra Miwok. The Northern Sierra Miwok occupied the foothills and mountains of the Mokelumne and Calaveras River drainages. The Central Sierra Miwok occupied the foothill and mountain portions of the Stanislaus and Tuolumne River drainages. The Southern Sierra Miwok territory included the upper drainages of the Merced and Chowchilla Rivers (Levy 1978:398).

Based upon their history and similarities, the Northern, Central, and Southern Sierra Miwok groups form a Sierra Miwok language group, different than the language groups of the Coastal, Bay and Plains Miwok (Callaghan 1971; Levy 1978:398). According to Freeland (1951:9), the Central Miwok language group can be further subdivided into two dialects, the West Central and East Central Miwok. Lexicostatistic data suggests that the division between Eastern and Western Miwok languages may have occurred as far back as 2,500 years ago (Levy 1978:398). The principal political unit of the Miwok was the tribelet. According to Levy (1978:398), “each tribelet was an independent and sovereign nation that embraced a defined and bounded territory exercising control over the natural resources contained therein.” Each tribelet consisted of several semi-permanent inhabited settlements and a larger number of annually inhabited seasonal campsites. Lineage was an important political element to Miwok society. Lineages were named specifically for their locality, and in most cases, a lineage was a permanent element of a tribelet. The population of the Southern Sierra Miwok settlements averaged 25 individuals. Trade occurred throughout the region, with the Southern Sierra Miwok trading salt and obsidian from the Great Basin to the east to the Plains Miwok in the west, and to the Northern Valley Yokuts to the south.

Information on the prehistory of the Miwok varies from group to group, though there is more information available on the Plains Miwok than the Sierra Miwok as whole (Northern, Central and Southern). The occupation of the Sierra Nevada appears to be more recent, and probably occurred after the beginning of the Late Horizon. The Mariposa archaeological complex can be attributed to the Sierra Miwok (Northern, Central, and Southern) and appears to be “chronologically contemporaneous” with Late Horizon sites found throughout Central California (Levy 1978:399-400).

2.4 Historic-Era Context

The following summary is derived from the URS (2006:14-18) review of the project area, which has a more extensive review of the local historical context, including a more comprehensive review of the Snelling Mining District, and is included in this report as **Appendix B**.

The town of Snelling, although not a mining town, was an overflow from the mining regions. The town was located along the road to the Mariposa mines and became a stopover for those traveling to and those from the area. By the early 1870s, the population and importance of the small settlements of Merced County began to fade as construction on the Central Pacific railroad progressed down the San Joaquin Valley. Communities with connections to the railroad became commercial centers in the San Joaquin Valley. As a result, in December 1872, Merced County voters chose to relocate the seat of government from Snelling to the town of Merced (Hoover et al. 1990:202). Not only did the Central Pacific Railroad establish towns and provide transportation throughout the Valley, it also promoted land use for ranching and farming.

Early agriculture in Merced County focused on “dry-farming” methods; however, during the 1860s many local ranches and farmers began to develop small-scale irrigation projects. During the 1870s, “dry-farmed” wheat continued to be the dominant agricultural crop in Merced County. By the early 1880s, Charles H. Huffman, a prominent businessman and landowner instrumental in the formation of the town of Merced, controlled the irrigation system through the Merced Canal and Irrigation Company. This company expanded existing irrigation systems and formed agricultural settlements known as “colonies.” These “colonies” served as ready-made irrigated farmsteads and enticed new settlement and increased real estate values throughout the area. Water developers typically bought up the lands to be served, in advance of their water development, in order to profit from the land boom that would follow.

In 1888, the Merced Canal and Irrigation Company was reorganized and refinanced to form the Crocker-Huffman Land and Water Company. With the financial backing of wealthy landowner Charles Crocker, this new entity organized the First National Bank, which financed numerous development projects in the county including a large creamery, the dam and canal that created Lake Yosemite, and the Fairfield and Le Grand canals leading out of the lake. By the 1890s, the Crocker-Huffman Company had organized sixteen colonies comprising approximately 30,000 acres, with roughly 6,000 acres cultivated. A wide variety of crops were grown in the colonies, including fruits, nuts, and alfalfa, an important feed crop for dairy cattle in Merced and surrounding areas.

In 1919, Merced County voters approved the creation of the Merced Irrigation District, a publicly owned entity that purchased the Crocker-Huffman system in 1922. Voters soon passed a bond issue funding improvements and expansion of the existing irrigation system, an effort that has continued into the present day.

Snelling Mining District

The Snelling Mining District was principally a dredging field; however, some placer mining and hydraulic mining of the terrace deposits along the Merced River were practiced during the gold rush without much success. Gold dredging operations first began in the general vicinity in 1907 and continued until 1919. Dredging in the APE did not begin until 1932 and lasted until 1942, when the United States War Production Board issued Work Limitation Order L-208 (Crews 1971:7). Dredging resumed in 1946 and lasted until 1952. The value of the total output of the Snelling Mining District is unknown, but the dredges are estimated to have produced about 17 million dollars in gold (Clark 1970:120).

Additional information about the Snelling Mining District can be found in Appendix B.

3 Native American Consultation and Archival Research

In accordance with the Secretary of the Interior’s Standards and the Guidelines for Archaeology and Historic Preservation, the primary goals of this archaeological inventory were to identify and completely document the location, qualities, and condition of any historic properties in the project’s APE. Methods employed to achieve these goals follow.

3.1 Native American Consultation

All Native American consultation for the project was handled by the U.S. Bureau of Reclamation and is not included as part of this report.

3.2 Archival Research

Cultural resources include prehistoric archaeological sites, historic-era archaeological sites, TCRs, and historic buildings, structures, landscapes, districts, and linear features.

A records search was conducted for the proposed project by the Central California Information Center at California State University, Stanislaus (File No. 105831). The purpose of the records search was to determine if the study area had previously been surveyed for cultural resources, and to identify any previously recorded cultural resources within, or within ¼ mile of, the proposed project. The archival research included review of the California Inventory of Historic Resources, local historical inventories, historical literature, and historical maps including USGS topographic maps, General Land Office maps, and Rancho Plat Maps. The results of the record search are included in **Appendix C**.

The records search identified two previously recorded resources within the project APE, P-24-001782 and P-24-001909 (District), although the latter was determined to actually be outside of the APE (See Table 1). One resource was recorded within the ¼-mile radius, P-24-000435. Two previous cultural resource investigations have been conducted within parts of the APE, P-06671 and P-8192 (See Table 2).

Table 1. Previously Recorded Cultural Resources

Primary #	Age	Description	Comments	Intersect APE?
P-24-001782	Historic	Merced River Ranch Dredge Tailings	Not considered a historical property or resource	Yes
P-24-001909	Historic	Merced Irrigation District (1919-1939)	Originally evaluated as eligible for NRHP and CRHR as a district; subsequent reviews determined re-evaluation was necessary and it was found not eligible.	No
P-24-000435	Historic	Dredge Field	Not evaluated	No

The Merced River Ranch Dredge Tailings (P-24-001782) are the result of bucket-line dredging activities conducted by the Snelling gold Mining Company between 1932 and 1952. According to the records search results (Appendix C), at least 281 acres of dredge tailings in the immediate vicinity of the proposed project have been previously recorded. These include 60 acres of tailings recorded by St. Clair (2006) that encompass the western portion of the tailings in the current project area and most of the access road off of Merced Falls Road. Kress (2015) recorded another 168 acres directly south of and adjacent to the URS 2006 survey and Elliott and Peske (2012) recorded 53 acres of tailings during a survey of Henderson Park, which is located about 1 mile downstream of the current project. Furthermore, Syda (2002) provided a general recording of the tailings as part of a survey of State Route 59/Merced Falls Road.

According to Dice (2010), the APE is located within the boundaries of the Merced Irrigation District (P-24-001909); however, the MID boundaries described and shown in the Dice (2010) document are incorrect in that they do not accurately reflect either the original 1927 MID boundary map or modern 1973 official boundary map. Official boundary maps show the APE to be outside the MID boundary. Further, although Dice (2010) recorded P-24-001909 as eligible for listing as an Historic District, subsequent reviews of the evaluation determined that the lack of physical inspection of all contributing elements to the district rendered the evaluation unreliable and a re-evaluation of the district and its integrity was recommended (Loftus 2011). Earlier and subsequent investigations of canal systems associated with the Merced Irrigation District determined they were not eligible for the NRHP or CRHR (FirstCarbon Solutions 2017; JRP 2007), and the SHPO concurred with this determination in a letter dated April 17, 2012 (FirstCarbon Solutions 2017).

Other facilities and resources in and near the project APE included the Merced River Fish Hatchery and Crocker Huffman (or Snelling) Diversion Dam and Main Canal. The south access road (Access road 2 in Figure 3) passes through the Merced River Fish Hatchery. The hatchery, which is operated by the California Department of Fish and Wildlife, was initially constructed as a spawning channel by the Merced Irrigation District in 1970 to enhance runs of Chinook Salmon. The facility was expanded to become a spawning and rearing hatchery during the 1980s and 1990s (CDFW 2018).

The Crocker Huffman Diversion Dam is located directly upstream from the Merced River Fish Hatchery. Constructed in the late 1800s by what was then the Crocker-Huffman Land & Water Company, the dam diverts water to the south through the Main Canal. The Crocker-Huffman Land & Water Company was purchased by the MID in 1922 (URS 2006:2-8). The dam is 0.25 mile upstream from the proposed project restoration area, while the Main Canal is 0.4 mile to the south; neither will be impacted by project construction.

Table 2. Cultural Resource Investigations Conducted within the APE

CCIC Report No. (ST-)	Author	Date	Title
P-06671	URS	2006	Cultural Resources Final Technical Report, Merced River Corridor Restoration Plan, Phase 4: Dredger Tailings Reach, Merced County, California.
P-8192	Kress, Margret	2015a	Department of Water Resources Archaeological Survey and Cultural Resources Inventory Report, Merced River Ranch Dredger Tailings Screening Project, Merced County, California.

4 Inventory Methods and Results

4.1 Pedestrian Survey

All accessible portions of the project APE were subjected to a pedestrian survey for cultural resources on January 17, 2018, by Horizon archaeologist Dean Martorana. A Cramer Fish Sciences biologist, Whitney Thorpe, was also present and provided guidance in the field regarding the project limits and types of activities proposed. Ms. Thorpe also provided waders to allow for crossing the river and survey the southern side of the river in the APE. Both the north and south sides of the Merced River, including river banks where accessible, were subject to survey.

Regularly-spaced survey transects were not employed due to the presence of numerous dredger tailing piles covering the APE, ranging in height from 3 to 10 feet high. The areas of proposed floodplain excavation and gravel augmentation were more closely inspected, which totals about 15 acres; however, the majority of these areas have been subject to alteration and scouring during major rain events, as well as the disturbances caused by the early dredging activities. Any cutbanks along the river were more closely inspected for any evidence of buried deposits. Although the vegetation obscured much of the surface, any exposed ground surfaces were more closely inspected.

4.2 Survey Results

No archaeological sites, other than the mine tailings, were identified during the pedestrian survey. The majority of the survey area was covered in dredger tailings precluding the inspection of the ground surfaces beneath (see photos in Appendix A). An updated site record form for the Merced River Ranch Dredge Tailings, based on the observations of the survey, is found in **Appendix D**. The north and south banks of the Merced River are unlikely to contain subsurface prehistoric deposits, as they were within an area in which the river channel meandered freely prior to the 1870s. Furthermore, the entire area was subject to dredge mining, which thoroughly disturbed the ground to depths of up to 20 feet. No irrigation features, such as primary canals, wells, or dams, were observed within the APE.

Buried Resource Potential

To assess the potential for buried archaeological sites within the proposed project components, an investigation will often take into account factors that either encouraged or discouraged human use or occupation of certain landforms (e.g., geomorphic setting and distance to water), combined with those that affected the subsequent preservation (i.e., erosion or burial) of those landforms. It is well known, for instance, that prehistoric archaeological sites in California are most often found on relatively level landforms near natural water sources (e.g., spring, stream, river, or estuary), which is often where two or more environmental zones (ecotones) are present. Landforms with this combination of variables are frequently found at or near the contact between a floodplain and a higher and older geomorphic surface, such as an alluvial fan or stream terrace (Hansen 2004:5).

In general, most Pleistocene-age landforms have little potential for harboring buried archaeological resources, as they developed before the first evidence of human migration into North America (ca. 13,000 years before the present [B.P.]). However, Pleistocene surfaces buried below younger Holocene deposits do have a potential for containing archaeological deposits. Holocene alluvial deposits may contain buried soils (paleosols) that represent periods of landform stability before renewed deposition. The identification of paleosols within Holocene-age landforms is of particular

interest because they represent formerly stable surfaces that have a potential for preserving archaeological deposits.

A review of the bedrock and soil maps of the APE indicates that the area is underlain by dredge tailings (Soil Survey Staff 2018). Consequently, any pre-existing Holocene age deposits along this area of the Merced River have been removed or buried as a result of periodic flooding and the deposition of vast quantities of mining debris from hydraulic mining practices; therefore, the probability of intact buried deposits in the APE is considered very low.

5 Recommendations of Eligibility

The APE surveyed for the purposes of the current action falls within the larger expanse of tailings that run both north and south of the Merced River in the area between the town of Snelling to the Mariposa County border, or about 10-miles. Indeed, the portion of Snelling Gold Dredging Company tailings evaluated by URS (2006) is analogous to the type of tailings landscape recorded by Syda (2002), St. Clair (2006), Elliot and Peske (2012), and Kress (2015b). As a result, all of the areas previously recorded in this region of tailings represent different localities within the same larger tailings landscape. The tailings identified within the current APE is indicative of all of the tailings landscapes surveyed for the above reports, but it is mostly within the area surveyed as associated with the Snelling Gold Dredging Company as recorded by URS (2006) for the Merced River Corridor Restoration project. A more detailed discussion of the Snelling Gold Dredging company and its history is provided in URS (2006) and is attached to this document as Appendix B.

As mentioned above, the western half of the current APE has been subject to recent cultural resource investigations and the existing dredge tailings have been evaluated as part of those investigations (URS 2006). The remaining areas that were not previously surveyed and are within the current APE were surveyed for the purposes of this project's actions and, based on the results of this survey, the dredge tailings that represent this section of the Merced River extend into the current APE and therefore the previous evaluation of the tailings is considered applicable to the current APE. The following is a brief description of the evaluation conducted by URS (2006:4-4):

After an intensive pedestrian survey as well as detailed historical research of the project area it was concluded that there is little or no significant data potential beyond that recovered from the historical description associated with the dredger tailings; and, that the tailings do not contribute any new information to the study of dredging in California. The vast amount of documentary materials dealing with the subject of dredging, particularly government mining reports, provide detailed information on the history and practice of bucket line dredging in California. Additionally, historical records and documents indicate exactly which dredging company, Snelling Gold Dredging Company, was in operation in the specific project area. Historical documents provide information on the type of dredging that took place in the project area, dredging capacity, size of the buckets, and how many crew members were employed to operate it. Additional information provided by a former employee (Vischer n.d.) of the Snelling Gold Dredging Company provided information on the path that the company dredges worked in and thus, gave a better idea of exactly which dredge was in operation in the project area. Given the destructive nature of dredging, it is not expected that any intact deposits will be discovered under the existing tailings.

In 2012, URS (2012:5-3 to 5-5) again evaluated the Snelling Dredge Tailings as part of their Henderson Park survey and concluded that they are not eligible for listing in the NRHP/CRHR.¹

Indeed, the ubiquity of tailings throughout the region demonstrate the commonplace nature of tailings; and that the tailings in the Snelling Mining District are neither associated with a principal dredging field of California, nor are they associated with the peak period for gold recovery from

¹ A request was made to the Office of Historic Preservation about the eligibility status of the tailings on July 16, 2018, but OHP could not find a record of submittal for the tailings (OHP 2018) (see **Appendix E**).

dredging. Therefore, it was determined that the dredger tailings piles located within the APE do not appear eligible for listing on the NRHP under Criteria A, B, C, or D, as well as CEQA under Criteria A, B, C, or D (URS 2006). Based on the survey conducted for the purposes of the current actions, there has been no change to the conditions or nature of the tailings to suggest that this conclusion should be changed or updated. The APE represents the same mining operations, and the concomitant tailings landscape, associated with the Snelling Gold Dredging Company as recorded by URS (2006; 2012), and the tailings are considered not eligible for NRHP/CRHR listing for the purposes of this project.

6 Summary and Recommendations

A cultural resources field investigation was conducted of the proposed project's APE on January 18, 2018. While the proximity to the river and riparian habitats would indicate a higher potential to encounter archaeological resources, the current project APE has been so extensively modified that prehistoric sites are no longer extant in mined areas, or they are deeply buried by silts and mine tailings. Similarly, historic-era sites do not appear to have been common in this location, with the exception of the tailings itself. No irrigation-related features were observed in the APE.

As discussed in Section 4.2, it is highly unlikely that any intact deposits remain beneath the dredger tailings piles, as the dredging in this area extended to bedrock (up to 20 feet below ground surface), thus obliterating any subsurface deposits that may have previously existed. Moreover, the proposed excavation of the tailings to use for salmonid habitat will not exceed the pre-existing level of disturbance. Therefore, based on these findings and the recommendation of ineligibility for the Snelling dredge tailings, it is further recommended that the project actions will not affect historical resources/historic properties.

Despite the low sensitivity of the APE, as planning moves forward, any changes to the project footprint or the nature of the proposed project should be reviewed by an archaeologist for changes to the potential impacts to historical resources/historic properties. As in most cases, the possibility of encountering cultural resources, while low, still exists in this area. Therefore, mitigations, such as, but not limited to, the following, should be implemented as planning proceeds.

In the event that any prehistoric or historic subsurface cultural resources are discovered during ground disturbing activities, all work within 100 feet of the resources shall be halted and the Project Proponent shall consult with a qualified archaeologist to assess the significance of the find. If any find is determined to be significant (CEQA Guidelines 15064.5[a][3] or as unique archaeological resources per Section 21083.2 of the California Public Resources Code), representatives of the Proponent and a qualified archaeologist shall meet to determine the appropriate course of action. In considering any suggested mitigation proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, the lead agency shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the project site while mitigation for historical resources or unique archaeological resources is carried out.

Similarly, although unlikely, the possibility of encountering human remains cannot be discounted. Under Section 7050.5 of the California Health and Safety Code, it is a misdemeanor to knowingly disturb a human burial. If human remains are encountered, work must halt in the vicinity of the remains and, as required by law, the Merced County coroner should be notified immediately. An archaeologist should also be contacted to evaluate the find. If human remains are determined to be of Native American origin, the coroner must notify the Native American Heritage Commission (NAHC) within 24 hours of that determination. In accordance with PRC Section 5097.98, the NAHC, in turn, will immediately contact an individual who is most likely descended from the remains (i.e., the Most Likely Descendant). The Most Likely Descendant has 48 hours to inspect the site and recommend treatment of the remains. The landowner is obligated to work with the Most Likely Descendant in good faith to find a respectful resolution to the situation and entertain all reasonable options regarding the Most Likely Descendant's preferences for treatment.

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Appendix A

Photographs



Photo 1: View north of the river bank conditions along the western side of the project area.



Photo 2: View West of tailings on northwest portion of the project area.



Photo 3: View north of river bank conditions on the western side of the project area.

**Appendix B
Cultural Resources Technical Report,
Merced River Corridor Restoration Plan, Phase IV:
Dredger Tailings Reach, Merced County, California
(URS 2006)**

**CULTURAL RESOURCES
FINAL TECHNICAL REPORT**

**MERCED RIVER CORRIDOR
RESTORATION PLAN, PHASE
IV: DREDGER TAILINGS
REACH, MERCED COUNTY,
CALIFORNIA**



Prepared for
Stillwater Sciences
2855 Telegraph Avenue, Ste. 400
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May 15, 2006

URS

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