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Environmental Consulting

August 9, 2021

U.S. Army Corp of Engineers
Sacramento District
Sent via email to: SPKRegulatoryMailbox@usace.army.mil

Subject: Aquatic Resources Delineation – Dixon 257 Project, City of Dixon, Solano County, California. Report prepared for Steve Gidaro on behalf of 5G Consulting Group.

To whom it may concern:

The attached files present the results of the aquatic resources delineation conducted by Bargas Environmental Consulting, LLC (Bargas) for the Dixon 257 property located in the City of Dixon, Solano County, California conducted for Steve Gidaro on behalf of 5G Consulting Group, LLC. The purpose of the aquatic resource delineation is to identify aquatic resources and determine if these aquatic resources are jurisdictional wetlands or other waters of the United States as defined by the U.S. Army Corp of Engineers under Section 404 of the Clean Water Act. The field survey identified one seasonal wetland swale encompassing a total of **0.142 acres** and **1.931 acres** of other waters for which the applicant is seeking a **preliminary jurisdiction determination**. Should you have any questions or comments regarding this letter, please do not hesitate to contact me at (916) 769-2150 or jstewart@bargasconsulting.com.

Sincerely,

James Stewart

Principal Project Manager

Attachments:

- Report
  - Aquatic Resource Delineation - Dixon 257, City of Dixon, Solano County, California (with attachments)
- Aquatic Resources Excel spreadsheet
  - 1280-20_ORM_Upload_Sheet_Consolidated_NWPR_Dixon257
- GIS data
  - 1280-20_Dixon_257_ARD_GIS.gdb (.zip file)

Aquatic Resource Delineation

Dixon 257, City of Dixon, Solano County, California

Prepared For: Steve Gidaro, on behalf of
5G Consulting Group

Report Date: July 2021

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Sacramento ◆ Orange ◆ Pasadena ◆ Riverside ◆ Temecula ◆ San Diego

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Project Team

Report Author(s):	Owen Routt
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Project Manager:	David Carr
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Review Committee:	Marcus England, Krystal Pulsipher, David Carr

Recommended Citation: Bargas Environmental Consulting. 2021. Aquatic Resources Delineation – Dixon 257, City of Dixon, Solano County, California. Report prepared for Steve Gidaro on behalf of 5G Consulting Group.

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1 Introduction

This report presents the results of the aquatic resources delineation (ARD) conducted by Bargas Environmental Consulting, LLC (Bargas) for the property located in the City of Dixon, Solano County, California (**Figure 1: Project Site and Vicinity**). The purpose of the delineation was to identify whether aquatic resources occur within the Study Area (**Figure 2: Study Area**) and to provide the U.S. Army Corps of Engineers (USACE) with sufficient information to determine if these aquatic resources are jurisdictional wetlands or other waters of the United States (U.S.), as defined by the USACE under Section 404 of the Clean Water Act (CWA). Permission to enter the Study Area to complete field verification by USACE must be verified in writing by the Applicant and Applicant's Agent prior to access.

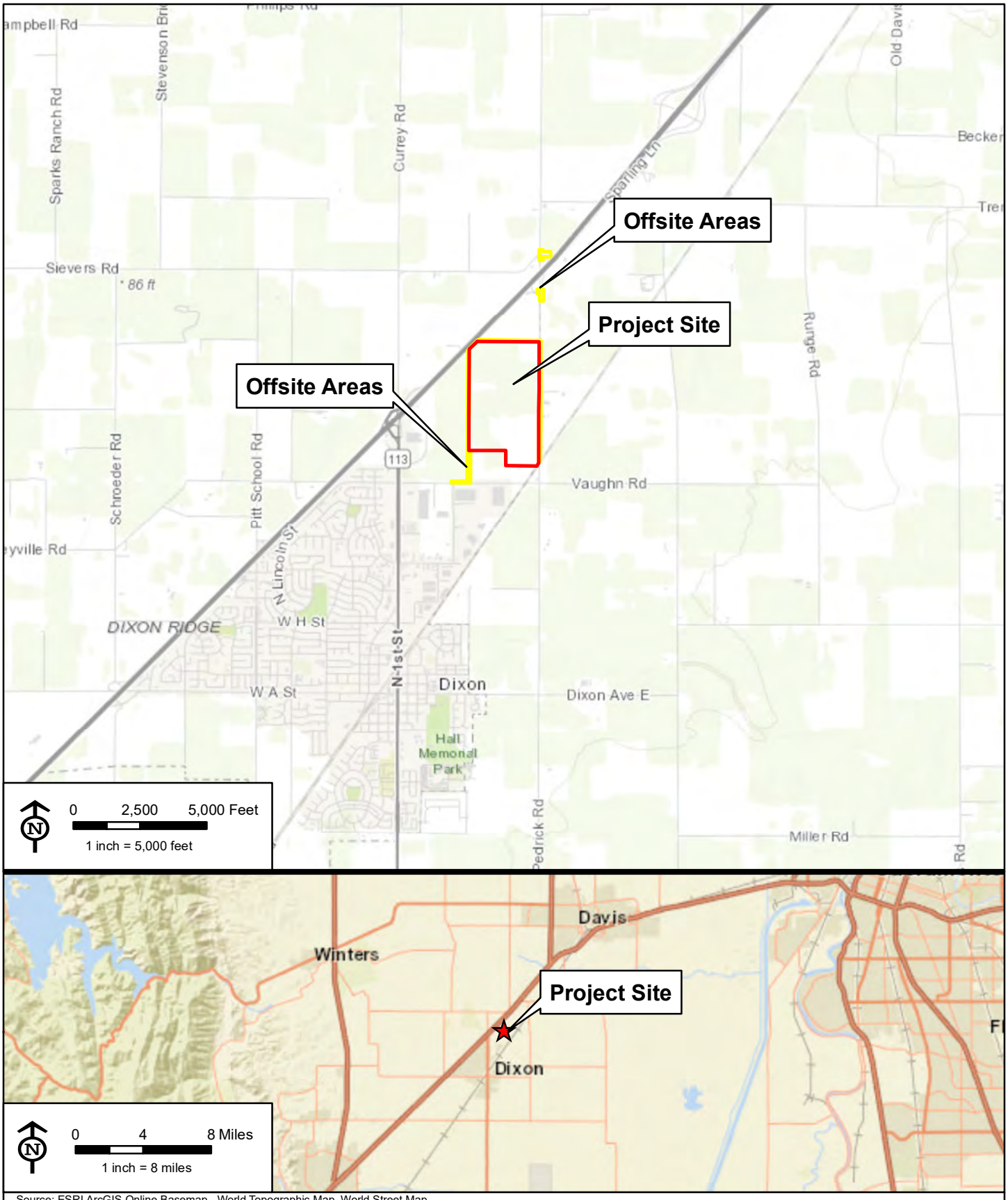
1.1 Project Study Area Location and Description

The Study Area is approximately 260 acres in size and located along the west side of Pedrick Road, from approximately 150 feet north of the intersection of Sievers Road and Pedrick Road and north of Vaugh Road, immediately northeast of the City of Dixon, Solano County, California. The Study Area includes the Project Site and Offsite Project Areas that are associated with the Project as depicted on Figure 1: Project Site and Vicinity. The Project Site corresponds to portions of APNs: 011-104-0040, 011-104-0030, 011-104-0020, 011-104-0010, 011-108-0050; the Offsite Project Areas correspond to APNs: 011-014-0070, 011-014-0180, 011-016-0100, 011-101-0070, 011-101-0080, 011-105-0180, 011-105-0190, 011-105-0200, 011-108-0230, 011-108-0290, 011-119-0010, 011-119-0120. The Study Area is situated in Section 1 of Township 7 North, Range 1 East of the U.S. Geological Survey's 7.5-minute *Dixon* quadrangle. The approximate center point of the Project Site is 38.476044°, -121.808344° (WGS84). Elevations in the Study Area range from approximately 55 to 70 feet above mean sea level. The Study Area is within the City of Dixon's Northeast Quadrant Specific Plan area.

The Study Area may be accessed from the private driveway located at 38.476811°, -121.803906° (WGS84) off Pedrick Road in Dixon, California. From Sacramento, take Interstate 80 west to the Pedrick Road exit. Follow Pedrick Road south for approximately 1 mile to the entrance of the private driveway.

1.2 Project Applicant and Agent

Applicant	Agent
Steve Gidaro 6647 20th Street Rio Linda, CA 95673	Bargas Environmental Consulting, LLC ATTN: James Stewart 3604 Fair Oaks Boulevard Suite 180 Sacramento, CA 95864



Source: ESRI ArcGIS Online Basemap - World Topographic Map, World Street Map

Public Land Survey System (PLSS):
Mount Diablo Meridian,Township 7N and 8N, Range 1E, Sections 01,12, 36

USGS Quad(s): Dixon (1981)

Watershed: Lower Sacramento (18020163)

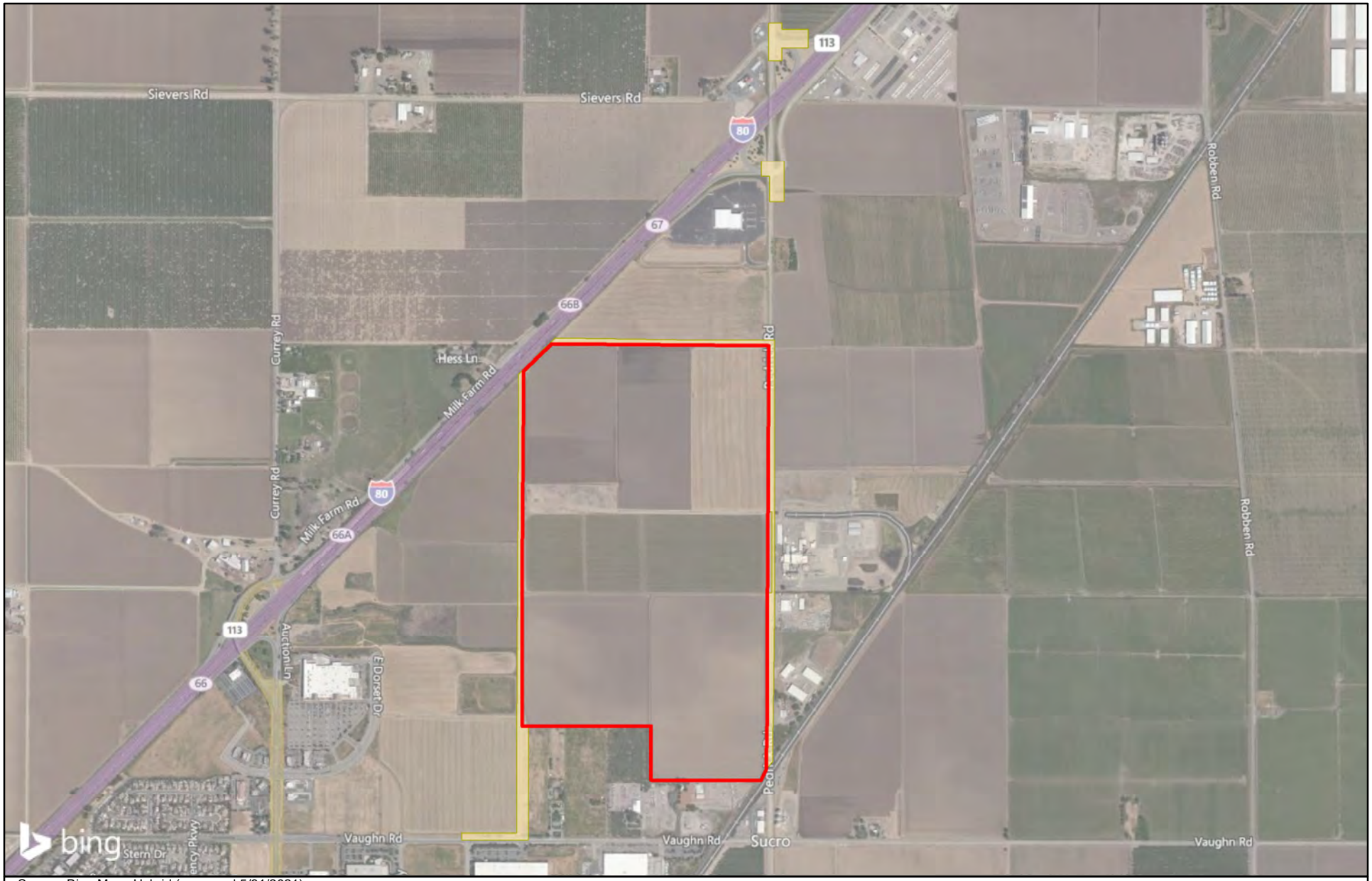
Project Site Coordinates: -121.808°, 38.476°

BARGAS Environmental Consulting

Figure 1
Project Site and Vicinity

Dixon 257

Map Created:7/30/2020, Map Revised: 5/31/2021, Bargas Project Number: 1280-20



Source: Bing Maps Hybrid (accessed 5/31/2021)

0 750 1,500 Feet

1 inch = 1,458 feet

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Project Site

Offsite Project Areas

Figure 2
Study Area

Dixon 257

Map Created:5/31/2021, Map Revised: N/A, Bargas Project Number: 1280-20

2 Regulatory Setting

The regulatory setting is framed by current enabling legislation and case law. Under Section 404 of the CWA, the USACE regulates the discharge of dredged and fill materials into "waters of the U.S." Jurisdictional waters of the U.S. include "territorial seas, and waters which are currently 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; lakes and ponds, and impoundments of jurisdictional waters; and adjacent wetlands" (33 Code of Federal Regulations [CFR] § 328.3). Certain waters of the U.S. are considered "special aquatic sites" because they are generally recognized as having ecological value; such sites include sanctuaries and refuges, wetlands, mudflats, vegetated shallows, and riffle and pool complexes (40 CFR § 230). Special aquatic sites are defined by the U.S. Environmental Protection Agency (EPA) and may be afforded additional consideration in a project's permit process. The USACE also regulates navigable waters under Section 10 of the Rivers and Harbors Act of 1899. Navigable waters are defined as "… those waters of the U.S. that… are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce" (33 CFR § 322.2). Projects that place fill in jurisdictional wetlands and non-wetland waters of the U.S. require a permit from the USACE under Section 404 of the CWA. The USACE issues nationwide permits for specific types of activities with minimal individual or cumulative adverse environmental impacts. Individual permits are required for large and/or complex projects or projects that exceed the impact threshold for nationwide permits. Recent federal rule-making has modified how the USACE defines certain waters of the U.S. The most pertinent rules are summarized below.

Wetlands are defined under 33 C.F.R. 328.3(c)(16) as:

> *Those areas that are inundated or saturated by surface or ground water 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 limits of USACE jurisdiction in non-tidal waters extend to the Ordinary High Water Mark (OHWM), which is defined under 33 CFR 328.3(c)(7) as:

> *That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses 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.*

Non-wetland features include:

> *Upland and lowland areas that are neither deep water aquatic habitats, wetlands nor other special aquatic sites. They are seldom or never inundated, or if frequently inundated, they have saturated soils for only a brief period of time during the growing season. If these features are vegetated, they normally support species that are predominantly adapted to aerobic soil conditions* (USACE - Environmental Laboratory 1987).

The EPA and the Department of the Army published the "Navigable Waters Protection Rule" in the *Federal Register* on April 21, 2020, which officially went into effect on June 22, 2020 (Federal Register 2020). This rule redefines the "Waters of the United States" into four categories:

1. the territorial seas and traditional navigable waters (TNW),
2. perennial and intermittent tributaries to those waters,
3. certain lakes, ponds, and impoundments, and
4. wetlands adjacent to jurisdictional waters.

3 Methodology

This report has been prepared per the Regulatory Division of the Sacramento District, USACE minimum standards (2016b). In addition, the following manuals and guidance were used to delineate waters of the U.S. and wetlands that are potentially subject to USACE jurisdiction under Section 404 of the CWA:

- *Corps of Engineers Wetlands Delineation Manual* (USACE 1987);
- *Regional Supplement to the Corps Wetland Delineation Manual: Arid West (Version 2.0)* (USACE 2008);
- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual* (Lichvar and Mccolley 2008)*;*
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979)

Before conducting the field delineation, the following information sources were reviewed:

- Aerial imagery of the Study Area and the vicinity (Google 2021)
- Natural Resources Conservation Service (NRCS) soil survey maps and unit descriptions, Web Soil Survey, Sacramento County (NRCS 2021)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) - Wetlands Online Mapper (USFWS 2021)

3.1 Delineation Survey and Field Conditions

Bargas biologists Krystal Pulsipher and Owen Routt conducted the aquatic resources delineation on Friday, March 26th, 2021. The site assessment consisted of walking meandering transects throughout the Study Area to identify wetlands or waterways potentially under the jurisdiction of the USACE. Where wetlands were suspected to be present based on aerial signatures and conditions observed in the field, soil pits were excavated to a depth of approximately 18 inches or until an impermeable layer was reached. The three wetland criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) were evaluated following the USACE protocol for the Arid West (USACE 2008). The locations of the soil pits and wetland features were noted on aerial images of the Study Area. Mapped soil types in the Study Area were determined using the NRCS Web Soil Survey, Custom Soil Resource Report (NRCS 2021). A standard Munsell® Soil Color Chart was used to determine soil matrix and mottle colors (Kollmorgen Instruments Company 2000) in the field. Where present, the OHWM for all potential non-wetland waters of the U.S. present were delineated. Plant community names follow *A Manual of California Vegetation: Second Edition* (CNPS 2021), where applicable. Plant nomenclature followed *Jepson eFlora* (2021). The *USACE National Wetland Plant List, version 3.4* (USACE 2018), was used to determine the status of observed plants as wetland indicator species. Datasheets are presented in **Appendix A.** Site photographs are presented in **Appendix B**.

3.2 Mapping

Wetland boundaries within the Study Area were surveyed and mapped using an EOS Arrow 100 Global Positioning System (GPS) technology receiver paired with the EOS Tools Pro and ESRI ArcMap Collector applications. This GPS is capable of real-time differential correction and sub-meter accuracy. The GPS data were downloaded through ArcGIS Online and converted into ESRI shapefile format. The geographic coordinate system used to reference the data was Universal Transverse Mercator (UTM–Zone 10), North American Datum (NAD83) in meters.

Each wetland was assessed by determining the wetland feature/upland edges and by observing the mandatory wetland indicators at selected points along each transect as defined by the 1987 Manual (USACE - Environmental Laboratory 1987), the Regional Supplemental Manual (U.S. Army Corps of Engineers 2010), and Guide to OHWM (Mersel and Lichvar 2014). Potential wetland boundaries were mapped at a level of accuracy of less than one meter. Soil pits were hand-excavated to obtain soil data for wetlands. Data were overlaid on an aerial photograph provided by ESRI ArcGIS World Imagery. The ESRI data and GIS software were used to calculate the acreage of each polygon. Mapping requirements, as set forth by *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016a) and the *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2016b) were followed.

3.3 Determination Methods

Data for each potential wetland were collected using the *USACE Wetland Determination Data Form – Arid West Region* (USACE 2013). Data forms were completed at representative locations to determine whether suspect features qualify as jurisdictional wetlands or other waters of the U.S. (**Appendix A**). Wetlands were determined based on the presence of the three factors that define wetlands – the presence of dominant hydrophytic vegetation, the presence of hydric soils, and wetland hydrology indicators.

4 Environmental Setting

The Study Area consists of cropland and ruderal/disturbed landcover types and no natural vegetation communities. A list of plant species observed is provided in **Appendix D – Observed Plant Species**. At the time this site visit occurred, much of the cropland was fallow or being prepared for planting. Fields in the center of the Study Area contained alfalfa (*Medicago sativa*) and a cover crop mix dominated by clover (*Trifolium* sp.).

There are interconnecting dirt roads, best described as ruderal/disturbed land cover, throughout the central portion of the Study Area used for agriculture. Historic Google Earth aerial imagery indicates there were several farm structures present in in the center of the Project Site in the northwest corner of APN 0111-040-020 at one time and it is currently used to store farm equipment and hay bales during harvest (Google 2021). Concrete and woody debris is piled in the western portion of this area, the entirety of which does not appear to be cultivated. The Offsite Project Areas consist of public road right of ways and thus largely comprised of paved surfaces. Adjacent areas are ruderal/disturbed landcover with a mix of non-native grasses and forbs. A narrow right of way extending from the southwest corner of the Project Site follows an existing dirt access road south to Vaughn Road. The two northern Offsite Project Areas are largely within public road rights of way and consist of pavement bordered by ruderal/disturbed landcover and adjacent drainage ditches. Land uses adjacent to the Study Area include row crops to the northeast, north, and west, orchard to the southwest, and urban industrial to the southeast and east.

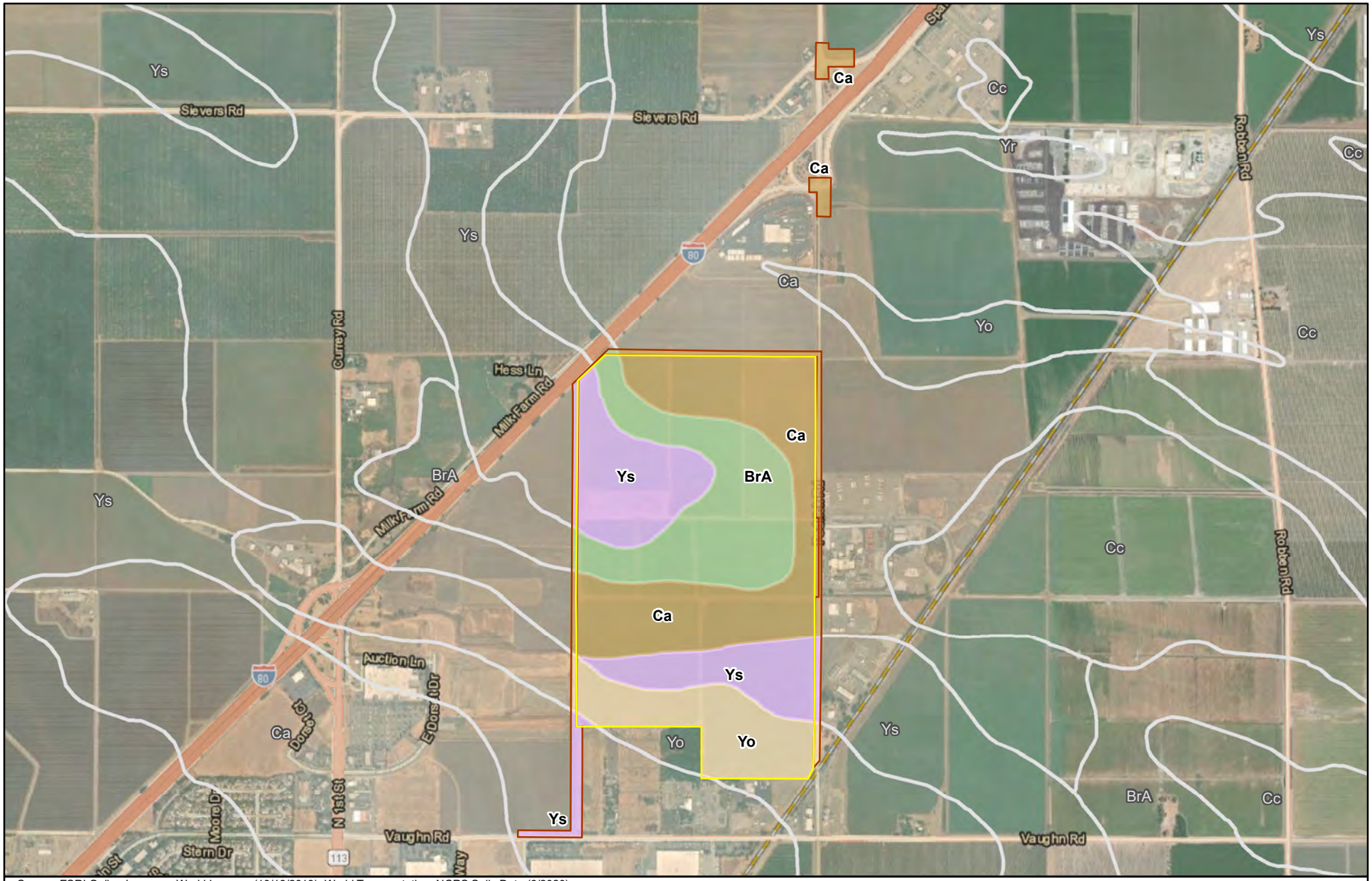
4.1 Soils

Mapped soil types in the Study Area were determined using the Soil Survey Geographic Database (SSURGO) and NRCS Web Soil Survey, Custom Soil Resource Report (NRCS 2021). **Table 1** identifies the soil type by series and subgroup, map symbol, and hydric characteristics (**Figure 3: SSURGO Soils**). The NRCS soil report for the Study Area is included in **Appendix C**.

Table 1. Soil Types within the Study Area

Soil Series	Map Symbol	Hydric Rating
Brentwood clay loam, 0 to 2 percent slopes	BrA	No
Capay silty clay loam, 0 percent slopes, MLRA 17	Ca	No
Yolo loam, 0 to 4 percent slopes, MLRA 17	Yo	No
Yolo silty clay loam, 0 to 2 percent slopes, MLRA 17	Ys	No

Source: NRCS 2021



Source: ESRI Online Imagery - World Imagery (10/18/2019), World Transportation, NCRS Soils Data (6/2020)

0 800 1,600 Feet

1 inch = 1,500 feet

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- Project Boundary
- Offsite Areas
- Surrounding SSURGO Soils

SSURGO Soils

- BrA - Brentwood clay loam, 0 to 2 percent slopes
- Ca - Capay silty clay loam, 0 percent slopes, MLRA 17
- Yo - Yolo loam, 0 to 4 percent slopes, MLRA 17
- Ys - Yolo silty clay loam, 0 to 2 percent slopes, MLRA 17

Figure 3
Soils Map

Dixon 257

Map Created:6/21/2021, Map Revised:, Bargas Project Number: 1280-20

4.2 Vegetation Communities

The majority of the Study Area is cultivated row crops surrounded by heavily disturbed ruderal vegetation best described as *Avena* spp. - *Bromus* spp. Herbaceous Semi-Natural Alliance and *Lolium perenne* Herbaceous Semi-Natural Alliance (CNPS 2021). The ruderal/disturbed area in the center of the Study Area is dominated by horseweed (*Erigeron canadensis*) and field bindweed (*Convolvulus arvensis*), but also contains a few small tree-of-heaven saplings (*Ailanthus altissima*). The remaining ruderal/disturbed areas are a mix of non-native species including Italian ryegrass (*Festuca perennis*; formerly *Lolium perenne*), spikeweed *(Centromadia fitchii*), long beak stork's-bill (*Erodium botrys*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and poison hemlock (*Conium maculatum*).

The seasonal wetland swale (PEM-1) is best characterized as *Typha (angustifolia, domingensis, latifolia)* Herbaceous Alliance (CNPS 2021). Species observed in this portion of the Study Area include a dense stand of broadleaf cattail (*Typha latifolia*) and several grasses which could not be identified due to their lack of flowers or fruiting bodies, including a species of wilidrye (*Elymus* sp.) and fescue (*Festuca* sp.).

The agricultural drainage ditches (Ditch-1 through Ditch-16) in the Study area are almost completely unvegetated except for occasional remnant senescent vegetation and tree-of-heaven saplings. The roadside ditches (Ditch-17 through Ditch-19) contained a mix of the non-native grasses and forbs also observed in the ruderal/disturbed areas with higher densities of poison hemlock, black mustard, and curly dock (*Rumex crispus*) with occasional pigweed (*Amaranthus sp.*), bullthistle (*Cirsium vulgare*) and milk thistle (*Silybum marianum*).

A list of plant species (including NWPL indicator status) observed at the surveyed data points and features within the Study Area is presented in **Appendix D**.

4.3 Hydrology

The Study Area is situated within the Lower Sacramento Hydrologic Unit Code (HUC)-18020109. All mapped ditches and other waters appear to be fed by groundwater pumps related to the irrigation of cropland. These features contained no water at the time of the survey. A review of USGS topographic maps and Google Earth aerial imagery did not show presence of any natural drainages, creeks, or other waters and field observations confirmed this to be accurate (USGS 2021, Google 2021).

The hydrologic regime in the Study Area is influenced by irrigation, seasonal precipitation, stormwater runoff from adjacent lands, and irrigation runoff from adjacent parcels. The wetland swale feature (PEM-1) mapped in the northern-most Offsite Project Area receives ephemeral flow in the form of stormwater and irrigation runoff from adjacent cropland to the north and surface runoff from Interstate 80 to the south and northeast. A culvert near the northwest corner of this area directs additional runoff from a gas station to the west under Pedrick Road into the wetland swale via the roadside ditch on the east side of Pedrick Road.

5 Delineation Results

Survey efforts identified one seasonal wetland swale feature encompassing 0.142 acres and 19 interconnected agricultural irrigation ditches covering 1.931 acres over 7,746 linear feet (**Table 2**). **Figure 4: Aquatic Resource Delineation** provides a labeled view of the seasonal wetland swale and ditches. In addition, delineation data sheets are included in **Appendix A**, and representative photographs are included in **Appendix B**.

5.1 Features Observed in the Study Area

The data point taken within the swale feature indicates the presence of problematic vegetation due to the timing of the survey early in the growing season. Despite the conditions within the vegetation sample plot, evidence of hydrophytic vegetation is present immediately to the east of the sample point. A dense stand of broadleaf cattail extends from approximately 20 feet east of the sample point to the eastern edge of the northern-most Offsite Project Area. As the location of the sample point is hydrologically connected to the area to the east and the soils in the sample pit were found to have indicators of hydric soils, it is likely that hydrophytic vegetation is present throughout PEM-1. In addition, below a 3-inch crust of dried soil, the soil excavated at the sample location was saturated indicating perennial inundation despite below-average precipitation during the 2020 water year (NOAA 2021).

The other water features in the Study Area are agricultural irrigation and drainage ditches fed by groundwater pumping that were dry at the time of the survey. These 19 features range in width at the OHWM from 3.5 feet to 8 feet and from 0.83 to 1.2 feet in depth. The longest of these features is Ditch-8, which extended 3,442 feet and the shortest feature is Ditch-3 at 6 feet in length. These features were mapped as individual features to capture the varying widths of the irrigation ditches more accurately. However, most of the features are hydrologically connected or represent segments of the same ditch. Ditch-1 through Ditch-12 are segments of a loop surrounding the cultivated cropland that comprise the majority of the Study Area; Ditch-17 and Ditch-18 are also contiguous with one another.

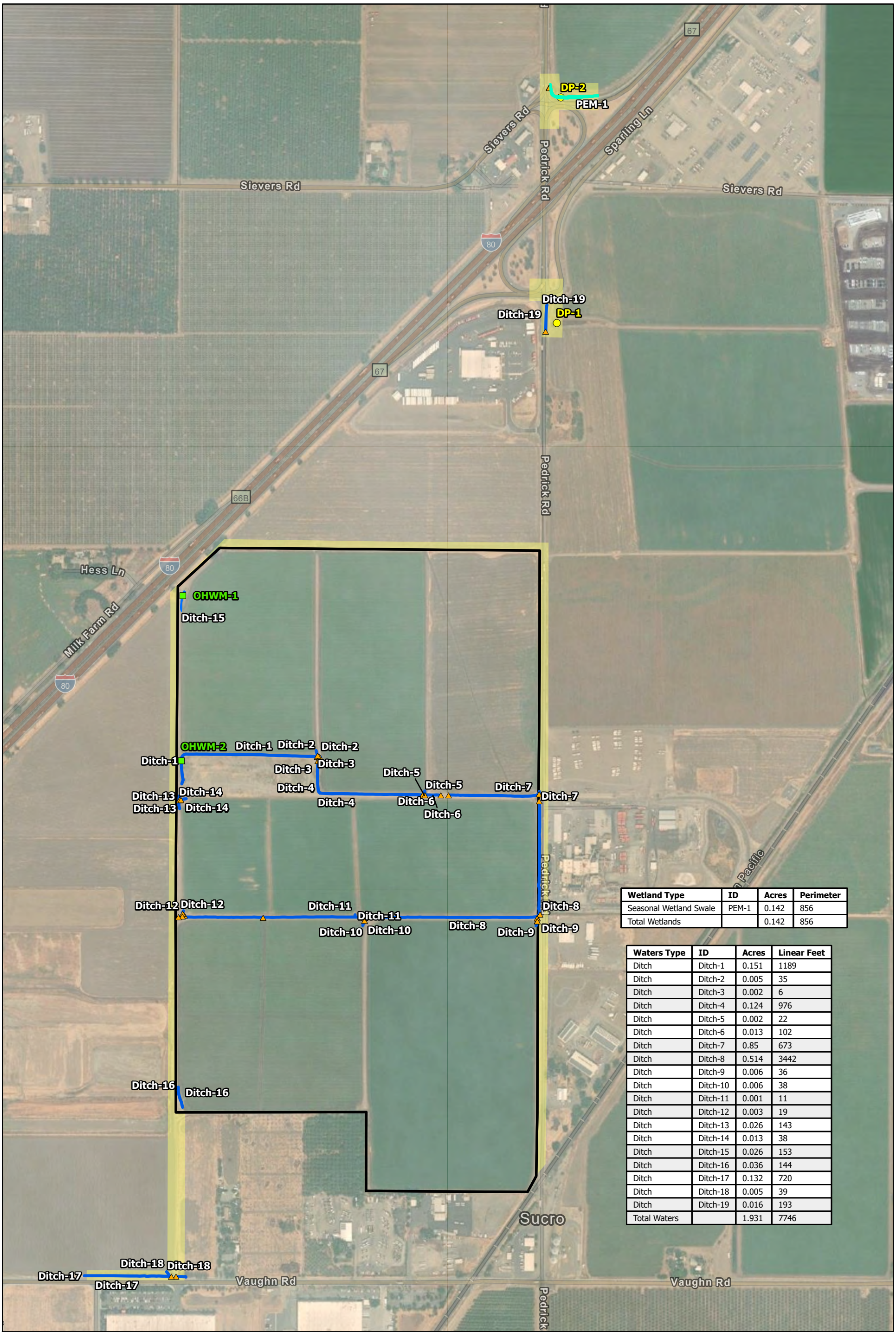
Table 2. Features Observed in the Study Area

Feature Type	Label**	Area (acres)*	Length (linear feet)
Seasonal Wetland Swale	PEM-1	0.142	856 (perimeter)
Ditch	Ditch-1	0.151	1,189
Ditch	Ditch-2	0.005	35
Ditch	Ditch-3	0.002	6
Ditch	Ditch-4	0.124	976
Ditch	Ditch-5	0.002	22
Ditch	Ditch-6	0.013	102
Ditch	Ditch-7	0.850	673
Ditch	Ditch-8	0.514	3,442
Ditch	Ditch-9	0.006	36
Ditch	Ditch-10	0.006	38
Ditch	Ditch-11	0.001	11
Ditch	Ditch-12	0.003	19
Ditch	Ditch-13	0.026	143

Feature Type	Label**	Area (acres)*	Length (linear feet)
Ditch	Ditch-14	0.013	38
Ditch	Ditch-15	0.026	153
Ditch	Ditch-16	0.036	144
Ditch	Ditch-17	0.132	720
Ditch	Ditch-18	0.005	39
Ditch	Ditch-19	0.016	139
Total		**1.931**	**7,746**

Source: Bargas, 2020. *Acreages are calculated estimations that are subject to modification pending formal verification by USACE.

**Features labeled PEM are potentially jurisdictional waters of the state.



Wetland Type	ID	Acres	Perimeter
Seasonal Wetland Swale	PEM-1	0.142	856
Total Wetlands		0.142	856

Waters Type	ID	Acres	Linear Feet
Ditch	Ditch-1	0.151	1189
Ditch	Ditch-2	0.005	35
Ditch	Ditch-3	0.002	6
Ditch	Ditch-4	0.124	976
Ditch	Ditch-5	0.002	22
Ditch	Ditch-6	0.013	102
Ditch	Ditch-7	0.85	673
Ditch	Ditch-8	0.514	3442
Ditch	Ditch-9	0.006	36
Ditch	Ditch-10	0.006	38
Ditch	Ditch-11	0.001	11
Ditch	Ditch-12	0.003	19
Ditch	Ditch-13	0.026	143
Ditch	Ditch-14	0.013	38
Ditch	Ditch-15	0.026	153
Ditch	Ditch-16	0.036	144
Ditch	Ditch-17	0.132	720
Ditch	Ditch-18	0.005	39
Ditch	Ditch-19	0.016	193
Total Waters		1.931	7746

Source: ESRI ArcGIS Online - World Imagery (8/21/2020) and Hybrid Reference Layer

0 300 600 Feet

1 inch = 645 feet

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Surveyor Name: Owen Routt
Map Date: 6/28/2021
Map Author: Daniela Zepeda-Vargas
Date Revised: 7/23/2021
Aerial Source: ESRI ArcGIS World Imagery, 8/21/2020
Coordinate System:
NAD 1983 State Plane Zone 2 (US Feet)

Project Boundary
Offsite Project Areas
Culvert
Sample Point
OHWM
Ditch
Wetland
Seasonal Wetland Swale

Figure 4
Aquatic Resource Delineation

Dixon 257

Map Created: 6/28/21, Map Revised: 7/23/2021, Bargas Project Number: 1280-20

6 Conclusion

There was one seasonal wetland swale encompassing a total of **0.142 acres** and **1.931 acres** of other waters present in the Study Area. New criteria to determine the presence of a jurisdictional wetland waters of the U.S. were implemented June 22, 2020, requiring a hydrologic nexus to a USACE TNW, such as "by directly abutting or having regular surface water communication with jurisdictional waters" (Federal Register 2020). The mapped features do not meet any USACE jurisdictional criteria under the Navigable Waters Protection Rule because there are no jurisdictional riverine, limnic, or tidal waters present adjacent to the swale which share hydrologic connectivity. These features are subject to the interpretation and verification of the USACE Sacramento District Regulatory Division. All features observed are depicted in **Figure 4 – Aquatic Resource Delineation**.

7 References

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USFWS. 2021. National Wetlands Inventory (NWI) - Wetlands Online Mapper. https://www.fws.gov/wetlands/.

USGS. 2021. The National Geological Map Database. https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html.

Appendix A. Arid West Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 1280-20 Dixon 257 City/County: Dixon, Solano County Sampling Date: 03/26/21
Applicant/Owner: 5G Consulting Group, LLC State: CA Sampling Point: DP-1
Investigator(s): O. Routt, K. Pulsipher Section, Township, Range: Section 6, Township 7 North, Rage 2 East
Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): <3%
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.4862505 Long: -121.8035077 Datum: NAD83
Soil Map Unit Name: Capay silty clay loam, 0% slopes, MLRA 17 NWI Classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Sample point within an agricultural dentention basin.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
	=Total Cover		

Sapling/Shrub Stratum (Plot size: _)			
1. *N/A*			
2.			
3.			
4.			
5.			
	=Total Cover		

Herb Stratum (Plot size: r = 5 ft)			
1. *Rumex crispus*	50%	Y	FACW
2. *Un-identifiable vine/linear herb*	25%	Y	FACU
3. *Xanthium strumarium*	20%	Y	FAC
4.			
5.			
6.			
7.			
8.			
	95% =Total Cover		

Woody Vine Stratum (Plot size:)			
1. *N/A*			
2.			
	95% =Total Cover		

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust 0%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **3** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **67%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**1**	x2 = **2**
FAC species	**1**	x3 = **3**
FACU species	**1**	x4 = **4**
UPL species		x5 =
Column Totals:	**4** (A)	**9** (B)

Prevalence Index = B/A = **2.3**

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
_____ Prevalence Index is ≤3.0[1]
_____ Morphological Adaptationd[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 X No _____

Remarks: Study area includes hairy cats ear, black mustard. Many other plants to dessicated and or grazed to identify.

SOIL

Sampling Point: DP-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y 3/1	83	7.5YR 5/8	17	C	M	Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (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 gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Aerial imagery indicate basin is used as irrigation overflow/drainage from adjacent row crops. Ditches from adjacent fields and associated temporary irrigation ditches appear in aerial imagery on a seasonal basis.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 1280-20 Dixon 257 City/County: Dixon, Solano County Sampling Date: 03/26/21
Applicant/Owner: 5G Consulting Group, LLC State: CA Sampling Point: DP-2
Investigator(s): O. Routt, K. Pulsipher Section, Township, Range: Section 6, Township 8 North, Rage 2 East
Landform (hillslope, terrace, etc.): Basin, Outflow-artificial Local relief (concave, convex, none): Concave <2%
Subregion (LRR): Mediterranean California (LRR C) Lat: 38.4907342 Long: -121.8033928 Datum: NAD83
Soil Map Unit Name: Capay siltly clay loam, 0% slopes, MLRA 17 NWI Classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Sample point within roadside drainage ditch, two low ruts with an island/mound between.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1. *N/A*			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. *N/A*			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: r=5 feet)			
1. *Fescue sp.*	50%	Y	
2. *Elymus sp.*	10%		
3.			
4.			
5.			
6.			
7.			
8.			
	60 =Total Cover		
Woody Vine Stratum (Plot size:)			
1. *N/A*			
2.			
	60 =Total Cover		

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

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

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	
FACW species	x2 =	
FAC species	x3 =	
FACU species	x4 =	
UPL species	x5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = **#DIV/0!**

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptationd[1] (Provide supporting data in Remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks: Vegetation in the sample plot is mostly dead or too young to identify. With the presence of hydric soils and wetland hydrology (see page 2) within a linear depression it is likely that hydrophytic vegetation would be present throughout the feature. A large patch of senesant cattail (*Typha latifolia)* with some new growth extends from aproximatly 20 feet east of the sample point to the edge of the Study Area. The sample point was not taken in the cattail patch for safety reasonse due to its location immediatly off the shoulder of an Interstate 80 off-ramp with vehicles moving at high speed.

SOIL

Sampling Point: DP-2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	Gley 13/10Y	99	5YR 3/4	1	C	M	Clay	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X 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** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (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 X No ___ Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks: Soil saturated below 3 inches.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Innovation Village / Dixon
Project Number: 1280-20
Stream: Ag Ditch - 1
Investigator(s): O. Routt, K. Pulcipher

Date: 03/26/21 **Time:**
Town: Dixon **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Agricultural fields w/commercial properties adjacent

Projection: **Datum:** NAD83
Coordinates:

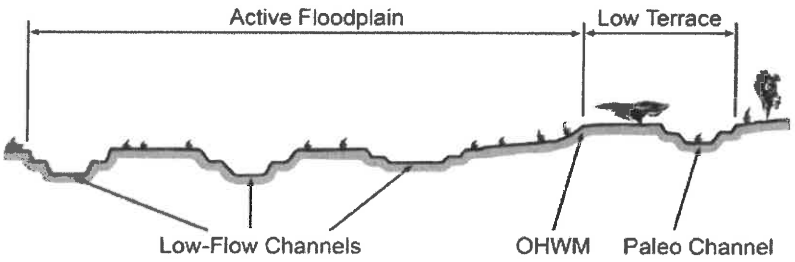
Potential anthropogenic influences on the channel system:
All features on site are anthropogenic, excavated to support agriculture activities.

Brief site description:
Man-made ag ditch, likely receives water from ground-water pump (a pump located adjacent). Ditch travels N, turns E & meets a 4-way culvert, OHWM evident by ~0.5ft w/ depth increasing ~10 inches. Another segment of ditch goes S. from 4-way culvert, similar except some dead veg. above OHWM.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☒ Other studies National Wetlands Inventory
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

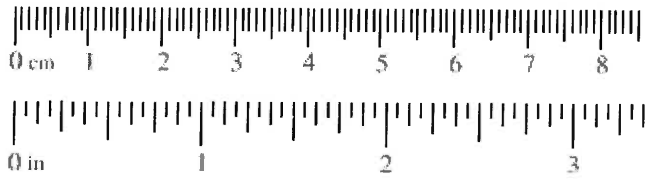


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ GPS
   - ☐ Digitized on computer
   - ☐ Other:

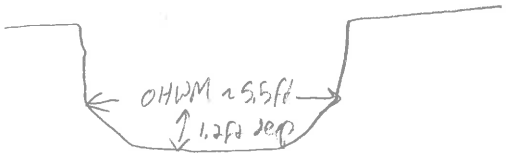
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
	10.08	256	Boulder	
	2.56	64	Cobble	Gravel
	0.157	4	Pebble	
	0.079	2.00	Granule	
	0.039	1.00	Very coarse sand	
	0.020	0.50	Coarse sand	
1/2	0.0098	0.25	Medium sand	Sand
1/4	0.005	0.125	Fine sand	
1/8	0.0025	0.0625	Very fine sand	
1/16	0.0012	0.031	Coarse silt	
1/32	0.00061	0.0156	Medium silt	Silt
1/64	0.00031	0.0078	Fine silt	
1/128	0.00015	0.0039	Very fine silt	
			Clay	Mud



Project ID: 1280-20 **Cross section ID:** Ag Ditch 1 **Date:** 03/26/21 **Time:**

Cross section drawing:



Looking North

OHWM

GPS point: 38.8775696, -121.813027 32

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:
GPS point taken at center of ditch.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Innovation Village / Dixon 252 **Date:** 03/02/21 **Time:**
Project Number: 1280-20 **Town:** Dixon **State:** CA
Stream: Ag Ditch - 15 **Photo begin file#:** **Photo end file#:**
Investigator(s): O. Routt, K. Pulaipka

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Agricultural land surrounded by commercial

Projection: **Datum:** NAD83
Coordinates:

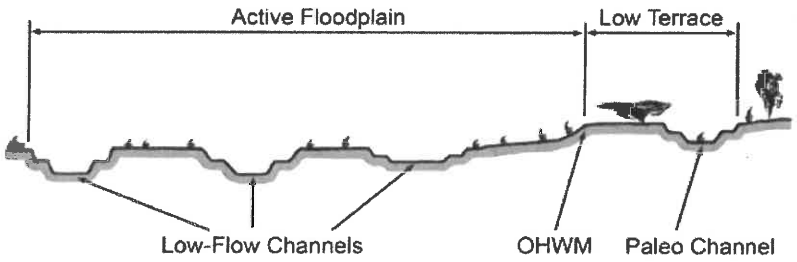
Potential anthropogenic influences on the channel system:
Man-made ditch for ag fields, maintained

Brief site description:
Man-made ag ditch

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☒ Other studies National wetlands Inventory
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

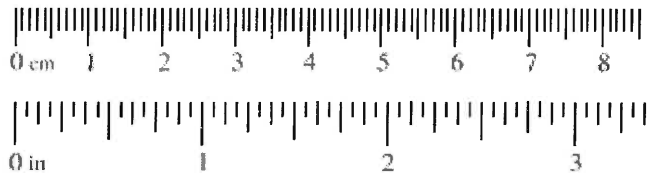


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☒ GPS
   - ☐ Other:

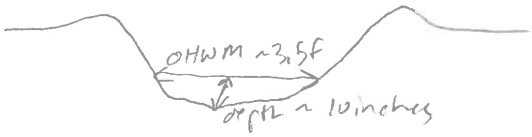
Wentworth Size Classes

Inches (in)	Millimeters (mm)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



Project ID: 1280-20 **Cross section ID:** Ag Ditch 15 **Date:** 03/26/21 **Time:**

Cross section drawing:



facing South

OHWM

GPS point: 38.48084857, -121.81298115

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

No vegetation, Biotic crust, soil cracks

GPS is ~ center of ditch

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

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- ☐ Mudcracks
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- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Appendix B. Representative Site graphs

Photo 1. Ditch-1 facing south with concrete debris in the foreground and ruderal/disturbed landcover typical of the Study Area.

Photo 2. Condition of agricultural irrigation and drainage ditches throughout the Study Area.

Photo 3. Ditch-4 facing east toward Pedrick Road with field prepared for planting on the left and cover-crop on the right.

Photo 4. Ditch-8 with row crops on either side of an access road. All drainage ditches were dry at the time of the survey.

Photo 5. Ditch-10 facing south with field prepared for planting on either side.

Photo 6. Ditch-13 facing north with concrete debris and ruderal/disturbed landcover

Photo 7. Ditch-17 facing east typical of Avena spp. - Bromus spp. Herbaceous Semi-Natural Alliance and Lolium perenne Herbaceous Semi-Natural Alliance.

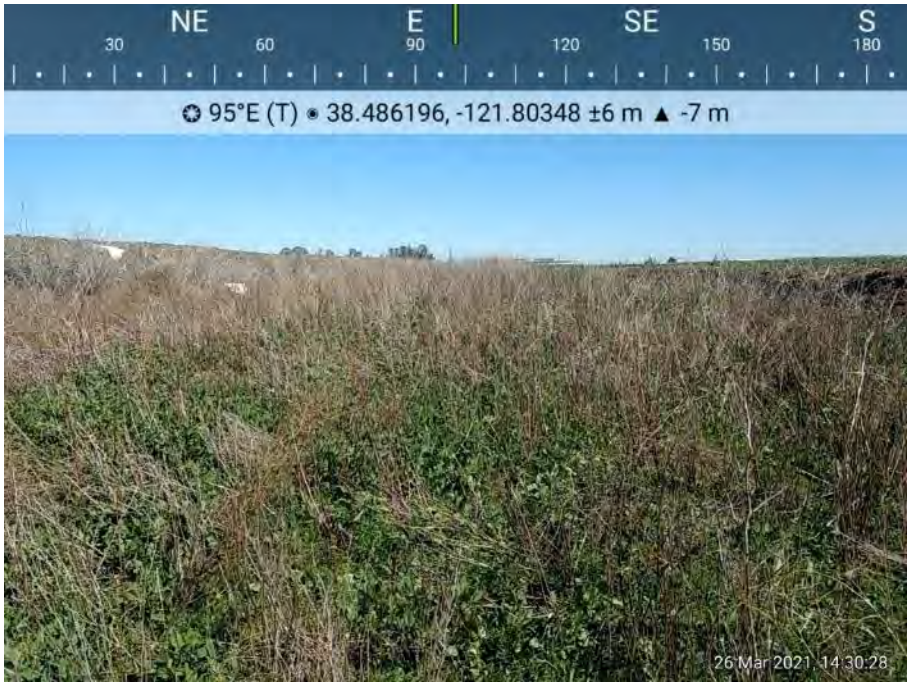


Photo 8. DP-1 facing east dominated by curly dock.

Photo 9. DP-2 Sample pit location surrounded by unidentifiable senescent and early growth stage vegetation

Photo 10. View from DP-2 sample pit location facing east with stand of senescent broadleaf cattail in the background with the Interstate 80 offramp on the right.

Appendix C. Custom Soil Resource Report

United States Department of Agriculture

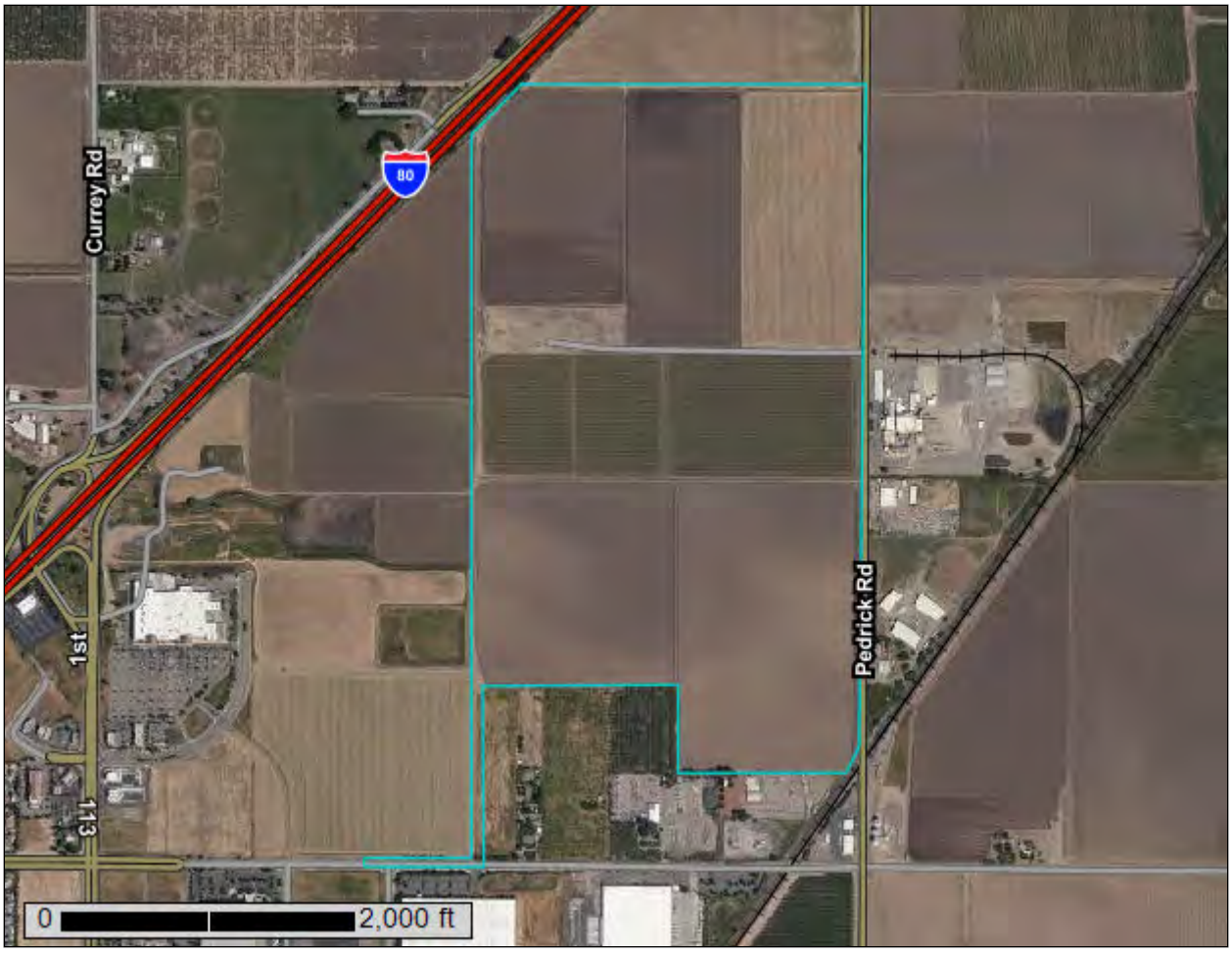
NRCS

Natural Resources Conservation Service

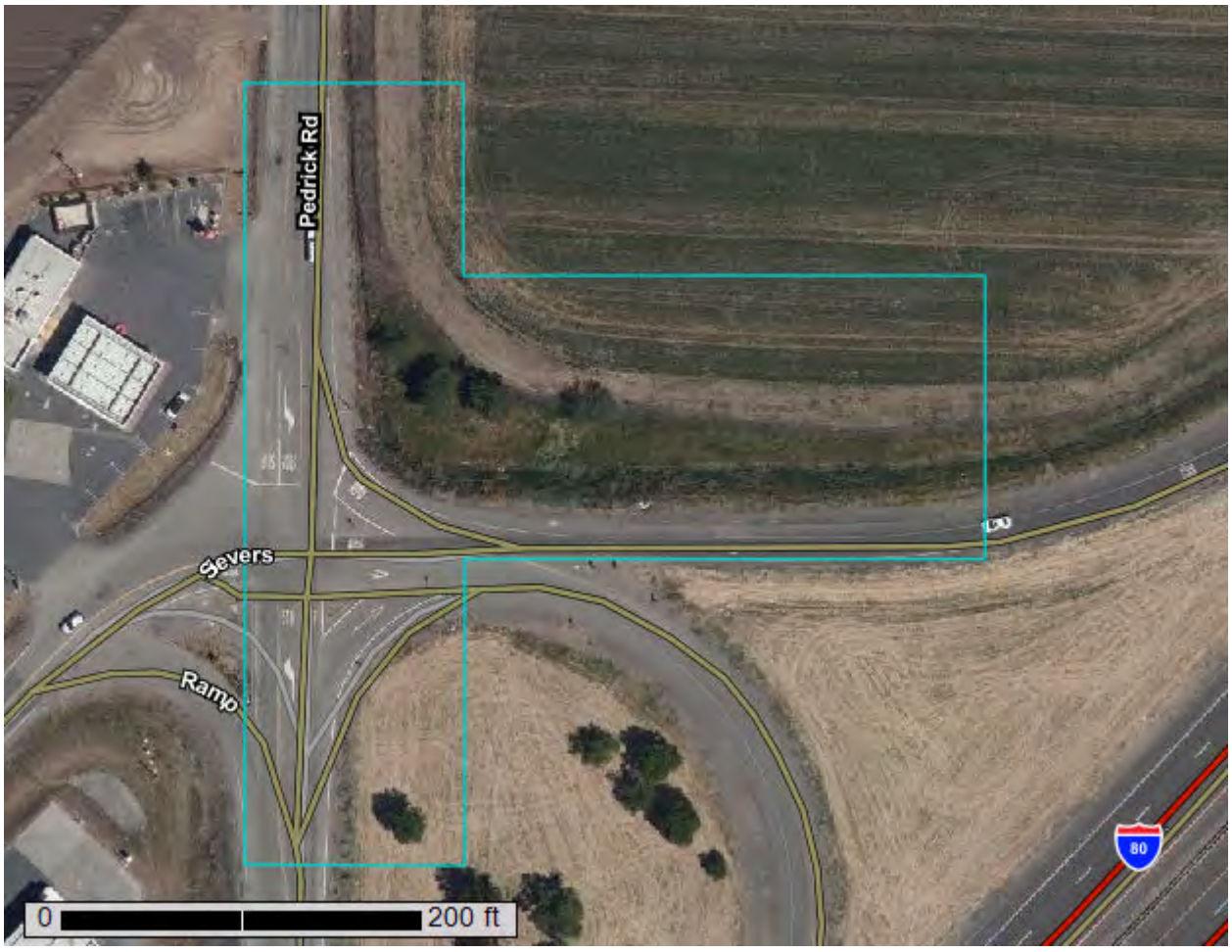
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Solano County, California

1280-20 Dixon 257



July 21, 2021


Pedrick Rd
Severs
Ramp
80
0
200 ft


Sparling
Pedrick Rd
0
200 ft

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 Scale: 1:9,500 if printed on A portrait (8.5" x 11") sheet.

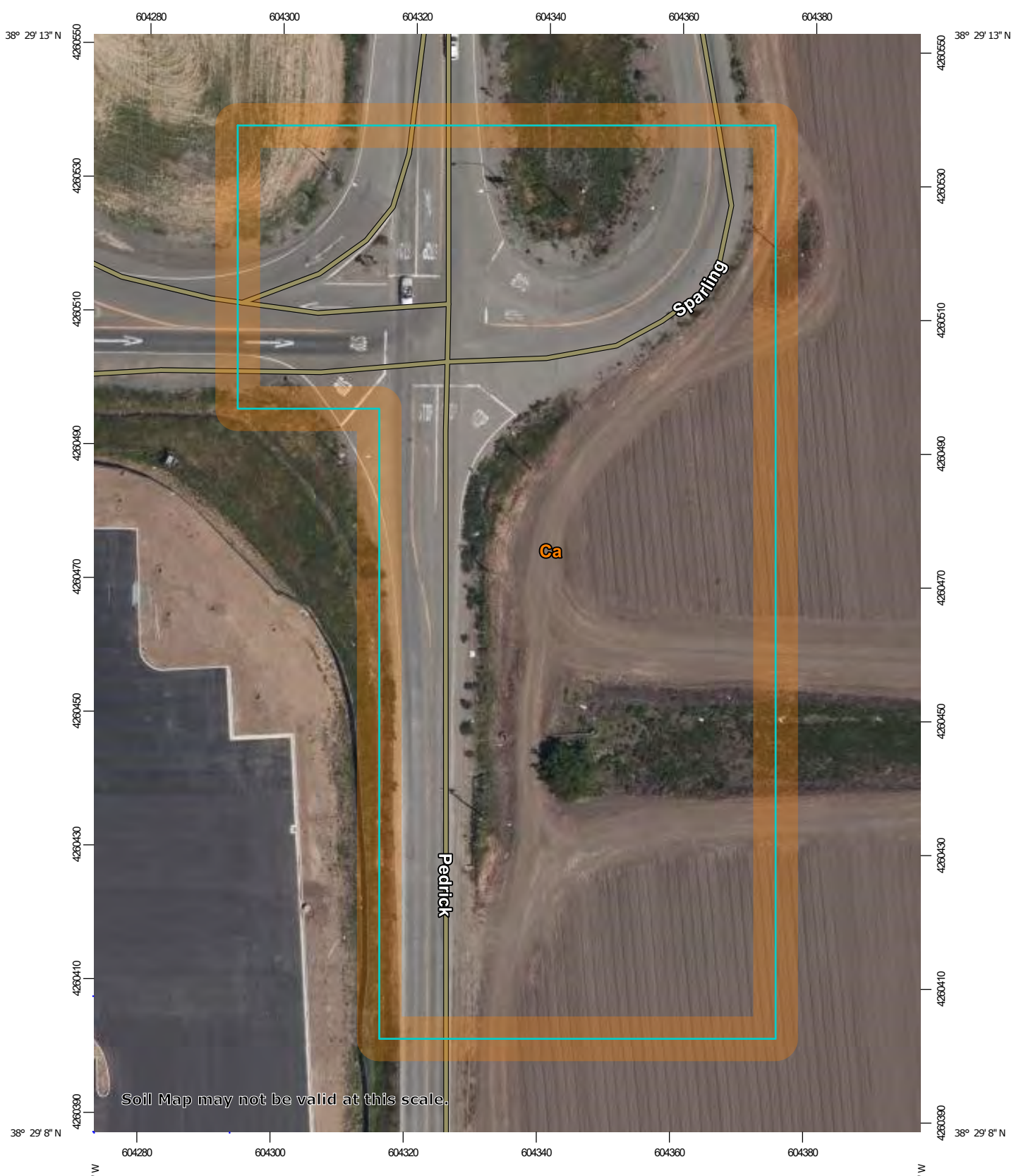
N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Custom Soil Resource Report
Soil Map



Map Scale: 1:800 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Custom Soil Resource Report
Soil Map

Map Scale: 1:966 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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: Solano County, California
Survey Area Data: Version 14, May 29, 2020

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

Date(s) aerial images were photographed: Apr 26, 2019—May 1, 2019

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
BrA	Brentwood clay loam, 0 to 2 percent slopes	67.5	25.0%
Ca	Capay silty clay loam, 0 percent slopes, MLRA 17	92.6	34.3%
Yo	Yolo loam, 0 to 4 percent slopes, MLRA 17	38.9	14.4%
Ys	Yolo silty clay loam, 0 to 2 percent slopes, MLRA 17	71.0	26.3%
Totals for Area of Interest		**270.0**	**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.

Solano County, California

BrA—Brentwood clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: h9kp
Elevation: 80 to 250 feet
Mean annual precipitation: 18 to 25 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 260 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Brentwood

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 34 inches: clay loam
H3 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Yolo

Percent of map unit: 10 percent
Hydric soil rating: No

Rincon

Percent of map unit: 5 percent
Hydric soil rating: No

Ca—Capay silty clay loam, 0 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2xcc2
Elevation: 20 to 110 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 61 to 62 degrees F
Frost-free period: 315 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Capay

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ap - 0 to 5 inches: silty clay loam
Bwk1 - 5 to 21 inches: silty clay loam
Bwk2 - 21 to 32 inches: silty clay loam
Bwk3 - 32 to 40 inches: silty clay loam
Bwk4 - 40 to 50 inches: silty clay loam
Bwk5 - 50 to 62 inches: silty clay loam
Bwk6 - 62 to 81 inches: silty clay loam
2Bwk7 - 81 to 88 inches: sandy clay loam
2Bk - 88 to 102 inches: fine sandy loam

Properties and qualities

Slope: 0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well 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 50 to 102 inches
Frequency of flooding: NoneRare

Frequency of ponding: Occasional
Calcium carbonate, maximum content: 1 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.5 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water capacity: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Rincon

Percent of map unit: 5 percent
Hydric soil rating: No

Yolo

Percent of map unit: 5 percent
Hydric soil rating: No

Brentwood

Percent of map unit: 5 percent
Hydric soil rating: No

Yo—Yolo loam, 0 to 4 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2w89p
Elevation: 20 to 370 feet
Mean annual precipitation: 18 to 28 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Yolo

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metamorphic and sedimentary rock

Typical profile

Ap - 0 to 9 inches: loam
A1 - 9 to 18 inches: loam
A2 - 18 to 28 inches: loam
Bw1 - 28 to 36 inches: loam
Bw2 - 36 to 44 inches: loam
Bw3 - 44 to 60 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.3 to 0.5 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Reiff

Percent of map unit: 5 percent
Hydric soil rating: No

Brentwood

Percent of map unit: 5 percent
Hydric soil rating: No

Sycamore

Percent of map unit: 5 percent
Hydric soil rating: No

Ys—Yolo silty clay loam, 0 to 2 percent slopes, MLRA 17

Map Unit Setting

National map unit symbol: 2w8b1
Elevation: 10 to 420 feet
Mean annual precipitation: 16 to 28 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Yolo

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
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 9 inches: silty clay loam
A1 - 9 to 18 inches: silty clay loam
A2 - 18 to 28 inches: silty clay loam
Bw1 - 28 to 36 inches: clay loam
Bw2 - 36 to 44 inches: loam
Bw3 - 44 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline (0.3 to 0.5 mmhos/cm)
Available water capacity: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Brentwood

Percent of map unit: 5 percent
Hydric soil rating: No

Sycamore

Percent of map unit: 5 percent
Hydric soil rating: No

Reiff

Percent of map unit: 5 percent
Hydric soil rating: No

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Appendix D. Plant List

Scientific Name	Common Name	Wetland Indicator Status*
Ailanthus altissima	tree-of-heaven	FACU
Amaranthus albus	tumbleweed	FACU
Avena fatua	wild oats	NL
Brassica nigra	black mustard	UPL
Bromus diandrus	ripgut brome	NL
Centaurea solstitialis	yellow starthistle	NL
Centromadia fitchii	spikeweed	FACU
Cirsium vulgare	bullthistle	FACU
Claytonia perfoliata	miner's lettuce	FAC
Conium maculatum	poison hemlock	FACW
Convolvulus arvensis	field bindweed	NL
Croton setiger	turkey mullein	NL
Cynodon dactylon	bermuda grass	FACU
Cyperus eragrostis	tall flatsedge	FACW
Elymus sp.	wilidrye	NL
Erigeron canadensis	horseweed	FACU
Erodium botrys	longbeak stork's-bill	FACU
Erodium moschatum	whitestem filaree	NL
Eryngium vaseyi	coyote thistle	FACW
Eschscholzia californica	California poppy	NL
Euphorbia maculata	spotted spurge	UPL
Festuca perennis	Italian ryegrass	FAC
Festuca sp.	fescue	NL
Foeniculum vulgare	sweet fennel	NL
Geranium sp.	geranium	NL
Helminthotheca echioides	bristly ox-tongue	FAC
Hypochaeris radicata	hairy cat's ear	FACU
Juglans nigra	black walnut	UPL
Lactuca serriola	prickly lettuce	FACU
Lupinus bicolor	lupine	NL
Malva parviflora	cheeseweed	NL
Medicago sativa	alfalfa	UPL
Pistacia chinensis	chinese pistache	NL
Plantago lanceolata	English plantain	FAC
Portulaca oleracea	common purslane	FAC
Prunus dulcis	almond	NL

Scientific Name	Common Name	Wetland Indicator Status*
Quercus lobata	valley oak	FACU
Robinia pseudoacacia	black locust	FACU
Rumex crispus	curly dock	FAC
Silybum marianum	milk thistle	NL
Sorghum halepense	johnsongrass	FACU
Trifolium sp.	clover	NL
Typha latifolia	cattail	OBL
Vicia sativa	vetch	FACU

*Definitions:

- FAC – Facultative
- FACU – Facultative Upland
- FACW – Facultative Wetland
- UPL – Obligate Upland
- NL – Not listed

Appendix E. GIS Shapefiles and ORM Upload Spreadsheet (electronic only attachment)