Appendix G

Water Quality Study Memorandum

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Memorandum

Date: **March 5, 2021**

To: **Julie Passalacqua, Victor Sherby - Mark Thomas**

From: **Analette Ochoa, Catherine Villarosa - WRECO**

Subject: **Water Quality Study Memorandum for the CR 96 Over Dry Slough Bridge**

1 GENERAL DESCRIPTION

1.1 Introduction

This memorandum summarizes the water quality requirements for the County Road (CR) 96 Over Dry Slough Bridge Project (Project).

1.2 Project Description

Yolo County proposes to replace the existing bridge on CR 96 crossing over Dry Slough with funding made available through the Federal Highway Administration (FHWA) Highway Bridge Program and administered by the California Department of Transportation (Caltrans). The bridge was determined to be functionally obsolete by Caltrans as recently as 2013 and currently has a sufficiency rating of 53.6.

The Project site is located within the southern region of Yolo County, between Interstate 505 and State Route 113. See Figure 1 for the Project Vicinity Map, Figure 2 for the Project Location Map, and Figure 3 for the Project Aerial Map. CR 96 is a rural local roadway that extends between Russell Boulevard on the south and CR 27 on the north. Within the Project vicinity, CR 96 is paved and has an approximate width of 20 feet. The bridge, with an Average Daily Traffic count of 216 vehicles, is bordered by agricultural and residential parcels. There are five driveways on the east side and four driveways on the west side of CR 96. There is a residential structure approximately 100 feet northwest of the bridge and an agricultural building approximately 60 feet southeast of the bridge. The posted speed limit along CR 96 within the Project vicinity is 45 miles per hour (mph).

The existing bridge (Bridge No. 22C0127) was constructed in 1929 and is approximately 44 feet long and 20 feet wide. The structure consists of single-span reinforced concrete T-girders. The bridge has longitudinal and shear cracking along the girders and evidence of water penetration through the deck. Additionally, the bridge railing is in poor condition with spalling and exposed rebar.

The proposed Project will construct a new bridge along the same roadway alignment. The new structure will accommodate two 11-foot travel lanes and 2-foot shoulders. The new bridge will be a 60-feet-long, single-span structure. The structure type will be a cast-in-place, post-

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tensioned concrete slab. The roadway and bridge profile will be lowered slightly to smooth out the existing substandard vertical curve, while still providing clearance over the 100-year storm event.

Construction of the bridge will involve excavation for and construction of concrete abutments, founded on driven piles. The new abutments will be constructed behind the existing abutments, and most of this work will occur outside of the waterway. Construction of the roadway approaches will involve the removal of existing pavement and placement of new roadway fill material, aggregate base, hot mix asphalt pavement, and installation of guard rail. Tree removal and removal of other vegetation along the slough will be necessary for the Project. Temporary work within Dry Slough includes removal of the existing structure, falsework erection and removal, and installation of scour countermeasures at the abutments. Temporary slough diversion is anticipated in order to complete activities within the waterway.

Relocation of overhead electrical and communication lines, including four utility poles, along the west side of CR 96 is anticipated as part of the Project. Although the traveled way and shoulders will remain within Yolo County's right-of-way, permanent acquisitions may be needed for the approach grading and utility relocation from three to four parcels. Temporary construction easements may be needed from up to seven parcels adjacent to the Project to facilitate driveway conforms, utility relocations, and allow construction access.

During construction, CR 96 will be closed to through traffic and a detour route made available. Vehicular traffic will be able to utilize CR 95, 31, and 29 as alternative routes. Construction is anticipated to begin in Spring 2023 and have a duration of approximately eight months.

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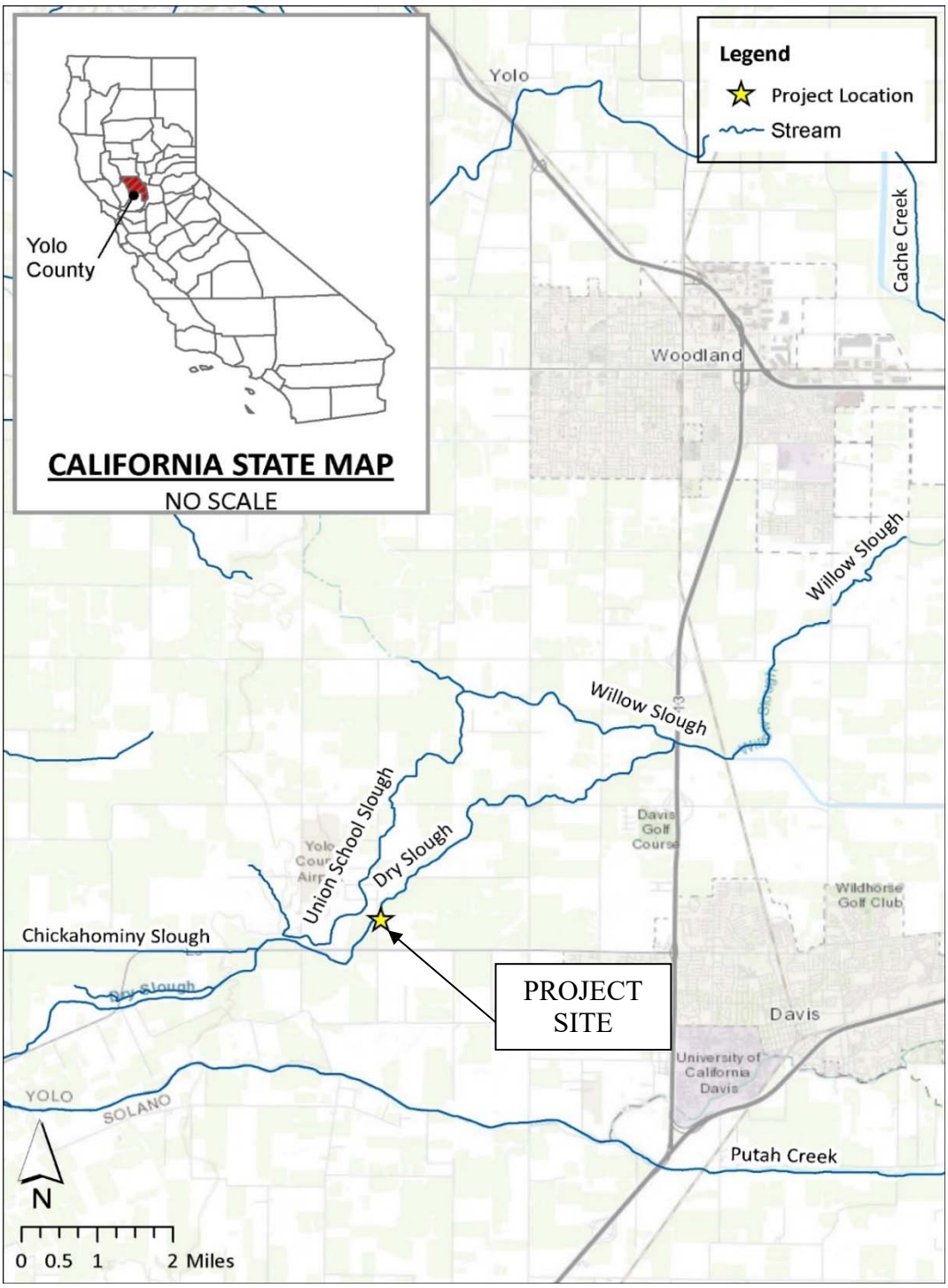

Figure 1. Project Vicinity Map

Source: United States Geological Survey (USGS), 2018

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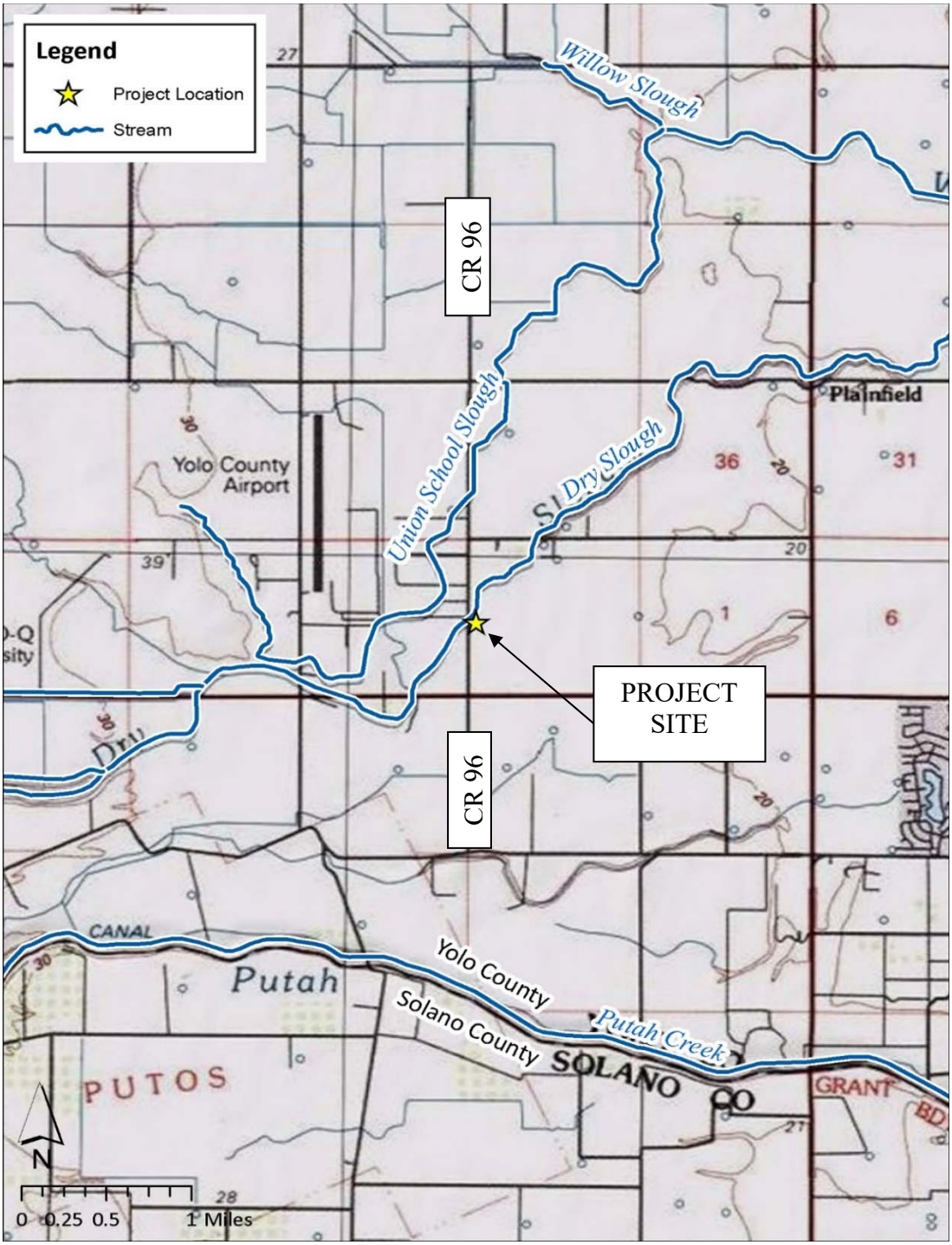

Figure 2. Project Location Map

Source: USGS, 2018

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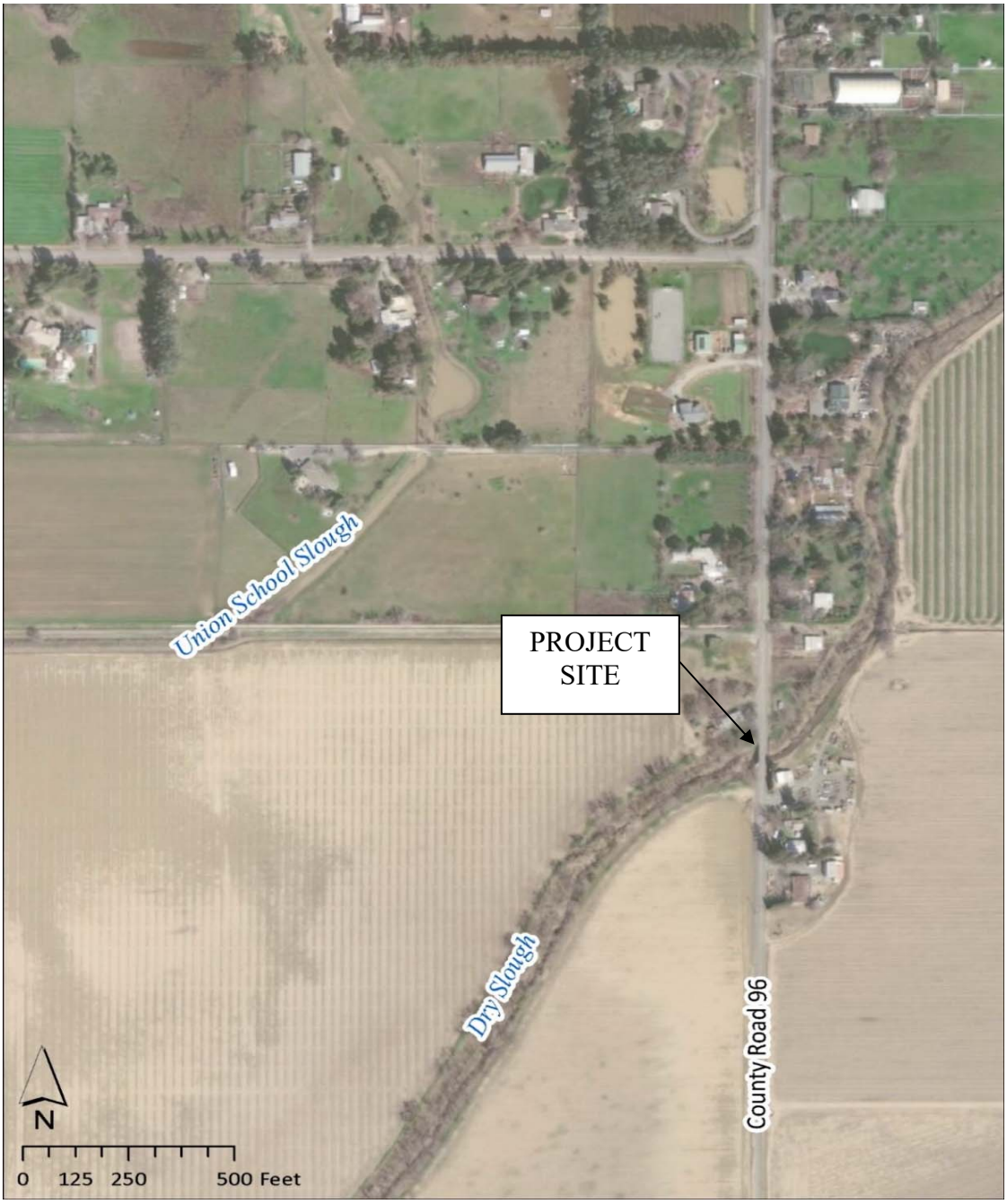

Figure 3. Project Aerial Map

Source: ESRI, 2019

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2 ENVIRONMENTAL CONDITIONS

2.1 Topography

The Project area is relatively flat, sloping west to east towards Willow Slough. Along CR 96, the elevations in North American Vertical Datum of 1988 (NAVD 88) range between 80 to 90 feet (United States Geological Survey [USGS], 2018).

2.2 Climate

The Project area has a Mediterranean climate, characterized by mild, moist winters and hot, dry summers. According to the Western Regional Climate Center (2020), for the Woodland 1 WNW station in California, the average yearly rainfall is 18.50 inches with the most rainfall occurring between October to April. Between March 1906 to May 2016, the annual temperatures range from an average high temperature of 96.3 degrees Fahrenheit to an average low temperature of 37.6 degrees Fahrenheit. The highest temperatures occur between the months of June to September, and the lowest temperatures occur between December to May.

2.3 Soil Characteristics

According to the *Draft Foundation Report for County Road 96 Bridge Replacement over Dry Slough* (2020), prepared by Crawford and Associates Inc., the immediate vicinity of the Project site is underlain by Rincon silty clay loam with hydrologic soil group rating C. Group C soils are classified as having a slow infiltration rate and a slow rate of water transmission.

The soils that were encountered in test borings completed for the study showed earth materials encountered in the borings separated into three units considered significant to the proposed Project. Unit 1 soil is classified as loose to medium dense silty/clayey sand and poorly graded sand with silt. Unit 2 soil is classified as stiff to hard lean clay and medium dense to dense silt. Unit 3 soil is classified as dense to very dense silty sand, poorly graded sand, silt with sand, and poorly graded gravel.

2.4 Land Use

The U.S Census Bureau determined the population of Yolo County to be approximately 220,500 (2019). According to the Yolo County *2030 Countywide General Plan* (2009), the land around CR 96 crossing over Dry Slough within the Project limits consists of largely agricultural uses. Other larger acreage uses include: open space, public and quasi-public uses, and specific plan uses. (County of Yolo, 2009)

2.5 Watershed Hydrologic Units / Hydrologic Sub-Areas

According to the Yolo County *2030 Countywide General Plan Environmental Impact Report* (EIR) prepared by LSA Associates, Inc., within the unincorporated county, there are about 7,300 acres covered in surface water. The surface water in Yolo County drains from west to east and is eventually received by the Yolo Bypass. The four major watersheds located in Yolo County include: Sacramento River, Cache Creek, Putah Creek, and Willow Slough watersheds. Dry

Slough is a tributary of the Yolo Bypass and contains the same beneficial uses as listed in Section 3.3.3.

The Yolo Bypass carries flood flows generated by runoff from the Sacramento River watershed and their associated tributary watersheds. Cache Creek is a tributary of the Yolo Bypass, however flow in the creek reaches the Bypass during the wet years due to damming and diversion of the stream's waters.

2.6 Crossings

2.6.1 Receiving Waterbodies

Dry Slough is the receiving water body for the Project and flows east and northeast approximately 2 miles to the Project site, as shown in Figure 2.

2.6.2 Drinking Water Facilities

According to the *Yolo County Stormwater Management Program (SWMP) Planning Document* (2003), Yolo County relies on the cities of Davis and Woodland to satisfy some of its permit obligations. The City of Davis Public Works Department maintains the water supply systems.

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3 PRELIMINARY WATER QUALITY ASSESSMENT

3.1 Regulatory Settings Federal

3.1.1 Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Known today as the Clean Water Act (CWA), Congress has amended it several times.

In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit program. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the State that the discharge will comply with other provisions of the act (most frequently required in tandem with a Section 404 permit request. See below.).

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The U.S. Environmental Protection Agency (EPA) delegated to the California State Water Resources Control Board (SWRCB) the implementation and administration of the NPDES program in California. The SWRCB established nine Regional Water Quality Control Boards (RWQCB). The SWRCB enacts and enforces the Federal NPDES program and all water quality programs and regulations that cross Regional boundaries. The nine RWQCBs enact, administer and enforce all programs, including NPDES permitting, within their jurisdictional boundaries. Section 402(p) requires permits for discharges of stormwater from industrial, construction, and Municipal Separate Storm Sewer Systems (MS4).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S, including wetlands. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

3.2 State Laws and Requirements

3.2.1 Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters

of the State. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDR) and may be required even when the discharge is already permitted or exempt under the CWA.

3.2.2 State Waters Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates water rights, sets water pollution control policy, issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

3.2.3 National Pollutant Discharge Elimination System Program

3.2.3.1 Construction General Permit (CGP)

CGP (NPDES No. CAS000002, SWRCB Order No. 2009-0009-DWQ, adopted on November 16, 2010) became effective on February 14, 2011 and was amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ. The permit regulates stormwater discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development.

The Project would not be required to adhere to the CGP, because the Project site does not disturb more than one acre or more of land.

3.2.3.2 Waste Discharge Requirements

If dewatering is required, then the Project would have to comply with the Central Valley Region's Order R5-2016-0076-01 NPDES No. CAG9950002 Waste Discharge Requirements Limited Threat Discharges to Surface Water. This permit discusses effluent limits that is allowed for volatile organic compounds (VOC), fuel compounds, and other wastes in extraction and treatment of polluted groundwater during dewatering activities.

3.2.3.3 Municipal Separate Storm Sewer System (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of stormwater dischargers, including MS4s. The U.S. EPA defines an MS4 as:

> any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying stormwater.

The Project lies within Yolo County's right-of-way. According to the Yolo County Boundary Map (Figure 4), the Project area is not within the incorporated cities of Yolo County, therefore

the Phase II permit would not apply to the Project as it adheres to Projects within any incorporated or urbanized areas.

The *Yolo County Stormwater Management Program (SWMP) Planning Document* (2003) provides guidance for addressing stormwater quality within the County's jurisdiction. The SWMP will address a wide variety of activities conducted in urbanized areas of the County that are sources of pollutants in stormwater. The construction activities element of the SWMP describes the controls to reduce the discharge of pollutants associated with construction activities. It will require construction sites to implement adequate water quality control measures by enforcing the implementation of the requirements through construction site inspections. Control measures address construction activities from the land development process to the completion of construction activities. The Project does not disturb more than one acre or more of land therefore these measures would not apply to the Project.

3.3 Regional and Local Requirements

3.3.1 Anticipated Permits

The Project may be required to obtain a Section 401 Certification from the Central Valley RWQCB and a Section 404 permit from the USACE since aquatic resources within the Project area would also potentially be regulated if work is to be anticipated in the water bodies. Work within waterways would require a Streambed Alteration Agreement (Fish and Game Code Section 1602) from the California Fish and Wildlife Services.

3.3.2 RWQCB Basin Plan

The Project is under the jurisdiction of the Central Valley RWQCB. The RWQCB implements the Region 5 *Central Valley Basin Plan (Basin Plan)* (2018) which states the goals and policies, beneficial uses, and water quality objectives that apply to water bodies through the Central Valley region, which includes the Project area. The Basin Plan has been adopted by the SWRCB, U.S EPA, and Office of Administrative Law.

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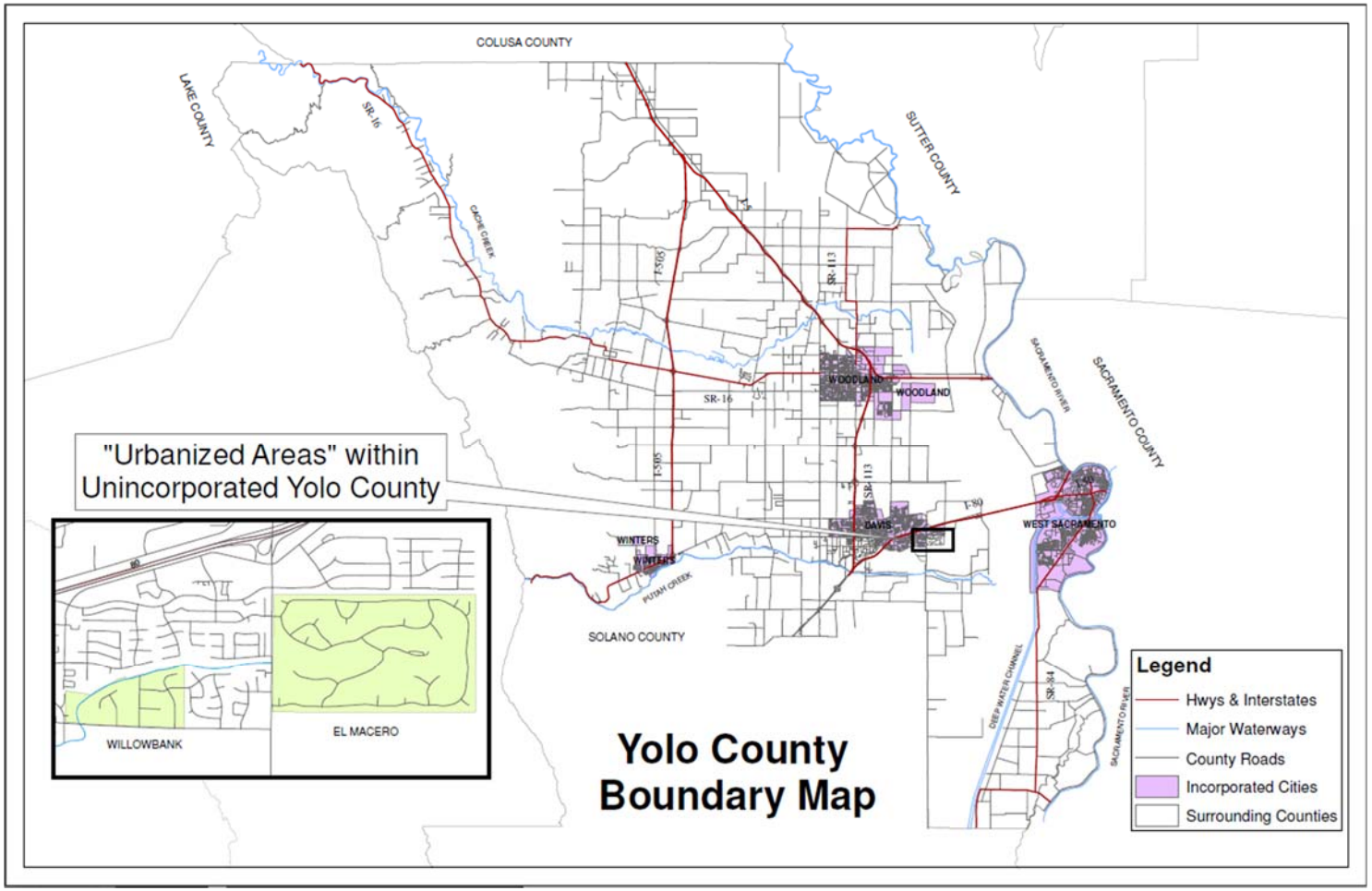

Figure 4. Yolo County Boundary Map

Source: Yolo County Planning and Public Works, 2013

3.3.3 Surface Water

Surface Water Quality Objectives/Standards and Beneficial Uses
Water quality objectives are numeric and narrative objectives used to define the appropriate levels of environmental quality, to protect beneficial uses, and to manage activities that can impact aquatic environments. The *Basin Plan* (2018) lists the following narrative and numeric water quality objectives for the region's surface waters: bacteria, biostimulatory substances, chemical constituents, cryptosporidium and giardia, color, dissolved oxygen, floating material, mercury, methylmercury, oil and grease, pesticides, pH, water temperature, toxicity, and turbidity.

Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning. The *Basin Plan* (2018) does not list any beneficial uses for Dry Slough which is a tributary to the Yolo Bypass. The Yolo Bypass does indicate beneficial uses in the Basin Plan (2018). As a tributary to the area, Dry Slough has the same beneficial uses shown in Table 1.

Table 1. Beneficial Uses

Beneficial use	Yolo Bypass
Agriculture Irrigation	E
Agriculture Stock Watering	E
Water Contact Recreation	E
Other Non-Water Contact Recreation	E
Warm Freshwater Habitat	E
Cold Freshwater Habitat	P
Warm Water Spawning	E
Wildlife Habitat	E

Source: Basin Plan, 2018

Notes:

- Beneficial uses include but are not limited to these uses
- E = Existing beneficial uses
- P = Potential beneficial uses

Water Quality Impairments and Total Maximum Daily Loads
The *2014/2016 California Integrated Report (Clean Water Act Section 303[d] List/305[b] Report)* (SWRCB, 2018) does not list the Yolo Bypass or Dry Slough for total maximum daily loads (TMDLs).

3.4 Groundwater Quality Objectives / Standards and Beneficials Uses

The Project is located within the Sacramento Valley Groundwater Basin Yolo Subbasin (5-21.67). Based on California's Groundwater Bulletin 118 (DWR, 2016), the Yolo Subbasin is located on the southern portion of the Sacramento Valley Basin primarily within Yolo County. It

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is bounded on the east by the Sacramento River, on the west by the Coast Range, on the north by Cache Creek, and on the south by Putah Creek.

According to the Central Valley RWQCB Basin Plan (2018), the Sacramento Valley Groundwater Basin Yolo Subbasin is not listed as having beneficial uses for groundwater.

3.5 Environmental Consequences and Project Impacts

3.5.1 Project Impacts

The Project is anticipated to have a DSA of 0.30 acres and 0.57 acres of added impervious area. Because the Project does not lie within the incorporated cities of Yolo County, the Phase II permit would not apply to the Project. The Project also does not disturb more than one acre or more of land, therefore it would not adhere to the CGP. Because of these criteria, the Project may be exempt from treatment BMPs. Temporary best management practices (BMP) and Permanent Erosion Control BMPs are project features that will be proposed to address water quality impacts of the Project.

3.5.2 Temporary Impacts and Project Features

Disturbed soils can result in sediment laden flows and increase the potential for erosion. Generally, as the DSA increases, the potential for temporary water quality impacts also increases. Routinely used temporary BMPs are included to protect water quality. These include preservation of existing vegetation, temporary cover for soil stabilization, temporary fiber rolls, silt fence for sediment control, potential creek diversion, dewatering, and temporary construction entrances and exits.

3.5.3 Permanent Impacts and Project Features

Long-term impacts from the Project could result from fill placed in environmentally sensitive areas, potential increases to the velocity and volume of downstream flows due to added impervious areas, and sediment transported from erosion. Stormwater runoff from the study area can potentially carry pollutants into naturally flowing streams, as well as into adjacent jurisdictional biotic/aquatic areas.

Yolo County's SWMP (2003) establishes a program for requiring permanent stormwater BMPs for major development and redevelopment projects. The Project's goal is to require the installation of permanent water quality control measures during the development application approval process such as permanent erosion control on disturbed slopes. The design of the control measures would then be verified during the development application approval process.

3.6 Avoidance, Minimization, and/or Mitigation Measures

3.6.1 Water Resources

The goal of the Project is to avoid or minimize the impacts to creeks, streams, riparian habitats, wetlands, and Waters of the United States and State.

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3.6.2 Temporary Dewatering Activities

According to the *Draft Foundation Report for County Road 96 Bridge Replacement over Dry Slough* (Crawford & Associates, Inc., 2020) construction dewatering is expected to be achievable during Dry Slough's dry season. A creek diversion may be needed during construction and all construction would be performed during the summer months per regulatory requirements and therefore the need for a diversion or dewatering would be minimized. If needed, the Project would have to obtain a dewatering permit and applicable non-stormwater BMPs would be required to manage the water quality levels in Dry Slough. The Central Valley Region's Order R5-2016-0076-01 NPDES No. CAG9950002 Waste Discharge Requirements Limited Threat Discharges to Surface Water discusses the permit for dewatering.

Dewatering would be achieved through diking/diversion of surface water and if present the use of sump pumps. The use of coarse, granular soils at the base of excavation would be expected to provide an appropriate working surface. During the winter and spring season, construction can expect a high-water surface level in the slough and may also encounter high groundwater levels that may require additional control.

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