APPENDIX F

Preliminary Federal Aquatic Resources Delineation Report

PRELIMINARY FEDERAL AQUATIC RESOURCES DELINEATION REPORT

PACIFIC GAS & ELECTRIC
THREEMILE SLOUGH PIPELINE CROSSINGS REMEDIATION AND DECOMMISSIONING PROJECT
SACRAMENTO COUNTY, CALIFORNIA

Padre Project No. 2402-1171

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1.0 EXECUTIVE SUMARY

Pacific Gas & Electric Company (PG&E) proposes to remediate two existing natural gas transmission pipelines and decommission and remove two previously abandoned pipelines that cross Threemile Slough. The Threemile Slough Pipeline Crossings Remediation and Decommissioning Project (Project) occurs on Threemile Slough between the Brannan Island State Recreation Area and Sherman Island in Sacramento County, California. Two pipeline crossings, L-131Y and L-131Z, will be remediated to address shallow depth of burial. The Project scope of work also includes the decommissioning and removal of two existing pipeline crossings at the same location that are no longer in use and were previously abandoned in place.

Padre Associates, Inc. (Padre), on behalf of PG&E, has prepared this delineation report to identify and delineate the geographic extent of Federal jurisdictional waters of the U.S. and wetlands. The methodology used in this wetland delineation is consistent with guidance provided by the U.S. Army Corps of Engineers (Corps) and Environmental Protection Agency (EPA) for federal jurisdictional Waters of the U.S. and wetlands.

During field survey efforts conducted in August 2024, Padre identified a total of 3.51 acres of Federal jurisdictional waters within the 7.6-acre study area. Activities within these delineated areas are regulated by the Corps.

Threemile Slough is a Navigable Waterway under Section 10 of the Rivers and Harbors Act of 1899 and a Water of the U.S. under Section 404 of the Clean Water Act (CWA) and is subject to Corps jurisdiction. Adjacent lands meeting the three-parameter definition of a federal wetland are also Corps jurisdictional under Section 404 of the CWA.

2.0 INTRODUCTION AND OBJECTIVES

2.1 BACKGROUND

Padre Associates, Inc. (Padre) has prepared this Federal Jurisdictional Aquatic Resources Delineation Report, on behalf of the Pacific Gas and Electric Company (PG&E), for the Threemile Slough Pipeline Crossings Remediation and Decommissioning Project (Project).

PG&E proposes to remediate two existing natural gas transmission pipelines and decommission and remove two previously abandoned pipelines that cross Threemile Slough. The proposed remediation of the shallowly buried pipeline sections consists of placing rock over the pipelines to achieve the prescribed minimum five feet of cover and restore the cover to the as-built condition. The proposed decommissioning for the two pipelines that were previously filled with cement and abandoned in place is complete removal of the pipelines beneath the slough, and removal of the pipelines from the waterside slope of the Sherman Island Levee and the north bank of the slough. This will require excavation of the north and south banks and underwater excavation along the pipeline alignment within Threemile Slough for removal of the previously abandoned pipelines.

2.2 OBJECTIVES

The objective of the aquatic resource delineation is to identify the geographic extent of waters of the United States, including wetlands that are under Corps jurisdiction. To accomplish this goal, the preliminary aquatic resource delineation can be submitted to the Sacramento District of the Corps to request verification of the location and geographic extent of jurisdictional waters and wetlands or with a permit application for the Project.

2.3 SITE LOCATION AND DIRECTIONS

2.3.1 Location

The Project site is located on Threemile Slough between the Brannan Island State Recreation Area and Sherman Island near the confluence with the Sacramento River. The Project site is located within the *Jersey Island, California* United States Geological Survey (USGS) 7.5-Minute Series topographic quadrangle map (Figure 1). The Project site is in Section 7, Township 3 North, Range 3 East and occurs within Sacramento County, California. Access to the Project site on the north bank of the slough is through the Brannan Island State Park and access to the Project site on the south side of Threemile Slough is from Sherman Island Levee Road.

2.3.2 Directions to the Site

From downtown Sacramento, take Interstate 5 south. Take exit 498 from Interstate 5 south and turn right onto Twin Cities Road. Make a left turn onto River Road and continue until making a right turn onto Walnut Grove Bridge. Make a left turn onto Interstate 160 south and continue until reaching Brannan Island State Recreation Area. Make a left turn into the recreation area.

2.4 CONTACT INFORMATION

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2.5 SITE GEOMORPHOLOGY AND LANDSCAPE SETTING

The Project site is located within the Delta subsection of the Great Valley ecological section of California (Miles and Goudey, 1997). The Delta subsection is located in low areas, near sea-level, at the confluence of the Sacramento and San Joaquin Rivers. The geomorphology of this subsection is a practically level plain, except for the levees of the Sacramento and San Joaquin Rivers. Elevations in this subsection range from a few feet on levees to sea-level, or lower, on the rest of the plain. Decomposition of organic deposits and consequential land subsidence is the main geomorphic process. Fluvial erosion and deposition are the main geomorphic processes on and adjacent to levees.

Three soil types that have been mapped by the Natural Resources Conservation Service (NRCS) are distributed across the Project area, as described in Section 4.3 below.

The Project is located within the Sacramento Valley subregion of the Great Valley California floristic region (Baldwin et al., 2012). The northern and western portions of the Project area are located within the Brannan Island State Recreation area. The southern portion of the Project area is located adjacent to agricultural and developed lands. The Project area crosses Threemile Slough which has a federal levee on the south side.

2.6 CLIMATE SUMMARY

The Project site is situated in Climate Zone 14, which includes Northern California's inland areas with some ocean influence (Sunset Western Garden Collection, 2024). The site has a climate that is moderated by the Pacific Ocean. The climate is characterized by slightly warmer winters and cooler summers than would be expected without moderation from the marine air. This is due to the opening in Northern California's Coast Ranges created by San Francisco and San Pablo bays which allows marine air to penetrate further inland. Most of the rainfall occurs during the period from November through April.

The nearest weather station with historic data that is representative of the climate at the Project area is the Concord Buchanan Field Station (041964), approximately 22.0 miles southwest of the Project area. The average maximum temperature for the 25-year period between 1999 and 2024 was 73.6° Fahrenheit (F), with a range of 58.3°F in January to 88.4°F in July. The average minimum temperature was 49.6°F with a range of 40.3°F in December and 58.7°F in August. The average annual precipitation is 14.91 inches with a range of 0.00 inches in July to 3.39 inches in December. No precipitation falls as snowfall in this location (Western Regional Climate Center, 2024).

Using climate data from the Concord Buchanan Field Station in Concord, CA, located approximately 22.0 miles southwest of the Project site, it was determined that the delineation field effort occurred during a period of average rainfall. Therefore, climatic conditions at the site can be considered normal. Table 1 below shows analysis of climate data obtained from the Western Regional Climate Center (WRCC) Climate Analysis for Wetlands Table (WETS table) used to determine site conditions at the time of surveys (Western Regional Climate Center, 2024) (Appendix A). The three months prior to the survey are shown on the left, followed by the lower-than-average rainfall, average rainfall, and above average rainfall amounts as determined based on long-term rainfall records. Under the “Rain Fall” column are the actual precipitation values for each of the three months leading up to the survey. Each month’s condition (dry, normal, wet) is assigned based on comparison to the long-term rainfall records and is considered against a weighted number that prioritizes the month prior to surveys over the two preceding months. The condition value and month weight value are then multiplied, and the results are summed and compared to an index evaluating values from 6 to 18. The sum value of 11 that was generated using the Concord Buchanan climate data indicates that the August 2024 delineation surveys were conducted at a time that had normal rainfall conditions.

The fieldwork for this delineation was conducted in August during the middle of the dry season at the Project site. During the dry season, it is common for this region to receive no rainfall; however, the average monthly rainfall data are not always 0.00 inches because during some years the dry months will receive trace amounts of precipitation. This uncommon summer rainfall inflates the total average precipitation for these months. In the majority of years this region will receive no precipitation during the dry season so 0.00 inches of rain is considered normal. In this manner, 0.00 inches of rain can be below average while still being considered normal simultaneously. As a result, the WETS table analysis is often unable to conclude drier than normal conditions during dry season months when it is normal to receive no rainfall. Despite this, a WETS table analysis can still be useful for indicating wetter than normal conditions during surveys conducted in the dry season.

Table 1. 2024 Precipitation Analysis

		Long-term Rainfall Records (Period of Record 1999-2024)							
	Month	3 yrs. in 10 < (Inches)	Average (Inches)	3 yrs. in 10 > (Inches)	2024 Rain Fall (Inches)	Condition[1]	Condition Value[1]	Month Weight Value	Products of previous two columns
First month prior to surveys	July	0.00	0.00	0.00	0.00	N	2	3	6
Second month prior to surveys	June	0.00	0.11	0.04	0.00	D	1	2	2
Third month prior to surveys	May	0.11	0.39	0.37	0.86	W	3	1	3
								Sum[2]	**11**

[1]Condition / Condition Value:
D = Dry / 1
N = Normal / 2
W = Wet / 3

[2]Index for Sum:
6 - 9 = period preceding surveys has been drier than normal
10-14 = period preceding surveys has been normal
15-18 = period preceding surveys has been wetter than normal

Precipitation in the months preceding a delineation can influence wetland indicators observed in the field. It is important to understand the influence that precipitation in months leading up to the surveys may have on field conditions at the time surveys were conducted. The normal rainfall conditions concluded by the precipitation analysis were taken into consideration during analysis of the field data collected for this report.

3.0 REGULATORY AUTHORITY

3.1 FEDERAL REGULATIONS

3.1.1 Waters of the United States

The Corps and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into jurisdictional waters of the U.S. and wetlands under Section 404 of the Clean Water Act.

The Corps is responsible for the issuance of permits for the placement of dredged or fill material into waters of the U.S. pursuant to Section 404 of the Clean Water Act (33 USC 1344). As defined by the Corps at 33 CFR 328.3(a)(3), waters of the U.S. are those waters that are used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; tributaries and impoundments to such waters; interstate waters; and territorial seas.

The Corps asserts jurisdiction over traditional navigable waters (TNW) and certain tributaries and adjacent wetlands that meet current federal definitions. In non-tidal waters, the lateral extent of Corps jurisdiction is determined by the OHWM which is defined as the: "…*line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas*." (33 CFR 328[e]).

In tidal areas, the Corps jurisdiction under Section 404 extends to the high tide line (HTL), which, in the absence of actual data, is defined as: "…*a line of oil or scum along shore objects, a more or less continuous deposit of fine shells or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide*."

The EPA and Corps issued a Revised Definition of waters of the United States that aimed to establish a durable definition of waters of the U.S. based on pre-2015 regulations, relevant Supreme Court decisions, the science, and the agencies' technical expertise. The Revised Definition became effective March 20, 2023, but on September 8, 2023, the EPA and Corps amended the Revised Definition to conform with the Supreme Court decision in the case of *Sackett v. Environmental Protection Agency (Sackett)*. Federal regulation concerning tributaries and adjacent wetlands has recently been revised in an amended Revised Definition of Waters of the United States to conform with the Sackett decision (Conforming Rule) (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, 2023).

3.1.2 Federal Wetlands

Wetlands are a special category of waters of the U.S., and are defined at 33 CFR 328.3(b) as: *"...those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

The Corps utilizes the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), herein referred to as *1987 Manual*, to identify wetlands subject to regulatory

jurisdiction (jurisdictional wetlands) under the CWA. In Northern California, the Pacific Northwest, and mountainous regions of the western U.S. the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (version 2.0)* prepared by the Corps' Engineer Research and Development Center (2010) is used to delineate jurisdictional wetlands. The spatial extent of the Western Mountains, Valleys, and Coast Region extends to some locations in the San Francisco Bay Area and the decision to use this Regional Supplement instead of the Arid West can be made by the delineator based on landscape and site conditions. The Western Mountains, Valleys, and Coast Regional Supplement was used in this case for consistency with the previous delineation efforts on this site.

The Corps identifies jurisdictional wetlands using a three-parameter definition using vegetation, soil, and hydrological characteristics. Excluding unusual conditions (atypical conditions or disturbed sites), all three parameters must be present for a site to be considered a jurisdictional wetland.

Wetlands can be regulated as waters of the U.S. if they are adjacent to jurisdictional waters. Under the Conforming Rule adjacent wetlands are defined as having a continuous surface connection.

3.1.3 Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

The Corps is also responsible for authorizing work affecting navigable waters of the United States. Structures or work under or over a navigable water of the United States is considered to have an impact on the navigable capacity of the waterbody (33 CFR 322.3[a]). All waterways subject to the ebb and flow of the tide are considered navigable waterways. Threemile Slough is identified as a Section 10 waterway. The Mean High Water Line is the extent of Corps jurisdiction in tidally influenced Section 10 waterways.

3.1.4 Section 14 of the Rivers and Harbors Act of 1899 (33 USC 408)

The Corps Civil Works Program is responsible for reviewing all Project approvals that alter or occupy Civil Works projects. Section 408 provides that the Corps may grant permission for another party to alter a Civil Works project upon a determination that the alternation proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project. The south bank of Threemile Slough is a federal levee along the north side of Sherman Island; however, if pipeline remediation and decommissioning activities are approved by minor alteration agreement issued by the Central Valley Flood Protection Board, a Section 408 review and permission will not be required.

4.0 METHODOLOGY

Methodology used in this delineation is consistent with guidance provided by the Corps and the EPA for Federal jurisdiction.

4.1 LITERATURE REVIEW

Prior to the field delineation, Padre conducted a literature review to determine the general character of the proposed Project site, and to identify potential areas of concern. Documents and resources reviewed included the following:

- Project site map
- U.S. Geological Survey (USGS) 7.5-minute topographic map for the Jersey Island, California quadrangle
- Soil survey and hydric soil list for Sacramento County, California
- National Wetland Inventory (NWI) Maps of the Jersey Island, California quadrangle
- Concord Buchanan WRCC weather station (041964)
- Stream gage data from the USGS Threemile Slough NR Rio Vista CA Station (Station #11337080)
- Tide data from the NOAA Threemile Slough, San Joaquin R., CA (Station #9415193)

4.2 DELINEATION METHODS

Field surveys for the purposes of site characterization and preliminary aquatic resources delineation were conducted by Padre biologists on August 15, 2024. An aquatic resources delineation study area (study area) was identified prior to beginning field surveys. The study area includes all temporary impact areas, staging areas, and access routes. The boundaries of the study area are depicted in Figure 2.

The Corps has prescribed methodologies for delineating waters/wetlands pursuant to the Clean Water Act. Padre used the Corps standard wetland delineation methods in developing survey results for the site. For delineating Waters of the U.S. in non-tidal environments, the Corps' standard is to locate the OHWM. For delineating Water of the U.S. in tidal environments, such as Threemile Slough, the Corps' standard is to locate both the mean high water (MHW) and the spring high tide line (HTL). Methods for delineating the MHW and HTL are described below in Section 4.2.1.

The standard methods for delineating wetlands are detailed in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and further refined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (U.S. Army Corps of Engineers, 2008). These manuals require that, under normal circumstances, an area possess three technical criteria (parameters) to be designated as a potentially jurisdictional wetland. These criteria are the presence of wetland hydrology, the presence of hydric soils, and the prevalence of hydrophytic vegetation. The following sections of this report summarize Padre's approach to surveying and documenting limits of Other Waters of the U.S. with the HTL and MHW as well as indicators of the three parameters throughout the

study area, and subsequently determining the limits of aquatic resources that are potentially jurisdictional waters and wetlands.

4.2.1 Other Waters of the U.S.

Within the study area boundary, Threemile Slough is classified as a tidal, unconsolidated bottom, semi permanently flooded-tidal, riverine system. Threemile Slough is part of the San Francisco Bay-Delta waterways that are used for interstate or foreign commerce. In tidal systems, the limits of Section 404 jurisdiction are defined by the HTL. The jurisdictional limits of Section 10 waterways are delineated by the MHW. To determine the HTL and the MHW within the study area, a combination of stream gage data and physical indicators observed in the field were used.

4.2.1.1 Stream Gage Data Analysis

During the literature review, stream gage data was analyzed to ultimately determine what gage height waterway routinely reaches during high tide events. This gage height is correlated to the HTL and, therefore, the limits of Corps jurisdiction. The nearest USGS stream gage is located approximately 0.7 miles downstream of the study area in the middle section of Threemile Slough (Station #11337080) (USGS, 2024). Using gage height data, combined with the elevation of the gage itself, the elevation at which the HTL is located can be determined. The stream gage is listed at 0 feet elevation and is in very close proximity to the study area so its gage height data can be interpreted to represent the study area very closely. Once the gage height of the high tide is determined, it can be used to confirm field observations of HTL indicators as discussed in section 4.2.1.3 below.

4.2.1.2 Field Data Collection

As previously discussed in section 3.1.1, the high tide line (HTL) can be determined in the field using physical characteristics including a line of oil or scum along shore objects, a continuous deposit of fine shell or debris, vegetation lines, and other physical markings or characteristics. After identifying the most likely location of the HTL using physical characteristics in the field, the elevation of the HTL can be determined using GPS, available topographic contours, or other land surveying techniques. The HTL and the delineated boundary of other waters of the U.S were recorded in the field using an EOS Arrow GPS with submeter accuracy. In some cases, where appropriate, the extent of the feature was delineated or refined using aerial imagery, mapped vegetation communities, or topographic contours. The combined GPS and digitized field data were overlaid onto aerial imagery to produce a preliminary aquatic resources delineation map of the study area (Figure 3).

4.2.1.3 Verification with Stream Gage Data

Once the location of the HTL has been identified using field indicators, the final step is to confirm its location using the stream gage data analysis. The elevation of the HTL delineated in the field should closely match the gage height of the HTL determined using stream gage data. Factors including the distance between the study area and the USGS stream gage can affect the correlation between physically observed indicators of HTL and gage data analysis; however, given the proximity of this site to the USGS stream gage, data obtained from the stream gage is representative of the tidal conditions in the study area.

4.2.2 Wetlands

One delineation sample plot was located within the study area to characterize the presence (or absence) of hydrophytic vegetation, hydric soils, and wetland hydrology outside of the boundaries of other waters of the U.S. The delineation sample plot was positioned to determine the extent of a potential wetland feature. The only location within the study area that showed potential wetland characteristics (presence of hydrophytic vegetation) was tested with a sample plot to determine the presence or absence and potential geographic extent of jurisdictional wetlands. This sample plot was not paired with an additional data point because it did not meet the three parameters and was determined not to be a wetland. See section 5.2 below for additional details on sample plot location and condition.

4.2.2.1 Hydrophytic Vegetation

Hydrophytic vegetation is plant life that occurs in areas that are frequently flooded or have saturated soil for a prolonged duration during the growing season. In accordance with Corps methodology, for a site to display a positive wetland vegetation indicator, a dominance or prevalence of hydrophytic plant species must be present.

To determine the dominance or prevalence of hydrophytic vegetation, circular sample plots are selected. The plot radius size is determined according to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (U.S. Army Corps of Engineers, 2008). A five-foot radius plot is used in areas with only herbaceous vegetation, a 15-foot radius plot is used in areas with shrubs and sub-shrubs, and a 30-foot radius plot is used in areas with trees. These values can be adjusted at the site to fit the specific setting. For example, if the sample plot radius overlaps multiple vegetation communities, and potentially the wetland boundary, the radius may be reduced. Within the sample plot, the plants were identified to species using standard taxonomic references (Baldwin et al., 2012). The hydrophytic class of each plant species was determined in accordance with the *National Wetland Plant List, Version 3.5* (U.S. Army Corps of Engineers, 2020) as facultative, facultative-wetland, or obligate wetland species. Sampling results were entered on approved wetland delineation forms (Appendix B). Table 2 contains a list of all plants observed during delineation surveys.

4.2.2.2 Hydric Soils

At the sample plot location, a soil pit was excavated to a depth of approximately 18 inches below ground surface (bgs) to determine the extent of saturation and to examine the soil for evidence of wetland hydrology. Once the pit was excavated, the soil profile was described on the wetland delineation form. After moistening, the soil color was determined using Munsell soil color charts (Munsell Color, 1990). Evidence of redoximorphic characteristics, such as low matrix chroma, gleying, and/or presence of redox features (e.g., concentrations or depletions) resulting from anaerobic conditions were recorded in the description to determine if hydric soil indicators were present in the soil profile. Soil texture was evaluated using field methods described by the Corps (Environmental Laboratory, 1987). The characteristics of the soil were then compared against descriptions of the soil-mapping units for the study area (NRCS, 2024) and analyzed to determine if it met one of the Arid West hydric soil indicators.

4.2.2.3 Wetland Hydrology

The NWI map of the Jersey Island 7.5-minute quadrangle was reviewed prior to the delineation of waters and wetlands within the study area (USFWS, 2024). NWI mapped a total of three wetlands within or immediately adjacent to the Project study area (Appendix C). Threemile Slough is depicted on the NWI map as a tidal, unconsolidated bottom, semi permanently flooded riverine system (R1UBT). The north bank of Threemile Slough is depicted as a freshwater forested/shrub wetland and is classified as palustrine, forested, broad-leaved deciduous, temporary flooded-tidal (PF01S). In addition, a forested/shrub wetland is mapped adjacent to the disturbed field in the southern portion of the study area and overlaps slightly with the study area. This wetland consists of a dredged agricultural ditch adjacent to the west of the study area and is classified as palustrine, forested, broad-leaved deciduous, seasonally saturated, diked/impounded (PFO1Bh).

Determination of wetland hydrology followed the standard procedures outlined in the 1987 Corps Manual (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (U.S. Army Corps of Engineers, 2008). Precipitation events preceding the delineation effort were also tracked to guide analysis of site hydrologic conditions, though delineation surveys were conducted in late summer, during the dry season. The Wetland Determination Data Form – Arid West Region was used in the field to guide inspection for and determination of wetland hydrology. Wetland hydrology indicators as described on the data form and in the Regional Supplement were evaluated while the soils and vegetation specialists were making their evaluations. The investigation consisted of walking the area and noting landscape position, indicators of previous flow vectors, and other signs of water flow or accumulation. Primary and secondary wetland hydrology indicators were noted and checked on the Arid West Data Form.

5.0 RESULTS

5.1 OTHER WATERS OF THE U.S.

Using a GPS, the location of the physical indicators of high tide line (HTL) were recorded on both banks of Threemile Slough.

A transect was walked on the south bank of Threemile Slough within the study area to identify the HTL. At the time surveys were conducted, the tide was low, allowing delineators to stand below physical indicators of HTL. Indicators of HTL that were identified included deposits of flotsam on the bank in the form of dead vegetation, driftwood, and trash. There was limited vegetation present below the HTL on the south bank, in part due to the presence of large riprap. Vegetation observed included herbaceous hydrophytes like alligator weed (*Alternanthera philoxeroides*) and tule (*Schoenoplectus acutus* var. *occidentalis*). A variety of submerged aquatic vegetation was also observed including Brazilian waterweed (*Egeria densa*), Berchtold's pondweed (*Potamogeton berchtoldii*), crisp-leaved pondweed (*Potamogeton crispus*), and parrot's feather (*Myriophyllum aquaticum*). Above the indicators of HTL, the vegetation abruptly transitions to a California sycamore and coast live oak riparian woodland vegetation community, consisting of a narrow band of coast live oak trees (see section 5.2.1).

On the north side of Threemile Slough, most of the bank is inaccessible due to steep eroded cliffs and dense vegetation. Only two small sections of the bank were accessible, so HTL was not walked along the entire north bank within the study area. Points along the HTL were recorded within the two sections of accessible bank and then extrapolated for the rest of the study area based on these points, topographic contours, and aerial imagery. Most areas at the top of the bank were covered in dense patches of Himalayan blackberry (*Rubus armeniacus*). Where visible, almost no vegetation was present below the HTL except for small patches of tule within Threemile Slough. Above the indicators of HTL, the vegetation transitions into a sandbar willow thicket vegetation community (see section 5.2.1).

Stream gage data analysis identified that the approximate location of the HTL was at 7 feet elevation (USGS, 2024). After plotting the GPS points recorded in the field for physical indicators of HTL, it was determined that the approximate location of the HTL was at 8 feet elevation. Although at slightly different elevations, the indicators observed in the field closely matched the expected HTL derived from stream gage data, and the HTL was therefore mapped at approximately the 8-foot elevation contour.

5.2 WETLANDS

5.2.1 Hydrophytic Vegetation

The study area is located south of the City of Rio Vista, between Brannan Island and Sherman Island. The surrounding area consists primarily of agricultural and developed land. A State Park and recreational area is located on the north and western sides of Threemile Slough and the eastern and southern sides of the slough are comprised of agricultural fields.

Six vegetation communities were identified onsite during field surveys (Figure 2). Wild oats and annual brome grasslands were present on Sherman Island along the landward levee slope adjacent to Sherman Island East Levee Road and throughout the majority of the upland study area on Brannan Island. A non-natural vegetation community with a significant amount of human

disturbance was also present within the southern portion of the study area on Sherman Island. This community was classified as disturbed land. Along the south bank of Threemile Slough, a California sycamore and coast live oak riparian woodland was present along the shoreline. On the north bank of Threemile Slough, a sandbar willow thicket was present along the steep banks. There were small pockets of emergent hydrophytic vegetation growing on both banks of Threemile Slough but these were not large enough to be considered separate vegetation communities. Threemile Slough is classified as a riverine community. Lastly, there were developed areas present including roads and a parking lot within the study area on both Brannan and Sherman Islands.

Vegetation communities were determined based on species composition and descriptions from *A Manual of California Vegetation* (MCV) (Sawyer et al., 2009) but were modified as needed to accurately describe the existing habitat observed within the study area. Plant species lists are provided for the study area in Table 2. Vegetation Communities mapped within the study area are shown in Figure 2. Below is a brief description of the six vegetation communities mapped within the study area.

5.2.1.1 California Sycamore and Coast Live Oak Riparian Woodland

California sycamore and coast live oak riparian woodlands are typically found on the banks of intermittent streams, springs, seeps, and gullies and on the adjacent floodplains. This community can be found throughout California's Central Valley and the South Coast, Transverse, and Peninsular Mountain Ranges at elevations ranging from sea level to approximately 7,800 feet. This riparian woodland community is characterized by the dominance of western sycamore (*Plantanus racemosa*) or coast live oak (*Quercus agrifolia*) in the tree canopy. Associate species in the tree canopy can include white alder (*Alnus rhombifolia*), California black walnut (*Juglans hindsii*), Fremont cottonwood (*Populus fremontii* ssp. *Fremontii*), valley oak (*Quercus lobata*), California bay (*Umbellularia californica*), and a variety of willow species including narrow-leaved willow (*Salix exigua*), Gooding's black willow (*Salix goodingii*), and red willow (*Salix laevigata*). The understory of this community may have an open or intermittent shrub layer and a sparse or grassy herbaceous layer. This community is well adapted to intermittent flooding and western sycamore often relies on flooding events to scour seeds for higher success in germination rates. California sycamore and coast live oak riparian woodland is a sensitive natural community (S3) on the California Department of Fish and Wildlife's (CDFW) *California Natural Communities List* (CDFW, 2023).

Within the study area, a California sycamore and coast live oak riparian woodland was present in a narrow band along the south bank of Threemile Slough. The dominant species observed in the tree canopy was coast live oak. Narrow-leaved willow and California button willow (*Cephalanthus occidentalis*) were present in the shrub layer. Herbaceous species observed in this community were varied but included California rose (*Rosa californica*), Himalayan blackberry, delta tule pea (*Lathyrus jepsonii var. jepsonii),* Bermuda grass (*Cynodon dactylis*), lamp rush (*Juncus effusus*), ragweed (*Ambrosia sp*.), and curly doc (*Rumex crispus*). This community was mapped both above and below the HTL due to portions of the canopy overhanging the slough and is classified as palustrine forested wetland.

5.2.1.2 Developed

This land cover type is not described in the MCV because it is not a natural community and is typically associated with human disturbance. Developed areas are characterized by a high degree of human disturbance and can include a variety of site conditions from buildings to roadways and parking lots. Typically, there is limited vegetation cover and limited habitat for wildlife present in developed areas.

Within the study area, developed lands were mapped along roads and on both Sherman Island and Brannan Island and within the paved parking lot and the PG&E valve station on Brannan Island. The ground surface in these areas was highly disturbed and was either covered in asphalt or gravel. Almost no vegetation was growing within this land cover type. All developed portions of the study area were mapped as upland.

5.2.1.3 Disturbed Land

This land cover type is not described in the MCV because it is not a natural community and is typically associated with human disturbance. Disturbed land may exhibit a variety of site conditions, but they are typically dominated by non-native and early successional herbaceous species that readily colonize areas that have been recently disturbed or are frequently disturbed.

Within the study area, disturbed land was present within the low-lying field to the south of Sherman Island East Levee Road. There were multiple types of human disturbance identified throughout this field including old storage facilities and equipment, remnants of burned vegetation and trash piles, and soil or debris dump piles. In addition, piles of dredge spoils and vegetation were present from recent dredging that occurred in an agricultural ditch approximately 15 feet west of the study area. Due to the variety of disturbance activities in this area, there was a variety of herbaceous vegetation observed in this community. The dominant vegetation observed in the disturbed area included Bermuda grass and beardless wild rye (*Elymus triticoides*). Where dredged material from the agricultural ditch was piled, there was a higher concentration of hydrophytic plants including common reed (*Phragmites australis*), narrow-leaved cattail (*Typha angustifolia*), willow weed (*Persicaria lapathifolia*), tall cyperus (*Cyperus eragrostis*), and cocklebur (*Xanthium strumarium*) presumably from the seedbank within the dredge spoils. Throughout the disturbed lands there were many disturbance-adapted weedy species like bristly ox-tongue (*Helminthotheca echioides*), bindweed (*Convolvulus arvensis*), bur clover (*Medicago polymorpha*), and Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*).

These hydrophytic plants made this location the most likely to support a potentially jurisdictional wetland, so sample plot SP1A was established at this location to determine the possible extent of wetlands. SP1A did not, however, meet any of the three wetland parameters. Further analysis of the area suggests that the presence of hydrophytic plants in this portion of the disturbed community was due to the transportation of hydrophytic vegetation and seed bank from the ditch onto the upland terrace from dredging activities. As a result, the entire disturbed community was mapped as upland. No additional sample plots were needed in this community as there were no other physical indicators of potential wetlands.

5.2.1.4 Riverine

This community is not described in the MCV because it is an open water aquatic community with limited vegetation. Within the study area, Threemile Slough traverses the Project

site and is a perennial and navigable waterway. Throughout most of this mapped feature, there is no emergent vegetation present; however, on the north and south banks of Threemile Slough there are dense to sparse stands of tule (*Schoenoplectus acutus* var. *occidentalis*) along with submerged aquatic vegetation like Brazilian waterweed (*Egeria densa*), pondweed (*Potamogeton sp*.), and parrot's feather (*Myriophyllum aquaticum*). Water hyacinth (*Eichhornia crassipes*) was also observed floating on the water's surface along with small patches of frogbit (*Limnobium* sp.). The open water cover type was mapped as a tidal riverine water and is classified as other waters of the U.S. below the HTL.

5.2.1.5 Sandbar Willow Thickets

Sandbar willow thickets are typically found on depositions along rivers and streams as well as in temporarily flooded floodplains and springs. This community can be found throughout California at elevations ranging from sea level to approximately 8,900 feet. This riparian shrubland community is characterized by the dominance of narrow-leaved willow. Associate species can include California rose, Himalayan blackberry, California blackberry (*Rubus ursinus*), arroyo willow (*Salix lasiolepis*), and dusky willow (*Salix melanopsis*). This community is typically the first to colonize sand bars and cut banks and if the flooding disturbance regime is not too intense, later successional communities like Fremont cottonwood forests can take their place.

Within the study area, sandbar willow thicket was present along the north bank of Threemile Slough. The dominant species was narrow-leaved willow, which was found in large dense patches along the steep north bank. Associate species observed included northern California black walnut, coast live oak, blue elderberry (*Sambucus mexicana*), Himalayan blackberry, and Gooding's black willow. This community was mapped both above and below the HTL due to portions of the canopy overhanging the slough and is classified as palustrine scrub-shrub wetland.

5.2.1.6 Wild Oats and Annual Brome Grassland

Wild oats grasslands are dominated by non-native grasses from Europe and Asia. This community is very common in valley and foothill grasslands as well in the open spaces among oak woodlands. Typically, it can be found at elevations ranging from approximately 30 to 3,900 feet in elevation. Within this cover type there is often very limited species diversity. Typical species include wild oat (*Avena fatua*), slender wild oats (*Avena barbata*), ripgut grass (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*). There is a wide variety of native and non-native forbes that can occur in this cover type as well.

Within the study area, wild oats and annual brome grasslands were present on both the south and north sides of Threemile Slough. In the southern portion of the study area, this community was present on the landward levee slope adjacent to Sherman Island East Levee Road. In the northern portion of the study area, this community was present in the large area surrounding the PG&E valve box. The species composition varied across the study area with some grasslands being dominated by ripgut grass and others being dominated by wild oat. Associate species in these communities also varied but commonly included other non-native upland grasses and forbes including soft chess, rattail sixweek grass (*Festuca myuros*), Bermuda grass, yellow star-thistle (*Centaurea solstitialis*), storksbill (*Erodium sp*.), and Spanish clover (*Acmispon americanus* var. *americanus*). This community was mapped as upland where it occurred within the study area.

Table 2. Plant Species Observed at the PG&E Threemile Slough Pipeline Crossings Remediation and Decommissioning Project Site

Common Name/Family	*Scientific Name*	Growth Habit	Wetland Indicator Status	Native Status	Sensitivity / Listing Status
EQUISETACEAE (Horsetail Family)					
Common horsetail	*Equisetum arvense*	H	FAC	N	
ADOXACEAE (Muskroot Family)					
Blue elderberry	*Sambucus mexicana*	S	FACU	N	
AMARANTHACEA (Amaranth Family)					
Alligator weed	*Alternanthera philoxeroides*	H	OBL	I	
APIACEAE (Carrot Family)					
Bur-chervil	*Anthriscus caucalis*	H	NL	I	
Fennel	*Foeniculum vulgare*	H	NL	I	
APOCYNACEAE (Dogbane Family)					
Indian hemp	*Apocynum cannabinum*	H	FAC	N	
ASTERACEAE (Sunflower Family)					
Ragweed	*Ambrosia sp.*	H	FACU		
Mugwort	*Artemisia douglasiana*	H	FAC	N	
Coyote brush	*Baccharis pilularis*	S	NL	N	
Italian thistle	*Carduus pycnocephalus* ssp. *pycnocephalus*	H	NL	I	
Yellow star-thistle	*Centaurea solstitialis*	H	NL	I	
Bull thistle	*Cirsium vulgare*	H	FACU	I	
Fleabane daisy	*Erigeron* sp.	H	NL		
Bristly ox-tongue	*Helminthotheca echioides*	H	FAC	I	
Telegraph weed	*Heterotheca grandiflora*	H	NL	N	
Prickly lettuce	*Lactuca serriola*	H	FACU	I	
Cocklebur	*Xanthium strumarium*	H	FAC	N	
BORAGINACEAE (Borage Family)					
Fiddleneck	*Amsinckia* sp.	H		N	
Alkali heliotrope	*Heliotropium curassavicum* var. *oculatum*	H	FACU	N	
BRASSICACEAE (Mustard Family)					
Black mustard	*Brassica nigra*	H	NL	I	
Perennial pepperweed	*Lepidium latifolium*	H	FAC	I	
CONVOLVULACEAE (Morning-Glory Family)					
Bindweed	*Convolvulus arvensis*	H	NL	I	
FABACEAE (Legume Family)					
Spanish clover	*Acmispon americanus* var. *americanus*	H	UPL	N	
Delta tule pea	*Lathyrus jepsonii* var. jepsonii	H	OBL	N	1B.2
California burclover	*Medicago polymorpha*	H	FACU	I	
Sourclover	*Melilotus indicus*	H	FACU	I	
Clover	*Trifolium* sp.	H			
Vetch	*Vicia* sp.	H			
Winter vetch	*Vicia villosa*	H	NL	I	
FAGACEAE (Oak Family)					
Coast live oak	*Quercus agrifolia*	T	NL	N	
Valley oak	*Quercus lobata*	T	FACU	N	

Table 2. Plant Species Observed at the PG&E Threemile Slough Pipeline Crossings Remediation and Decommissioning Project Site

Common Name/Family	*Scientific Name*	Growth Habit	Wetland Indicator Status	Native Status	Sensitivity / Listing Status
GERANIACEAE (Geranium Family)					
Storksbill	*Erodium* sp.	H			
HALORAGACEA (Water-Milfoil Family)					
Parrot's feather	*Myriophyllum aquaticum*	H	OBL	N	
JUGLANDACEAE (Walnut Family)					
Northern California black walnut	*Juglans hindsii*	T	FAC	N	1B.1
MALVACEAE (Mallow Family)					
Bull mallow	*Malva nicaeensis*	H	NL	I	
ONAGRACEAE (Evening Primrose Family)					
Hairy willow herb	*Epilobium ciliatum*	H	FACW	N	
Water primrose	*Ludwigia sp.*	H	OBL	I	
Smartweed	*Persicaria sp.*	H			
PLATANACEAE (Sycamore Family)					
Western sycamore	*Platanus racemosa*	T	FAC	N	
POLYGONACEAE (Buckwheat Family)					
False waterpepper	*Persicaria hydropiperoides*	H	OBL	N	
Willow weed	*Persicaria lapathifolia*	H	FACW	N	
Curly dock	*Rumex crispus*	H	FAC	I	
ROSACEAE (Rose Family)					
California rose	*Rosa californica*	S	FAC	N	
Himalayan blackberry	*Rubus armeniacus*	V	FAC	I	
RUBIACEAE (Madder Family)					
California button willow	*Cephalanthus occidentalis*	S	OBL	N	
SALICACEAE (Willow Family)					
Narrow-leaved willow	*Salix exigua*	S	FACW	N	
Gooding's black willow	*Salix goodingii*	T	FACW	N	
VERBENACEAE (Vervain Family)					
Shore vervain	*Verbena littoralis*	H	FACU	I	
ZYGOPHYLLACEAE (Caltrop Family)					
Puncture vine	*Tribulus terrestris*	H	NL	I	
ARECACEAE (Palm Family)					
Fan palm		T	FAC/FACW		
CYPERACEAE (Sedge Family)					
Sedge	*Carex* sp.	H			
Santa Barbara sedge	*Carex barbarae*	H	FAC	N	
Tall cyperus	*Cyperus eragrostis*	H	FACW	N	
Tule	*Schoenoplectus acutus* var. *occidentalis*	H	OBL	N	
HYDROCHARITACEAE (Waterweed Family)					
Brazilian waterweed	*Egeria densa*	H	OBL	I	
Frogbit	*Limnobium sp.*	H	OBL		
JUNCACEAE (Rush Family)					
Lamp rush	*Juncus effusus*	H	FACW	N	
POACEAE (Grass Family)					

Table 2. Plant Species Observed at the PG&E Threemile Slough Pipeline Crossings Remediation and Decommissioning Project Site

Common Name/Family	*Scientific Name*	Growth Habit	Wetland Indicator Status	Native Status	Sensitivity / Listing Status
Giant reed	*Arundo donax*	G	FACW	I	
Wild oat	*Avena* sp.	G		I	
Slender wild oat	*Avena barbata*	G	NL	I	
Wild oat	*Avena fatua*	G	NL	I	
Ripgut grass	*Bromus diandrus*	G	NL	I	
Soft chess	*Bromus hordeaceus*	G	FACU	I	
Bermuda grass	*Cynodon dactylon*	G	FACU	I	
Beardless wild rye	*Elymus triticoides*	G	NL	N	
Rattail sixweeks grass	*Festuca myuros*	G	FACU	I	
Hare barley	*Hordeum murinum* ssp. *leporinum*	G	FACU	I	
Dallis grass	*Paspalum dilatatum*	G	FAC	I	
Harding grass	*Phalaris aquatica*	G	FACU	I	
Common reed	*Phragmites australis*	G	FACW	N	
Rabbitfoot grass	*Polypogon monspeliensis*	G	FACW	I	
PONTEDERIACEAE (Pickerel-Weed Family)					
Water hyacinth	*Eichhornia crassipes*	H	OBL	I	
POTAMOGETONACEAE (Pondweed Family)					
Berchtold's pondweed	*Potamogeton berchtoldii*	H	OBL	N	
Crisp-leaved pondweed	*Potamogeton crispus*	H	OBL	I	
TYPHACEAE (Cattail Family)					
Narrow-leaved cattail	*Typha angustifolia*	H	OBL	I	

Wetland Indicator Status

OBL = Obligate wetland species, occurs almost always in wetlands (>99% probability)
FACW = Facultative wetland species, usually found in wetlands (67-99% probability)
FAC = Facultative species, equally likely to occur in wetland and non-wetlands (34-66% probability)
FACU = Facultative upland species, not usually found in wetlands (1-33% probability)
UPL = Upland species, almost never found in wetlands (<1% probability)
NI = No indicator has been assigned due to a lack of information to determine indicator status
NL = Not listed, assumed upland species

Sensitivity / Listing Status

FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate SE = California State Endangered ST = California State Threatened	1B.1 = Threatened in California and elsewhere, seriously threatened in California 1B.2 = Threatened in California and elsewhere, moderately threatened in California 2B = Plants rare, threatened, or endangered in California but more common elsewhere 3 = Plants about which more information is needed 4 = Plants of limited distribution
Growth Habit	**Native Status**
F = Fern G = Grass H = Herb S = Shrub T = Tree	N = Native I = Introduced

5.3 HYDRIC SOILS

The soils in the Delta subsection are mostly poorly to very poorly drained. Soil temperature regimes are thermic (defined as mean annual temperature between 60°F and 70°F, with a difference of greater than 9°F between mean summer and winter soil temperatures). Soil moisture regimes are mostly aquic (soil saturated long enough to cause anaerobic conditions) but they are xeric (dry for 45 or more consecutive days) on levees.

5.3.1 Soils Mapped

Based on a review and analysis of the U.S. Department of Agriculture's Web Soil Survey for Sacramento County (NRCS, 2024) (Appendix D), the Project site is underlain by Egbert clay, 0 to 2 percent slopes, Xeropsamments, 1 to 15 percent slopes, and water. The Egbert clay and xeropsamments mapping units are described below.

5.3.1.1 Egbert clay, 0 to 2 percent slopes (map unit 139)

This soil mapping unit is a poorly drained soil formed in alluvium. Typically, the soil profile is described from 0 to 20 inches as clay and from 20 to 60 inches as silt clay loam. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is typically 0 inches. This mapping unit is classified as hydric soil. This soil mapping unit underlies the entire study area south of Threemile Slough on Sherman Island.

5.3.1.2 Xerospamments, 1 to 15 percent slopes (map unit 244)

This soil mapping unit is a somewhat excessively drained soil formed in mine spoil or earthy fill. Typically, the soil profile is described as variable from 0 to 60 inches. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is typically more than 80 inches. This mapping unit is classified as non-hydric soil. This mapping unit underlies the entire study area north of Threemile Slough on Brannan Island.

5.3.2 Soils Observed

One sample plot was selected within the study area to identify the presence or absence of hydric soils. This sample plot, SP1A, was located in soil map unit 139 and the location was selected based on the presence of hydrophytic vegetation and location immediately adjacent to a dredged agricultural ditch located outside the study area. The soil texture observed at sample plot SP1A was silty clay. Soil colors observed in the matrix at the sample plot ranged from very dark brown (10YR 2/2) to black (10YR 2/1 and 2.5Y 2.5/1). Some redox concentrations were observed in the upper and lower layers of soil including a strong brown (7.5YR 5/8). Despite the dark matrix color and the presence of some redoximorphic features, this sample plot did not meet any of the hydric soil indicators. As discussed in section 5.2.1.3 above, the adjacent agricultural ditch (located outside the study area) had recently been dredged and the dredge spoils were deposited at this location. Dredge spoils appear to be routinely deposited in and around this area; therefore, this sample plot may exhibit some wetland characteristics due to the import of dredged material from the bottom of an agricultural ditch and not due to in-situ conditions.

5.4 WETLAND HYDROLOGY

Surveys were conducted on August 15, 2024, during the middle of the dry season with average rainfall conditions (see Table 1). The one sample plot that was selected to determine the presence/absence of adjacent wetlands lacked hydrologic indicators (SP1A). There were no wetland signatures or other indicators of wetlands observed within the study area outside of the limits of Threemile Slough. As a result, only one sample plot was selected within the study area.

6.0 FEDERAL JURISDICTIONAL DETERMINATION

One sample plot was sited in an area that supported hydrophytic vegetation to determine if adjacent wetlands were present within the study area; however, the sample plot did not meet any of the three parameters (a dominance of hydrophytic vegetation or presence of hydric soil and wetland hydrology) for consideration as a federally jurisdictional wetland. The field delineation data form is included under Appendix B. A total of 3.51 acres of jurisdictional waters of the U.S. were mapped within the study area boundary.

From a Cowardin classification standpoint, the study area supported two wetland types and one deepwater habitat type, both of which were defined as other waters of the U.S. due to their location below the HTL. Wetland types are defined both by their abiotic features such as water regime and topography as well as biotic factors like vegetation communities. Cowardin classification wetlands are not necessarily considered three parameter jurisdictional wetlands. The wetland types found within the study area were a palustrine scrub-shrub wetland and a palustrine forested wetland. Both wetland types were located below the HTL and are therefore considered other waters of the U.S. Wetland types were determined by their abiotic and biotic features and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, 1979). In addition to the two vegetated areas on the banks of Threemile Slough, other waters of the U.S. present within the unvegetated portion of Threemile Slough are classified as tidal riverine wetlands (Threemile Slough). Below is a brief description of each wetland type and deepwater habitat present in the study area.

6.1 FEDERAL WATERS

6.1.1 Tidal Riverine Waters

Riverine waters are defined as aquatic resource features that are confined within a channel and lack dominance of trees, shrubs, persistent emergent herbs, mosses, or lichens. Wetlands that occur on a river's floodplain are classified separately from the riverine system due to the presence of vegetation cover (Cowardin, 1979). Within the riverine system classification there are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. Within the study area, Threemile Slough is a tidal channel. This subsystem is characterized by its fluctuating water velocity caused by the ebb and flow of the tide. Tidal riverine waters typically have a muddy streambed with patches of sand. The existence of floodplains is common in tidal riverine systems.

In tidal systems, the limits of Corps jurisdiction on waters of the U.S. are defined by the high tide line (limits of Clean Water Act Section 404 jurisdiction) and mean high water line (limits of Rivers and Harbors Act Section 10 jurisdiction). See the Preliminary Federal Aquatic Resources Delineation Map (Figure 3) for the location of the HTL on Threemile Slough within the study area, and the limits of federal jurisdiction. A total of 3.51 acres of tidal riverine waters occurs within the study area and are considered jurisdictional.

6.1.2 Palustrine Forested Wetland

The palustrine classification of wetlands includes a wide variety of different wetland types. Wetlands commonly called ponds, prairies, fens, bogs, marshes, and swamps are all types of palustrine wetlands. In most circumstances, palustrine wetlands are dominated by persistent

emergent herbs, shrubs, or trees and are found in non-tidal areas. Palustrine wetlands could occur in tidal wetlands if the salinity derived from the ocean is below 0.5 ppt (Cowardin, 1979).

Palustrine forested wetlands have a dominance of woody plants that are greater than 20 feet tall (trees). In the western United States, this wetland type is common on the fringes of river systems where higher soil moisture is present but frequent and violent flooding does not occur. The south bank of Threemile Slough is jurisdictional as a water of the U.S. below the HTL and it is classified as a palustrine forested wetland due to its physical properties. Within the study area, this wetland type was part of the California sycamore and coast live oak riparian forest vegetation community and was located on the southern side of Threemile Slough. A total of 0.11 acres of palustrine forested wetlands occurs within the study area.

6.1.3 Palustrine Scrub-Shrub Wetland

Palustrine scrub-shrub wetlands share the same characteristics of other palustrine systems as described above but have a dominance of woody plants that are less than 20 feet tall. Scrub-shrub wetlands often develop from adverse environmental conditions like flooding and erosion which prevent larger or older woody plants from developing. For this reason, a palustrine scrub-shrub wetland may be an early succession of a palustrine forested wetland and could develop into a forest given enough time to develop without adverse environmental conditions.

Within the study area, palustrine scrub-shrub wetlands were present on the north bank of Threemile Slough below the HTL. The north bank of Threemile Slough is jurisdictional as a water of the U.S. below the HTL and it is classified as a palustrine scrub-shrub wetland due to its physical properties. Palustrine scrub-shrub wetlands were mapped within the sandbar willow thickets vegetation community and occurred only below the HTL within the study area. A total of 0.13 acres of palustrine scrub-shrub wetlands occurs within the study area.

Table 3. Federal Jurisdictional Aquatic Resource Features Within the Study Area at the Threemile Slough Pipeline Crossings Remediation and Decommissioning Project

Feature	ID	Cowardin Classification	Waters of the U.S.		Acreage
			Other Waters	Wetlands	
Threemile Slough	R1	Palustrine Scrub-Shrub Wetland	Yes	No	0.13
		Palustrine Forested Wetland	Yes	No	0.11
		Tidal Riverine Water	Yes	No	3.27
Total Federal Jurisdiction (Acres):					**3.51**

7.0 CONCLUSIONS

On the basis of the field delineation and data analysis, we have concluded that the Project study area contains approximately 3.51 acres of Federally jurisdictional waters of the U.S., and no federal wetlands.

The preliminary aquatic resources delineation map is included as Figure 3. Wetland features are also summarized in Table 3 with a summary of federal jurisdiction. These findings are preliminary and require review and verification by the Sacramento District of the Corps.

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FIGURES

LEGEND:

Pipeline | Workpace | Access Route

MAP EXTENT:

Source: Esri Online Topo Basemap
Coordinate System:NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E L-131Y & L-131Z
THREE MILE SLOUGH CROSSING REMEDIATION
SACRAMENTO COUNTY, CA

PROJECT NUMBER: 2402-1171

DATE: August 2024

PROJECT VICINITY MAP

FIGURE 1

N

LEGEND:

- Control Point
- Delta Tule Pea *(Lathyrus jepsonii var. jepsonii)*
- Study Area (7.6ac)
- Dripline of Blue Elderberry Shrub *(Sambucus nigra ssp. caerulea)*

Vegetation Communities

- California Sycamore and Coast Live Oak Riparian Woodland
- Developed
- Disturbed Land
- Riverine
- Sandbar Willow Thickets
- Wild Oats and Annual Brome Grassland

MAP EXTENT:

0 90 180
FEET

Source: Esri Online Imagery Basemap, County of Sacramento
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

PROJECT NAME: THREEMILE SLOUGH PIPELINE CROSSING REMEDIATION AND DECOMMISSIONING SACRAMENTO COUNTY, CA

PROJECT NUMBER: 2402-1171

DATE: November 2024

VEGETATION COMMUNITY MAP

FIGURE 2

N

LEGEND:

- Control Point
- Sample Plot Location
- High Tide Line
- Study Area (7.6ac)

Cowardin Classification

- Palustrine Forested Wetland (0.11ac)
- Palustrine Scrub Shrub Wetland (0.13ac)
- Tidal Riverine Water (3.27ac)

Preliminary Jurisdiction Delineation Acreage Calculations

Feature	ID	Cowardin Classification	Waters of the U.S.		Acreage
			Other Waters	Wetlands	
Three Mile Slough	R1	Palustrine Scrub Shrub Wetland	Yes	No	0.13
		Palustrine Forested Wetland	Yes	No	0.11
		Tidal Riverine Water	Yes	No	3.27
				Total:	3.51

MAP EXTENT:

0 90 180
FEET

Source: Esri Online Imagery Basemap, County of Sacramento
Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Notes: This map was created for informational and display purposes only.

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PROJECT NAME: THREEMILE SLOUGH PIPELINE CROSSING REMEDIATION AND DECOMMISSIONING SACRAMENTO COUNTY, CA

PROJECT NUMBER: 2402-1171

DATE: November 2024

PRELIMINARY AQUATIC RESOURCES DELINEATION MAP

FIGURE 3

Photograph A. View of the disturbed land in the southern portion of the study area with visible remnants of burn piles and trash piles. View north (photograph taken 8/15/24).	
Photograph B. View of sample plot SP1A located in an area of deposited dredge spoils adjacent to a recently dredged drainage ditch. View northeast (photograph taken 8/15/24).	

Photograph C. View of the disturbed land cover type. The agricultural ditch adjacent to the study area and the location of SP-1A is visible in the right of the photo. View south (photograph taken 8/15/24).	
Photograph D. View of Threemile Slough from the south bank on Sherman Island. View northwest (photograph taken 8/15/24).	

Photograph E. View of the south bank of Threemile Slough along the waterside slope of the Sherman Island levee showing drift deposit where the high tide line was mapped. View northeast (photograph taken 8/15/24).	
Photograph F. View of Sherman Island East Levee Road along the levee crown and the California sycamore and coast live oak riparian woodland community along the southern bank of Threemile Slough. View northeast (photograph taken 8/15/24).	

Photograph G. View of the sandbar willow thickets vegetation community located along the northern bank of Threemile Slough. View northeast (photograph taken 8/15/24).	
Photograph H. View of the wild oats and annual brome vegetation community north of Threemile Slough on Brannan Island. View southwest (photograph taken 08/15/2024).	

APPENDIX A

WETS TABLES

WETS Table

WETS Station: CONCORD BUCHANAN FIELD, CA

Requested years: 1999 - 2024

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	58.3	40.5	49.4	2.63	1.12	3.04	5	-
Feb	62.3	42.2	52.3	2.72	1.08	3.20	6	-
Mar	66.5	45.4	55.9	2.16	0.96	2.63	6	-
Apr	71.0	48.1	59.6	1.14	0.33	1.34	3	-
May	77.7	52.6	65.1	0.39	0.11	0.37	1	-
Jun	84.8	56.5	70.6	0.11	0.00	0.04	0	-
Jul	88.4	58.2	73.3	0.00	0.00	0.00	0	-
Aug	87.7	58.7	73.2	0.01	0.00	0.00	0	-
Sep	85.3	57.0	71.2	0.07	0.00	0.06	0	-
Oct	77.6	51.7	64.6	0.86	0.11	0.59	1	-
Nov	65.9	44.3	55.1	1.42	0.87	1.72	3	-
Dec	57.9	40.3	49.1	3.39	1.29	4.10	7	-
Annual:					11.72	17.42		
Average	73.6	49.6	61.6	-	-	-	-	-
Total	-	-	-	14.91			33	-

GROWING SEASON DATES

Years with missing data:	24 deg = 0	28 deg = 0	32 deg = 2
Years with no occurrence:	24 deg = 26	28 deg = 23	32 deg = 3
Data years used:	24 deg = 26	28 deg = 26	32 deg = 24
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	1/23 to 12/19: 330 days
70 percent *	No occurrence	No occurrence	1/12 to 12/31: 353 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1999						MT	T	T	0.02	0.36	1.37	0.29	2.04
2000	6.02	6.86	2.08	0.85	0.83	0.10	0.00	0.00	0.18	1.64	0.67	0.69	19.92
2001	2.15	5.53	1.13	0.98	0.00	0.14	0.00	0.00	0.15	0.24	3.28	6.45	20.05
2002	0.78	1.30	1.50	0.16	1.20	0.00	0.00	0.00	0.00	0.00	2.08	8.79	15.81
2003	1.10	1.08	1.59	3.15	0.64	0.00	T	0.19	T	0.00	1.31	4.97	14.03
2004	2.23	4.68	0.56	0.07	0.05	0.00	0.00	0.00	0.08	2.43	1.53	4.48	16.11
2005	3.28	2.07	1.38	0.78	0.67	0.09	0.00	0.00	0.00	0.06	0.46	6.92	15.71
2006	0.75	1.01	4.55	3.28	0.57	0.06	0.00	0.00	0.00	0.12	1.15	2.00	13.49

2007	0.37	3.35	0.15	0.81	0.30	0.00	0.01	0.00	0.04	1.57	0.61	2.16	9.37
2008	6.56	1.67	0.13	0.05	T	0.00	0.00	0.00	0.00	0.12	2.09	1.28	11.90
2009	1.04	5.74	2.12	1.16	0.51	0.01	0.00	0.00	0.07	3.79	0.41	2.37	17.22
2010	5.35	1.87	1.72	3.64	0.89	0.00	0.00	0.00	0.00	0.65	1.70	4.98	20.80
2011	1.01	3.64	5.17	0.19	0.54	1.99	0.00	0.00	0.02	0.71	0.77	0.07	14.11
2012	2.38	1.07	3.76	2.41	T	0.04	0.00	0.00	T	1.04	3.50	5.07	19.27
2013	0.40	0.32	0.68	0.51	0.02	0.12	0.00	0.00	0.65	T	1.34	0.46	4.50
2014	0.10	4.47	1.87	1.51	T	0.00	T	0.09	0.28	0.44	1.01	7.86	17.63
2015	T	2.87	0.17	0.87	0.04	0.37	T	T	0.05	0.01	1.53	2.04	7.95
2016	4.77	0.86	4.96	1.05	0.22	T	T	T	0.00	2.61	0.95	2.19	17.61
2017	8.50	6.05	2.12	2.53	0.02	0.01	0.00	T	0.03	T	2.59	0.10	21.95
2018	3.20	0.57	4.48	2.27	T	0.00	0.00	0.00	T	0.01	3.42	1.49	15.44
2019	3.97	6.34	3.40	0.12	1.38	0.00	0.00	0.00	0.11	0.00	0.83	4.00	20.15
2020	0.97	0.00	1.70	0.47	0.46	0.00	0.00	0.02	0.00	0.00	0.30	0.95	4.87
2021	M1.37	0.63	0.84	0.01	0.01	0.00	0.00	0.00	T	5.69	0.69	M4.77	14.01
2022	T	0.01	0.55	0.77	MT	T	T	0.01	0.17	0.00	1.31	7.97	10.79
2023	M6.72	2.83	5.59	0.04	0.46	T	0.00	T	0.01	0.04	0.69	2.40	18.78
2024	2.85	3.16	1.68	0.78	0.86	0.00	0.00	MT					9.33

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2024-08-08

APPENDIX B

ROUTINE WETLAND DELINEATION DATA FORM

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: L-131 V/Z Remediation / Access City/County: Sac County Sampling Date: 8/15/24
Applicant/Owner: PGE State: CA Sampling Point: 1A
Investigator(s): SPowell, NTallman, RBedard Section/Township/Range: 7/3N/3E
Landform (hillslope, terrace, etc.): Island Local Relief (concave, convex, none): none Slope (%): 0-5%
Subregion (LRR): C Lat: 38°6'49.62 N Long: 121°41'6.59"W Datum: W6584
Soil Map Unit Name: Egbert clay, 0 to 2% slopes NWI Classification: PF01Bh
Are climatic/hydrologic conditions on the site typical for this time of years? Yes X No ____ (if no, explain in Remarks)
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Yes Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks)

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

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

Remarks: Wet area in topographic low area adjacent to the ditch. Ditch was recently dredged and dredge spoils placed in this area. Due to placement of dredge spoils, this area exhibits some wetland characteristics.

VEGETATION

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Cynodon dactylon	80	X	FACU
2. Phragmites australis	15		FACW
3. Typha angustifolia	20		OBL
4. Persicaria lapathifolia	10		FACW
5. Cyperus eragrostis	1		FACW
6. Elymus triticoides	20		FAC
7. Xanthium strumarium	1		FAC
8. Phalaris aquatica	1		FACU
	148 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum: ____ % Cover of Biotic Crust ____

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

OBL species	20	X1	20	
FACW species	26	X2	52	
FAC species	21	X3	63	
FACU species	81	X4	324	
UPL species	0	X5	0	
Column Totals:	148	(A)	459	(B)

Prevalence Index = B/A = 3.1

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
No Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Hydrophytes occur in this area due to routine dredging of the adjacent channel and placement of dredge spoils of hydrophytes in seed bank in this area. Very small stands of FACW & OBL species, but the dominant species is FACU.

SOIL Sampling Point 1A

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	Percent	Color (moist)	Percent	Type[1]	Loc[2]	Texture	Remarks
0-2.5"	10YR 2/2	96	7.5YR 5/8	3	C	M		
			10YR 2/1	1	C	M		
2.5-10"	10YR 2/1	100						
10-18"	2.5Y 2.5/1	90	7.5YR 3/4	10	C	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Soils moist, not saturated

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks: Soil is moist in soil pit, but not saturated.

APPENDIX C

NATIONAL WETLAND INVENTORY MAP

U.S. Fish and Wildlife Service
National Wetlands Inventory

PG&E Threemile Slough

August 27, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX D

NRCS WEB SOIL SURVEY MAP

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Sacramento County, California

April 24, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

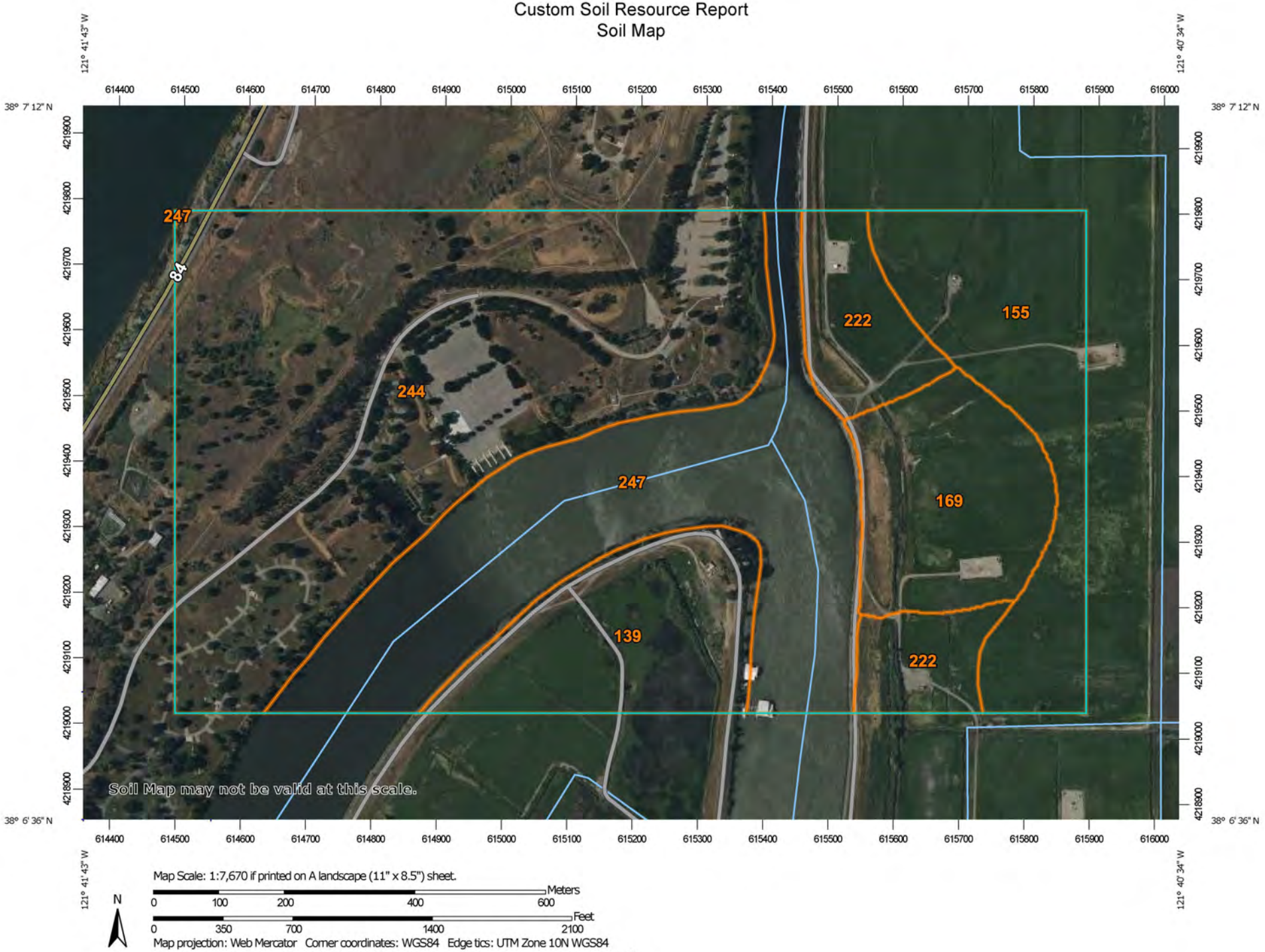
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sacramento County, California
Survey Area Data: Version 23, Aug 31, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
139	Egbert clay, 0 to 2 percent slopes	24.8	9.3%
155	Gazwell mucky clay, partially drained, 0 to 2 percent slopes	30.9	11.7%
169	Laugenour loam, partially drained, 0 to 2 percent slopes, MLRA 16	22.8	8.6%
222	Scribner clay loam, partially drained, 0 to 2 percent slopes, MLRA 16	18.9	7.1%
244	Xeropsamments, 1 to 15 percent slopes	109.5	41.3%
247	Water	58.5	22.0%
Totals for Area of Interest		**265.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not

mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sacramento County, California

139—Egbert clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhmg
Elevation: 20 to 30 feet
Mean annual precipitation: 24 to 30 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 220 to 260 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Egbert and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Egbert

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 20 inches: clay
H2 - 20 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Minor Components

Gazwell

Percent of map unit: 5 percent
Landform: Backswamps

Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Sailboat

Percent of map unit: 5 percent
Landform: Levees
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: Yes

Scribner

Percent of map unit: 5 percent
Landform: Backswamps
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

155—Gazwell mucky clay, partially drained, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhmz
Elevation: 20 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 275 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Gazwell and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gazwell

Setting

Landform: Backswamps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 30 inches: mucky clay
2Ab - 30 to 36 inches: mucky silty clay
3Oa - 36 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 13.7 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Minor Components

Egbert

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Rindge

Percent of map unit: 4 percent
Landform: Marshes
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Sailboat

Percent of map unit: 3 percent
Landform: Levees
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: Yes

Scribner

Percent of map unit: 3 percent
Landform: Backswamps
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Unnamed, clayey below 20in.

Percent of map unit: 1 percent
Hydric soil rating: No

169—Laugenour loam, partially drained, 0 to 2 percent slopes, MLRA 16

Map Unit Setting

National map unit symbol: 2yc9x
Elevation: 0 to 10 feet
Mean annual precipitation: 19 to 20 inches

Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 320 to 324 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Laugenour and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laugenour

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ap - 0 to 7 inches: loam
A - 7 to 16 inches: loam
C1 - 16 to 39 inches: sandy loam
C2 - 39 to 60 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very high (about 12.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: Yes

Minor Components

Sailboat

Percent of map unit: 6 percent
Landform: Flood plains on natural levees
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: Yes

Lang

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: Yes

Unnamed, hydric, occasionally flooded

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

222—Scribner clay loam, partially drained, 0 to 2 percent slopes, MLRA 16

Map Unit Setting

National map unit symbol: 2x4l6
Elevation: 0 to 10 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 319 to 327 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Scribner, partially drained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scribner, Partially Drained

Setting

Landform: Backswamps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ap1 - 0 to 4 inches: clay loam
Ap2 - 4 to 12 inches: clay loam
A - 12 to 21 inches: clay loam
Ab - 21 to 39 inches: clay loam

Bg - 39 to 51 inches: clay loam
Bkg - 51 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 0.28 in/hr)
Depth to water table: About 20 to 35 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline (0.0 to 0.4 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Minor Components

Egbert

Percent of map unit: 5 percent
Landform: Backswamps
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Sailboat

Percent of map unit: 5 percent
Landform: Levees
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R016XA002CA - Freshwater, Stratified, Fluventic
Hydric soil rating: No

Gazwell

Percent of map unit: 2 percent
Landform: Backswamps
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: Yes

Dierssen

Percent of map unit: 1 percent
Landform: Basin floors

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Guard

Percent of map unit: 1 percent
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Tinnin

Percent of map unit: 1 percent
Landform: Bars
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

244—Xeropsamments, 1 to 15 percent slopes

Map Unit Setting

National map unit symbol: hhqv
Elevation: 10 to 2,500 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Xeropsamments and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xeropsamments

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mine spoil or earthy fill

Typical profile

H1 - 0 to 60 inches: variable

Properties and qualities

Slope: 1 to 15 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6e
Ecological site: R016XA001CA - Tidally-Influenced, Freshwater
Hydric soil rating: No

Minor Components

Fluvaquents

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Hydric soil rating: Yes

Gazwell

Percent of map unit: 5 percent
Landform: Backswamps
Hydric soil rating: Yes

Sailboat

Percent of map unit: 4 percent
Landform: Levees
Hydric soil rating: Yes

Unnamed, water table below 18 inches

Percent of map unit: 1 percent
Hydric soil rating: No

247—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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