Project Description

The Department of Water Resources (DWR) and United States Bureau of Reclamation (Reclamation) propose to:

- Remove the existing fish passage impediment, including removal of the existing earthen road crossing and culvert infrastructure to:
    - Improve fish passage for federally and State-listed Green Sturgeon and adult and juvenile salmonids through the Tule Canal under non-flooded conditions
    - Reduce fish stranding and migratory delay in the Yolo Bypass under non-flooded conditions
- Construct a bridge that maximizes open flow area and provides continued agricultural equipment and vehicle access across the Tule Canal under non-flooded conditions

DWR is responsible for operating and maintaining the State Water Project (SWP), and Reclamation is responsible for managing the Central Valley Project (CVP). The SWP and CVP deliver water to agricultural, municipal, and industrial contractors throughout California. The National Marine Fisheries Service's (NMFS's) 2009 Biological Opinion (BO) and Conference Opinion (CO) on *the Long-term Operations of the Central Valley Project and the State Water Project* (NMFS 2009) specified the need for more reliable fish passage throughout the Yolo Bypass. Reasonable and Prudent Alternative (RPA) Action I.7 of the 2009 NMFS BO stated the need to reduce migratory delays and mortalities of federally listed fish species within the Yolo Bypass (NMFS 2009). The most recent *Biological Opinion on Long Term Operation of the Central Valley Project and the State Water Project* reissued by NMFS on October 21, 2019 (NMFS 2019) also includes the need to improve adult fish passage and reduce straying and migratory delays in the Yolo Bypass. Additionally, the fish passage improvements are required under Section 9.2.2 of the *Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta* (2081-2019-066-00) issued by the California Department of Fish and Wildlife on March 31, 2020 (CDFW 2020).

RPA Action I.7 of the 2009 NMFS BO focused on adult and juvenile fish passage improvements in the Yolo Bypass for four federally listed anadromous species: the Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*); Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*); and California Central Valley steelhead (*Oncorhynchus mykiss*), which are collectively referred to as salmonids; and the Southern Distinct Population Segment (Southern DPS) of North American green sturgeon (*Acipenser medirostris*). The Proposed Project was designed by DWR and Reclamation to achieve partial compliance with the aforementioned fish passage requirements in the Yolo Bypass.

Project Location

The Project is located in the northern portion of the Yolo Bypass, near the Sacramento Bypass and between the towns of Davis and West Sacramento in Yolo County, California. The Project area includes the Tule Canal north of Interstate 80 (I-80) and Agricultural Road Crossing 4 (ARC4), which provides access for vehicles and agricultural equipment from the east side of the Tule Canal to agricultural fields

on the west side of Tule Canal. ARC4 is approximately 13 miles south of Fremont Weir (Figure 1). The Project area is located within the United States Geological Survey (USGS) 7.5-minute Sacramento West quadrangle.

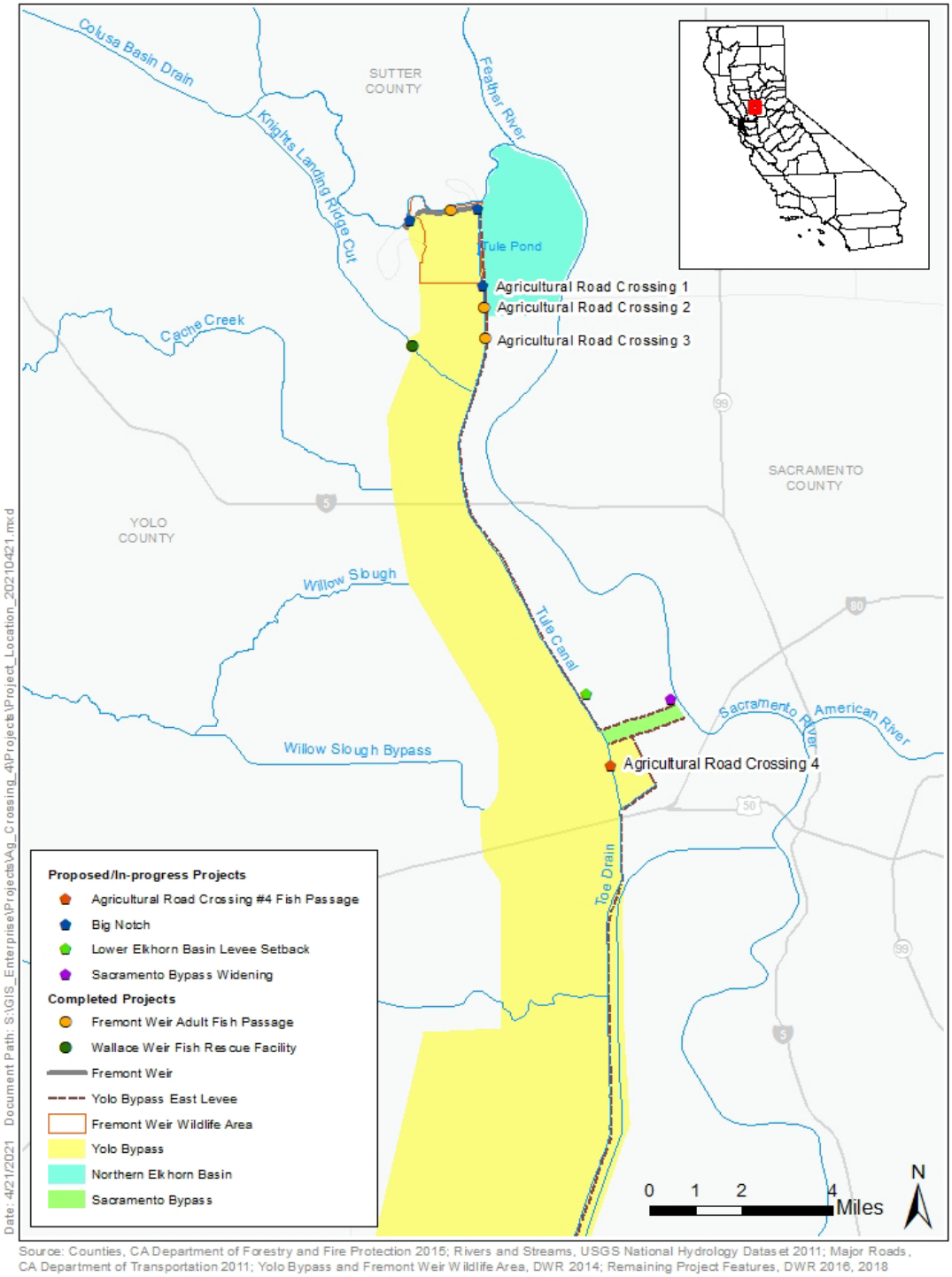

Figure 1. Project Location

Purpose and Need

The Proposed Project would facilitate partial compliance with State and federal fish passage requirements in the Yolo Bypass by removing an agricultural road crossing that acts as an impediment to fish movement through the Tule Canal.

The existing road crossing, which controls irrigation for agricultural and waterfowl purposes, is an earthen berm with two 48-inch-diameter culverts controlled by stoplogs, and one 72-inch-diameter culvert controlled by a cable-operated slide gate. Typically, the existing culverts are seasonally operated to impound water from May 15 to November 30 and are opened to allow flow through the structure from December 1 to May 14. When the culverts are opened in the winter, the land manager typically removes the earthen material off the top of the road crossing to prevent it from washing out during high flows, and replaces the earthen material to facilitate vehicle crossing the following season. Although the existing seasonal operation may facilitate some fish passage during the peak migration period for listed salmonids and sturgeon, the seasonal operation is not sufficient to reduce all migratory delays and stranding events.

The larger (72-inch diameter) culvert may provide adequate salmonid passage under some conditions; however, conditions required to provide sturgeon passage are less likely to occur. Therefore, most adult fish passage occurs during high flow events, once flows overtop the existing crossing and provide sufficient depth for fish passage. However, substantial flows are needed to provide sufficient depths and debris can become lodged in the culverts, which further reduces fish passage.

When ARC4 is not passable, fish downstream of the road crossing are only able to reconnect to the Sacramento River if they turn around and migrate downstream in the Tule Canal/Toe Drain, and exit the southern end of the Yolo Bypass into the Sacramento River near Rio Vista. However, flows coming from the northern Yolo Bypass can often attract salmonids and sturgeon to continue their migration upstream, resulting in migratory delays until the road crossing is passable.

When ARC4 is not passable, fish upstream of the road crossing may continue to migrate upstream through the Tule Canal to the Fremont Weir Adult Fish Passage (FWAFP) Project and Wallace Weir Fish Rescue Facility (WWFRF) that were recently completed by DWR (Figure 1). During and immediately following an overtopping event, salmonids and sturgeon that continue up through the Tule Canal may be able to use the FWAFP structure to volitionally return to the Sacramento River. In all other conditions, salmonids that continue upstream and through the Knights Landing Ridge Cut cross canal, can be rescued at the Wallace Weir fish collection facility and relocated to the Sacramento River.

The Proposed Project would be implemented to remove the fish passage impediment at ARC4 and provide a bridge to maintain agricultural equipment and vehicle access across the Tule Canal under non-flooded conditions.

Existing Features

Agricultural Road Crossing 4

ARC4 is located approximately nine-miles downstream from the confluence of Knights Landing Ridge Cut cross canal and Tule Canal, and one-mile upstream from I-80 (Figure 1).

The road crossing, which impounds water for agricultural and waterfowl management purposes, consists of two 48-inch-diameter culverts controlled by stoplogs and one 72-inch-diameter culvert controlled by a cable-operated slide gate (Figure 2). This road crossing is accessed by both maintenance vehicles and agricultural equipment and provides access from the east side of the Tule Canal to agricultural fields on the west side of Tule Canal under non-flooded conditions.

Adjacent landowners have existing pump infrastructure, elevated platforms, and stairways for utility access both northwest and southeast of the Project area. There is an existing power pole and guy wire on the eastern Tule Canal bank directly south of the existing crossing. Project modifications may require relocating the power pole, stairways, and other utilities, as needed (Figure 2).

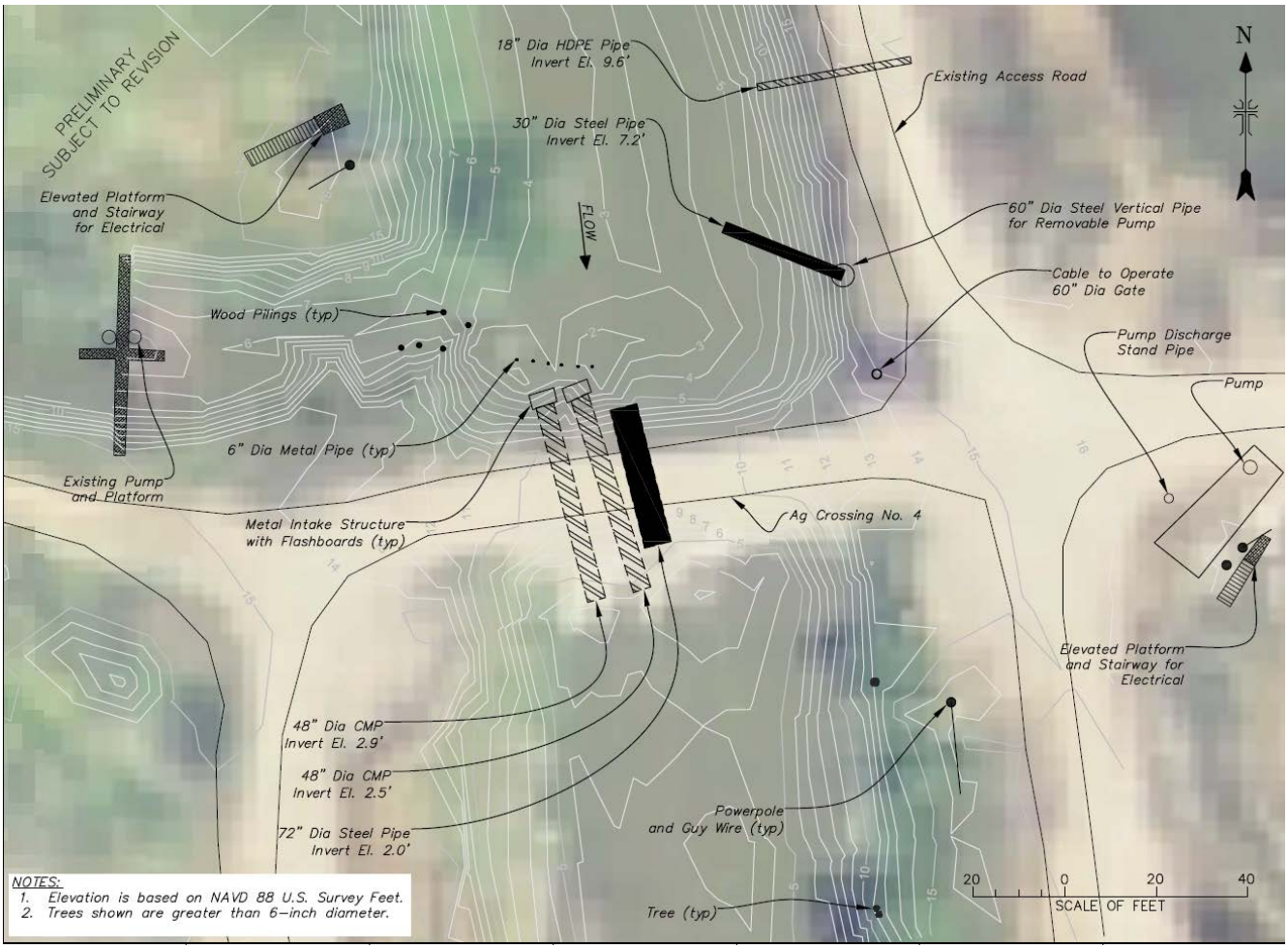

Figure 2. Agricultural Road Crossing 4 Existing Facilities- Plan View

Tule Canal

Tule Canal is a channel along the eastern side of the Yolo Bypass, which begins south of Tule Pond and connects with the Toe Drain to the south. Tule Canal receives water from westside tributaries and agricultural diversions nearly year-round. Tule Canal also drains the initial flows from the Sacramento River when the river rises above the crest of the Fremont Weir.

Proposed Project Features

The existing earthen road crossing would be removed and replaced with a permanent bridge structure that spans Tule Canal. The new bridge would consist of 2-span precast or cast-in-place concrete slabs. The bridge would be approximately 80 ft-long and 24-ft wide (22ft for roadway section). The design truck load for the bridge will be AASHTO standard HL-93 (single lane) with a total axle weight of 72 kips. Project disturbance will affect less than 5 acres of land. The overall construction footprint, shown in Figure 4, including staging areas, access road, and permanent Project features is approximately 3.88 acres.

Construction Methods

Site Access, Mobilization, and Staging

Construction easements for the Project would encompass staging areas for equipment and mobilization. After construction, staging areas would be returned to pre-construction condition. Staging areas and site access can be seen in Figure 3 and Figure 4. Depending on the conditions in the staging areas, minor tree and vegetation removal and local grading may be required. Additionally, the access route seen in Figure 4 may require some grading to improve construction access.

Figure 3. Project Features

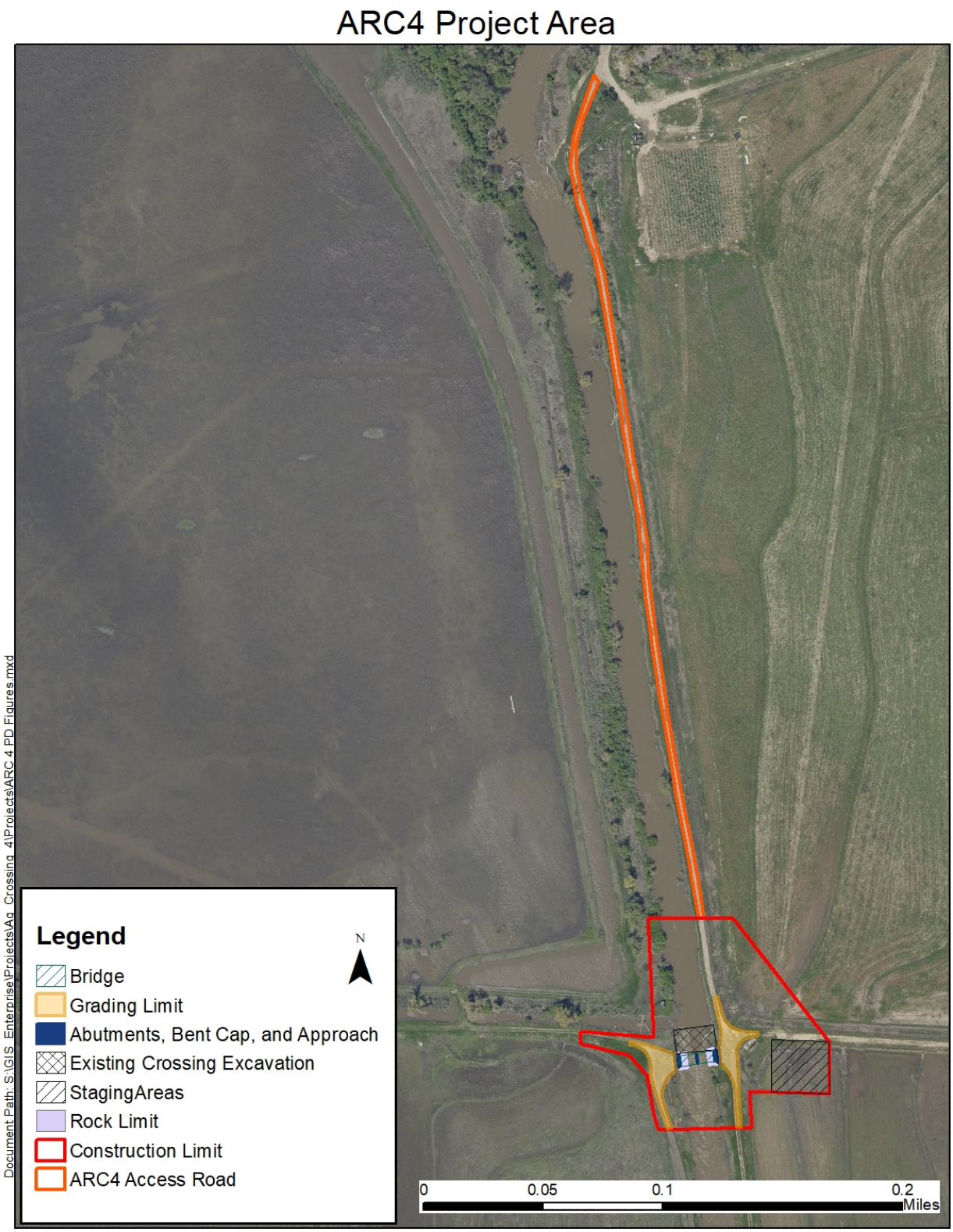

Figure 4. Project area, including access road and staging areas.

The Sacramento Bypass Levee and access roads used for construction access would be repaired to pre-Project conditions, if affected by construction of the Project. Prior to construction, DWR design and/or construction staff and the contractor shall conduct a road inspection if an impact to the local roads is anticipated. When necessary, inspections may include conducting core samples, the use of drones, filming, photography and other methods of documentation.

Construction equipment and materials would be transported from Interstate 5 (I-5) to Reed Avenue, then north on Harbor Boulevard. The Project area would be accessed by turning left on Tule Jake Road (road on the south side of the Sacramento Bypass Wildlife Area) and driving through the locked gate for 1.8 miles. The road turns left down off the levee on to the main access road. The Project area is 0.4 miles south of the Sacramento Bypass levee.

Site Preparation

Prior to the start of construction, the construction area would be clearly marked with flagging and signs. In addition, signage would be posted near the Sacramento Bypass entrance to let the public know not to enter the construction area. Low spots in the access road to the site would be filled and overhanging vegetation would be trimmed back to prepare for construction equipment access. Some grading may be required.

Exclusion fencing would be placed around the work area to exclude any wildlife, specifically giant garter snake. Clearing and grubbing would occur as needed in coordination with the on-site biologist. Turbidity curtains would be placed upstream and downstream of the existing crossing to avoid water quality concerns from degrading the existing crossing.

Bridge Construction

Construction Activities

Construction of the bridge features would involve site excavation, driving 15 concrete or steel cased piles with a hydraulic drop hammer, casting concrete pile caps at abutments, placing prefabricated bridge sections by crane or cast-in-place bridge sections, and placing a cast-in-place decking surface. Localized grading, see in Figure 3, would occur on the east and west sides approaching the bridge. If the construction work for the abutments is intended to be accomplished in a wet condition, then a coffer dam would be used to isolate the immediate abutment work areas on both sides of the Tule Canal. Depending on site conditions, the isolated abutment work areas may need to be drawn down, but not completely dewatered, to construct the abutments. The coffer dams would not impede hydraulic function of the Tule Canal. Best management practices to avoid water quality impacts would be implemented, which may include turbidity curtains, water quality monitoring, and on-site erosion control, if necessary.

Existing Crossing Removal

Construction Activities

Project construction would require excavation of the existing earthen road crossing and removal of the existing culverts once the bridge is installed. An excavator would do this excavation down to an elevation of approximately 3 feet (all elevations referenced are Vertical Datum: North American Vertical

Datum of 1988 – NAVD88, unless otherwise noted) to match the up- and downstream channel profile. This excavation would generate a total of approximately 840 CY of excess excavated material that would require removal from the construction area. The spoils, including soil, metal culverts, and concrete would be hauled to a landfill by dump trucks. Rock slope protection may be placed to stabilize the banks and canal after excavation, limits of rock slope protection can be seen in Figure 3.

Construction Equipment

A list of major equipment needed for the construction of the Project is provided in Table 1. Equipment specifics may vary based on the contractor's capabilities and the availability of equipment.

Table 1. Construction Equipment

- Excavator
- Crane
- Grader and roller
- Dozer
- Tractor/Loader/Backhoe
- Water truck
- Compressor
- Generator
- Coffer dam transport truck
- Skid-steer loader
- Rock slope protection transport truck
- Backhoe/Hydraulic excavator
- Bridge support pile transport truck
- Bridge support pile driving equipment
- Dump trucks
- Other equipment (e.g. chainsaw)

It is anticipated that maintenance equipment would consist of an excavator, loader, dozer, dump truck, mower, and other equipment (e.g. chainsaw), depending on the type of maintenance that needs to be performed.

Construction Schedule and Workers

Project construction would likely begin in 2022 and is estimated to last approximately 12 weeks. All Project components are expected to be completed in one construction season during times that are outside the flood period (July 1 through October 31). Construction would likely take place during daylight hours, typically from 7 am to 7 pm, Monday through Friday. These work times may be extended into the evening or weekend during key points of the construction phase, as needed.

Throughout the entire Project area, an estimated 10 construction personnel, two construction supervisors, and at least one biological monitor would be on-site daily during construction of the Proposed Project. Private worker vehicles would be parked within the staging areas or on top of the Sacramento Bypass levee road.

Proposed Maintenance

The newly constructed bridge would be a passive structure with no operational components.

Maintenance is expected to be low since the hydraulic capacity of ARC4 would be increased to more closely match that of the Tule Canal by removal of the crossing. The bridge would be visually inspected annually. In addition, visual inspections may occur at the beginning and end of the flood season, prior to the agricultural irrigation season, and after overtopping or high flow events. Debris removal would be performed by DWR's Sacramento Maintenance Yard and would typically be conducted outside of flood season, between April 16 and October 31. However, if debris is observed outside of this window and is affecting fish passage or is impeding flow, debris may be removed in coordination with the appropriate regulatory agencies. Debris removal in and around the bridge would be accomplished using an excavator or a crane.

If scour is observed, rock slope protection material may be replaced in the wet. Placement of rock slope protection would occur between June 1 and August 31 to avoid listed species presence windows. Rock slope protection would be placed by DWR's Sacramento Maintenance Yard using a dump truck, backhoe, or similar type of equipment.