

SUNPOWER LOP WASTEWATER PLANT SOLAR PROJECT

Wetland Delineation

Prepared for
SunPower

October 2015



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550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900
www.esassoc.com

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CHAPTER 1.0

Introduction

On behalf of the SunPower, ESA has prepared this report to delineate and document wetland and channel boundaries for the SunPower LOP Wastewater Plant Solar Project (project). ESA investigated the extent of potentially jurisdictional wetlands and other waters of the U.S. occurring at the project site (**Figure 1-1**), hereafter referred to as the “study area.” The study area consists of approximately 5.27 acres of land approximately 9.3 mile north of the City of Auburn in Nevada County (**Figure 1-2**). The site investigation was conducted in September 2015. The study concludes that there are 0.01 acres of potentially jurisdictional waters of the U.S in the study area. These include:

- 0.01 acres of ephemeral stream channel.

This report documents wetland and channel boundary delineation using the best professional judgment of qualified biologists. All conclusions presented should be considered preliminary and subject to change pending official review and verification in writing by the U.S. Army Corps of Engineers (USACE).

1.1 Responsible Parties

The applicant’s contact information is:

Sevi Gultes, Sr. Development Engineer
SunPower
1414 Harbour Way South
Richmond, CA 94804

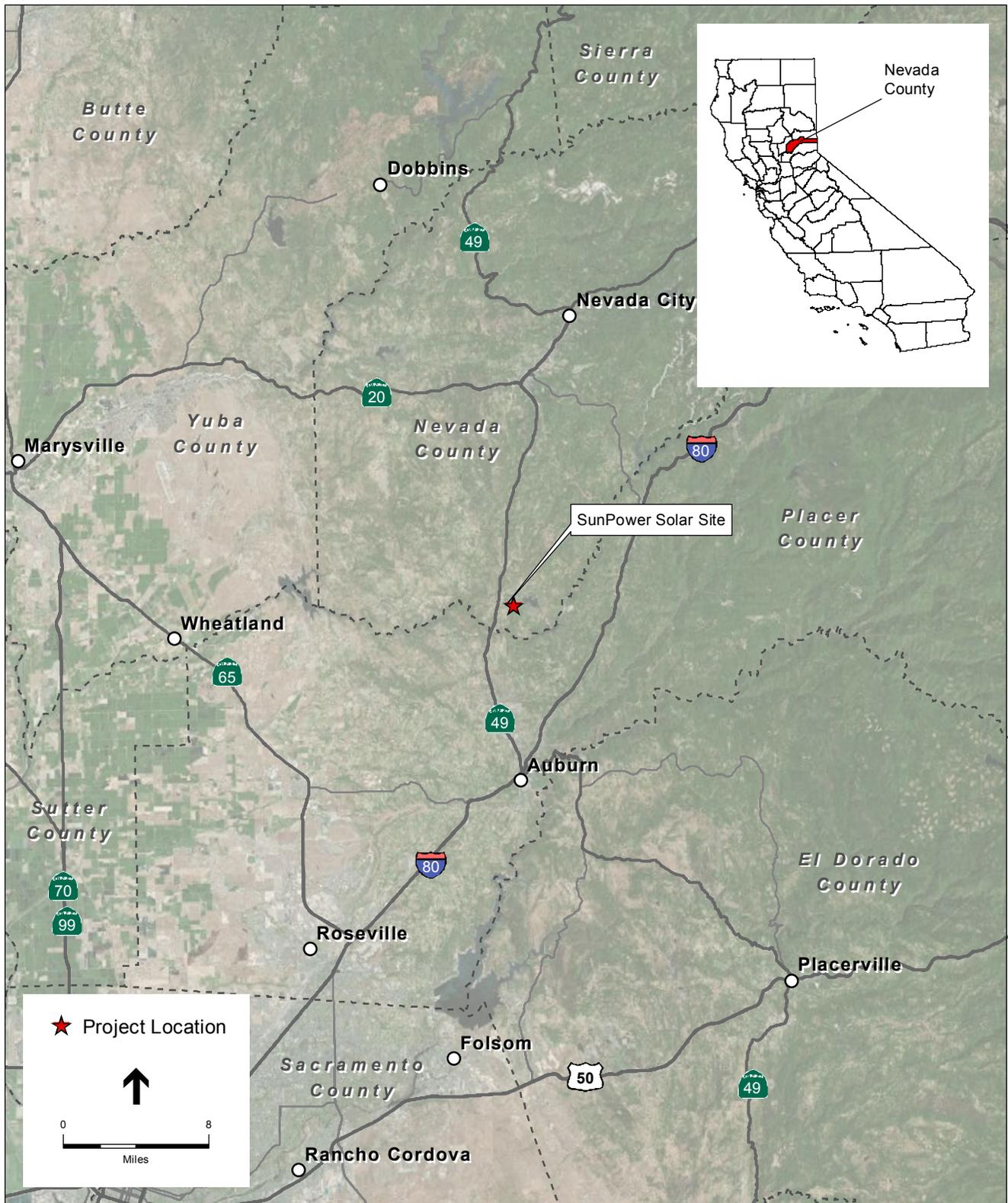
1.2 Directions to Site

Directions to the site:

- From Sacramento, take I-80 East;
- Take exit 119B for CA-49 north toward Grass Valley;
- Turn right onto Combie Lane;
- Turn right onto Timber Ridge Drive;
- Turn right onto Riata Way.

1.3 Purpose of Assessment

The purpose of this investigation is to describe and delineate all wetlands and waters of the U.S. within the study area that may be subject to Section 404 of the Clean Water Act. If necessary, information from this report may be used in preparing permit applications for future actions proposed in the study area. This report will be reviewed by the USACE to verify their jurisdiction over wetlands and other waters of the U.S. in the study area.



SOURCE: i-cubed, 1999; ESRI, 2012; ESA, 2015

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Figure 1-1
Regional Locator



SOURCE: Microsoft, 2011; SunPower, 2015; ESA, 2015

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Figure 1-2
Study Area

SECTION 2.0

Setting

2.1 Study Area

The study area is located at the Lake of the Pines wastewater treatment plant in an unincorporated part of Nevada County approximately 9.3 miles north of the City of Auburn and 12.8 miles south of the City of Grass Valley. This location corresponds to Township 14 North, Range 8 East, Section 27 of the Lake Combie, CA U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map. Surrounding land uses include the wastewater treatment plant facilities, open space, and low density residential.

The study area is located in the heart of the northern Sierra Nevada foothills. The Sierra Nevada foothills lie between the western edge of the Sierra Nevada and the eastern border of the Central Valley. The foothills form a belt 10 to 30 miles wide that ranges from 500 to 5,000 feet in elevation in a series of northwest to north-northwest aligned ridges that decline in elevation from northeast to southwest. Many rapidly flowing rivers and streams run westerly in deeply incised canyons with bedrock channels to the Central Valley and eventually to the Pacific Ocean. Alluvial fans, floodplains, and terraces are not extensive; and all but the largest streams are generally dry during the summer. Dominant vegetation communities include grasslands, oak/pine woodlands, and chaparral. The climate is temperate with mean annual precipitation of 54.31 inches and mean annual temperatures ranging from a high of 67.7 to a low of 40.1 degrees Fahrenheit (Western Regional Climate Center, 2015). Within the study area, the topography gently slopes from south to north. Elevations in the study area range from approximately 1,460 to 1,475 feet above mean sea level (msl).

Representative photographs were taken throughout the project area; select photographs are included in **Appendix B**.

2.2 Soils

The *Custom Soil Resource Report for Nevada County Area, California* (NRCS, 2015 – **Appendix A**) (**Table 2-1** and **Figure 2-1**) indicates two soil units within the study area. One of the soil units is listed by the Natural Resource Conservation Service (NRCS) on the national hydric soils list for Nevada County, California (NRCS, 2014).

**TABLE 2-1
STUDY AREA SOIL UNITS**

Soil Map Unit Name	Hydric Status	Percentage of Study Area
AsD: Argonaut-Rock outcrop complex, 2 to 30 percent slopes	Non-hydric component with hydric inclusion	74.2%
BrD: Boomer-Rock outcrop complex, 5 to 30 percent slopes	Non-hydric	25.8%

SOURCE: NRCS, 2015; NRCS, 2014

- Argonaut-Rock outcrop complex, 2 to 30 percent slopes**, is listed as hydric by the NRCS (NRCS, 2014). Included in this map unit are small inclusions of Sobrante, Auburn, Rescue, and Unnamed soils. The Unnamed inclusion is listed as hydric by the NRCS, but the main Argonaut-Rock complex is not. The map unit composition is 60 percent Argonaut and similar soils, 20 percent Rock outcrop, and 20 percent minor components. This complex consists of well drained gravely loam and gravelly clay loam soils. Mapped areas are on hills.
- Boomer-Rock outcrop complex, 5 to 30 percent slopes**, is not listed as hydric by the NRCS (2014). Included in this map unit are small inclusions of Rescue, Josephine, Sites and Sobrante soils. The map unit composition is 60 percent Boomer and similar soils, 20 percent Rock outcrop, and 20 percent minor components. This complex consists of well drained loam and clay loam soils. Mapped areas are on mountains and hills.

2.3 Hydrology

The study area is situated in small watershed that has relatively flat terrain that gently slopes from south to north, draining towards Magnolia Creek just north of the Lake of the Pines wastewater treatment plant. There are no perennial watercourses within the study area; a single ephemeral channel provides drainage for the area. The study area is drained by surface percolation and overland sheet flow. In the northern section of the study area, surface water drains into an ephemeral channel that flows north into Magnolia Creek. Magnolia Creek is a perennial channel which flows west to the Bear River. The Bear River eventually drains to the Feather River near the town of Nicolaus. The Feather River is considered a “traditional navigable water” (TNW) under Section 404 of the Clean Water Act from Marysville to its confluence with the Sacramento River.

2.4 Vegetation

Plant communities are assemblages of plant species that occur together in the same area, and are defined by species composition and relative abundance. Plant communities and habitats within the study area are limited to annual grasslands and riverine; plant communities surrounding the study area include mixed oak woodlands. In additions, a wastewater treatment pond is located immediately north of the study area. This pond supports limited riparian and wetland habitats.

Annual Grassland

Annual grassland is present throughout the study area and also forms the understory in the mixed oak woodland communities surrounding the site. This plant community is dominated by nonnative Mediterranean annual grasses such as Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum*), perennial rye grass (*Festuca perennis*), wild oats (*Avena fatua*), and soft chess (*Bromus hordeaceus*). An assemblage of nonnative forbs was noted in the grasslands including filaree (*Erodium botrys*, *E. cicutarium*), Italian thistle (*Carduus pycnocephalus*), and bird's-foot trefoil (*Lotus corniculatus*). The annual grassland in the study area was heavily grazed at the time of the survey.

Riverine

Stream habitats are distinguished by intermittent or continually running water, and occur in association with a variety of terrestrial habitats. The study area supports a single ephemeral channel that traverses upland annual grassland habitat and collects water from adjacent areas. The channel originates as an upland vegetated swale, which eventually becomes channelized near the center of the study area. The stream channel is a mix of unvegetated areas and annual grassland species.



SOURCE: Microsoft, 2011; SSURGO, 2014; SunPower, 2015; ESA, 2015

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Figure 2-1
 Soils

SECTION 3

Methodology

3.1 Definition of “Waters of the U.S.”

The U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) published a Clean Water Rule on June 29, 2015 defining the term “Waters of the United States” (“Clean Water Rule: Definition of “Waters of the United States” 80 Federal Register 124 (29 June 2015), pp. 37054 – 37127). The final rule became effective on August 28, 2015. The rule is intended to resolve jurisdictional uncertainty surrounding what constitutes “Waters of the United States” following the U.S. Supreme Court decisions in the *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers* case and the *Rapanos v. United States (Rapanos)* case. This new Clean Water Act rule supersedes previous guidance on Clean Water Act jurisdiction related to the SWANCC and Rapanos U.S. Supreme Court decisions. Under the new Clean Water Act Rule, the federal government defines “Waters of the United States” in 40 Code of Federal Regulations (CFR) 230.3 as follows:

- A. For the purposes of the Clean Water Act, subject to the exclusions in paragraph (B) below, the term “waters of the United States” means:
- i. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
 - ii. All interstate waters including interstate wetlands;
 - iii. The territorial seas;
 - iv. All impoundments of waters otherwise identified as waters of the United States under the definition;
 - v. All tributaries, as defined in paragraph (C)(iii) below, of waters identified in paragraphs (A)(i) through (iii) above;
 - vi. All waters adjacent to a water identified in paragraphs (A)(i) through (v) above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters;
 - vii. All waters in paragraphs (a) through (e) of this subsection where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (A)(i) through (iii) above. The waters identified in each of paragraphs (a) through (e) of this subsection are similarly situated and shall be combined, for purposes of a significant nexus analysis, in the watershed that drains to the nearest water identified in paragraphs (A)(i) through (iii) above. Waters identified in this paragraph shall not be combined with waters identified in

paragraph (A)(iv) above when performing a significant nexus analysis. If waters identified in this paragraph are also an adjacent water under paragraph (A)(iv) above, they are an adjacent water and no case-specific significant analysis is required.

- a. *Prairie potholes*. Prairie potholes are a complex of glacially formed wetlands, usually occurring in depressions that lack permanent natural outlets, located in the upper Midwest.
 - b. *Carolina bays and Delmarva bays*. Carolina bays and Delmarva bays are ponded, depressional wetlands that occur along the Atlantic coastal plain.
 - c. *Pocosins*. Pocosins are evergreen shrub and tree dominated wetlands found predominantly along the Central Atlantic coastal plain.
 - d. *Western vernal pools*. Western vernal pools are seasonal wetland located in parts of California and associated with topographic depressions, soils with poor drainage, mild wet winters, and hot dry summers.
 - e. *Texas coastal prairie wetlands*. Texas coastal prairie wetlands are freshwater wetlands that occur as a mosaic of depressions, ridges, intermound flats, and mima mound wetlands located along the Texas Gulf Coast.
- viii. All waters located within the 100-year floodplain of a water identified in paragraphs (A)(i) through (iii) above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (A)(i) through (iv) above where they are determined on a case-specific basis to have a significant nexus to a water identified in paragraphs (A)(i) through (iii) above. For waters determined to have a significant nexus, the entire water is a water of the United States if a portion is located within the 100-year floodplain of a water identified in paragraphs (A)(i) through (iii) above or within 4,000 feet of the high tide line or ordinary high water mark. Waters identified in this paragraph shall not be combined with waters identified in paragraph (A)(iv) above when performing a significant nexus analysis. If waters identified in this paragraph are also an adjacent water under paragraph (A)(iv), they are an adjacent water and no case-specific significant nexus analysis is required.

- B. The following are not “waters of the United States” even where they otherwise meet the terms of paragraphs (A)(iv) through (viii) above:
- i. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act are not waters of the United States.
 - ii. Prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.
 - iii. The following ditches:
 - a. Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

- b. Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.
 - c. Ditches that do not flow, either directly or through another water, into a water identified in paragraphs (A)(i) through (iii) above.
 - iv. The following features:
 - a. Artificially irrigated areas that would revert to dry land should application of water to that area cease;
 - b. Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;
 - c. Artificial reflecting pools or swimming pools created in dry land;
 - d. Small ornamental waters created in dry land;
 - e. Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;
 - f. Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways; and
 - g. Puddles.
 - v. Groundwater, including groundwater drained through subsurface drainage systems.
 - vi. Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.
 - vii. Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures build for wastewater recycling.
- C. Definitions:
- i. *Adjacent*. The term *adjacent* means bordering, contiguous, or neighboring a water identified in paragraphs (A)(i) through (v) above, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like. For purposes of adjacency, an open water such as a pond or lake includes any wetlands within or abutting its ordinary high water mark. Adjacency is not limited to waters located laterally to a water identified in paragraphs (A)(i) through (v) above. Adjacent waters also include all waters that connect segments of a water identified in paragraphs (A)(i) through (v) above or are located at the head of a water identified in paragraphs (A)(i) through (v) above and are bordering, contiguous, or neighboring such waters. Waters being used for established normal farming, ranching, and silviculture activities are not adjacent.
 - ii. *Neighboring*. The term *neighboring* means:
 - a. All waters located within 100 feet of the ordinary high water mark of a water identified in paragraphs (A)(i) through (v) above. The entire water is

- neighboring if a portion is located within 100 feet of the ordinary high water mark;
- b. All waters located within the 100-year floodplain of a water identified in paragraphs (A)(i) through (v) above and not more than 1,500 feet from the ordinary high water mark of such a water. The entire water is neighboring if a portion is located within 1,500 feet of the ordinary high water mark and within the 100-year floodplain;
 - c. All waters located within 1,500 feet of the high tide line of a water identified in paragraphs (A)(i) through (iii) above, and all waters within 1,500 feet of the ordinary high water mark of the Great Lakes. The entire water is neighboring if a portion is located within 1,500 feet of the high tide line or within 1,500 feet of the ordinary high water mark of the Great Lakes.
- iii. *Tributary* and *tributaries*. The terms *tributary* and *tributaries* each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (A)(iv) above), to a water identified in paragraphs (A)(i) through (iii) above that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark. These physical indicators demonstrate there is volume, frequency, and duration of flow sufficient to create a bed and banks and ordinary high water mark, and thus to qualify as a tributary. A tributary can be a natural, man-altered, or man-made water and includes waters such as rivers, streams, canals, and ditches not excluded under paragraph (B) above. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if, for any length, there are one or more constructed breaks (such as bridges, culverts, pipes, or dams), or one or more natural breaks (such as wetlands along the run of a stream, debris piles, boulder fields, or a stream that flows underground) so long as a bed and banks and an ordinary high water mark can be identified upstream of the break. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if it contributes flow through a water of the United States that does not meet the definition of tributary or through a non-jurisdictional water to a water identified in paragraphs (A)(i) through (iii) above.
- iv. *Wetlands*. The term *wetlands* means 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.
- v. *Significant nexus*. The term *significant nexus* means that a water, including wetlands, either alone or in combination with other similarly situated waters in the region, significantly affects the chemical, physical, or biological integrity of a water identified in paragraphs (A)(i) through (iii) above. The term “in the region” means the watershed that drains to the nearest water identified in paragraphs (A)(i) through (iii) above. For an effect to be significant, it must be more than speculative or insubstantial. Waters are similarly situated when they function alike and are sufficiently close to function together in affecting downstream waters. For purposes of determining whether or not a water has a significant nexus, the water’s effect on downstream (A)(i) through (iii) waters shall be assessed by evaluating the

aquatic functions identified in paragraphs (C)(v)(a) through (i) below. A water has a significant nexus when any single function or combination of functions performed by the water, alone or together with similarly situated waters in the region, contributes significantly to the chemical, physical, or biological integrity of the nearest water identified in paragraphs (A)(i) through (iii) above. Functions relevant to the significant nexus evaluation are the following:

- a. Sediment trapping,
 - b. Nutrient recycling,
 - c. Pollutant trapping, transformation, filtering, and transport,
 - d. Retention and attenuation of flood waters,
 - e. Runoff storage,
 - f. Contribution of flow,
 - g. Export of organic matter,
 - h. Export of food resources, and
 - i. Provision of life cycle dependent aquatic habitat (such as foraging, feeding, nesting, breeding, spawning, or use as a nursery area) for species located in a water identified in paragraphs (A) through (C).
- vi. *Ordinary high water mark.* The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a 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.
- vii. *High tide line.* The term *high tide line* means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell 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 line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

3.2 Pre-field Review

Prior to conducting the field investigation, ESA conducted a review of the following background documents:

- USGS 7.5 minute topographic quadrangle for Lake Combie, CA;
- Color aerial photography for vegetative, topographic, and hydrologic signatures;

- The *Custom Soil Resource Report for Nevada County Area, California* (NRCS, 2015), for information about soils and geomorphology;
- The National Hydric Soils List for California, Nevada County (NRCS, 2014) to determine if any soils mapped within the study area are considered hydric at the level of soil series;
- The National Wetlands Inventory (U.S. Department of the Interior, 2015).

3.3 Field Investigation

A delineation of wetlands and other waters of the U.S. was conducted within the study area by ESA biologist Joshua Boldt on September 16, 2015. The delineation used the “Routine Determination Method” as described in the *1987 U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), hereafter called the “1987 Manual.” The 1987 Manual was used in conjunction with the *Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE, 2010), hereafter called the “Western Mountains, Valleys, and Coast Supplement.” For areas where the 1987 Manual and the Western Mountains, Valleys, and Coast Supplement differ, the Supplement was followed.

Three positive wetland parameters must normally be present for an area to be wetland: 1) a dominance of wetland vegetation, 2) presence of hydric soils, and 3) presence of wetland hydrology. Presence or absence of positive indicators for wetland vegetation, soils, and hydrology was assessed per the 1987 Manual and Western Mountains, Valleys, and Coast Supplement guidelines. Data points were recorded on Arid West wetland delineation forms, which are provided as **Appendix C**

For “other waters of the U.S.” to be considered jurisdictional, these features must exhibit a defined bed and bank and an ordinary high water mark (OHWM). Drainages with obvious bed and banks and OHWM were characterized by noting vegetation, geomorphology (e.g., incision) and hydrologic characteristics, and by measuring representative channel bank cross-sections to obtain average bankfull width (i.e., OHWM). Representative channel cross-section average bankfull width was recorded in the field and used to map stream channels in GIS, along with high-resolution aerial photographs and detailed topographic data.

3.4 Mapping and Acreage Calculations

Within the study area, boundaries of other “waters of the U.S.” were recorded in the field on color aerial photo base maps at a scale of 1 inch = 50 feet. Field mapping was digitized onto the aerial base maps using ArcGIS 10.1 software. The acreages of potential jurisdictional features were calculated with ArcGIS, based on the portion of each feature contained within the study area.

SECTION 4.0

Results

4.1 Results

The wetland delineation identified approximately 0.01 acres of potentially jurisdictional features within the study area. Potentially jurisdictional features within the study area consist entirely of other waters of the U.S. (an unnamed ephemeral channel). No potentially jurisdictional wetlands were observed in the study area. The locations and extent of jurisdictional features are depicted in **Figure 4-1** with a summary provided in **Table 4-1**.

**TABLE 4-1
POTENTIAL JURISDICTIONAL FEATURES WITHIN THE STUDY AREA**

Map ID	Type of Feature	Average OHWM (feet)	Acres
OTHER WATERS			
Channels			
Unnamed Channel	Riverine Intermittent (Ephemeral Channel)	2	0.01
Total Area of Potentially Jurisdictional Features		--	0.01

4.1.1 Potentially Jurisdictional Waters of the U.S.

Ephemeral Channel (Riverine Intermittent)

Ephemeral channels are classified as “riverine intermittent” using the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al, 1979). An ephemeral channel has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

The study area contains one ephemeral channel, totaling approximately 0.01 acres. Within the study area, the channel flows through a culvert, then north off the study area. The channel eventually drains to a stormwater drainage system, ultimately connecting with Magnolia Creek through the drainage system. The ephemeral channel in the study area is very low gradient with weakly incised banks, indicating very low flows. Bed material consists of soil, silt and gravel and is largely vegetated with upland annual grassland species. The boundaries of the ephemeral channel were determined using the OHWM.



SOURCE: Microsoft, 2011; SunPower, 2015; ESA, 2015

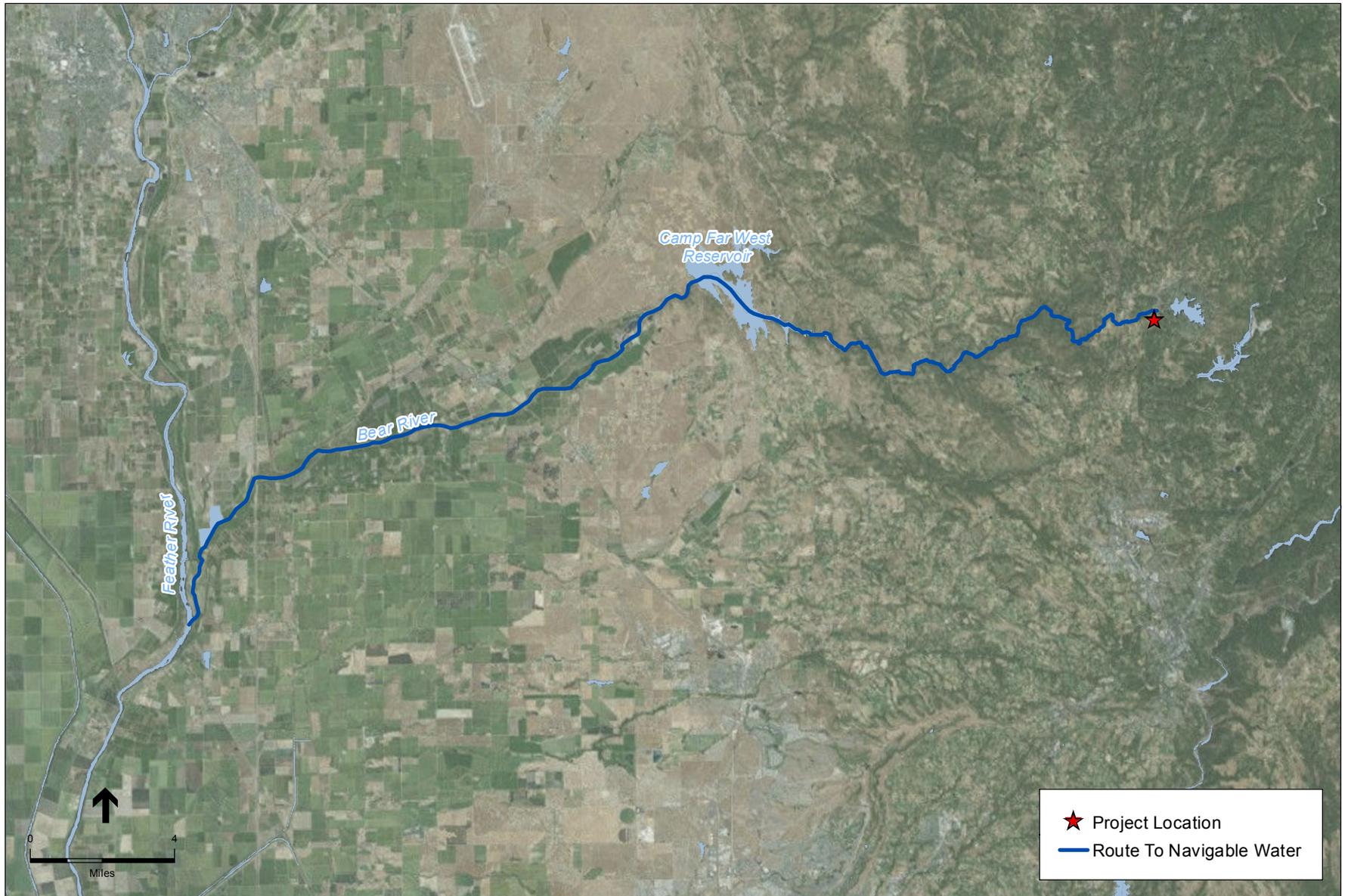
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Figure 4-1
 Potentially Jurisdictional Features

The ephemeral channel was mapped as a line based on field data, topographic data, and aerial photos; its total extent was calculated by multiplying stream length by OHWM.

4.1.2 Jurisdictional Analysis

The USACE and USEPA published a Clean Water Rule on June 29, 2015 defining the term “Waters of the United States” (“Clean Water Rule: Definition of “Waters of the United States” 80 Federal Register 124 (29 June 2015), pp. 37054 – 37127). The final rule became effective on August 28, 2015. This rule supersedes previous guidance on Clean Water Act jurisdiction related to the *Rapanos* and *SWANCC* U.S. Supreme Court decisions. Under the rule, tributaries are defined as waters that contribute flow, either directly or through another water (including an impoundment), to a Traditional Navigable Water (TNW), and are characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if, for any length, there are one or more constructed breaks (such as bridges, culverts, pipes, or dams), or one or more natural breaks (such as wetlands along the run of a stream, debris piles, boulder fields, or a stream that flows underground) so long as a bed and banks and an ordinary high water mark can be identified upstream of the break. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if it contributes flow through a water of the United States that does not meet the definition of tributary or through a non-jurisdictional water to a TNW.

The ephemeral channel in the study area meets the criteria described above for a tributary. The channel is characterized by the presence of a bed and bank and OWHM. Although the channel drains to a storm water system, this system drains to Magnolia Creek. Magnolia Creek is a perennial channel which flows west to the Bear River. The Bear River eventually drains to the Feather River near the town of Nicolaus (**Figure 4-2**). The Feather River is considered a TNW under Section 404 of the Clean Water Act from Marysville to its confluence with the Sacramento River. Based on the hydrologic connection of study area waters to the Feather River, the ephemeral channel in the study area should be considered as a potentially regulated feature under the CWA.



SOURCE: SOURCE: CNES/Airbus DS, 2008; ESRI, 2012; SunPower, 2015; ESA, 2015

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Figure 4-2
Route To Navigable Water

4.2 Conclusions

A total of 0.01 acres of potentially jurisdictional features occur within the 5.27-acre study area consisting of 0.01 acres of ephemeral channel.

This report documents the wetland boundary delineation and best professional judgment of ESA's qualified biologists. All conclusions presented should be considered preliminary and subject to change pending official review and verification in writing by the Corps.

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SECTION 5.0

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APPENDIX A

NRCS Soils Report

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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 Nevada County Area, California

SunPower LOP Study Area



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 (<http://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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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

Custom Soil Resource Report

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.

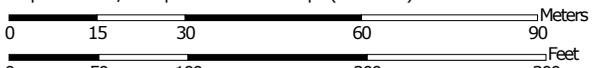
Soil Map

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: 1:1,280 if printed on A landscape (11" x 8.5") sheet.



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: <http://websoilsurvey.nrcs.usda.gov>
 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: Nevada County Area, California
 Survey Area Data: Version 8, Sep 16, 2014

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

Date(s) aerial images were photographed: Aug 15, 2011—Apr 29, 2012

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

Nevada County Area, California (CA619)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AsD	Argonaut-Rock outcrop complex, 2 to 30 percent slopes	3.6	74.2%
BrD	Boomer-Rock outcrop complex, 5 to 30 percent slopes	1.3	25.8%
Totals for Area of Interest		4.8	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

Custom Soil Resource Report

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.

Nevada County Area, California

AsD—Argonaut-Rock outcrop complex, 2 to 30 percent slopes

Map Unit Setting

National map unit symbol: hfvk
Elevation: 300 to 2,500 feet
Mean annual precipitation: 26 to 50 inches
Mean annual air temperature: 58 to 62 degrees F
Frost-free period: 235 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Argonaut and similar soils: 60 percent
Rock outcrop: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Argonaut

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Diabase

Typical profile

A - 0 to 10 inches: gravelly loam
Bt - 10 to 28 inches: gravelly clay loam
R - 28 to 32 inches: bedrock

Properties and qualities

Slope: 2 to 30 percent
Depth to restrictive feature: 18 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: CLAYPAN (R018XD082CA)

Description of Rock Outcrop

Setting

Landform: Hills

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Properties and qualities

Slope: 2 to 30 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Minor Components

Sobrante, loam

Percent of map unit: 6 percent

Landform: Hills

Auburn, loam

Percent of map unit: 6 percent

Landform: Hills

Rescue, loam

Percent of map unit: 6 percent

Landform: Hills

Unnamed

Percent of map unit: 2 percent

Landform: Depressions

BrD—Boomer-Rock outcrop complex, 5 to 30 percent slopes

Map Unit Setting

National map unit symbol: hfvw

Elevation: 1,000 to 2,200 feet

Mean annual precipitation: 30 to 45 inches

Mean annual air temperature: 56 to 58 degrees F

Frost-free period: 200 to 260 days

Farmland classification: Not prime farmland

Map Unit Composition

Boomer and similar soils: 60 percent

Rock outcrop: 20 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boomer

Setting

Landform: Mountains

Custom Soil Resource Report

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from metavolcanics

Typical profile

A - 0 to 18 inches: loam
Bt - 18 to 37 inches: clay loam
C - 37 to 47 inches: loam
R - 47 to 51 inches: bedrock

Properties and qualities

Slope: 5 to 30 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: LOAMY (R022XD013CA)

Description of Rock Outcrop

Setting

Landform: Hills

Typical profile

R - 0 to 4 inches: bedrock

Properties and qualities

Slope: 5 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D

Minor Components

Rescue, loam

Percent of map unit: 4 percent
Landform: Hills

Josephine, loam

Percent of map unit: 4 percent

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Landform: Hills

Sites, very stony loam

Percent of map unit: 4 percent

Landform: Hills

Sites, loam

Percent of map unit: 4 percent

Landform: Hills

Sobrante, loam

Percent of map unit: 4 percent

Landform: Hills

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APPENDIX B

Site Photos

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Photo 1
Headwater of EC-1. September 16, 2015



Photo 2
EC-1 (note culvert in background). September 16, 2015

APPENDIX C

Data Sheets

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 _____ No _____	Is the Sampled Area within a Wetland?	
Hydric Soil Present?	Yes _____ No _____		Yes _____ No _____
Wetland Hydrology Present?	Yes _____ No _____		
Remarks:			

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>Woody Vine Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Present?
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				Yes _____ No _____
% Bare Ground in Herb Stratum _____				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 _____ No _____	Is the Sampled Area within a Wetland?	
Hydric Soil Present?	Yes _____ No _____		Yes _____ No _____
Wetland Hydrology Present?	Yes _____ No _____		
Remarks:			

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>Herb Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>Woody Vine Stratum</u> (Plot size: _____)				Hydrophytic Vegetation Present? Yes _____ No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: _____ City/County: _____ Sampling Date: _____
 Applicant/Owner: _____ State: _____ Sampling Point: _____
 Investigator(s): _____ Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 _____ No _____	Is the Sampled Area within a Wetland?	
Hydric Soil Present?	Yes _____ No _____		Yes _____ No _____
Wetland Hydrology Present?	Yes _____ No _____		
Remarks:			

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

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 _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0¹

___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants¹

___ Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present?	Yes _____	No _____
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SOIL

Sampling Point: _____

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No _____
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)
	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
	<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: