

## Exhibit C: Critical Issues Analysis

# CRITICAL ISSUES ANALYSIS

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## Proposed Lassen Solar Farm

APN 133-070-001; 133-070-002; 133-070-004; 133-070-005; 121-090-028; 133-020-004;  
133-020-001; 133-080-003; 133-080-009; and 133-080-013

Lassen County, California

AEI Project No. 470890

Report Date: November 15, 2022



### Prepared For:

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November 15, 2022

Mr. Troy Helming  
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Richmond, CA 94801

**Subject: Critical Issues Analysis (CIA)**

Lassen Solar Farm

APN 133-070-001; 133-070-002; 133-070-004; 133-070-005; 121-090-028; 133-020-004; 133-020-001; 133-080-003; 133-080-009; and 133-080-013

Lassen County, California

AEI Project No. 470890

Dear Mr. Helming,

AEI Consultants (AEI) is pleased to provide the Critical Issues Analysis (CIA) for the proposed solar farm located across ten (10) parcels (133-070-001; 133-070-002; 133-070-004; 133-070-005; 121-090-028; 133-020-004; 133-020-001; 133-080-003; 133-080-009; and 133-080-013) of land located in Lassen County, California. This desktop-level CIA was completed in general accordance with AEI's authorized proposal number 87619, executed on October 18, 2022.

Thank you for allowing AEI to assist you with this project. If you have any questions regarding the CIA, please do not hesitate to contact Jennifer Johns at 858.414.5686 or [jjohns@aeiconsultants.com](mailto:jjohns@aeiconsultants.com).

Sincerely,

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Vice President  
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## Executive Summary

Pristine Sun Corporation ("the Client") has contracted AEI to provide a desktop level Critical Issues Analysis (CIA) for the proposed Lassen Solar Farm ("Project Area") located in Lassen County, California. The Client proposes to develop the Project Area with a solar farm facility on approximately 2,990.4 acres of privately owned land on the east side of Honey Lake and north of the Amedee Army Airfield. The Project Area will consist of a solar farm spanning across approximately 2,990.4 acres. The solar panels will be at a maximum height of 1.5 meters (5 feet) above ground surface and affixed to a multi-panel articulating tracker mounting system. The Client plans to construct a private transmission line with a direct Gen-tie to a proposed substation the Client will also construct.

The Project Area contains variable sandy and silt loam soils and wetlands that may impact the proposed project. Hydrologic Group C soils were identified as the dominate soil in the Project Area, which are defined as having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture. These soils have a slow rate of water transmission. However, according to United States Department of Agriculture (USDA) Webs Soil Survey, these soils have a high calculated K value, which suggests the soil is subject to erosion due to hydraulic factors. It is recommended to implement best management practices for soil erosion and sediment control, by developing a soil mitigation and planting plan to ensure sediment and stormwater run-off is reduced during and post-construction. Due to soil propensity for erosion, a geotechnical evaluation may be necessary to assess the geological hazards that may affect the proposed layout, design, and long-term stability of the Project Area.

Potential wetlands have been identified on the Project Area. It is recommended that a wetlands delineation be performed to field verify the extent of wetlands within the Project Area. Once defined, a jurisdictional determination will be required to file with the United States Army Corps of Engineers (USACE) to identify if any wetlands are considered Water of the United States (WOTUS). This will allow the Client to reduce level of impact to defined wetlands and determine whether a nationwide or individual permit is necessary. Furthermore, as the westernmost portion of the Project Area is located in FEMA Flood Zone A, Lassen County Code 12.26.056 states a Floodplain Development Permit shall be obtained before any construction or other development begins within any area of special flood hazard. The state of California recommends the lowest floor be elevated at least two feet above the base flood elevation, as determined by the community (Lassen County).

Threatened and Endangered Species and migratory birds have been identified by the United States Fish and Wildlife Service (USFWS) and California Natural Diversity Database (CNDDB) to be present within the Project Area and surrounding vicinity. Due to the possible presence of Threatened and Endangered (T&E) Species and Critical Habitats, a biological site survey is necessary to field verify the presence or absence of T&E Species and Critical Habitats within the Project Area. If T&E Species and Critical Habitats are encountered, consultation with the USFWS and CDFW would be necessary to mitigate impacts to less than significant levels. If no T&E Species or Critical Habitats are identified, a Biological Survey Report would be prepared with the findings of no impact or less than significant impact from the developed of the proposed project.

Consultation with the following regulatory authorities is necessary to proceed with the proposed Lassen Solar Farm project: Lassen County Planning and Building Services Department, Lassen County Environmental Health, Lassen County Surveyor's Office, Lassen County Public Works, California State Historic Preservation Officer (SHPO), California Regional Water Quality Control Board (RWQB) Lahontan





Region, California Department of Fish and Wildlife (CDFW), Department of Defense (DOD) Clearinghouse Review, Federal Aviation Administration (FAA), (USACE), and United States Fish and Wildlife Service (USFWS). Based on AEI email correspondence with the Lassen County Land Use Department, a division of Lassen County Planning and Building Services, a **Conditional Use Permit** (CUP) and a **Project Decommissioning Plan** is required, and the project is not exempt from the California Environmental Quality Act (CEQA). Refer to Appendix A for correspondence with Lassen County and the DOD.



## CIA Commonly Used Abbreviations

## Units

µg/L	Micrograms per Liter	pCi/L	PicoCuries per Liter
mg/kg	Milligrams per Kilogram	ppb	Parts per Billion
mg/L	Milligrams per Liter	ppm	Parts per Million

## Abbreviations and Acronyms

AEI	AEI Consultants	NEXRAD	Next-Generation Radar
BGEPA	Bald and Golden Eagle Protection Act	NHD	National Hydrography Dataset
BLM	Bureau of Land Management	NHPA	National Historic Preservation Act
CIA	Critical Issues Analysis	NLCD	National Land Cover Database
CGP	Construction General Permit	NOI	Notice of Intent
CUP	Conditional Use Permit	NPC	Notice of Proposed Construction
CWA	Clean Water Act	NRHP	National Register of Historic Places
dBA	A-Weighted Decibels	NPDES	National Pollution Discharge Elimination System
DPS	Distinct Population Segment	NRCS	Natural Resources Conservation Science
DEQ	Department of Environmental Quality	NWI	National Wetland Inventory
DOD	Department of Defense	OHWM	Ordinary High Water Mark
ESA	Endangered Species Act	PGH	Preliminary General Habitat
FAA	Federal Aviation Administration	PPH	Preliminary Primary Habitat
FERC	Federal Energy Regulatory Commission	SHPO	State Historic Preservation Office
HCP	Habitat Conservation Plan	SWPPP	Stormwater Pollution Prevention Plan
ITP	Incidental Take Permit	USACE	U.S. Army Corps of Engineers
MBTA	Migratory Bird Treaty Act	USFWS	U.S. Fish and Wildlife Service
NEPA	National Environmental Policy Act	WUS	Water of the United States



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## 1.0 Introduction

Pristine Sun Corporation ("the Client") has contracted AEI to provide a desktop level Critical Issues Analysis (CIA) for the proposed Lassen Solar Farm ("Project Area") located in Lassen County, California. Pristine Sun Corporation proposes to develop a solar farm facility on approximately 2,990.4 acres of privately owned land. This report documents the methods and findings of the CIA in conformance with AEI's contract for the proposed Project Area. The information presented in this CIA was obtained by the following sources:

- Department of Defense (DOD)
- CalFire Fire Hazard Zone Assessment
- ESRI ArcGIS Desktop online aerial imagery and base map information
- Federal Emergency Management Agency (FAA)
- United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database
- U.S. Fish and Wildlife Service (USFWS) Ecological Service for Endangered Species
- California Natural Diversity Database (CNDDB) – Biogeographic Information and Observation System (BIOS)
- California Historical Resources Information System (CHRIS)
- United States Geological Survey (USGS) Topographic database
- USGS GAP/LANDFIRE National Terrestrial Ecosystems
- Google Earth Desktop Evaluation Tool
- Lassen County Planning and Building Services Division
- Major Land Resource Area (MLRA)
- California State Historic Preservation Office's (SHPO)
- National Register of Historic Places (NRHP)
- National Pipeline Mapping System
- U.S. Energy Information Administration
- Federal Emergency Management Agency (FEMA)
- USGS Earthquake Hazards

The final section of this report will identify and discuss permits and approvals that may be necessary for the proposed Lassen County Solar Farm.

### 1.1 Project Description

The Client proposes to develop the Lassen County Solar Farm facility across ten (10) parcels located east adjacent to Honey Lake and north adjacent to Amedee Army Airfield, which is part of the Sierra Army Depot. The project will consist of a solar farm spanning across approximately 2,990.4 acres. The solar panels will be at a maximum height of 1.5 meters (5 feet) above ground surface and will be affixed to a multi-panel articulating tracker mounting system. The Client plans to construct a below ground private transmission line with a direct Gen-tie to a substation.

### 1.2 Methods

This CIA report is based on a desktop study of relevant background information. It aids in the characterization of existing environmental and regulatory settings, potential issues, and possible project constraints. This preliminary study relies on readily available information provided by the Client, or data that can be gathered by a search of existing information sources that include online databases, aerial photography, conversations / correspondences with local, state, and federal officials, and AEI staff expertise.



AEI conducted a review of soils, waters, and floodplains within the Project Area and surrounding vicinity. Sources included the Natural Resources Conservation Service (NRCS) soil maps, Federal Emergency Management Agency (FEMA) floodplains maps, U.S. Department of the Interior, Division of Fish and Wildlife (USFW), and other readily available online data. AEI consultants conducted a review of cultural and archaeological resources within the immediate Project Area and surrounding properties. Sources included the California State Historic Preservation Office's (SHPO), National Register of Historic Places (NRHP), and historic aerials and topographic maps. AEI also conducted a review of existing land uses, county ordinances/plans, and permits potentially required for the proposed project.

## 2.0 Project Area and Vicinity Description

The Project Area consists of approximately 2,990.4 acres of predominately undeveloped land between the eastern side of Honey Lake and west of Wendel Road (Figure 1 and 2).

### 2.1 Property Description

The Project Area is undeveloped and consists of low-lying vegetation throughout, with two-track roads crossing the Project Area in various directions. A wetland area and natural hot springs is located in the central portion of the Project Area.

Table 1 Property Information

Property Information	
Project Name	Lassen Solar Farm
Project Location	Lassen County, California
Current Land Use	Undeveloped land
Approximate Project Acreage	2,990.4 acres
Proposed Development	Solar Farm

Refer to Figures 1 and 2 for Project Area and Project Vicinity Map.

### 2.2 Vicinity Description

The Project Area is immediately bounded by primarily undeveloped land to the north, east, and west. Amedee Army Airfield is south adjoining to the Project Area, and Wendel Road borders portions of the Project Area to the east. The Project Area is located approximately two miles south of the town of Wendel, California, and lies near the eastern shore of Honey Lake.

The immediate surrounding properties consist of the following:

Table 2 Vicinity Characteristics

Vicinity Characteristics	
Direction	Land Use
North	Undeveloped land
East	Undeveloped land, railroad bed, and Wendel Road
South	Amedee Army Airfield
West	Undeveloped land and Honey Lake

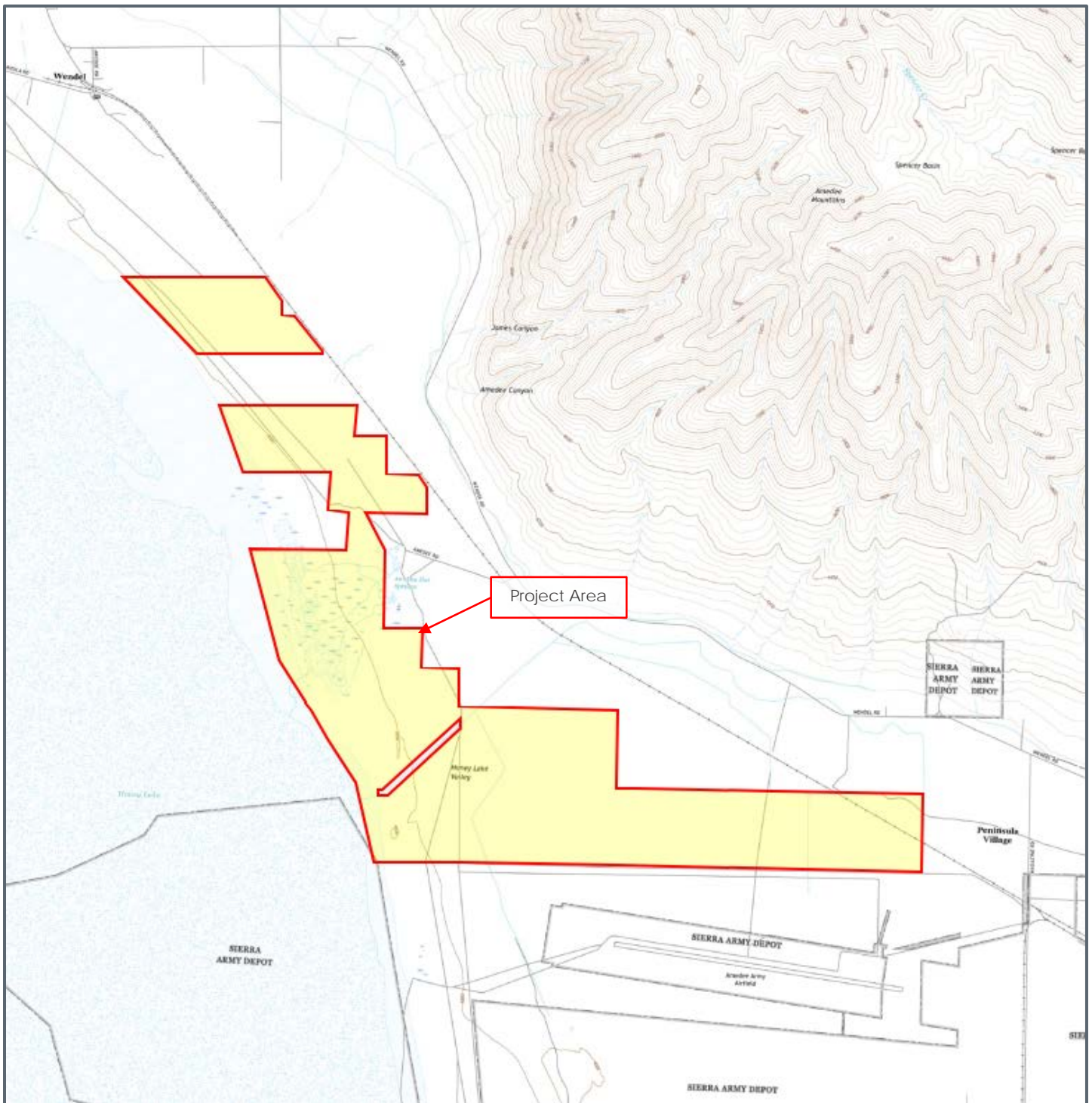


Figure 1: Project Area Topographic Map

Proposed Lassen Solar Farm

AEI Project No.: 470890





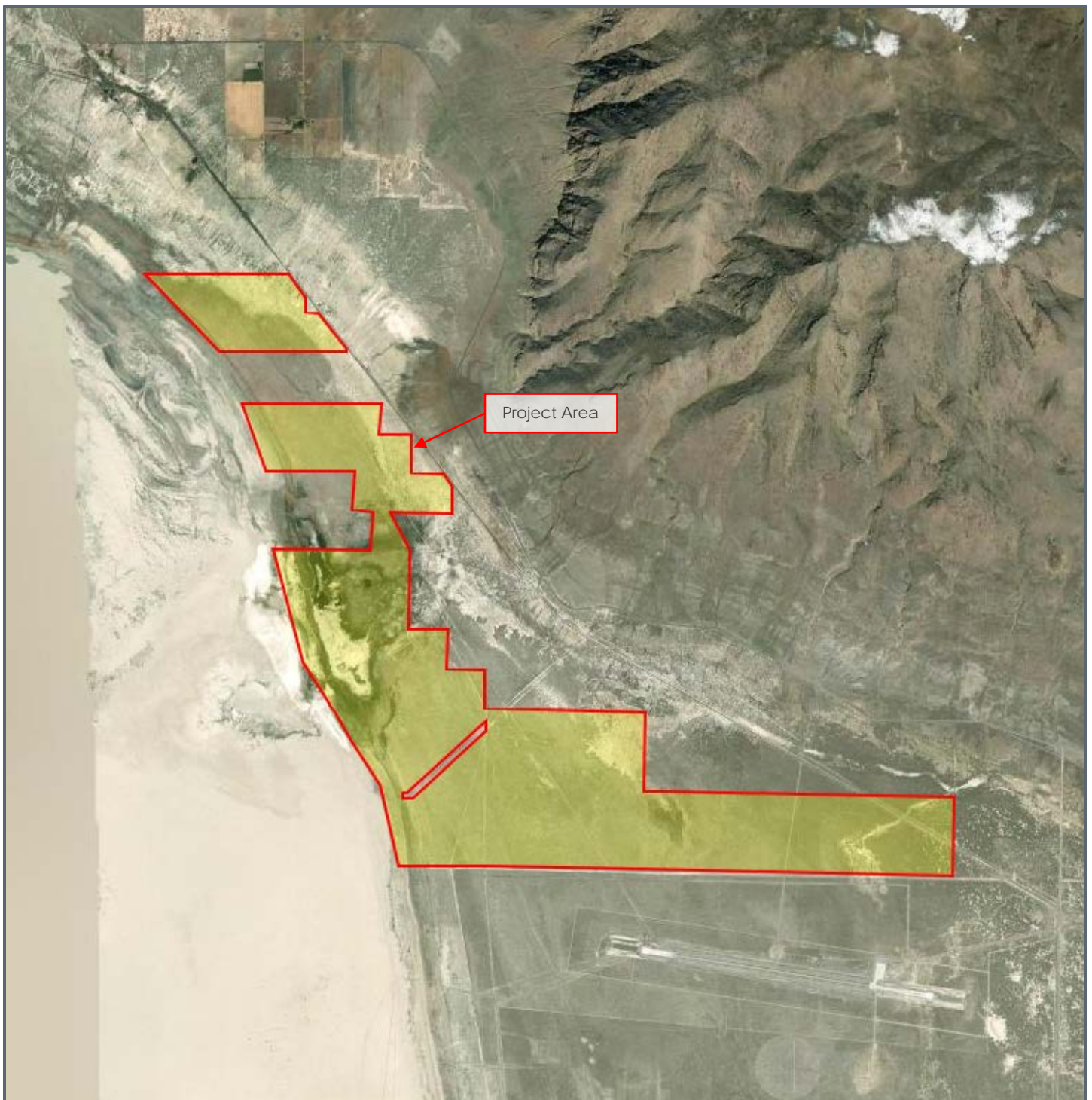


Figure 2: Project Area Aerial Image

Proposed Lassen Solar Farm

AEI Project No.: 470890







## 3.0 Environmental Setting

### 3.1 Physical Resources

#### 3.1.1 Regional Setting

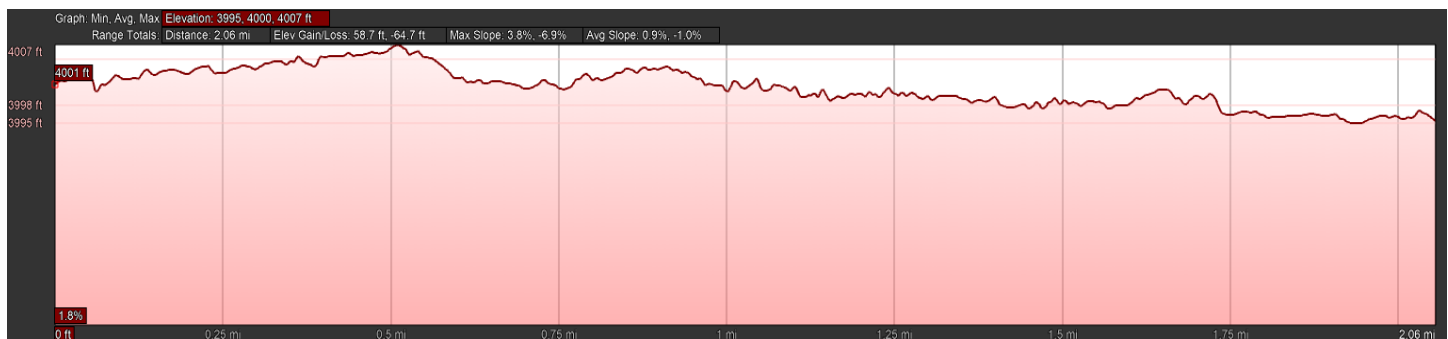
According to the USDA *Land Resource Regions and Major Land Resource Areas the United States, the Caribbean, and the Pacific Basin* handbook 296, the major portion of the Project Area is located in the Malheur High Plateau, Major Land Resource Area (MLRA) – Western Range and Irrigated Region, Land Resource Region (LRR).

The Malheur High Plateau – MLRA consists primarily of nearly level to moderately steep plateaus, basins, and valleys bordered by long, gently sloping alluvial fans. North-south-trending, fault-block mountain ranges separate some basins. Volcanic plateaus rise sharply above the valleys. The area has no major rivers and consists mostly of closed basins. Elevation ranges from 3,900 to 6,900 feet (1,190 to 2,105 meters) in most of the MLRA, but it exceeds 9,000 feet (2,745 meters) on some mountains. In most of this area, the average annual precipitation is 6 to 52 inches (156 to 1,331 millimeters). The precipitation is fairly evenly distributed throughout fall, winter, and spring but is low in summer. Snow can occur throughout the area in winter. The average annual temperature is 35 to 51 degrees F (2 to 11 degrees C), decreasing with elevation. The freeze-free period averages 105 days and ranges from 35 to 175 days, decreasing in length with elevation and latitude (USDA Handbook 296 2022).

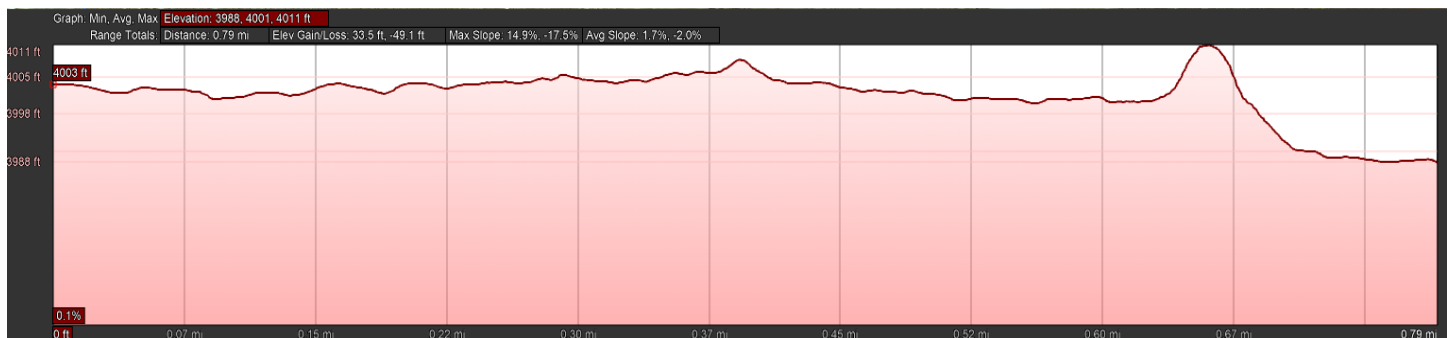
#### 3.1.2 Elevation and Topography

Topography within the overall Project Area is relatively flat and slopes gently west toward Honey Lake. The elevation of the Project Area ranges from 3,995 to 4,012 feet (1,217.7 to 1,222.9 meters). The lowest elevation exists in the western of the Project Area near the shore of Honey Lake.

**Elevation Profile of northern Project Area - North to South**

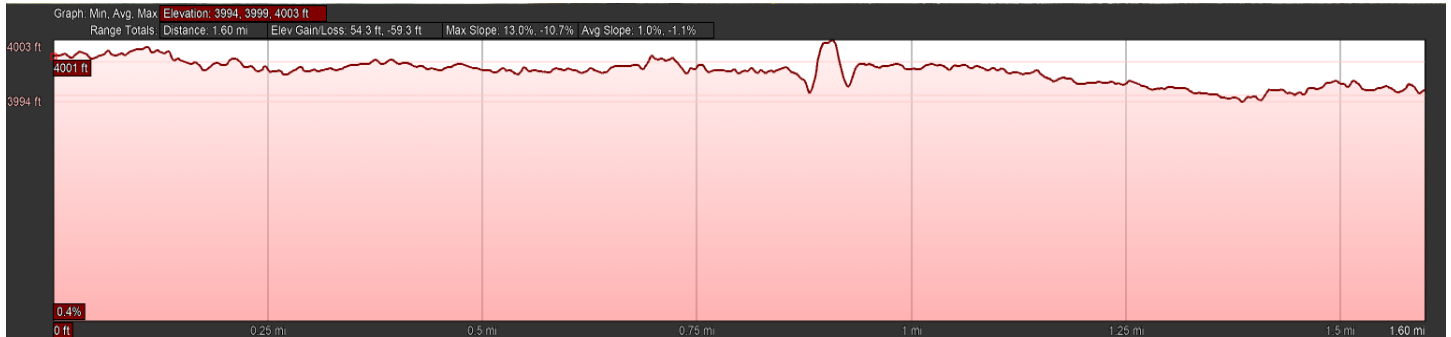


**Elevation Profile of northern Project Area - East to West**

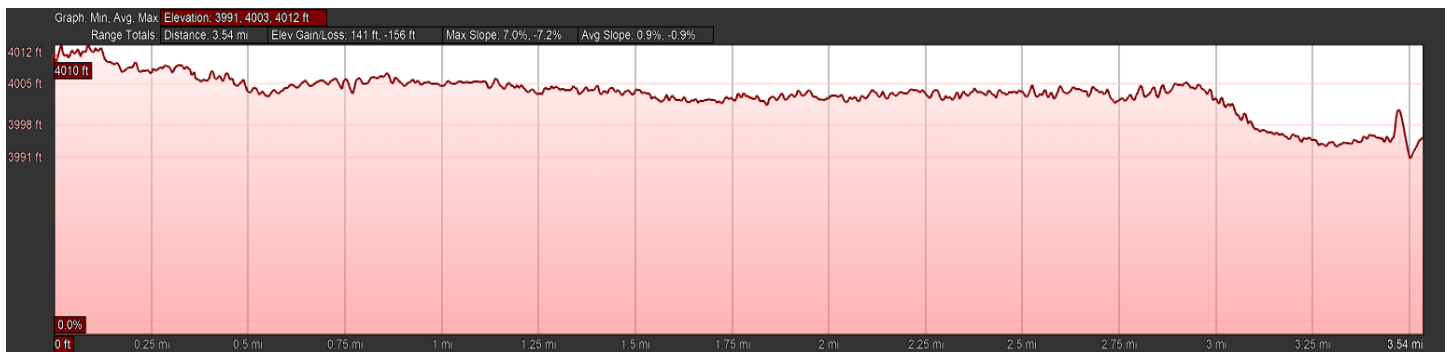




### Elevation Profile of southern Project Area - North to South



### Elevation Profile of northern Project Area - East to West



### 3.1.3 Geology

The Project Area is located near the southeast portion of Lassen County. Most of this area consists of young (6 to 17 million years old) andesite and basalt layers. Older volcanic rocks and marine and continental sediments are exposed in the mountain ranges. These north-south-trending ranges are uplifted fault blocks. The basins between the mountains and lava plateaus are filled with a mixture of Quaternary alluvium, continental sediments, and volcanic ash. The long alluvial fans consist of coarser alluvium near the mountains and fine-grained sediments at their distal ends. Playas or shallow lakes are common in the lowest areas within the closed basins (USDA Handbook 2022).



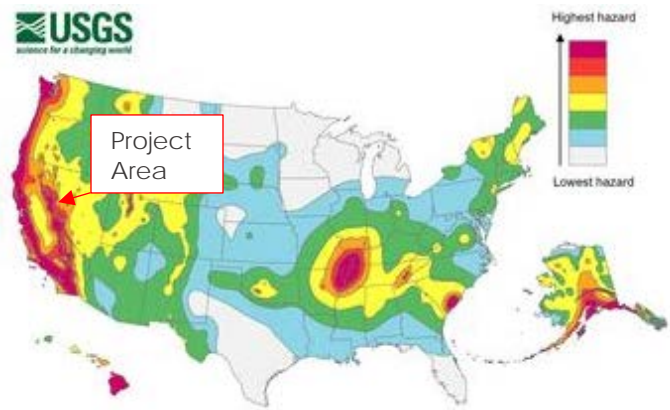
### 3.1.4 Seismic Hazards

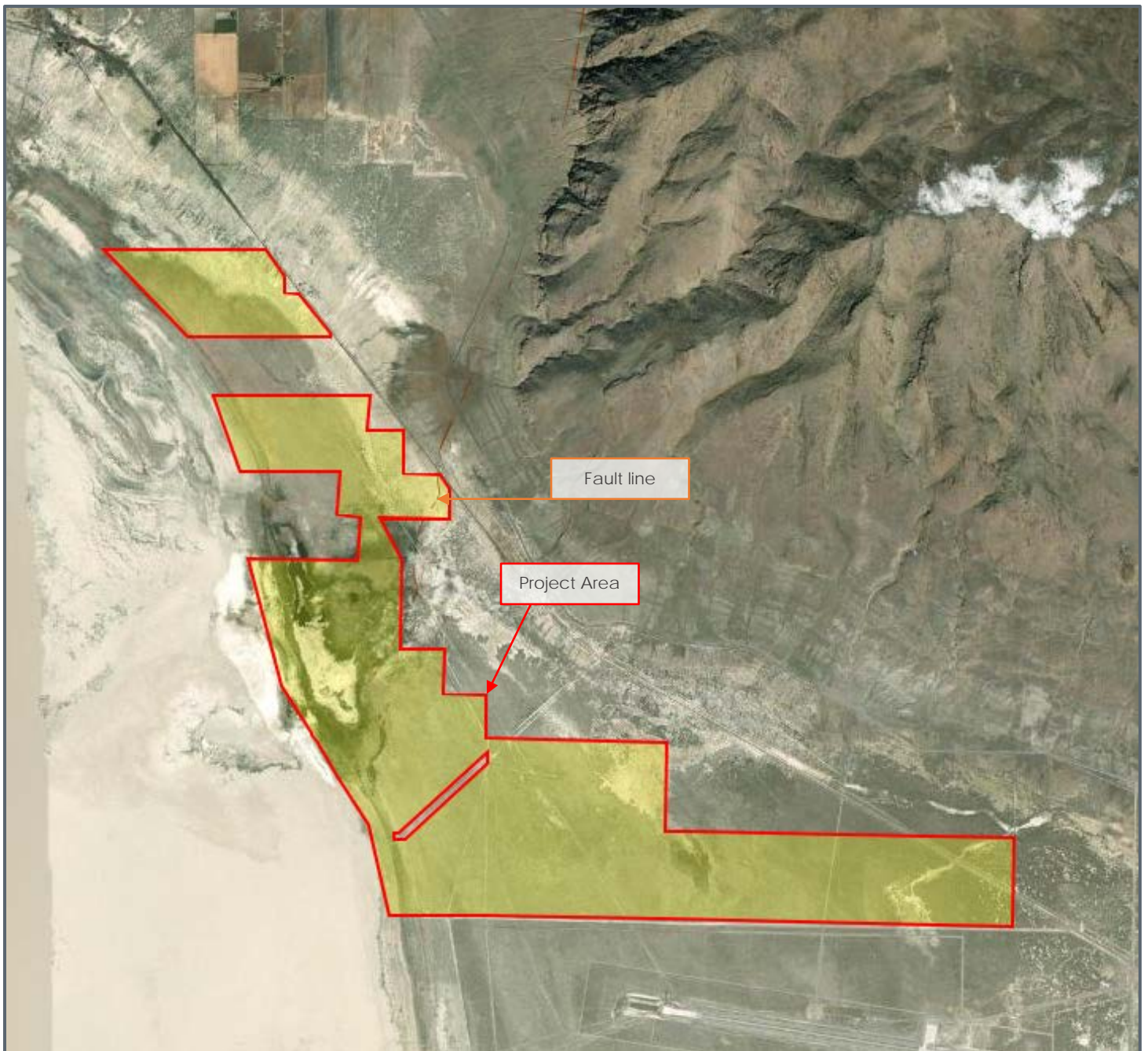
According to the USGS California Geological Survey (CGS) (2016), the Project Area possesses a moderate hazard of seismic activity. The USGS U.S. Quaternary Faults interactive online map identified one fault running through and adjacent to the immediate boundary of the Project Area. See Table 4 below for more information.

**Table 3 Project Area Faults**

Fault Name	Distance from Project Area	Direction from Project Area
Amedee Fault	In the northern portion of the Project Area	North-northeast

According to the interactive online map, Amedee Fault is identified as a Fault Creep. A Fault Creep is defined as the slow, constant slippage that can occur on some active faults without there being an earthquake. Seismic activity cannot be ruled out for the Project Area. It is recommended that the facility should take seismic hazards into consideration when designing the solar farm facility, and a geotechnical evaluation be completed to assess the geological hazards that may affect the proposed layout, design, and long-term stability of the Project Area.





Legend

— Amedee Fault Line



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Faults within the Project Area

Lassen Solar  
Farm

Figure 3  
Project No.470890



### 3.1.5 Soils

According to the National Resources Conservation Service (NRCS) Web Soil Survey (WSS) database, the following soil types underlay the Project Area (see Figure 4):

**Table 4 Soils**

Soil Name & Symbol	Geomorphic Description	Surface Texture	Parent Material	Erosion Factor (K)	Hydro. Group	Acres	% of Site
Artay sandy loam (109)	Alluvial fans	Sandy loam	Alluvium derived from granite	0.24	A/D	42.2	1.4
Bobert sandy loam, lake terrace (123)	Lake terraces	Sandy loam	Alluvium derived from mixed rocks	0.28	C	170.9	5.7
Calneva silt loam (140)	Lake terraces	Silty loam	Lacustrine deposits	0.55	C	177.9	5.9
Calneva-Playas complex (141)	Lake terraces	Silt loam	Lacustrine deposits	0.55	C	152.0	5.1
Epot-Playas complex (192)	Lake terraces	Very fine sandy loam	Lacustrine deposits	0.55	D	912.2	30.5
Herjun loamy sand (236)	Lake terraces	Loamy sand	Alluvium derived from mixed rocks and lacustrine deposits	0.28	B	374.4	12.5
Lieberman fine sandy loam (270)	Lake terraces	Fine sandy loam	Lacustrine deposits	0.43	C	189.4	6.3
Mazuma fine sandy loam (282)	Lake terraces	Fine sandy loam	Alluvium derived from mixed rocks and lacustrine deposits	0.37	A	207.7	6.9
Rose Creek loam (342)	Flood plains	Loam	Alluvium derived from mixed rocks	0.43	C	56.0	1.9
Saddlerock peat (347)	Flood plains	Peat	Alluvium derived from volcanic rock	N/A	C/D	306.5	10.3
Xerolls-aquolls complex (405)	Lakeshores	Loamy coarse sand and gravelly	Alluvium derived from granite and mixed rocks	0.10	A	104.5	3.5





		sandy loam					
Yobe silt loam (406)	Lake terraces	Silt loam	Lacustrine deposits	0.55	C	290.2	9.7
Water (409)	Depressions	N/A	N/A	N/A	N/A	6.3	0.2
<b>Project Area Totals</b>						<b>2,990.4</b>	<b>100%</b>

Hydrologic soil classifications estimate the rate at which water infiltrates the soil and ability of the soil to hold water when vegetation is not present and when the soil is thoroughly saturated. There are four main classifications (A, B, C, and D) and three dual classes (A/D, B/D, and C/D) that describe soils from most hydric with the highest infiltration rate (A) to least hydric with the slowest infiltration rate (D). Dual classifications are assigned to areas with a combination of soils. All areas of dual classification contain non-hydric soils with the slowest infiltration rate (D) and areas that are more easily infiltrated (A through C). Hydrologic soil classifications are not applicable to frozen soil.

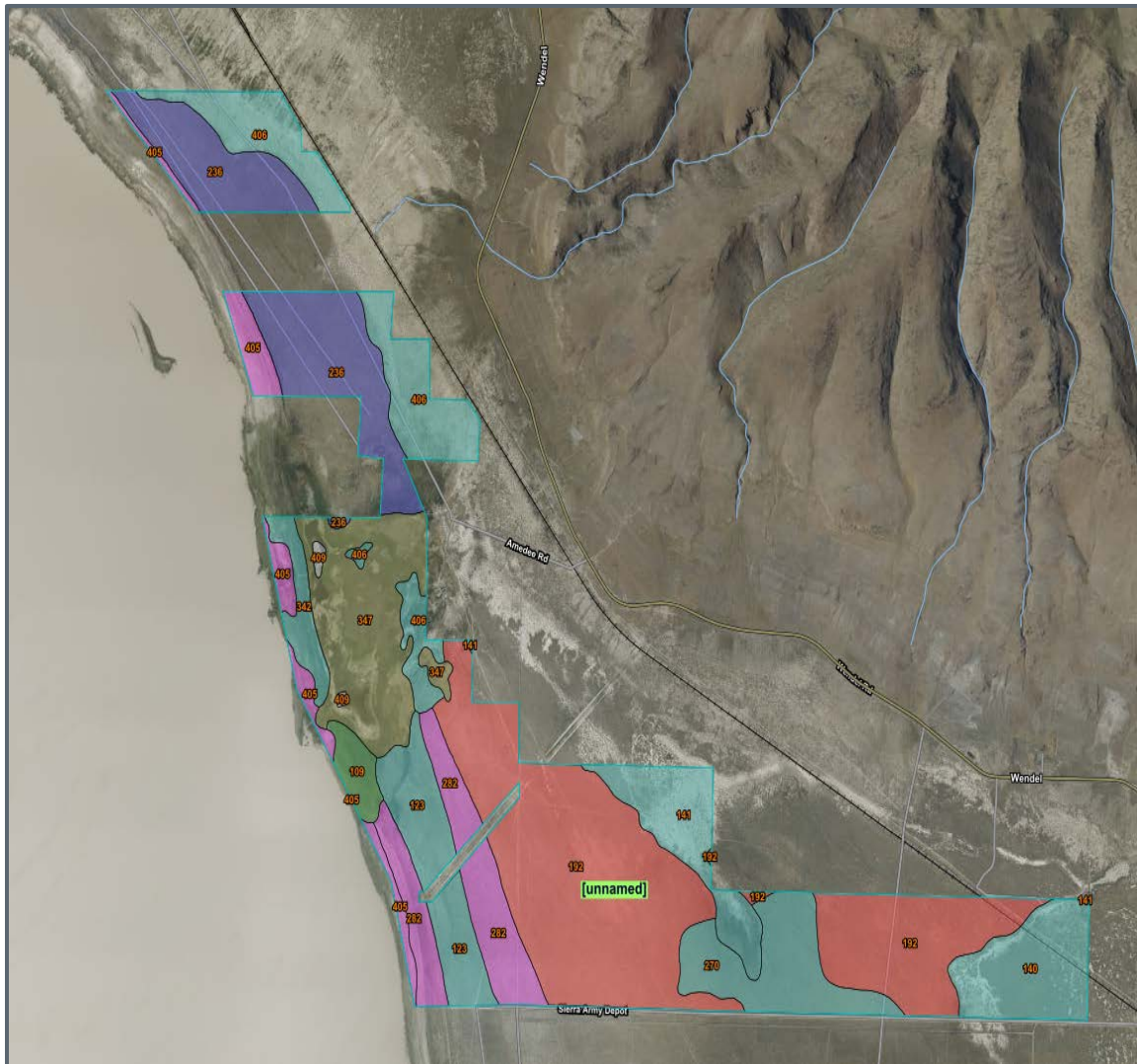
According to information obtained from the NRCS WSS online database, 34.6% of the soil in the Project Area has been assigned the hydrologic soil classification of C. Hydrologic Group C Soils are defined as having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission. For additional information regarding the various hydrologic soils group totals within the Project Area, see the table to the right.

The erosion factor (K) assigns a unitless quantitative value between 0.02 and 0.69 designating the susceptibility of soil to sheet and rill (shallow flow paths through which rainwater flows) erosion by water. The erosion factor of a soil is based on relative percentages of silt, sand, coarse to very coarse material (pebbles and rock fragments), and organic matter present within a hydrologic soil group, the physical structure of the soil, and its permeability. The greater the calculated value of K, the greater the tendency for the soil to be subject to erosion due to hydrologic forces. In the Project Area, soil in hydrologic group A/D has the lowest overall erosion factor (K=0.24), group A has an erosion factor of K=0.10 to 0.37, group B has an erosion factor of K=0.28 group C has an erosion factor ranging between K=0.28 to 0.55, and group D has an erosion factor of K=0.55. Given the high erosion factors for Group C and D, erosion control measures are recommended for project construction.

**Table 5 Hydraulic Groups**

Hydro. Group	Total Acres	% of Site
A	312.2	10.4
A/D	42.2	1.4
B	374.4	12.5
C	1,036.4	34.6
C/D	306.5	10.3
D	912.2	30.5

Due to soil propensity for erosion, a geotechnical evaluation may be necessary to assess the geological hazards that may affect the proposed layout, design, and long-term stability of the Project Area.



### Legend

-  Artray sandy loam
-  Bobert sandy loam
-  Calneva silt loam
-  Calneva-Playas complex
-  Epot-Playas complex
-  Herjun loamy sand
-  Lieberman fine sandy loam
-  Mazuma fine sandy loam
-  Rose Creek loam
-  Saddlerock peat
-  Xerolls-aquolls complex
-  Yobe silt loam
-  Water

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### Soils Map

Lassen Solar Farm

Figure 4  
Project No. 470890



### 3.2 Water Resources

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredge and fill material into Waters of the United States (WOTUS) under Section 404 of the Clean Water Act (CWA). USACE jurisdiction over non-tidal WOTUS extends to the "ordinary high-water mark (OHWM) provided the jurisdiction is not extended by the presence of wetlands" (33 CFR Part 328.4); and under Title 40 CFR Part 230.3 (s)(1). The term WOTUS has been broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as rivers, streams (including intermittent and ephemeral streams), and their tributaries, canals, reservoirs, lakes, and adjacent wetlands.

Many wetlands are protected under the CWA as WOTUS. Wetlands are defined by the USACE based on the presence of wetland vegetation, wetland hydrology, and hydric soils. In addition, Executive Order 11990, Protection of Wetlands (42 Federal Register 26961), directs all federal agencies to minimize the destruction, loss, or degradation of wetlands, and to enhance the natural and beneficial values of wetlands. Federal regulation and management of wetlands follows a "no net loss" policy.

**Table 6 Water Resources**

Water Resource Type	Site Impacts	Source
Jurisdictional Waters and Wetlands	Approximately 63.62 acres of freshwater emergent wetlands, and 165.5 acres of freshwater forested/shrub wetland were identified within the Project Area.	National Wetlands Inventory (NWI) data
Surface Water and Groundwater	Several freshwater ponds and lake habitat and streams are located within the central portion of the Project Area.	National Wetlands Inventory (NWI) data
Floodplains	The Project Area is located within FEMA FIRM Panel 06035C2300D.  No Floodplains exists in the Project Area. However, the westernmost portion of the Project Area bordering Honey Lake is classified as a Zone A Floodplain. See Section 3.2.3 for additional information.	Federal Emergency Management Agency (FEMA) National Flood Hazard Layer

#### 3.2.1 Wetlands and Waterbodies

As shown in Figure 5 and the table below, the Project Area possesses several freshwater emergent wetlands and freshwater forested/shrub wetlands, streams, and ponds concentrated in its central and easternmost portions, as indicated in the National Wetland Inventory (NWI) data map. The NWI identified the streams as riverines and ponds as freshwater ponds. The table below provides the acres of NWI wetlands present in the Project Area.



**Table 7 Wetland Resources**

Resource Type	Habitat	Total Acreage	% of Project Area
Stream	Riverine	~5.84 acres	0.001%
Freshwater Forested/Shrub Wetland	Freshwater Forested/Shrub Wetland	~207.8 acres	0.07%
Freshwater Emergent Wetland	Freshwater Emergent Wetland	~61.75 acres	0.02%
Freshwater Pond	Freshwater pond	~41.4 acres	0.1%

Wetlands that are considered WOTUS, are regulated by USACE, whose jurisdiction only includes non-isolated wetlands connected to WOTUS. According to the USFWS, an isolated wetland is defined as “wetlands with no apparent surface water connection to perennial rivers and streams, estuaries, or the ocean.” These geographically isolated wetlands are surrounded by dry land. Streamside wetlands where the stream disappeared underground or entered an isolated (no outflow) lake or pond are also classified as isolated. Based on a preliminary review of the Project Area, using aerial photos and USGS maps, the identified riverines and wetlands are isolated and will not be considered jurisdictional under USACE regulations.

A wetland delineation is recommended to define identified and unidentified wetlands within the Project Area. Once all wetlands have been delineated, a jurisdictional determination will be filed with the USACE for approval. It is advisable to set-back all infrastructure on the Project Area 100 feet from any identified wetlands, which will help reduce amount of impact and lessen the financial burden of an individual permit for impacting wetlands.

### 3.2.2 Watershed

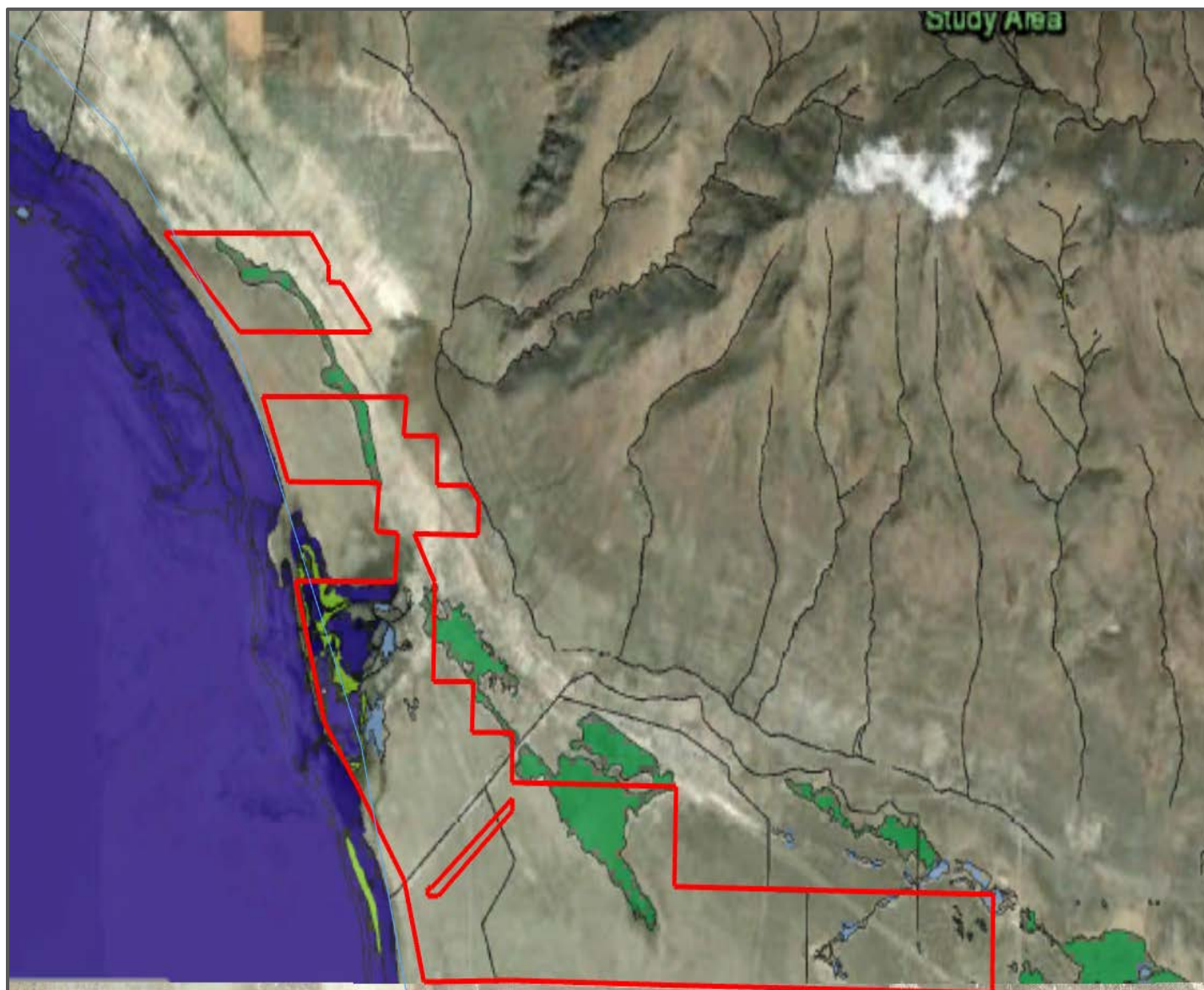
The Project Area lies within the greater Honey-Eagle Lakes watershed, and within the Honey Lake Valley-Frontal Honey Lake sub-watershed. According to the Honey Lake Valley Resource Conservation District, the watershed originates in the Cascade Range, at which the Susan River begins at 7,000 feet of elevation and drains, 40 miles later, into Honey Lake at approximately 4,000 feet above sea level. The Susan River has six major tributaries that drain the watershed, Paiute Creek, Gold Run Creek, Lassen Creek, Willard Creek, Cheney Creek, and Willow Creek, as well as numerous seasonal streams and creeks located within the watershed. The Honey Lake Valley Resource Conservation District is the regulatory authority that oversees the Honey Lake Valley-Frontal Honey Lake watershed. Due to the Project Area’s location within the watershed and proposed construction for the Lassen Solar Farm facility, consultation with the California State Water Resources Control Board (SWRCB)- Lahontan Region and The Honey Lake Valley Resource Conservation District is recommended, and will require a stormwater permit prior to construction.

### 3.2.3 Floodplains

A review of the Federal Emergency Management Agency’s (FEMA’s) National Flood Hazard Layer identifies that the Project Area is located within one FIRM Panel: 06035C2300D. According to the FIRM Panel data, the Project Area exists primarily within Zone X, defined as an area with low-to-moderate flood risk (Figure 6). A Zone A floodplain is located at the westernmost portion of the Project Area bordering Honey Lake. A Zone A floodplain is considered a Special Flood Hazard Area (SFHA) that is subject to inundation by the 1% chance flood, with no Base Flood Elevations (BFE) identified. According



to the Lassen County Code 12.26.056, a Floodplain Development Permit shall be obtained before any construction or other development begins within any area of special flood hazard established in Section 12.26.040(b) (Basis for Establishing the Areas of Special Flood Hazard). In an A zone, elevated to or above the base flood elevation; said base flood elevation shall be determined by one of the methods in Section 12.26.056(b)(3) of this the Lassen County Code 12.26.056. The state of California recommends the lowest floor be elevated at least two feet above the base flood elevation, as determined by the community.



### Legend

-  Project Area
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Riverine
-  Lake

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2500 Camino Diablo, Walnut Creek,  
CA 94597

### Wetlands Map

Lassen Solar  
Farm

Figure 5  
Project No.  
470890



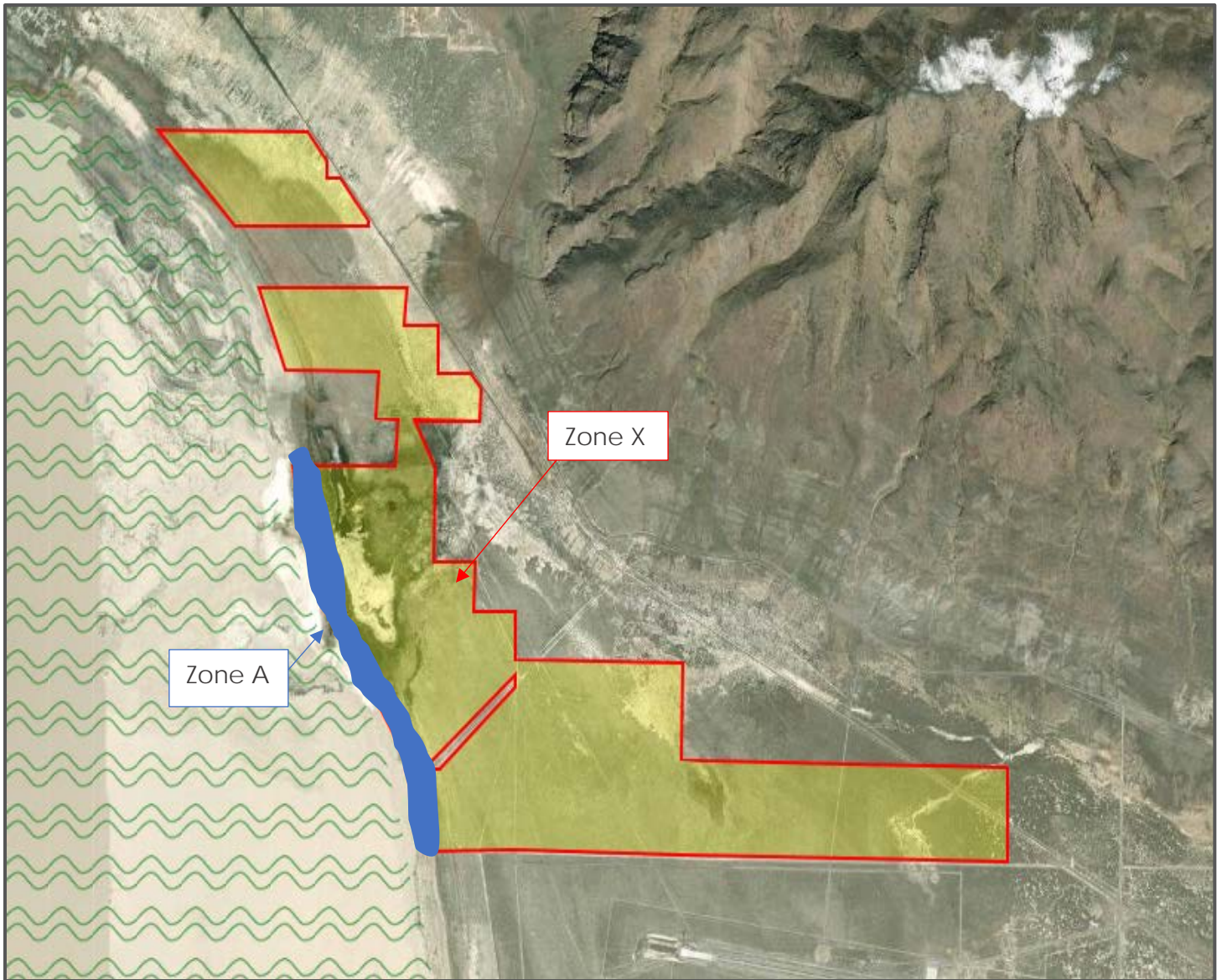


Figure 6: FEMA Flood Map

Proposed Lassen Solar Farm

AEI Project No.: 470890





### 3.3 Biological Resources

#### 3.3.1 Vegetation

According to a review of aerial imagery for the years 1951, 1969, 1975, 1989, 1998, 2010, and 2020 the Project Area has historically been undeveloped with a large wetland area in the central portion, with various two-track roads crossing the Project Area (Envirosite Atlas 2022). A similar review of historic topographic maps supports the aerial imagery observations and indicates the Project Area is west adjacent to a natural hot springs area. A portion of the Southern Pacific Railroad crosses the northern portion of the Project area in the mid-20<sup>th</sup> century. The Sierra Army Depot, which contains the Amadee Army Airfield, has been located south adjacent to the Project Area since at least the mid-20<sup>th</sup> century. Based on our review of the area, historic use of the south adjacent army airfield and former presence of the railroad, it would be recommended to perform a Phase I Environmental Site Assessment to determine possible subsurface contamination at the Project Area.

#### 3.3.2 Special-Status Plants and Other Species of Concern

The Federal Endangered Species Act of 1973 (ESA) mandates that actions are not to jeopardize the continued existence of listed threatened or endangered species. Species listed by the U.S. Fish and Wildlife Service (USFWS) often have low population sizes, are sensitive to habitat alterations, or have cultural significance and require protective measures for their perpetuation. The ESA makes it unlawful to "take" a listed species. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in any such conduct." Significant modification or degradation of listed species' habitats are considered "harm" under ESA regulations; projects that have such potential will require close scrutiny by USFWS and may require special permitting or mitigation measures to avoid or reduce impacts on these species. In general, the ESA covers activities on federal lands.

According to information reviewed on the CDFW California Natural Diversity Database (CNDDDB) – Biogeographic Information and Observation System (BIOS) tool, 15 plant species were identified within the Project Area Quadrangle. None of the plant species are listed as Federally threatened or endangered. However, 13 are identified as Rare, Threatened, or Endangered in California, but more common elsewhere. Please refer to Appendix B for a comprehensive list of State Status Codes and their definition. AEI recommends a biological site survey to determine the presence or absence of the below-listed flora within the Project Area.

Table 8 Plant List

Wendel Topographic Quadrangle Plant List			
Scientific Name	Common Name	Last Observed	State Status
<i>Allium atrorubens</i> var. <i>atrorubens</i>	Great Basin Onion	N/A	2B.3
<i>Thelypodium milleflorum</i>	Many-flowered Thelypodium	N/A	2B.2
<i>Astragalus geyeri</i> var. <i>geyeri</i>	Geyer's milk-vetch	N/A	2B.2
<i>Astragalus iodanthus</i> var. <i>diaphanoides</i>	Snake milk-vetch	N/A	4.3
<i>Lupinus pusillus</i> var. <i>intermontanus</i>	Intermontane Lupine	N/A	2B.3
<i>Phacelia gymnoclada</i>	Naked-stemmed Phacelia	N/A	2B.3
<i>Sidalcea multifida</i>	Cut-leaf Checkerbloom	N/A	2B.3
<i>Sphaeralcea grossulariifolia</i>	Currant-leaved Desert Mallow	N/A	2B.3
<i>Chylismia claviformis</i> ssp. <i>cruciformis</i>	Cruciform Evening-primrose	N/A	2B.3



<i>Eremothera boothii</i> ssp. <i>alyssoides</i>	Pine Creek Evening-primrose	N/A	4.3
<i>Eremothera minor</i>	Nelson's evening-primrose	N/A	2B.3
<i>Eriogonum nutans</i> var. <i>nutans</i>	Dugway wild buckwheat	N/A	2B.3
<i>Rumex venosus</i>	Winged Dock	N/A	2B.3
<i>Potamogeton zosteriformis</i>	Eel-grass Pondweed	N/A	2B.2
<i>Ivesia baileyi</i> var. <i>baileyi</i>	Bailey's Ivesia	N/A	2B.3

### 3.3.3 Special-Status Wildlife and Other Species of Concern

This section describes federal- and state-listed wildlife species that potentially could occur or that are known to occur within the Project Area or surrounding vicinity. Species of concern include avian species and those wildlife species occurring within sensitive or unique habitats which could be disturbed during the construction and operation of facilities.

#### Species of Federal Concern

The Endangered Species Act (ESA), as administered by the USFWS, mandates protection of species federally listed as threatened or endangered and their associated habitats. According to the Information for Planning and Consultation (IPaC) Tool at the USFWS website, there are two (2) Federally threatened, endangered, or candidate species known to occur or potentially could occur in or at the Project Area, as well as 12 Birds of Conservation Concern (BCC) that are known to occur, or potentially occur, in the Project Area. The BCC may nest and/or migrate during defined periods and is recommended that construction activities are scheduled outside of the nesting or migration time periods, to prevent an incidental take from occurring.

Table 9 Species of Federal Concern

Species	Federal Status	Species-Habitat Associations	Potential for Occurrence
<b>Insects</b>			
Carson Wandering Skipper ( <i>Pseudocopa eunus obscurus</i> )	FE	None designated for species	Moderate
Monarch Butterfly ( <i>Danaus plexippus</i> )	FC	None designated for species	Moderate
<b>Birds</b>			
American White Pelican ( <i>pelecanus erythrorhynchos</i> )	BCC	None designated for species	Moderate
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	BCC	None designated for species	Moderate
Clark's Grebe ( <i>Aechmophorus clarkia</i> )	BCC	None designated for species	Moderate
Franklin's Gull ( <i>Leucophaeus pipixcan</i> )	BCC	None designated for species	Moderate
Lesser Yellowlegs ( <i>Tringa flavipes</i> )	BCC	None designated for species	Low
Lewis's Woodpecker ( <i>Melanerpes lewis</i> )	BCC	None designated for species	Low



Marbled Godwit ( <i>Limosa fedoa</i> )	BCC	None designated for	Low
Olive-sided Flycatcher ( <i>Contopus cooperi</i> )	BCC	None designated for	Moderate
Rufous Hummingbird ( <i>Selasphorus rufus</i> )	BCC	None designated for	Moderate
Sage Thrasher ( <i>Oreoscoptes montanus</i> )	BCC	None designated for	Moderate
Western Grebe ( <i>Aechmophorus occidentalis</i> )	BCC	None designated for	Moderate
Willet Tringa ( <i>Semipalmata</i> )	BCC	None designated for	Moderate

A Threatened and Endangered Species and Habitat Assessment will be required to determine the presence or absence of the Federal Endangered (FE) and Federal Candidate (FC) species and BCC. If species are present, or nests are identified, coordination with the USFWS will be required for mitigation efforts. If no species, nests, or habitats are observed, the biological report will be submitted to the USFWS for confirmation of negative findings, with a request that no further actions are required.

### Species of State Concern

In addition to federal listing, most states list species that are declining and in danger of becoming extinct within the state's borders. In California, plant and animal species may be designated as threatened or endangered species under the California Endangered Species Act (CESA) after a formal listing process by the California Fish and Game Commission.

According to the CNDDDB – BIOS tool, there are 12 identified threatened or endangered species within or near the Project Area. AEI recommends a biological site survey to determine the presence or absence of the below-listed fauna within the Project Area. Please refer to Appendix B for a complete list of identified species.

Table 10 Species of State Concern

Common Name	Scientific Name	Group	Federal Status	State Status
Golden Eagle	<i>Aquila chrysaetos</i>	Birds	None	None
Prairie Falcon	<i>Falco mexicanus</i>	Birds	None	None
Greater Sandhill Crane	<i>Antigone canadensis tabida</i>	Birds	None	Threatened
Long-eared Owl	<i>Asio otus</i>	Birds	None	None
Burrowing Owl	<i>Athene cunicularia</i>	Birds	None	None
Carson Wandering Skipper	<i>Pseudocopaeodes eunus obscurus</i>	Insects	Endangered	None
Pronghorn	<i>Antilocapra americana</i>	Mammals	None	None
Gray Wolf	<i>Canis lupus</i>	Mammals	Endangered	Endangered
North American Porcupine	<i>Erethizon dorsatum</i>	Mammals	None	None
American Badger	<i>Taxidea taxus</i>	Mammals	None	None
Piute Ground Squirrel	<i>Urocitellus mollis</i>	Mammals	None	None
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Mammals	None	None





Definitions	
FE	Federally Endangered
FT	Federally Threatened
FC	Federal Candidate
FP	Federally Proposed
SE	State Endangered
ST	State Threatened
DCH	Designated Critical Habitat
BCC	Bird of Conservation Concern
S1	Critically imperiled: At high risk because of extreme rarity (often 5 or fewer occurrences), rapidly declining numbers, or other factors that make it particularly vulnerable to rangewide extinction or extirpation.
S2	Imperiled: at risk because of restricted range, few populations (often 20 or fewer), rapidly declining numbers, or other factors that make it vulnerable to rangewide extinction or extirpation.
S3	Vulnerable: at moderate risk because of restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors that make it vulnerable to rangewide extinction or extirpation.
B	Breeding: conservation status refers to only the breeding population of the species.

Potential for Occurrence on Site	
Unlikely	No species range overlap with the Project Area or unsuitable habitat in the Project Area vicinity.
Low	Species range overlaps with the Project Area and marginally suitable habitat in the Project Area vicinity.
Moderate	Species range overlaps with the Project Area and suitable habitat present in the Project Area, or species known to occur in habitat similar to the Project Area.
High	Species observed during field survey, highly suitable habitat present in the Project Area, or known populations exist in the Project Area vicinity.





## 3.4 Land Use and Community Resources

### 3.4.1 Land Use

Lassen County is approximately 3,022,905 acres, with a primary land use of rural land followed by agricultural land and rangeland. Agriculture consists primarily of alfalfa, wheat, oats, barley, and rye. Livestock and pastureland also are significant crops. Miscellaneous crops include alfalfa seed, strawberry plants, garlic seed, and mint.

### 3.1.2 Land Cover

According to the Project Area's Gap Analysis Program (GAP) Landcover 2011 Class analysis, the Project Area consists of Class 3 Desert and Semi-Desert, Shrub and Herb Vegetation, and Class 8 Developed and Other Human Use (Figure 7).

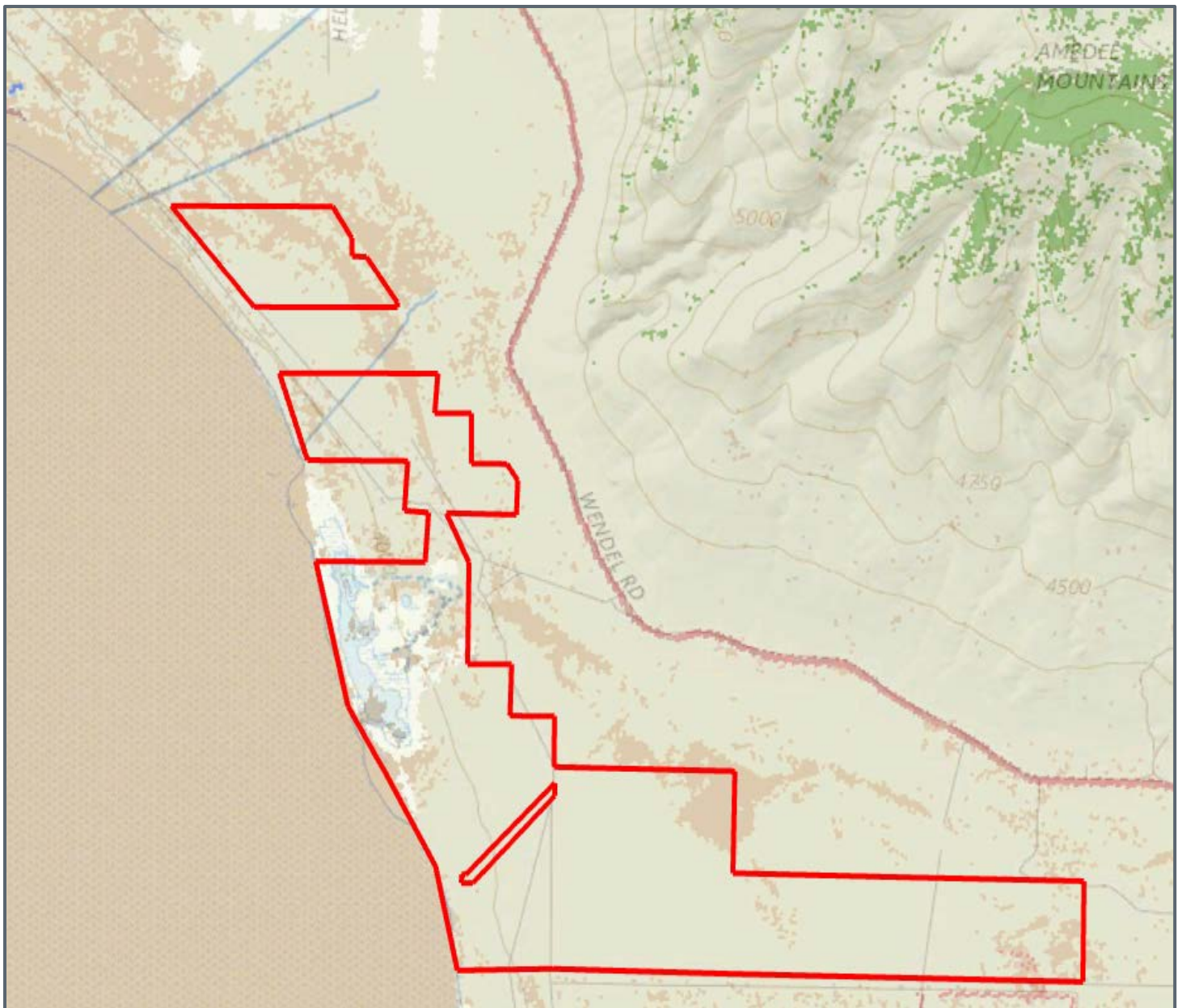
Class 3 Desert and Semi-Desert consists of cool and warm semi-deserts dominated by xeromorphic growth forms, including succulents (e.g., cacti, euphorbias), small-leaved shrubs, and trees, desert grasses and other xeromorphic growth forms, with an irregular horizontal canopy spacing that is often open to very sparse (1%) cover.

Shrub and Herb Vegetation consists of grasslands, shrublands, open tree savannas, marshes, bogs and fens dominated by broadly mesomorphic (including *scleromorphic*) shrub and herb growth forms (including *broad-leaved*, *needle-leaved*, and *sclerophyllous shrubs*, and *forb* and *graminoid herbs*) with an irregular horizontal canopy structure, mesomorphic trees typically 10% cover (but tropical tree savannas typically 40%), tropical to boreal and subalpine climates, and wet to dry substrate conditions.

Class 8 Developed and Other Human Use includes areas with a mixture of some constructed materials, but mostly consisting of vegetation in the form of lawn grasses. Impervious soils, or soil that does not allow water to seep into the ground, accounts for less than 20% of total cover. These areas are commonly found in large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreational use, erosion control, or aesthetic purposes.

Table 11 GAP

GAP Landcover Analysis		
Land Cover	Acreage	% of Total Project Area
Desert & Semi-Desert	~2,742.65	~91.7%
Shrub & Herb Vegetation	~243.57	~8.3%
Developed and Other Human Use	~3.78	~1%



### Legend

-  Project Boundary
-  Desert & Semi Desert
-  Shrub & Herb Vegetation
-  Developed & Other Human Use



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### GAP Land Cover Map

Lassen Solar Farm

### Figure 7

Project No. 470890



### 3.4.3 Important Farmland

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. According to the California Department of Conservation Important Farmland Finder, the Project Area and its immediate vicinity is **not located within important farmland.**

### 3.4.4 Fire Hazard Zone

According to the California Office of the State Fire Marshall (CalFire), the Project Area is located within an unincorporated Local Responsibility Area (LRA). The area of the Project Area falls under the Lassen-Modoc Unit. According to a telephone conversation with a representative from the Lassen-Modoc Unit, the Project Area lies within an unprotected area, but would likely receive mutual aid from various Fire Departments depending on the time of year and size of the fire. The nearest response units would be the Sierra Army Depot Fire Department, Doyle Fire Department, and Milford Fire Department. The Lassen-Modoc Unit also has an agreement with the Bureau of Land Management for the area regarding wildland fires, and CalFire, whose response would be dependent on the time of year.

### 3.4.5 Noise

Noise is generally defined as unwanted or excessive sound. Some land uses are considered more prone to intrusive noise than others due to the type of activities involved at the receptor location. Specifically, sensitive human noise receptors normally include residences, schools, libraries, religious institutions, hospitals, nursing homes, daycare centers, and other businesses. Based on a preliminary desktop review, the primary receptors near the Project Area consist of an airfield and industrial developments (geothermal plant).

Solar farms typically have very low noise profiles, as such, noise generated from the facility is not expected to be discernable from the nearby traffic noise and airfield/industrial facilities. Operational noises generated by the solar farm will occur during daylight hours. On occasion, some limited noise will be generated after sunset during maintenance activities. The daytime noises will be generated by the electric inverters, and to a lesser extent by the transformers and the rotation of the solar tracking system.

Noise generated by the inverter, transformers, and tracking system will be reduced by the existing airfield and roadway background noise. It is not expected noise will be heard from the adjacent airfield and industrial property.

During project construction, noise will be generated by trucks and construction equipment such as forklifts, cranes, and vibratory pile drivers for the installation of vertical posts upon which the solar panels will be mounted. Noise levels emitted by the construction equipment is expected to range from approximately 80 to 90-plus dbA. This will vary based on the piece(s) of equipment being used on any particular day. The noise impacts will be temporary, ending when construction of the solar array has been completed.

**According to Lassen County's Ordinance Code Chapter 9.65 Noise, §9.65.070 Exemptions, notes construction work conducted within a valid building permit between the hours of seven a.m. to seven p.m. is exempt from noise ordinances.**

Noise will be mitigated during construction by maintaining engine mufflers in accordance with equipment manufacturers' specifications. Construction activities are expected to be limited to daylight hours.



### 3.4.6 Visual Impacts

The height of the solar panels will be approximately five feet above ground surface at their highest point. The proposed facility within the Project Area will tap into a private transmission line and substation that will be constructed by the Client. The low-lying vegetation and west-trending slope of the Project Area will partially obscure the lower portion of the panels from public roadways. Additionally, given the Project Area is located in a rural area far from city limits with only an existing airfield and geothermal plant nearby, it is unlikely the proposed solar farm will impact present infrastructure or residences. Furthermore, there are no NRHP listed resources in the vicinity of the Project Area. As such, the solar farm is not anticipated to adversely affect known historic resources.

The biggest visual impacts may be due to aviation and airspace, as glare may be a factor with the Amedee Army Airfield runway to the south. See Section 3.4.8 "Aviation and Airspace" and Figure 9 for additional information. Correspondence with the Military Aviation and Installation Assurance Sitting Clearinghouse, Office of the Assistant Secretary of Defense (Sustainment), the Department of Defense (DOD), has requested information regarding the solar panels will contain an anti-reflective coating to reduce/prevent glare. Given the proximity of the south adjacent airfield and size of the proposed project, anti-reflective coating is recommended and will be taken into consideration in the DOD review.

Additional requirements may be requested by the Lassen County Planning and Building Services Division to mitigate or accommodate what may be perceived as adverse visual impacts posed by the development of the solar farm. However, such requirements are likely to be made during the project review process for each department.

### 3.4.7 Zoning

The Project Area falls within the jurisdiction of the Lassen County Planning and Building Services Division. According to the Lassen County Assessor, most of the Project Area is not assigned a zone. A few parcels are currently zoned as agricultural (133-070-001, 133-020-004-000, 133-020-004, 133-080-003, 133-080-009, and 133-080-013).

According to a representative from the Lassen County Land Use Department of the Planning and Building Services Division, zoning efforts will require a Certificate of Compliance to be submitted prior to any other applications. The Certificate of Compliance process may take up to 60 days. AEI recommends an in-person consultation with a Senior Planner to confirm zoning and permit requirements and timeline.

### 3.4.8 Aviation and Airspace

The Federal Aviation Administration (FAA) is responsible for the safety of civil aviation and has jurisdiction over any object that may impact or interfere with the navigable airspace or communications technology used in aviation operations. The Code of Federal Regulations (CFR) Title 14 Part 77.9 states that any person/organization who intends to sponsor any of the following construction or alterations must file a Notice of Proposed Construction or Alteration (Form 7460-1) with the Administrator of the FAA prior to beginning construction:

- A structure will be in an instrument approach area and might exceed Part 77 Subpart C

The nearest airport to the Project Area is Amedee Army Airfield which serves as a small airfield for the United States Army Sierra Army Depot. The airfield allows for the shipment and receiving of various Army equipment and supplies.



The Amedee Army Airfield only has one runway, which is situated northwest to southeast and is located approximately 0.43-miles (0.69 kilometers) south of the Project Area. Due to the solar panels mounted on a rotating system, glare may be the greatest factor for the runway, depending on available landing / takeoff patterns.

AEI utilized the online FAA Notice Criteria Tool (FAA, 2014b) to determine whether the proximity of the Project Area was likely to interfere with MFD's commercial and (DOD) operations.

The preliminary findings indicated that the Project Area did not exceed the FAA Notice Criteria.

The Department of Defense was also contacted on November 3, 2022, to provide a Military Aviation and Installation Assurance Siting Clearinghouse Review for the proposed Project Area. The review helps identify if the Lassen Solar Farm has the potential to interfere with military operations and/or missions. An addendum will be issued once the review results are received from the DOD.

### 3.4.9 Public Services and Infrastructure

Figure 8 below shows roads, a gas pipeline, a geothermal plant, and transmission lines located near the Project Area.

#### County and Local Roads

Figure 2 shows roads located in close proximity to the Project Area. Amedee Road crosses the Project Area's northern portion and the nearest portion of Wendel Road is approximately 0.29-miles east of the Project Area.

#### Railroads

No railroad tracks or crossings have been identified within or adjacent to the Project Area.

#### Pipelines

According to the National Pipeline Mapping System, the Tuscarora Gas Transmission Pipeline containing natural gas is located east adjacent to the Project Area.

#### Transmission Lines

According to the U.S. Energy Information Administration (EIA), there is one electric transmission line within the Project Area. See Figure 8.

#### Buildings

Greenleaf Honey Lake Power geothermal plant is located east adjacent to the Project Area. See Figure 8.

#### FCC Towers

No cellular communication towers exist within the Project Area. The closest cellular tower is located 19.9 miles northwest of the northwestern corner of the Project Area, near the town of Susanville. Refer to Figure 9.

#### Airports and Heliports

Amedee Army Airfield is located approximately 0.43-miles (0.69 kilometers) south of the southernmost boundary of the Project Area. There are a total of three (3) additional airports and/or heliports within a 20-mile radius of the Project Area. See table below for additional information and Figure 9.







Table 12 Airports and Heliports

Airports and Heliports Information			
Airport Name	Locator ID	Type	Distance from Project Area
Amedee Army Airfield	AHC	Airport	0.43 miles
Herlong	H37	Airport	9.39 miles
Susanville Muni	SVE	Airport	17.86 miles





Legend

-  Project Boundary
-  Gas Pipeline (subsurface)
-  Transmission Line
-  Geothermal Plant



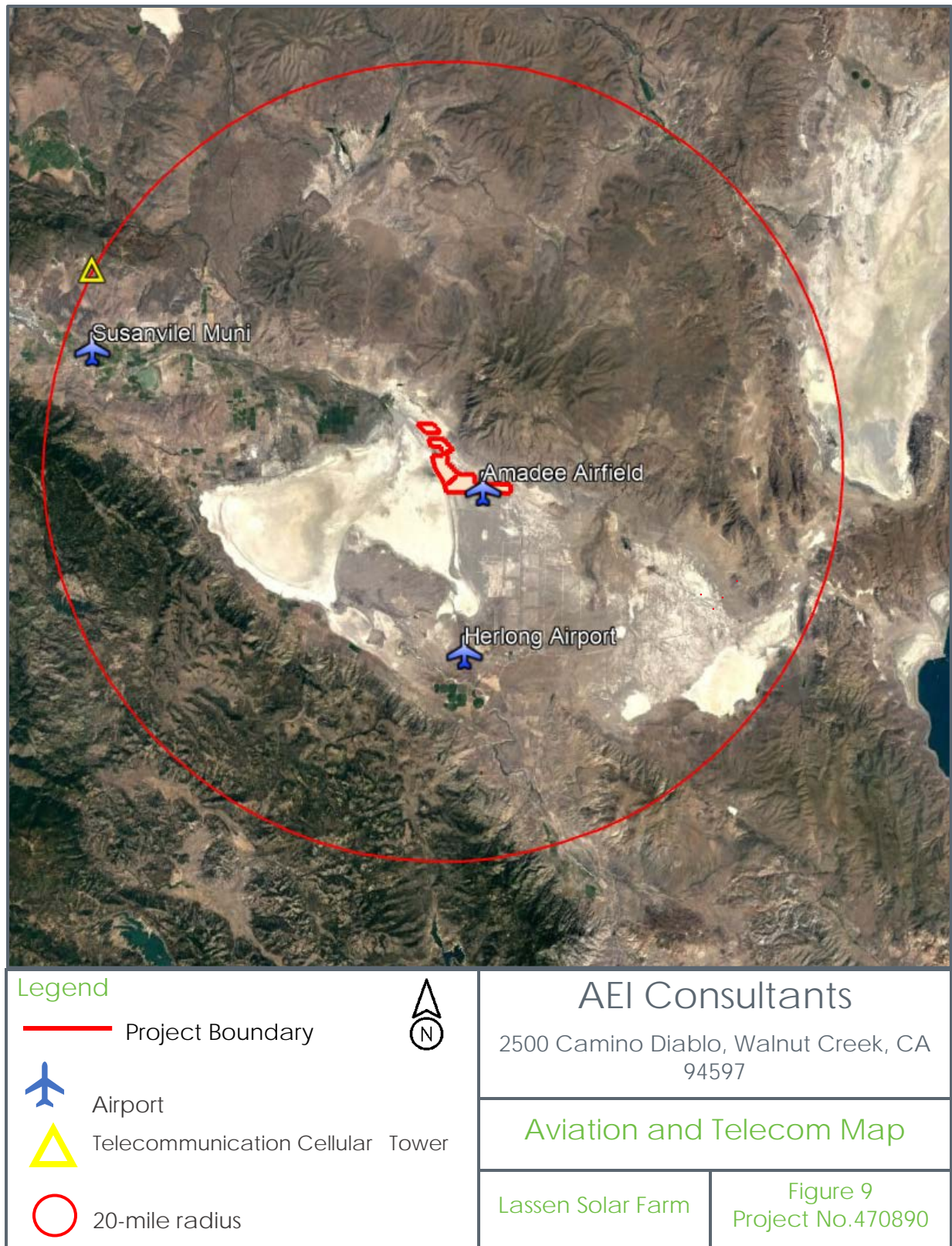
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94597

Pipeline & Transmission Lines

Lassen Solar Farm

Figure 8  
Project No.470890







## 3.5 Cultural Resources

### 3.5.1 Archaeological and Historic Facility Resources

Archaeological and historic facility resources represent the visible or otherwise tangible record of human activities on the landscape that occurred over fifty (50) years ago. Cultural resources vary in size, shape, condition, and importance, among other considerations. Archaeological sites can range from pre-contact to historic and may be evident by structures, depressions, or other physical components, buried, or only visible to knowledgeable people. Additionally, some locations may not possess any cultural materials, but may have an oral, traditional, or spiritual importance to groups, tribes, or communities.

There are five (5) categories of properties, or cultural resources, that are used to help determine eligibility for the National Register of Historic Places (NRHP). These include object, site, building, structure, and district. Once a category has been identified, then it must possess significance and integrity, and meet one or more of the four (4) criteria for listing on the NRHP. The criteria for evaluation, according to the NRHP 36 Code of Federal Regulations (CFR) 60.4, must satisfy one of the following:

- (a) association with events that have made a significant contribution to the broad patterns of our history; or
- (b) association with the lives of persons significant in our past; or
- (c) embodiment of distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) having yielded, or likely to yield, information important in prehistory or history

The status of a resource falls into three possible categories: "Not Eligible", "Not Evaluated", and "Eligible". A cultural resource is determined "not eligible" when a lead Federal Agency has reviewed a nomination, determines if the object, site, building, structure, or district does not possess significance and integrity, and does not meet any of the four (4) criteria for evaluation. Such resources do not require further investigation. A cultural resource is considered "not evaluated" when a federal agency has not made any determination as to its eligibility. Further work is needed to understand the significance of the cultural resource. A cultural resource is considered "eligible" when a federal agency has determined that the resource meets one of criteria items, represents significance, and retains its integrity; then it will be listed on the NRHP. Coordination with the "appropriate parties" is needed to discuss project impacts as they relate to the resources.

Resource status is useful for project planning purposes. In addition, when resources have not been evaluated for significance and will be physically impacted by a project, coordination with the SHPO will be required to address the impacts and provide reasonable mitigation measures to prevent destruction to archaeological and historic resources.

Records were reviewed through the NRHP. The record search was used as an initial search to identify if any NRHP listed resources were located on, or adjacent to, the Project Area. No NRHP were identified on the Project Area, through online public databases.

AEI also reviewed available files on the California Built Environment Resource Directory (BERD) for state listed resources within or in the vicinity of the Project Area. According to the BERD database for Lassen County, various buildings within the Sierra Army Depot property, located south adjacent to the Project Area, are listed in the BERD database. The buildings are listed either as ineligible for inclusion in the



NRHP or are unevaluated. As such, proposed project should not negatively affect the buildings listed in the Lassen County BERD.

### 3.5.2 Recorded Archaeological and Historic Facility Resources

Information regarding recorded archaeological and historic resources was requested via the California Historical Resources Information System (CHRIS) Northeast Information Center for registered properties in the Project Area. As of the date of this report, a response has not been received from the CHRIS Northeast Information Center. AEI will provide an addendum to this report when a response is received.

### 3.5.3 Possible Concerns or Effects

Possible concerns that should be considered for this project include:

- Unrecorded cultural resources located within the Project Area;
- Any ground disturbing activity within the Project Area that has potential to impact known or unknown cultural resources;
- Visual impacts to recorded or unrecorded cultural resource properties;
- Cultural resources that are currently undergoing the evaluation process or identified as "Not Evaluated".

AEI searched the NRHP database online. No NRHP properties were identified within, or adjacent to, the Project Area. However, there may be a likelihood that unevaluated or unknown significant resources may be present within or near the Project Area. To better assist the initial development of a project layout, AEI recommends a review of background literature when it becomes available to thoroughly identify previously recorded cultural resources and if any surveys have covered the Project Area. If a Phase I Archaeological pedestrian survey has not been previously completed in the Project Area, AEI recommends a pedestrian survey be conducted to identify subsurface cultural resources that can, or otherwise should be avoided. Additionally, an evaluation of historic structures within the general Project Area is sometimes appropriate to inform project development of potential adverse visual effects.

## 4.0 Regulatory Compliance and Permitting

This section outlines applicable regulatory compliance issues and related permitting and coordination requirements for the proposed Lassen Solar Farm. The need for federal, state, and/or local environmental permits and/or approvals depends on several factors, such as project infrastructure layout (i.e., tracking mounts, solar panel coating, erosion mitigation, transmission line construction), transportation/equipment used, land ownership and use, the presence of threatened or endangered species, wetland and non-wetland WOTUS determination, and federal and state agency involvement.

The table below summarizes the potential environmental compliance and permitting requirements and associated costs for the proposed project within federal, state, and local categories. The permits/approvals listed in the table may not be required and the regulatory and permit requirements will vary based on proposed development plans and any future changes. Conversely, other permits not listed below may be necessary depending on the issues identified as the project is developed. The actual permits required will be determined based on the final design of the proposed solar arrays and consultation with local municipal and state agencies.

The permitting assessment for this CIA assumes that the Project Area will be located on privately-owned land. Further details on these federal laws, permits, and the regulatory process of the administering agencies are provided in Sections 4.1 - 4.3.



Based on email correspondence with Lassen County Land Use, a division of Lassen County Planning and Building Services, the Proposed Solar Farm would require the preparation of a Conditional Use Permit (CUP) and is not exempt from CEQA. Once the CUP application is complete, the proposed project would be subject to CEQA and would require the preparation of an Initial Study. AEI recommends the Client schedule a meeting with a Senior Planner with Lassen County to discuss the Solar Farm planning, design, implementation, and operation.



## 4.1 Federal Regulatory Framework

Regulatory Authority	Statute	Permit / Approval	Description	Trigger	Fee	Application Timeline
Department of Defense	PGRR047 FIS Department of Defense Declaration	Approval	Structured process for developers to request a mission compatibility evaluation of a proposed energy project known to be inside a military training route or in a radar surveillance line-of-sight that the DoD owns or operates in.	Amedee Army Airfield	None	A timeline for review will be established once a developer agrees to have a mitigation discussion.
Federal Aviation Administration (FAA)	49 USC 44718	Notice of Proposed Construction (Form 7460-1)	Notifies FA of proposed structures that might affect navigable airspace. Form requires proposed markings and lighting. FAA must review possible impacts to air safety and navigation, as well as the potential for adverse effects on radar systems.	Project Area was identified as Did Not Exceed Notice Criteria via the Notice Criteria Tool on the FAA preliminary finding tool.	None	Submit notice at least 30 days prior to anticipated start of construction and after construction is complete should any change in site plans occur.
U.S. Army Corps of Engineers (USACE)	Clean Water Act	Section 404 Permit	Required for the discharge of dredged or fill material into waters of U.S.	Presence of WOTUS in the Project Area.	No Fee	Depends on the level of permit required (individual vs. nationwide)
U.S. Fish and Wildlife Service (USFWS)	Section 7/9/10 of Endangered Species Act (ESA)	Consultation pursuant to Section 7 or 10 of the ESA - USFWS and project proponent (or federal agency) to coordinate on	Determination that "take" is likely to occur during a proposed non-Federal activity and a decision by the landowner or project proponent to apply for an incidental take permit. Federal activities and non-Federal activities that receive Federal funding or require a Federal	Presence of endangered species near the study area and project potentially impacting the endangered	No Fee	Prior to ground disturbing activities. Depending on project size and potential impacts to listed species – 1 to 6 months.



		how to implement proposed project while avoiding impacts to federally-listed endangered species to the greatest extent feasible.	permit (other than a section 10 permit) typically obtain incidental take authority through the consultation process under Section 7 of the ESA. Thus, the Habitat Conservation Plan (HCP) process is designed to address non-Federal land or water use or development activities that do not involve a Federal action that is subject to Section 7 consultation.	species. If a federal permit or approval is required, Section 7 Consultation will be necessary.		
U.S. Environmental Protection Agency (EPA)	40 CFR 112	Spill Prevention and Counter-measure Control Plan	Would be required if any facility associated with the project (O&M or substation) has a tank holding more than 1,320 gallons.	Oil storage of more than 1,320 gallons of oil.	None	A copy of the plan will need to be maintained on file with the owner/ operator and reviewed by the certifying engineer every five years.





## 4.2 State Regulatory Framework

Regulatory Authority	Statute	Permit / Approval	Description	Trigger	Fee	Application Timeline
California State Water Resources Control Board – Lahontan Region	SB205	Stormwater Pollution Prevention Program	Required for businesses with operating facilities with regulated industrial activities.	Industrial Construction	Dependent on Construction Cost and acreage. Minimum of \$10k.	30-45 days
California Department of Fish and Wildlife – Northern Region	California Code 15381	Wildlife Conservation Recommendations	Consultation with the CDFW is dependent on Lassen County permitting requirements and determination that the Project Area contains endangered species.	If an Incidental Take Permit is required	No	TBD
California State Historic Preservation Officer (SHPO)	Section 106 Compliance	Review, Coordination, Approval	Section 106 Compliance is required if there is a federal permit or approval, if federal funding is being used, or if the Project Area is located on State or Federal lands.	May be requested by City review boards	No Fee	Prior to construction. Response times vary from 45-60 days.



### 4.3 Local Regulatory Framework

Regulatory Authority	Statute	Permit / Approval	Description	Trigger	Fee	Application Timeline
Lassen County Planning and Building Services	State Law, Building Code, the General Plan, Zoning Ordinance and Development Code	Conditional Use Permit, Building Permit	Special limited use of a property or properties	Conditional or limited use of private land	\$1,350	Allow 5 months before planned start of construction
		CEQA review	Review of initial study with Mitigated Negative Declaration	New solar facility construction	\$2,619 minimum	6 months to 1 year
		Initial Study	Initial Study can be provided if additional project information was provided	Determines type of environmental document required	\$2,000 for application	6 months to 1 year
		Decommission Plan	Plan for decommission of solar farm	Solar farm construction	Estimated cost is depended on client funds available for decommission cost	Not provided
		Floodplain Development Permit	Permit to construct in Zone A	FEMA Flood Zone	To Be Determined	Not provided
Lassen County Surveyor's Office	Subdivision Map Act	Certificate of Compliance (C.O.C.)	Any person owning real property in Lassen County may request that the County determine whether the real property complies with the provisions of the Subdivision Map Act and	Real property use	\$600 per application/per parcel	60 days



			County subdivision regulations.			
Lassen County Public Works	Encroachment Permit	Any structure or object which is places in, under, or over any portion of the entire width of right-of-way of a county highway within the county of Lassen, whether or not such portion is actually used for highway purposes.	New construction	Yes, depending on type, size, and location of project	Varies depending on application and construction timeframe; requires site inspection for which the Public Works Department will contact the business in advance.	Varies depending on project size
Lassen County Environmental Health	N/A	Hazardous Materials Permit	Any storage and transport of hazardous materials	Hazardous materials use	\$85 per parcel	Not provided



## 5.0 Conclusions and Recommendations

AEI has completed a Critical Issues Analysis (CIA) for the proposed installation for the proposed Lassen Solar Farm in Lassen County, California. The purpose of this CIA is to assess potential significant issues which may present obstacles to completion of the project or prevent its installation. AEI has contacted the relevant federal, state, and local authorities and the following conclusions and recommendations are provided.

### Physical Resources

- Develop and implement best management practices for soil erosion and sediment control, including: stormwater management and proper drainage, as necessary.
- Avoid construction activity near existing waterways where feasible.
- A geotechnical evaluation may be necessary to assess the geological hazards that may affect the proposed layout, design, and long-term stability of the Project Area.

### Water Resources and Wetlands

- Perform a wetlands delineation to assess the wetlands located on the Project Area and to further assess the floodplain potential of the wetland and hot springs area in the central portion of the Project Area. Submit to the USACE for review and concurrence.
- If a wetland permit is required, determine areas of impact within the Project Area and obtain a Section 401 (EPA) permit.
- Prepare a Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan (ECP) for construction activities detailing soil erosion and sediment control measures for submittal to Lassen County and California State Water Resources Control Board – Lahontan Region.

### Land Use and Community Resources

- Consult with Lassen County Planning and Building Services to identify specific permits and application information needed and complete required CEQA review.
- Field verify the extent of wetlands with a wetland delineation survey.
- Contact FEMA on “limited study” to determine if additional studies are required to define the extent of floodplain Zone A within the proposed Project Area.
- To reduce potential issues with Lassen County and California State Water Resources Control Board Lahontan Region, as well as potential erosion issues, AEI recommends avoiding construction in wetland and hot springs areas.
- Consult with Lassen County Surveyor’s Office for Certificate of Compliance for each parcel in the Project Area.
- Consult with Lassen County Public Works to determine encroachment requirements.
- To reduce potential issues with the FAA and DOD, it is recommended that all solar panels possess an anti-glare coating to reduce any visual impacts to aviation operations.
- Written permission from the current property owner is required to avoid a Notice of Violation in the Official Records of the County.

### Natural Resources

- Conduct a threatened and endangered species and habitat survey and assessment to determine the potential for presence/absence within the Project Area.



- Conduct Phase I Environmental Site Assessment (ESA) to identify if there are any present or existing environmental hazards associated with south adjacent military depot and airfield, and east adjacent geothermal plant and historic railroad tracks.
- Conduct a Phase I Archaeological pedestrian survey to determine if cultural resources are present within the Project Area.

## 6.0 Limitations and Reliance

### 6.1 Limitations

This report presents a summary of work completed by AEI Consultants. The completed work includes data and reports reviewed from available online resources and interviews with pertinent local, state or federal regulatory agencies. The information collected and summarized in this report is based on the scope of work for which AEI was retained and limitations inherent in this type of work.

Any conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document. These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work. No other warranty, either expressed or implied, has been made.

### 6.2 Reliance

AEI has completed a Critical Issues Analysis (CIA) for the proposed Lassen Solar Farm for Pristine Sun Corporation in Lassen County, California. The completed work includes a review of project data obtained from the client, available online resources, and/or interviews with pertinent local, state or federal regulatory agencies. The information collected and summarized in this report is based on the scope of work for which AEI was retained and the limitations inherent in this type of work.

AEI has made several assumptions to complete this CIA. AEI reviewed and evaluated the thoroughness of and relied upon information derived from secondary sources including governmental agencies and publicly available online databases. Although it appears that the information obtained from the sources accessed for this analysis is thorough and reliable, AEI extends no guarantee regarding the thoroughness and reliability of this information. Other information may become available at a later date which may alter the opinions of this report.

Any conclusions and/or recommendations are based on the information obtained from the sources listed above and current governing regulations. No conclusions should be inferred from this document beyond those stated and reported herein. This CIA was completed in accordance with generally accepted practices in the environmental consulting and construction fields in existence at the time and location of the work. No other warranty, expressed or implied has been made.





## 7.0 Signatures of Environmental Professionals

Report prepared by:

Kimberly Dickens  
Project Manager  
Natural Resources & Permitting

Report Reviewed By:

Valerie Marshall  
Vice President  
Natural Resources & Permitting



## 8.0 References

Item	Date(s) ) accessed	Source
Important Farmland	November 4, 2022	California Department of Conservation Important Farmland Finder. Accessed at <a href="https://maps.conservation.ca.gov/dlrp/ciff/">https://maps.conservation.ca.gov/dlrp/ciff/</a> .
Soils Information	November 2, 2022	USDA Web Soil Survey <a href="http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx">http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx</a>
Hydraulic Soil Groups	November 2, 2022	USDA Part 630 Hydrology National Engineering Handbook, Chapter 7 Hydrologic Soil Groups
Environmental Setting	October 26, 2022	USDA Natural Resources Conservation Service (NRCS). May 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin.  Envirosite Atlas. Accessed at <a href="https://atlas.envirositecorp.com/Review?hash=5e2db5cbc40577b6ae2bd8de5444279e06155451797ac7a131e256747c7ed3bb">https://atlas.envirositecorp.com/Review?hash=5e2db5cbc40577b6ae2bd8de5444279e06155451797ac7a131e256747c7ed3bb</a> .
Seismic	November 2, 2022	USGS. U.S. Quaternary Faults Interactive Map. Available at <a href="https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf">https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf</a>
	November 2, 2022	California Department of Conservation. <i>Probabilistic Seismic Hazard Map</i> . Available at <a href="https://www.conservation.ca.gov/cgs/Pages/PSHA/shaking-assessment.aspx">https://www.conservation.ca.gov/cgs/Pages/PSHA/shaking-assessment.aspx</a>
Topographic Map	November 2, 2022	USGS topoView <a href="https://ngmdb.usgs.gov/topoview/">https://ngmdb.usgs.gov/topoview/</a>  Envirosite Atlas. Accessed at <a href="https://atlas.envirositecorp.com/Review?hash=5e2db5cbc40577b6ae2bd8de5444279e06155451797ac7a131e256747c7ed3bb">https://atlas.envirositecorp.com/Review?hash=5e2db5cbc40577b6ae2bd8de5444279e06155451797ac7a131e256747c7ed3bb</a> .
Wetlands and Water of the United States	November 4, 2022	United States Fish and Wildlife Service (USFWS). 2021. National Wetland Inventory (NWI). Online data.  Available : <a href="http://www.fws.gov/wetlands/Data/Data-Download.html">http://www.fws.gov/wetlands/Data/Data-Download.html</a> .
Floodplains Information	November 2, 2022	Dept. of Homeland Security-Federal Emergency Management Agency. Available: <a href="https://msc.fema.gov/portal/home">https://msc.fema.gov/portal/home</a> - Accessed November 2, 2022.
Honey Lake Valley Resource	November 4, 2022	Honey Lake Valley Resource Conservation District  Available: <a href="https://www.honeylakevalleyrcd.us/">https://www.honeylakevalleyrcd.us/</a> . Accessed November 4, 2022.



Conservation District		
Endangered and Threatened Species	November 3, 2022	USFWS. Information for Planning and Consultation. Available: <a href="https://ecos.fws.gov/ipac/">https://ecos.fws.gov/ipac/</a> .
Cultural Resources	November 3, 2022	National Register of Historic Places (NRHP). Available at <a href="https://www.nps.gov/subjects/nationalregister/database-research.htm">https://www.nps.gov/subjects/nationalregister/database-research.htm</a> . Accessed on November 3, 2022.
	November 9, 2022	California Office of Historic Preservation (SHPO) – Built Environment Resource Directory. Available at <a href="https://ohp.parks.ca.gov/?page_id=30338">https://ohp.parks.ca.gov/?page_id=30338</a> Accessed on November 9, 2022.
Infrastructure	November 4, 2022	National Pipeline Mapping System Public Viewer. Available at <a href="https://pvnpm.phmsa.dot.gov/PublicViewer/">https://pvnpm.phmsa.dot.gov/PublicViewer/</a>
	November 4, 2022	U.S. Energy Information Administration. Energy Mapping System. Available at <a href="https://www.eia.gov/state/maps.php?v=electricity">https://www.eia.gov/state/maps.php?v=electricity</a>
Aerial and Elevation Profile Images	October 26, 2022	Google Earth Pro. Desktop Version.
Land Use	November 3, 2022	U.S. Geological Survey Gap Analysis Project, 20160513, GAP/LANDFIRE National Terrestrial Ecosystems 2011: U.S. Geological Survey, <a href="https://doi.org/10.5066/F7ZS2TM0">https://doi.org/10.5066/F7ZS2TM0</a>



# **APPENDIX A**

## Correspondences

## Kimberly Dickens

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**From:** OSD Pentagon OUSD A-S Mailbox ASD EIE-RP-SC <osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil>  
**Sent:** Friday, November 4, 2022 9:17 AM  
**To:** Kimberly Dickens  
**Cc:** OSD Pentagon OUSD A-S Mailbox ASD EIE-RP-SC  
**Subject:** RE: Vendor Informal Review Inquiry

Ms. Dickens,

Thank you for the quick reply. We'll get going on this right away.

If you are able to find out if the solar panel are anti-reflective, please let us know.

Thank you.

Very Respectfully,

The Clearinghouse  
Military Aviation and Installation Assurance Siting Clearinghouse  
Office of the Assistant Secretary of Defense (Sustainment)  
Email: osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil

**From:** Kimberly Dickens <kdickens@aeiconsultants.com>  
**Sent:** Friday, November 4, 2022 8:49 AM  
**To:** OSD Pentagon OUSD A-S Mailbox ASD EIE-RP-SC <osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil>  
**Subject:** [URL Verdict: Neutral][Non-DoD Source] RE: Vendor Informal Review Inquiry

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

---

Good morning,

Below is the requested information:

- Proposed Solar Technology (photovoltaic/concentrated solar power): photovoltaic
  - Solar Panel Height (at maximum tilt) or Tower Height: 1.5 meters (4.9 feet)
  - Solar Panel or Heliostat Array Acreage: 2,990.4
  - Axis Tracking (yes/no - if yes, single or dual): Single Axis Tracker
  - Anti-Reflective Panels (yes/no): To Be Determined
- Associated Transmission Infrastructure (if known):





**From:** Kimberly Dickens <[kdickens@aeiconsultants.com](mailto:kdickens@aeiconsultants.com) < Caution-mailto:kdickens@aeiconsultants.com > >  
**Sent:** Thursday, November 3, 2022 3:31 PM  
**To:** OSD Pentagon OUSD A-S Mailbox ASD EIE-RP-SC <[osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil](mailto:osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil) < Caution-mailto:osd.pentagon.ousd-a-s.mbx.asd-eie-rp-sc@mail.mil > >  
**Subject:** [URL Verdict: Neutral][Non-DoD Source] Vendor Informal Review Inquiry

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

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To Whom this May Concern,

I am requesting a Military Aviation and Installation Assurance Sitting Clearinghouse informal review of a proposed Solar Farm located in Lassen County, California. I have attached a PDF with the requested information and site plans, as well as a shapefile for the proposed Project Area. Please note, the information attached is **Business Sensitive**.

Please let me know if you need any additional information. Thank you for your time and review.

With kind regards,



**Kim Dickens**  < Caution-  
<https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.linkedin.com%2Fcompany%2FeyJWljoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=>  
*Project Manager*

**AEI Consultants**

4009 Fitzhugh Ave., Suite 200  
Richmond, VA 23230

O:916.282.6226 ext. 8826

C:510.585.7020

E:[kdickens@aeiconsultants.com](mailto:kdickens@aeiconsultants.com) < Caution-mailto:kdickens@aeiconsultants.com >

*"If you received this email in error, please notify AEI Consultants immediately by sending an e-mail or by calling"*

*"If you received this email in error, please notify AEI Consultants immediately by sending an e-mail or by calling"*



# DOD CLEARINGHOUSE REVIEW REQUEST

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November 3, 2022

To: **Military Aviation and Installation Assurance Site Clearinghouse**  
From: **AEI Consultants**

**1.) Point of Contact (POC) Information**  
**Project POC**

Kimberly Dickens  
AEI Consultants  
2500 Camino Diablo  
Walnut Creek, CA 94597  
(510) 585-7020  
[kdickens@aeiconsultants.com](mailto:kdickens@aeiconsultants.com)

**Developer POC**

Troy Helming  
Pristine Sun Corporation  
1 Barret Avenue  
Richmond, CA 94801  
(415) 940-5768  
[troy.helming@pristinesun.com](mailto:troy.helming@pristinesun.com)

**Project Information**

**Project Name:** Lassen Solar Farm  
**Nearest City:** Susanville  
**Township:** N/A  
**County:** Lassen  
**State:** California

**2.) Geographic Location of Proposed Project**

**[Solar Array/ Wind] Information**

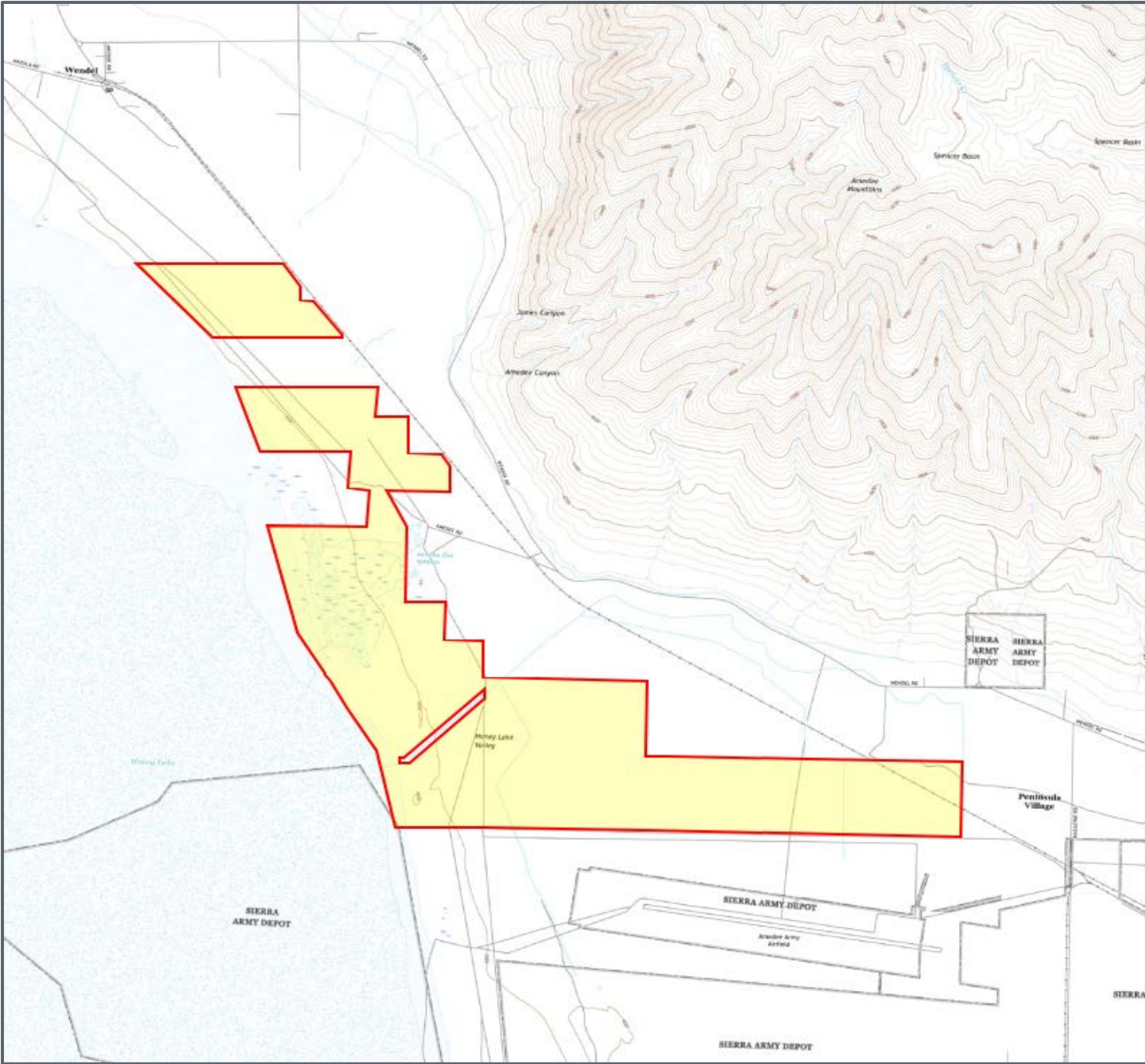
**Northern Boundary:** Undeveloped land  
**Eastern Boundary:** Undeveloped land  
**Southern Boundary:** Amedee Army Airfield  
**Western Boundary:** Honey Lake  
**Latitude:** 40°17'55.25"N  
**Longitude:** 120°12'5.13"W  
(Lat/Long is approximate center point of Project Area)

**Transmission Lines and Point of Connection**

Transmission Lines and Point of Connection details are currently To Be Determined.

**3.) Nature of Project**


Solar Farm – Multi-Panel Articulating Tracker Mounting System  
**Solar Acreage:** 2,990.4±  
**Solar Layout:** See Attachment A – Conceptual Site Plans



Legend		AEI Consultants	
<div><div></div>Project Area Boundary</div>		Project Area – Topographic Map	
		Lassen Solar Farm	Figure 1 Project No.470890





Legend		AEI Consultants	
<div> <div></div> Project Area Boundary </div> <div>  </div>		Project Area – Aerial Map	
		Lassen Solar Farm	Figure 2 Project No.470890



# Attachment A

## Conceptual Site Plans

## Lassen Solar

### Report Rundown



Module Rating  
550 W



Module Quantity  
1174770



Yield  
2249.4 kWh/kWp



Racking Product  
Generic SAT  
30mod/str



Tracking Angle  
+/- 60°



Generation Yr 1  
1453390.69 MWh



GCR  
0.46

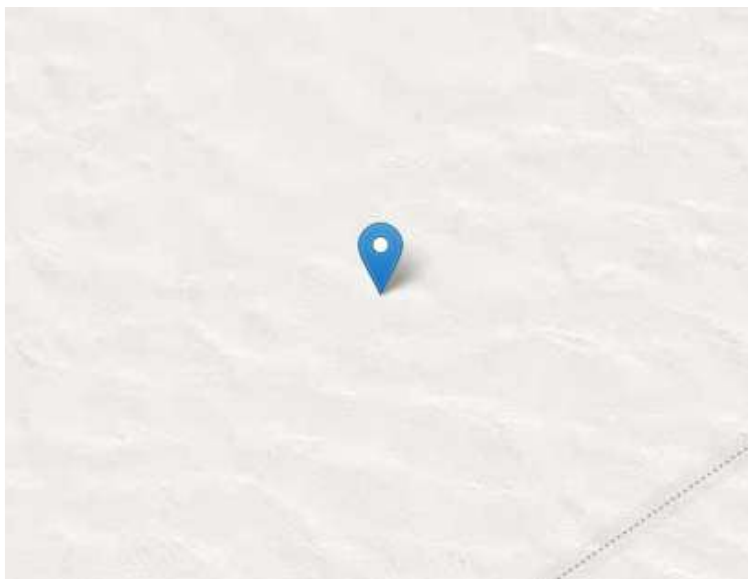


DC:AC  
0.94



Site Capacity  
646.12 MWp

### Vicinity Map



### Layout Map



## Large Layout Map



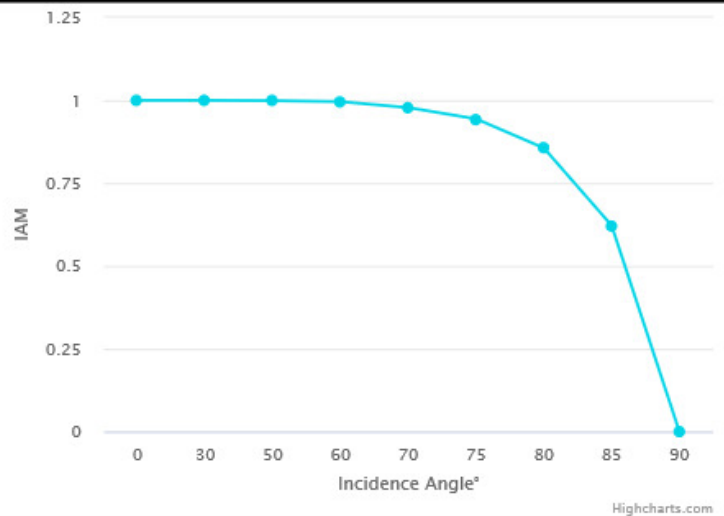
## Racking

Racking Inputs	
Racking Product	Generic SAT 30mod/str
Type	Single Axis Tracker
Grade Limit	10 %
Backtrack	Yes
Tracking Angle	+/- 60°
Height Above Ground	1.5 m

Tracker Sizes	Qty	Module Count	Tracker X	Tracker Y
A	12776	90	4.79 m	52.20 m
B	468	60	4.79 m	35.46 m
C	0	30	4.79 m	18.72 m

## Module

Module Inputs	
Module Name	Generic 550W Bifacial
Module Rating	550 W
Module Width	1.096 m
Module Height	2.384 m
Module Area	2.61 m <sup>2</sup>
Technology	Si-Mono
Bifacial	True
Bifaciality Factor	0.7
Gref	1000 W/m <sup>2</sup>
Tref	25° C
Isc	18.52 A
Voc	37.9 V
Imp	17.4 A
Vmp	31.6 V
Tcoef of Isc	10.56 mA/°C
Tcoef of Voc	-115.8 mV/°C
Cells In Series	55
Cells In Parallel	2
Rsh	120 ©
Rshunt at G=0	3200 ©
Rs	0.109 ©
Shunt Exp	3.2
Absorb Coef	0.9
Tcoef of Pmpp	-0.352 %/°C
Gamma	1.02
Tcoef of Gamma	-0.0006 1/°C

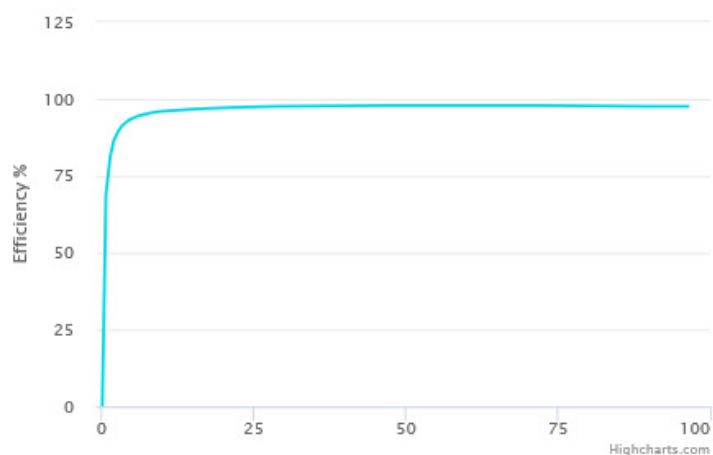


IAM Values	
0	1
30	1
50	0.999
60	0.996
70	0.978
75	0.944
80	0.856
85	0.622
90	0

## Inverter

Inverter Inputs	
Inverter Rating	1000 kW
AC Power Nom	1000 kWac
Min MPPT	460 V
AC Power Max	1100 kWac
Max MPPT	850 V
Max Efficiency	99 %
Max PV Volts	1000 V
DC at Max Pwr	1111.11 kW
Night Pwr Use	0 W

## Inverter Efficiency





## Performance

Performance Inputs	
Modules Per String	30
DC Degredation	1.5 %
Thermal Constant Loss	29 W/m²k
Thermal Wind Loss	0 W/m²k/m/s
Mod Quality Loss	0 %
Mod LID Loss	3.00 %
DC Module Mismatch	1 %
DC Strings Mismatch	0 %
DC Wiring Loss @ STC	1.5 %
Bifacial Back Mismatch	10 %
Auxiliaries	0 kW
AC Wiring Loss @ STC	4 %
Transformer Constant Loss	0 %
Transformer Loss @ STC	0 %
MV Line Loss @ STC	0 %
Transmission Loss	0 %
Other AC Losses	0 %

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Soiling (%)	2	2	2	2	2	2	2	2	2	2	2	2
Albedo	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Layout

Layout Inputs	
GCR	0.46
Pitch	10.409 m
Azimuth	180°
Racks Removed based on Grade	Off
Intrarow Spacing	5.62 m
Buildable Area	1012.74 ha
Coordinate System	WGS 84

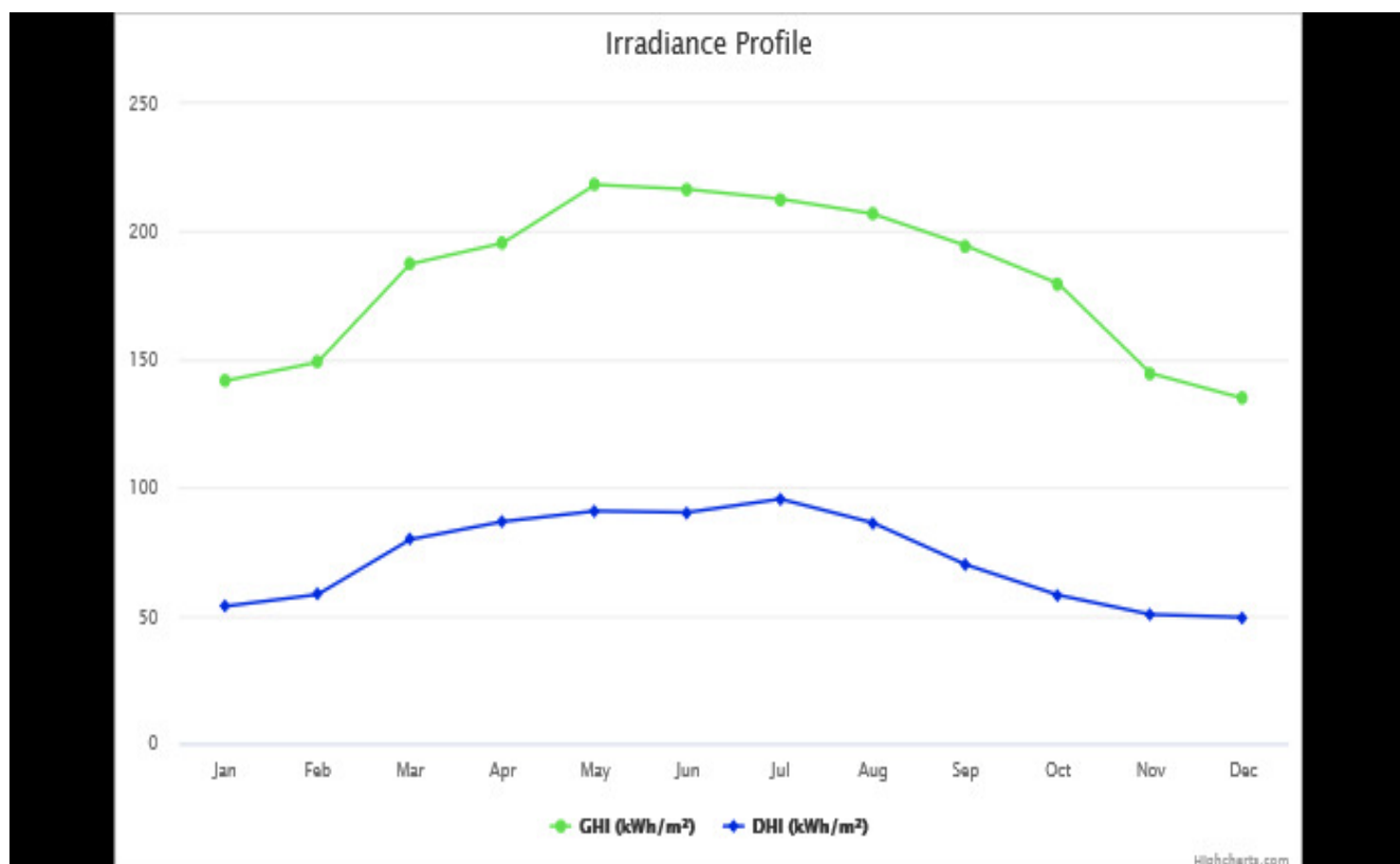
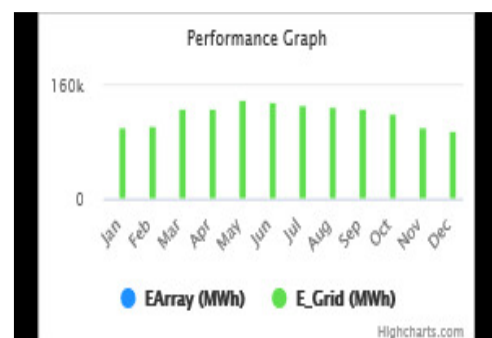
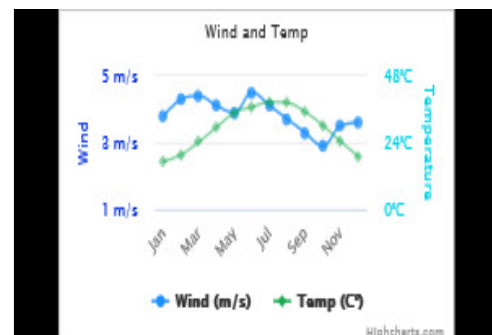
## Bill of Materials

BOM Table	
Rack A Qty	12776
Rack B Qty	468
Rack C Qty	0
Module Qty	1174770
Inverter Qty	687

\*Bill of materials is presented here for budgetary and general guidance purposes only.

## Performance Results

	GHI (kWh/m <sup>2</sup> )	DHI (kWh/m <sup>2</sup> )	Temp (C°)	Wind (m/s)	Global Incident (kWh/m <sup>2</sup> )	EArray (MWh)	E_Grid (MWh)
JAN	141.7	53.6	17.29	3.8	181.3	165.7	101707
FEB	148.9	58.2	19.69	4.3	188.7	173.2	104331
MAR	187.3	79.7	24.32	4.4	236.1	216	127325.4
APR	195.5	86.7	29.58	4.1	242.2	222.3	128553.4
MAY	218.3	90.8	34.73	3.9	272.5	249.3	140351.8
JUN	216.5	90.3	36.8	4.5	270.4	247.3	137943
JUL	212.7	95.5	38.56	4.1	261.5	239.9	133744.8
AUG	206.9	86.2	38.29	3.7	257.3	236.4	131536.4
SEP	194.5	69.9	35.01	3.3	248.3	227.8	127571.9
OCT	179.7	58	30.17	2.9	232.3	212.8	121896.7
NOV	144.6	50.4	24.44	3.5	186.3	170.9	101602.2
DEC	134.8	49.3	19.02	3.6	172.4	158.1	96827.2



## Loss Tables

Horizontal global irradiation (kWh/m <sup>2</sup> )	2181.45
Global incident in coll. plane %	26.03 %
Global incident below threshold	-0.01 %
Near Shadings: irradiance_loss	-3.16 %
IAM factor on global	-0.7 %
Soiling loss factor	-2 %
Ground reflection on front side	0.41 %
Effective irradiation on collectors 2601.29 kWh/m <sup>2</sup> * 3069514.24 m <sup>2</sup> coll.	

Efficiency at STC (%) = 21.04%

Array nominal energy at STC (MWh)	1731091.4
Loss due to irradiance level	0.44 %
PV loss due to temperature	-9.16 %
Shadings: Electrical loss	0%
Spectral correction	0%
Module quality loss	0%
LID - Light induced degradation	-3 %
Mismatch loss, modules and strings	-1 %
Mismatch for back irradiance	-0.42 %
Ohmic wiring loss	-1.13 %
Array virtual energy at MPP (MWh)	1493470.33
Inverter Loss during operation (efficiency)	-0.27 %
Inverter Loss over nominal inv. power	0%
Inverter Loss due to max input current	0%
Inverter Loss over nominal inv. voltage	0%
Inverter loss due to power threshold	0%
Inverter loss due to voltage threshold	0%
Night consumption	0%
Available Energy at Inverter Output (MWh)	1489381.94
Auxiliaries (fans, other)	0%
AC ohmic loss	-2.42 %
MV transformer loss	0%
MV line ohmic losses	0%
Fixed Transmission Loss	0%
AC Other	0%
Unused energy (grid limitation)	0%
Energy injected into Grid (MWh)	1453390.69
Yield (kWh/kWp)	2249.4

## Bifacial

Global incidence on ground  
1009.59 kWh/m<sup>2</sup> on 6672857.05 m<sup>2</sup>

Ground reflection loss (Albedo)	-80.00 %
View Factor for rear side	-81.02 %
sky diffuse on the rear side	68.39 %
Beam effective on the rear side	0.00 %
Shadings loss on rear side	0.00 %

4.35% Global irradiance on rear side (113.19 kWh/m<sup>2</sup>)

Bifaciality Factor = 0.7

**From:** [Land Use](#)  
**To:** [Kimberly Dickens](#)  
**Subject:** RE: Proposed Solar Farm Permitting Questions  
**Date:** Wednesday, November 9, 2022 1:56:16 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)

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Hello Kim,

A proposal such as the one described below would likely require the following (this may not represent a complete list):

- Prior to submittal of any of the following applications, applications for Certificate of Compliance (C.O.C) pursuant to the Subdivision Map Act for each parcel would be required.
- Pursuant to Lassen County Code a use permit would be required for this project
- This project would be subject to review under the California Environmental Quality Act. Given the scope of the proposal and lack of information, an Environmental Impact Report including appropriate site studies (e.g. Cultural Study Prepared by Qualified Archaeologist, Biological Resources Study etc.) would be required prior to approval. Alternatively, if more information was provided, an Initial Study could be prepared to determine the appropriate environmental document.
- If approved, construction would require Lassen County building permits
- Encroachment permits for site access from Lassen County Public Works.
- Appropriate permits from Lassen County Environmental Health for storage and transport of Hazardous Materials.
- The following additional permits and requirements may apply:
  - o Permits from the applicable electrical utility service.
  - o Permits and Storm water plan approved by the Lahontan Regional Water Quality Control Board
  - o Delineation of existing wetlands
  - o Decommission plan with funds for the estimated cost made available to Lassen County

The use permit filing fee is \$1,350, plus \$85 per parcel for Environmental Health. If additional information was provided, an Initial Study application (\$2,000 application fee) could be taken in for the project to determine the type of environmental document required, per the California Environmental Quality Act (CEQA). If an Environmental Impact Report is required, the department's application fee is \$2,619 plus either: (1) a preparation charge based on actual cost (time and materials) exceeding the application fee if the document is prepared and/or reviewed by county staff; or (2) an administration fee equal to ten percent of the total contract costs if the document is prepared under contract to the county. Depending on the type of environmental document required, this process could take between 6 months to a year, or longer if the project is put on hold for any reason. Contract costs and additional fees (from other departments/agencies) may be applicable.

With regard to the C.O.C. requirements, in responding to a similar enquiry in March of 2022, the Lassen County Surveyor Don Willis determined that :

*"These parcels are not as easily researched as your previous parcels were. I reviewed the*



*Patents, which were issued by the U.S. Government when the parcels were first conveyed from the government to private ownership, and found that there wasn't one which directly described the lands represented by the various Assessor's Parcel Numbers (A.P.N.'s). In other words, one Patent would include portions of an A.P.N. and another Patent would include another portion, but would also include additional lands beyond the boundaries of the A.P.N. Therefore, in order to determine if the lands represented by an Assessor's Parcel Number were legitimately created, I would need to review a chain of title for each parcel to see when the various parcels were first described in their current configurations.*

*The County has a process for this and it is known as the Certificate of Compliance process. A process form (which explains the process in detail) and application form are attached to this email in case you would like to pursue this. Please note that this requires an application for each parcel requested and a \$600 application fee for each application. If a parcel is found to be in compliance with the provisions of the Subdivision Map Act (i.e. legitimately created), \$300 of each application fee is returned. If it is found not to be in compliance, the application is forwarded to the Technical Advisory Committee where a Conditional Certificate of Compliance would be issued, which would have conditions imposed that would be required to be completed before the issuance of any permits for development.*

*Please note that written permission from the current property owner is required because, if a violation of the Subdivision Map Act is inadvertently discovered, I would be obligated to file what is known as a Notice of Violation in the Official Records of the County. This is not desirable from a property owners' viewpoint and its purpose is to provide constructive notice to subsequent purchasers that a violation of the Subdivision Map Act has been discovered. Please also note that I am not saying that there is or would be a violation, only that the possibility exists once a chain of title is reviewed."*

Please let us know if you have any other questions at this time.

Thank you,

## **Land Use**

Planning and Building Services  
707 Nevada St. Suite 5  
Susanville CA 96130  
Phone: (530) 251-8269  
Fax: (530) 251-8373



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**From:** Kimberly Dickens <[kdickens@aeiconsultants.com](mailto:kdickens@aeiconsultants.com)>

**Sent:** Friday, November 4, 2022 6:56 AM

**To:** Land Use <[landuse@co.lassen.ca.us](mailto:landuse@co.lassen.ca.us)>

**Subject:** Proposed Solar Farm Permitting Questions

This message comes from an external sender. EXTERNAL SENDER WARNING!

Good morning,

I am representing a client who is seeking to construct a solar farm spanning across 2,990 acres east adjacent to Honey Lake in Lassen County (please see attached map). What are the permitting requirements (i.e. stormwater, conditional use permit, building permit, etc.) for this type of project and what are the estimated review timelines and fees?

Would this type of project trigger CEQA review?

Thank you very much for your time. Please feel free to call me at one of the numbers below if there are any questions.

With kind regards,



**Kim Dickens**    
*Project Manager*

**AEI Consultants**  
4009 Fitzhugh Ave., Suite 200  
Richmond, VA 23230  
O: 916.282.6226 ext. 8826  
C: 510.585.7020  
E: [kdickens@aeiconsultants.com](mailto:kdickens@aeiconsultants.com)

*"If you received this email in error, please notify AEI Consultants immediately by sending an e-mail or by calling"*



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Reno Fish And Wildlife Office  
1340 Financial Boulevard, Suite 234  
Reno, NV 89502-7147  
Phone: (775) 861-6300 Fax: (775) 861-6301



In Reply Refer To:

November 03, 2022

Project Code: 2023-0011964

Project Name: Lassen Solar Farm (AEI 470890)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

#### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
  - Migratory Birds
  - Wetlands
-

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Reno Fish And Wildlife Office**

1340 Financial Boulevard, Suite 234

Reno, NV 89502-7147

(775) 861-6300

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## Project Summary

Project Code: 2023-0011964  
Project Name: Lassen Solar Farm (AEI 470890)  
Project Type: New Constr - Above Ground  
Project Description: Proposed solar farm installation  
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@40.296783649999995,-120.201191953447,14z>



Counties: Lassen County, California

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## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Insects

NAME	STATUS
Carson Wandering Skipper <i>Pseudocopaeodes eunus obscurus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/674">https://ecos.fws.gov/ecp/species/674</a>	Endangered
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Candidate

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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# Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

- 
1. The [Migratory Birds Treaty Act](#) of 1918.
  2. The [Bald and Golden Eagle Protection Act](#) of 1940.
  3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

**The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location.** To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<b>American White Pelican <i>pelecanus erythrorhynchos</i></b> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/6886">https://ecos.fws.gov/ecp/species/6886</a>	Breeds Apr 1 to Aug 31
<b>Bald Eagle <i>Haliaeetus leucocephalus</i></b> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

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NAME	BREEDING SEASON
<b>Clark's Grebe</b> <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds Jun 1 to Aug 31
<b>Franklin's Gull</b> <i>Leucophaeus pipixcan</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
<b>Lesser Yellowlegs</b> <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
<b>Lewis's Woodpecker</b> <i>Melanerpes lewis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9408">https://ecos.fws.gov/ecp/species/9408</a>	Breeds Apr 20 to Sep 30
<b>Marbled Godwit</b> <i>Limosa fedoa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9481">https://ecos.fws.gov/ecp/species/9481</a>	Breeds elsewhere
<b>Olive-sided Flycatcher</b> <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/3914">https://ecos.fws.gov/ecp/species/3914</a>	Breeds May 20 to Aug 31
<b>Rufous Hummingbird</b> <i>selasphorus rufus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/8002">https://ecos.fws.gov/ecp/species/8002</a>	Breeds Apr 15 to Jul 15
<b>Sage Thrasher</b> <i>Oreoscoptes montanus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9433">https://ecos.fws.gov/ecp/species/9433</a>	Breeds Apr 15 to Aug 10
<b>Western Grebe</b> <i>aechmophorus occidentalis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/6743">https://ecos.fws.gov/ecp/species/6743</a>	Breeds Jun 1 to Aug 31
<b>Willet</b> <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5



## Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

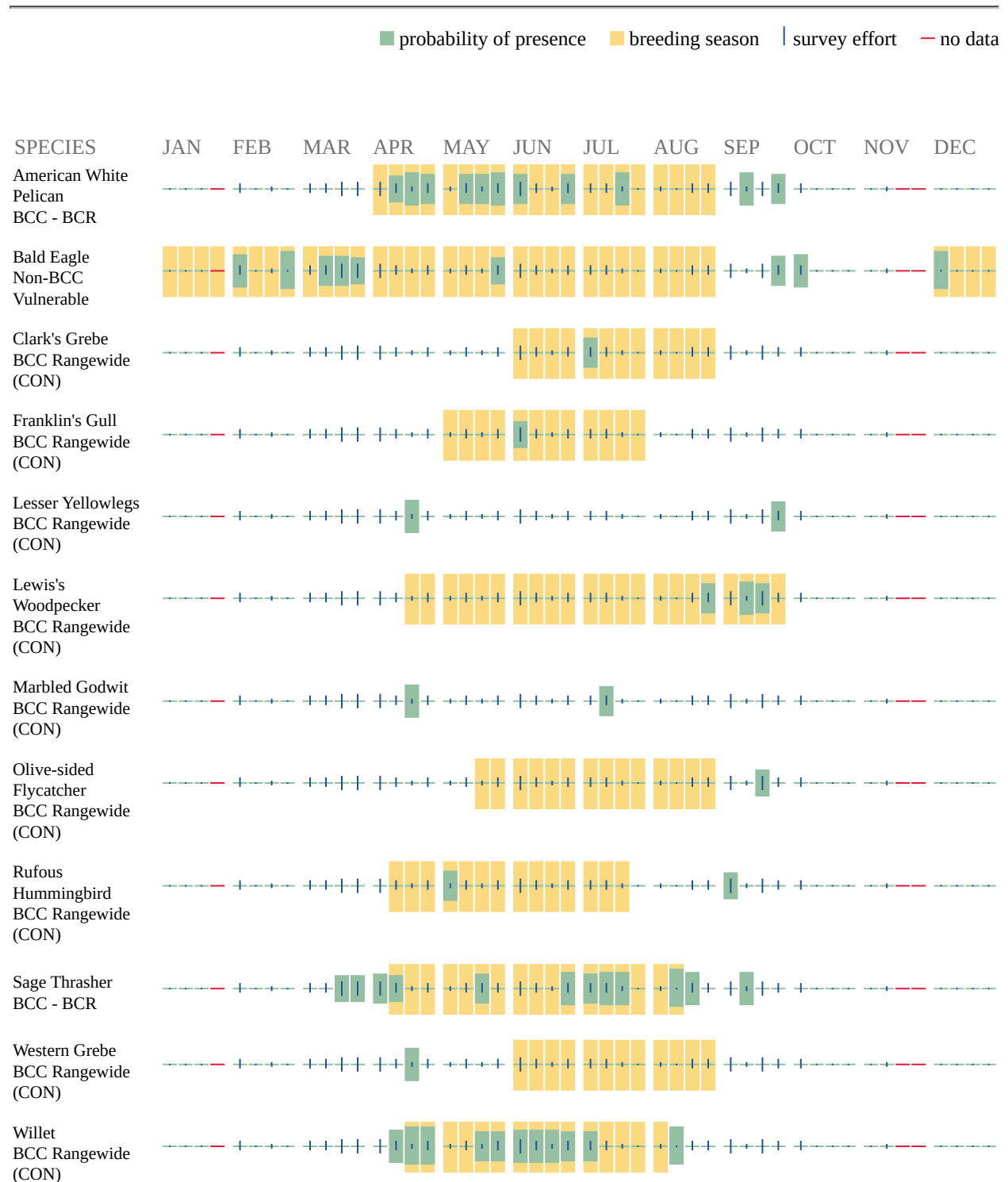
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

### No Data (—)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

## Migratory Birds FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and

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how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### **What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

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**Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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# Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

## LAKE

- [Lacustrine](#)

## FRESHWATER EMERGENT WETLAND

- [Palustrine](#)

## RIVERINE

- [Riverine](#)
-



**IPaC User Contact Information**

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# **APPENDIX A**

## Support Documents



## Notice Criteria Tool

[Notice Criteria Tool - Desk Reference Guide V\\_2018.2.0](#)

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference [CFR Title 14 Part 77.9](#).

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the [FAA Co-location Policy](#)
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

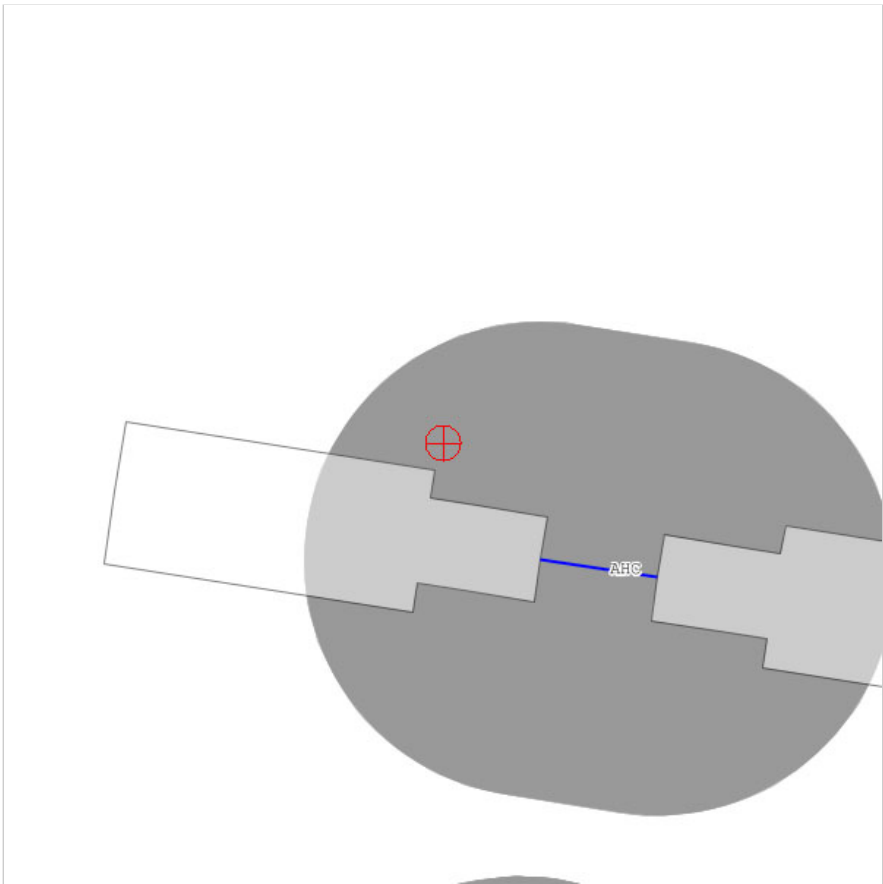
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the [Air Traffic Areas of Responsibility map](#) for Off Airport construction, or contact the [FAA Airports Region / District Office](#) for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

<b>Latitude:</b>	<input type="text" value="40"/> Deg <input type="text" value="17"/> M <input type="text" value="41.15"/> S <input type="button" value="N ▼"/>
<b>Longitude:</b>	<input type="text" value="120"/> Deg <input type="text" value="11"/> M <input type="text" value="52.66"/> S <input type="button" value="W ▼"/>
<b>Horizontal Datum:</b>	<input type="button" value="NAD83 ▼"/>
<b>Site Elevation (SE):</b>	<input type="text" value="4010"/> (nearest foot)
<b>Unadjusted Structure Height :</b>	<input type="text" value="5"/> (nearest foot)
<b>Height Adjustment:</b>	<input type="text" value="15"/> (nearest foot)
<b>Total Structure Height (AGL):</b>	<input type="text" value="20"/> (nearest foot)
<b>Traverseway:</b>	<input type="button" value="Public Roadway ▼"/> (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
<b>Is structure on airport:</b>	<input checked="" type="radio"/> No <input type="radio"/> Yes

### Results

You do not exceed Notice Criteria.





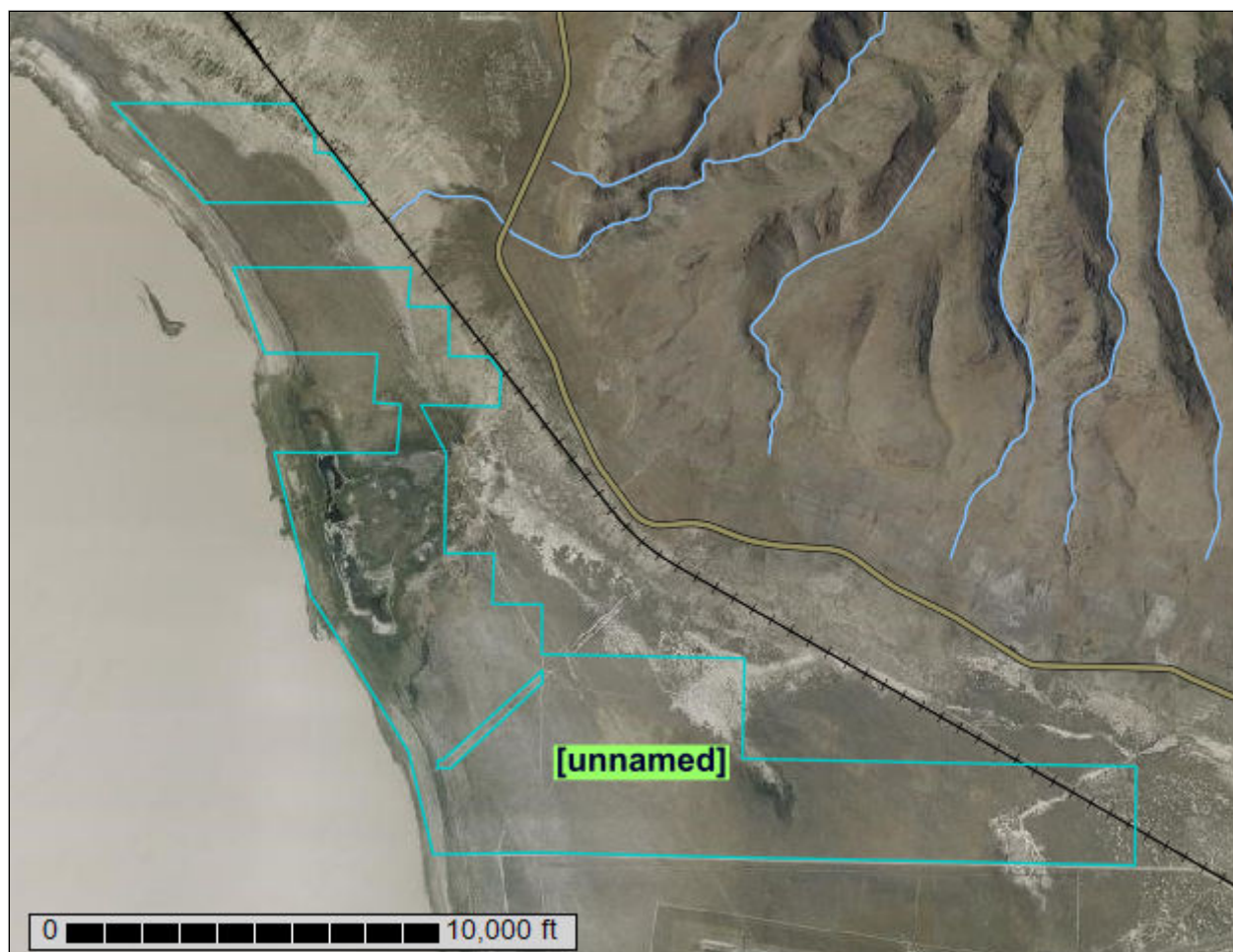
United States  
Department of  
Agriculture

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 Susanville Area, Parts of Lassen and Plumas Counties, California



# Preface

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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](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

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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

## Custom Soil Resource Report

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

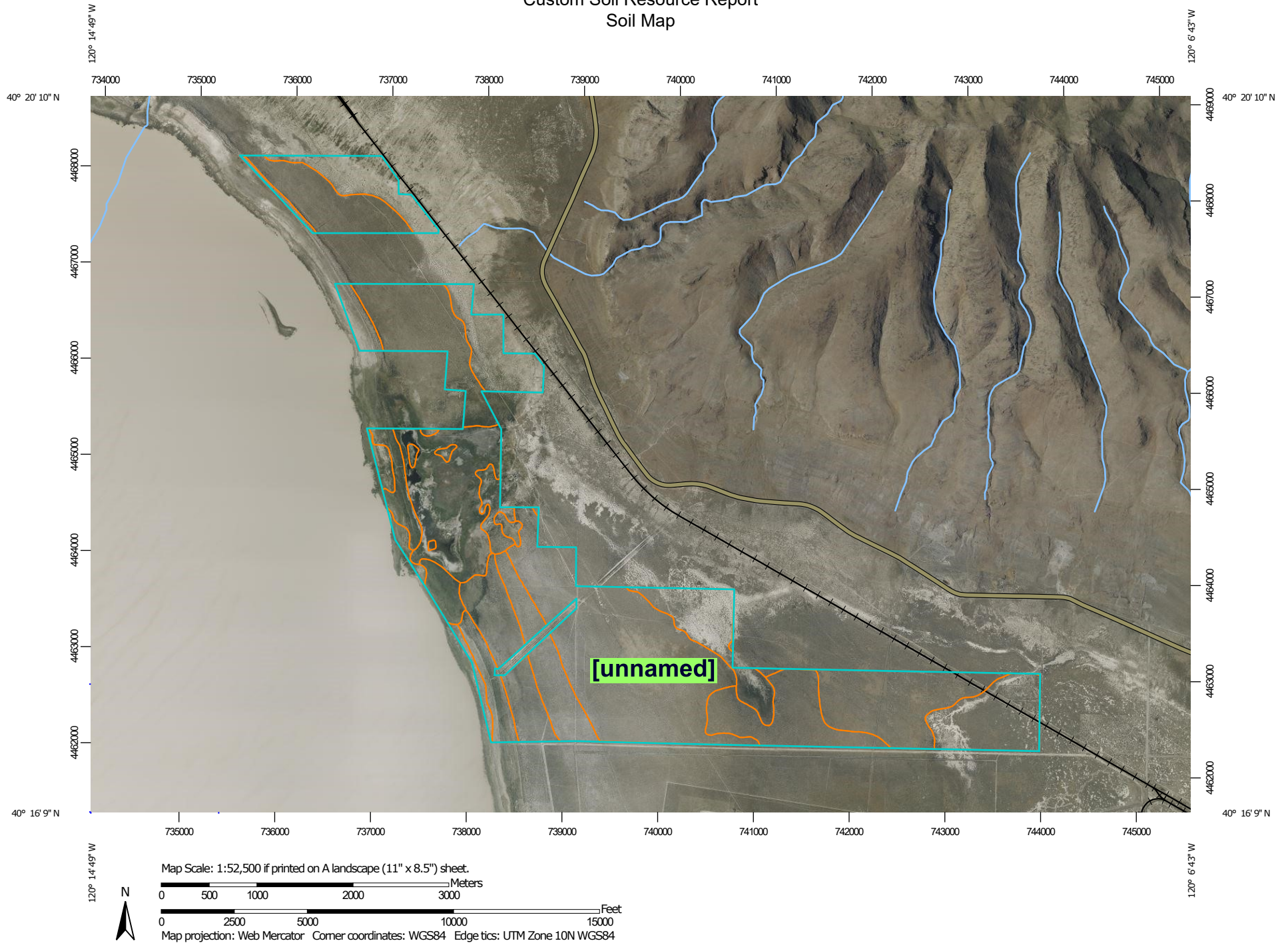
# Soil Map

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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



# Custom Soil Resource Report

## 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.

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: Susanville Area, Parts of Lassen and Plumas

Counties, California

Survey Area Data: Version 14, Sep 2, 2022

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

Date(s) aerial images were photographed: Jun 8, 2019—Jun 21, 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
109	Artray sandy loam, 2 to 9 percent slopes	42.2	1.4%
123	Bobert sandy loam, lake terrace, 0 to 2 percent slopes	170.9	5.7%
140	Calneva silt loam, 0 to 1 percent slopes	177.9	5.9%
141	Calneva-Playas complex, 0 to 1 percent slopes	152.0	5.1%
192	Epot-Playas complex, 0 to 2 percent slopes	912.2	30.5%
236	Herjun loamy sand, 0 to 2 percent slopes	374.4	12.5%
270	Lieberman fine sandy loam, 0 to 2 percent slopes	189.4	6.3%
282	Mazuma fine sandy loam, 0 to 2 percent slopes	207.7	6.9%
342	Rose Creek loam, sodic, 0 to 2 percent slopes	56.0	1.9%
347	Saddlerock peat, 0 to 1 percent slopes, ponded	306.5	10.3%
405	Xerolls-aquolls complex, 0 to 2 percent slopes	104.5	3.5%
406	Yobe silt loam, 0 to 2 percent slopes	290.2	9.7%
409	Water	6.3	0.2%
<b>Totals for Area of Interest</b>		<b>2,990.4</b>	<b>100.0%</b>

## 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.

## Custom Soil Resource Report

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.

## Susanville Area, Parts of Lassen and Plumas Counties, California

### 109—Artray sandy loam, 2 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* jc3g  
*Elevation:* 4,000 to 5,000 feet  
*Mean annual precipitation:* 9 to 35 inches  
*Mean annual air temperature:* 44 to 52 degrees F  
*Frost-free period:* 60 to 130 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

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

#### Description of Artray

##### 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 granite

##### Typical profile

*A1 - 0 to 9 inches:* sandy loam  
*A2 - 9 to 48 inches:* coarse sandy loam  
*C - 48 to 60 inches:* coarse sand

##### Properties and qualities

*Slope:* 2 to 9 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 4w  
*Land capability classification (nonirrigated):* 4w  
*Hydrologic Soil Group:* A/D  
*Ecological site:* F022AW002CA - Alluvial Fans  
*Hydric soil rating:* Yes

#### Minor Components

##### Calpine

*Percent of map unit:* 5 percent  
*Landform:* Alluvial fans



## Custom Soil Resource Report

*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Ecological site:* R021XE181CA - GRANITIC FAN 12-16"  
*Hydric soil rating:* No

### **Mottsville**

*Percent of map unit:* 5 percent  
*Landform:* Fan remnants  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Ecological site:* R026XF051CA - GRANITIC FAN 9-12"  
*Hydric soil rating:* No

### **Aquolls**

*Percent of map unit:* 5 percent  
*Landform:* Lakeshores  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

## **123—Bobert sandy loam, lake terrace, 0 to 2 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* jc48  
*Elevation:* 4,000 to 4,100 feet  
*Mean annual precipitation:* 6 to 12 inches  
*Mean annual air temperature:* 49 to 52 degrees F  
*Frost-free period:* 100 to 130 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

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

### **Description of Bobert**

#### **Setting**

*Landform:* Lake terraces  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from mixed rocks

#### **Typical profile**

*A - 0 to 6 inches:* sandy loam  
*Btkn - 6 to 14 inches:* sandy clay loam  
*Bkq - 14 to 26 inches:* loam  
*Bk - 26 to 60 inches:* sandy loam

**Properties and qualities**

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* 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:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 200.0  
*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4s  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* R023XG050CA - SALINE-SODIC FLAT 6-9"  
*Hydric soil rating:* No

**Minor Components**

**Calneva**

*Percent of map unit:* 5 percent  
*Landform:* Basin floors  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

**Honlak**

*Percent of map unit:* 5 percent  
*Landform:* Fan remnants  
*Across-slope shape:* Convex  
*Ecological site:* R023XG058CA - SALINE-SODIC SUBIRRIGATED 6-16"  
*Hydric soil rating:* No

**Mazuma**

*Percent of map unit:* 5 percent  
*Landform:* Lake terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R023XG050CA - SALINE-SODIC FLAT 6-9"  
*Hydric soil rating:* No

## 140—Calneva silt loam, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* jc56  
*Elevation:* 4,000 to 4,010 feet  
*Mean annual precipitation:* 6 to 9 inches  
*Mean annual air temperature:* 49 to 52 degrees F  
*Frost-free period:* 100 to 130 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Calneva

#### Setting

*Landform:* Lake terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Lacustrine deposits

#### Typical profile

*A - 0 to 6 inches:* silt loam  
*Btkn - 6 to 16 inches:* silty clay  
*Bk - 16 to 36 inches:* loam  
*2C - 36 to 72 inches:* stratified sand to silty clay loam

#### Properties and qualities

*Slope:* 0 to 1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Runoff class:* Low  
*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:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Gypsum, maximum content:* 2 percent  
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 200.0  
*Available water supply, 0 to 60 inches:* Moderate (about 7.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s

## Custom Soil Resource Report

*Hydrologic Soil Group:* C  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

### Minor Components

#### Playas

*Percent of map unit:* 6 percent  
*Landform:* Playas  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* Yes

#### Ragtown

*Percent of map unit:* 5 percent  
*Landform:* Lake terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R023XG047CA - SODIC TERRACE 6-9"  
*Hydric soil rating:* No

#### Lieberman

*Percent of map unit:* 4 percent  
*Landform:* Lake terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

## 141—Calneva-Playas complex, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* jc57  
*Elevation:* 4,000 to 4,100 feet  
*Mean annual precipitation:* 6 to 9 inches  
*Mean annual air temperature:* 49 to 52 degrees F  
*Frost-free period:* 100 to 130 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Calneva and similar soils:* 65 percent  
*Playas:* 20 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Calneva

### Setting

*Landform:* Lake terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Rise  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Lacustrine deposits

### Typical profile

*A - 0 to 6 inches:* silt loam  
*Bt<sub>kn</sub> - 6 to 16 inches:* silty clay  
*B<sub>k</sub> - 16 to 36 inches:* loam  
*2C - 36 to 72 inches:* stratified sand to silty clay loam

### Properties and qualities

*Slope:* 0 to 1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Gypsum, maximum content:* 2 percent  
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 200.0  
*Available water supply, 0 to 60 inches:* Moderate (about 7.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

## Description of Playas

### Setting

*Landform:* Playas  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Dip, rise  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Parent material:* Lacustrine deposits

### Typical profile

*H1 - 0 to 6 inches:* silty clay  
*H2 - 6 to 60 inches:* silty clay

### Properties and qualities

*Slope:* 0 to 1 percent  
*Drainage class:* Moderately well drained  
*Runoff class:* Negligible

## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low  
(0.01 to 0.06 in/hr)

*Frequency of ponding:* Frequent

*Calcium carbonate, maximum content:* 15 percent

*Gypsum, maximum content:* 5 percent

*Maximum salinity:* Strongly saline (16.0 to 32.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 1.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* D

*Hydric soil rating:* Yes

### Minor Components

#### Mazuma

*Percent of map unit:* 8 percent

*Landform:* Lake terraces

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* R023XG050CA - SALINE-SODIC FLAT 6-9"

*Hydric soil rating:* No

#### Calneva, clay loam substratum

*Percent of map unit:* 7 percent

*Landform:* Basin floors

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* R023XG047CA - SODIC TERRACE 6-9"

*Hydric soil rating:* No

## 192—Epote-Playas complex, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* jc7y

*Elevation:* 4,000 to 4,050 feet

*Mean annual precipitation:* 6 to 9 inches

*Mean annual air temperature:* 49 to 52 degrees F

*Frost-free period:* 100 to 130 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Epote and similar soils:* 55 percent

*Playas:* 15 percent

## Custom Soil Resource Report

*Minor components: 30 percent*

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

### Description of Epot

#### Setting

*Landform: Lake terraces*

*Landform position (two-dimensional): Toeslope*

*Landform position (three-dimensional): Rise*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Lacustrine deposits*

#### Typical profile

*An - 0 to 6 inches: very fine sandy loam*

*En - 6 to 13 inches: loam*

*Btkn - 13 to 21 inches: clay loam*

*BCnz - 21 to 35 inches: clay loam*

*Cnyz1 - 35 to 42 inches: loam*

*Cnyz2 - 42 to 48 inches: clay loam*

*2Cnz - 48 to 63 inches: stratified fine sand to very fine sand*

#### 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): Low to moderately low  
(0.01 to 0.06 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Calcium carbonate, maximum content: 15 percent*

*Gypsum, maximum content: 1 percent*

*Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)*

*Sodium adsorption ratio, maximum: 120.0*

*Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)*

#### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 7e*

*Hydrologic Soil Group: D*

*Ecological site: R023XG046CA - SODIC FLAT 6-9"*

*Hydric soil rating: No*

### Description of Playas

#### Setting

*Landform: Playas*

*Landform position (two-dimensional): Toeslope*

*Landform position (three-dimensional): Dip*

*Down-slope shape: Concave*

*Across-slope shape: Concave*

*Parent material: Lacustrine deposits*

#### Typical profile

*H1 - 0 to 6 inches: silty clay*



## Custom Soil Resource Report

*H2 - 6 to 60 inches: silty clay*

### Properties and qualities

*Slope: 0 to 1 percent*

*Drainage class: Moderately well drained*

*Runoff class: Negligible*

*Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low  
(0.01 to 0.06 in/hr)*

*Frequency of ponding: Frequent*

*Calcium carbonate, maximum content: 15 percent*

*Gypsum, maximum content: 5 percent*

*Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)*

*Available water supply, 0 to 60 inches: Very low (about 1.8 inches)*

### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 8*

*Hydrologic Soil Group: D*

*Hydric soil rating: Yes*

### Minor Components

#### Ardep

*Percent of map unit: 9 percent*

*Landform: Lake terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Ecological site: R023XG046CA - SODIC FLAT 6-9"*

*Hydric soil rating: No*

#### Highrock

*Percent of map unit: 8 percent*

*Landform: Lake terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Ecological site: R023XG047CA - SODIC TERRACE 6-9"*

*Hydric soil rating: No*

#### Ragtown

*Percent of map unit: 7 percent*

*Landform: Lake terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Ecological site: R023XG047CA - SODIC TERRACE 6-9"*

*Hydric soil rating: No*

#### Wespac

*Percent of map unit: 6 percent*

*Landform: Lake terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Ecological site: R023XG048CA - SODIC LOAM 6-9"*

*Hydric soil rating: No*

## 236—Herjun loamy sand, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* jc9v  
*Elevation:* 4,000 to 4,100 feet  
*Mean annual precipitation:* 9 to 12 inches  
*Mean annual air temperature:* 49 to 52 degrees F  
*Frost-free period:* 100 to 130 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Herjun

#### Setting

*Landform:* Lake terraces  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from mixed rocks and lacustrine deposits

#### Typical profile

*A - 0 to 18 inches:* loamy sand  
*Cnq - 18 to 40 inches:* sandy loam  
*2C - 40 to 53 inches:* loamy sand  
*3C - 53 to 60 inches:* loam

#### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately 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:* About 48 to 60 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 3 percent  
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 200.0  
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s  
*Land capability classification (nonirrigated):* 7s

## Custom Soil Resource Report

*Hydrologic Soil Group: B*

*Ecological site: R023XG058CA - SALINE-SODIC SUBIRRIGATED 6-16"*

*Hydric soil rating: No*

### Minor Components

#### Playas

*Percent of map unit: 5 percent*

*Landform: Playas*

*Hydric soil rating: Yes*

#### Blickenstaff

*Percent of map unit: 5 percent*

*Landform: Stream terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Hydric soil rating: No*

#### Honlak

*Percent of map unit: 5 percent*

*Landform: Fan remnants*

*Down-slope shape: Convex*

*Across-slope shape: Linear*

*Ecological site: R023XG058CA - SALINE-SODIC SUBIRRIGATED 6-16"*

*Hydric soil rating: No*

## 270—Lieberman fine sandy loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol: jcc5*

*Elevation: 4,000 to 4,050 feet*

*Mean annual precipitation: 6 to 9 inches*

*Mean annual air temperature: 50 to 52 degrees F*

*Frost-free period: 100 to 130 days*

*Farmland classification: Not prime farmland*

### Map Unit Composition

*Lieberman and similar soils: 85 percent*

*Minor components: 15 percent*

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

### Description of Lieberman

#### Setting

*Landform: Lake terraces*

*Landform position (two-dimensional): Toeslope*

*Landform position (three-dimensional): Tread*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Lacustrine deposits*

## Custom Soil Resource Report

### Typical profile

*A - 0 to 12 inches:* fine sandy loam  
*Bkq - 12 to 20 inches:* clay loam  
*2C - 20 to 60 inches:* stratified sand to fine sand

### 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 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 25 percent  
*Gypsum, maximum content:* 1 percent  
*Maximum salinity:* Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 200.0  
*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

### Minor Components

#### Mazuma

*Percent of map unit:* 5 percent  
*Landform:* Lake terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R023XG047CA - SODIC TERRACE 6-9"  
*Hydric soil rating:* No

#### Ardep

*Percent of map unit:* 5 percent  
*Landform:* Lake terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R023XG046CA - SODIC FLAT 6-9"  
*Hydric soil rating:* No

#### Playas

*Percent of map unit:* 5 percent  
*Landform:* Playas  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* Yes

## 282—Mazuma fine sandy loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* jcct  
*Elevation:* 4,000 to 4,100 feet  
*Mean annual precipitation:* 6 to 9 inches  
*Mean annual air temperature:* 49 to 52 degrees F  
*Frost-free period:* 100 to 130 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Mazuma

#### Setting

*Landform:* Lake terraces  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from mixed rocks and lacustrine deposits

#### Typical profile

*A - 0 to 7 inches:* fine sandy loam  
*Bk - 7 to 30 inches:* sandy loam  
*Bkq - 30 to 60 inches:* stratified gravelly coarse sand to silt loam

#### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Gypsum, maximum content:* 1 percent  
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 45.0  
*Available water supply, 0 to 60 inches:* Low (about 5.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2s  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A

## Custom Soil Resource Report

*Ecological site:* R023XG050CA - SALINE-SODIC FLAT 6-9"

*Hydric soil rating:* No

### Minor Components

#### Ardep

*Percent of map unit:* 5 percent

*Landform:* Lake terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Ecological site:* R023XG046CA - SODIC FLAT 6-9"

*Hydric soil rating:* No

#### Zorravista

*Percent of map unit:* 5 percent

*Landform:* Dunes

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Ecological site:* R023XG049CA - SAND DUNES 6-9"

*Hydric soil rating:* No

#### Calneva

*Percent of map unit:* 5 percent

*Landform:* Basin floors

*Down-slope shape:* Linear

*Across-slope shape:* Concave

*Ecological site:* R023XG046CA - SODIC FLAT 6-9"

*Hydric soil rating:* No

## 342—Rose Creek loam, sodic, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* jcgs

*Elevation:* 4,000 to 4,400 feet

*Mean annual precipitation:* 9 to 12 inches

*Mean annual air temperature:* 49 to 52 degrees F

*Frost-free period:* 100 to 130 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Rose creek and similar soils:* 80 percent

*Minor components:* 20 percent

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

### Description of Rose Creek

#### Setting

*Landform:* Flood plains

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Dip

*Down-slope shape:* Linear

## Custom Soil Resource Report

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from mixed rocks

### Typical profile

*A - 0 to 25 inches:* loam

*C - 25 to 60 inches:* stratified sand to silt loam

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* About 18 to 42 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Maximum salinity:* Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

*Sodium adsorption ratio, maximum:* 30.0

*Available water supply, 0 to 60 inches:* Moderate (about 7.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* 3w

*Land capability classification (nonirrigated):* 6w

*Hydrologic Soil Group:* C

*Ecological site:* R026XY001NV - MOIST FLOODPLAIN

*Hydric soil rating:* No

### Minor Components

#### Fortsage

*Percent of map unit:* 10 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Truckee

*Percent of map unit:* 10 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

## 347—Saddlerock peat, 0 to 1 percent slopes, ponded

### Map Unit Setting

*National map unit symbol:* jcgz

*Elevation:* 4,000 to 5,300 feet

*Mean annual precipitation:* 9 to 16 inches



## Custom Soil Resource Report

*Mean annual air temperature:* 44 to 52 degrees F

*Frost-free period:* 60 to 130 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Saddlerock and similar soils:* 80 percent

*Minor components:* 20 percent

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

### Description of Saddlerock

#### Setting

*Landform:* Flood plains

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Dip

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from volcanic rock

#### Typical profile

*Oi - 0 to 6 inches:* peat

*A - 6 to 12 inches:* silty clay

*AC - 12 to 60 inches:* silty clay

#### Properties and qualities

*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 0 inches

*Frequency of flooding:* None

*Frequency of ponding:* Occasional

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* High (about 10.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4w

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* C/D

*Ecological site:* R021XG909CA - Clayey

*Hydric soil rating:* No

### Minor Components

#### Saddlerock

*Percent of map unit:* 8 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Pit

*Percent of map unit:* 7 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

## Custom Soil Resource Report

*Across-slope shape:* Linear

*Ecological site:* R023XF092CA - CLAY FLOODPLAIN 9-16"

*Hydric soil rating:* Yes

### **Humboldt**

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

## **405—Xerolls-aquolls complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* jckq

*Elevation:* 4,000 to 4,550 feet

*Mean annual precipitation:* 10 to 35 inches

*Mean annual air temperature:* 44 to 52 degrees F

*Frost-free period:* 60 to 130 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Xerolls and similar soils:* 55 percent

*Aquolls and similar soils:* 45 percent

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

### **Description of Xerolls**

#### **Setting**

*Landform:* Lakeshores

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from granite

#### **Typical profile**

*A - 0 to 11 inches:* loamy coarse sand

*C - 11 to 60 inches:* stratified coarse sand to loam

#### **Properties and qualities**

*Slope:* 0 to 2 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 very high (0.06 to 20.00 in/hr)

*Depth to water table:* About 30 to 40 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

## Custom Soil Resource Report

*Available water supply, 0 to 60 inches:* Low (about 4.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

### Description of Aquolls

#### Setting

*Landform:* Lakeshores

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Dip

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Alluvium derived from mixed rocks

#### Typical profile

*A - 0 to 7 inches:* gravelly sandy loam

*AC - 7 to 38 inches:* gravelly loam

*2C - 38 to 60 inches:* very gravelly sand

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Very poorly drained

*Runoff class:* Very high

*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:* About 0 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Maximum salinity:* Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5w

*Hydrologic Soil Group:* B/D

*Hydric soil rating:* No

## 406—Yobe silt loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* jcks

*Elevation:* 4,000 to 4,500 feet

*Mean annual precipitation:* 6 to 9 inches

*Mean annual air temperature:* 49 to 52 degrees F

*Frost-free period:* 100 to 130 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Yobe and similar soils: 85 percent*

*Minor components: 15 percent*

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

**Description of Yobe**

**Setting**

*Landform: Lake terraces*

*Landform position (two-dimensional): Toeslope*

*Landform position (three-dimensional): Talf*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Lacustrine deposits*

**Typical profile**

*A - 0 to 4 inches: silt loam*

*C - 4 to 60 inches: stratified very fine sandy loam to silty clay loam*

**Properties and qualities**

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Somewhat poorly drained*

*Runoff class: High*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)*

*Depth to water table: About 36 to 60 inches*

*Frequency of flooding: OccasionalNone*

*Frequency of ponding: None*

*Calcium carbonate, maximum content: 10 percent*

*Gypsum, maximum content: 1 percent*

*Maximum salinity: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)*

*Sodium adsorption ratio, maximum: 60.0*

*Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)*

**Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 7w*

*Hydrologic Soil Group: C*

*Ecological site: R023XG058CA - SALINE-SODIC SUBIRRIGATED 6-16"*

*Hydric soil rating: No*

**Minor Components**

**Mazuma**

*Percent of map unit: 8 percent*

*Landform: Lake terraces*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Ecological site: R023XG050CA - SALINE-SODIC FLAT 6-9"*

*Hydric soil rating: No*

**Zorravista**

*Percent of map unit: 7 percent*

*Landform: Dunes*

*Down-slope shape: Convex*

## Custom Soil Resource Report

*Across-slope shape:* Convex

*Ecological site:* R023XG054CA - SANDY TERRACE 6-9"

*Hydric soil rating:* No

### **409—Water**

#### **Map Unit Setting**

*National map unit symbol:* jcsq

*Elevation:* 4,000 to 6,500 feet

*Farmland classification:* Not prime farmland

#### **Map Unit Composition**

*Water:* 100 percent

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

#### **Description of Water**

##### **Setting**

*Landform:* Depressions

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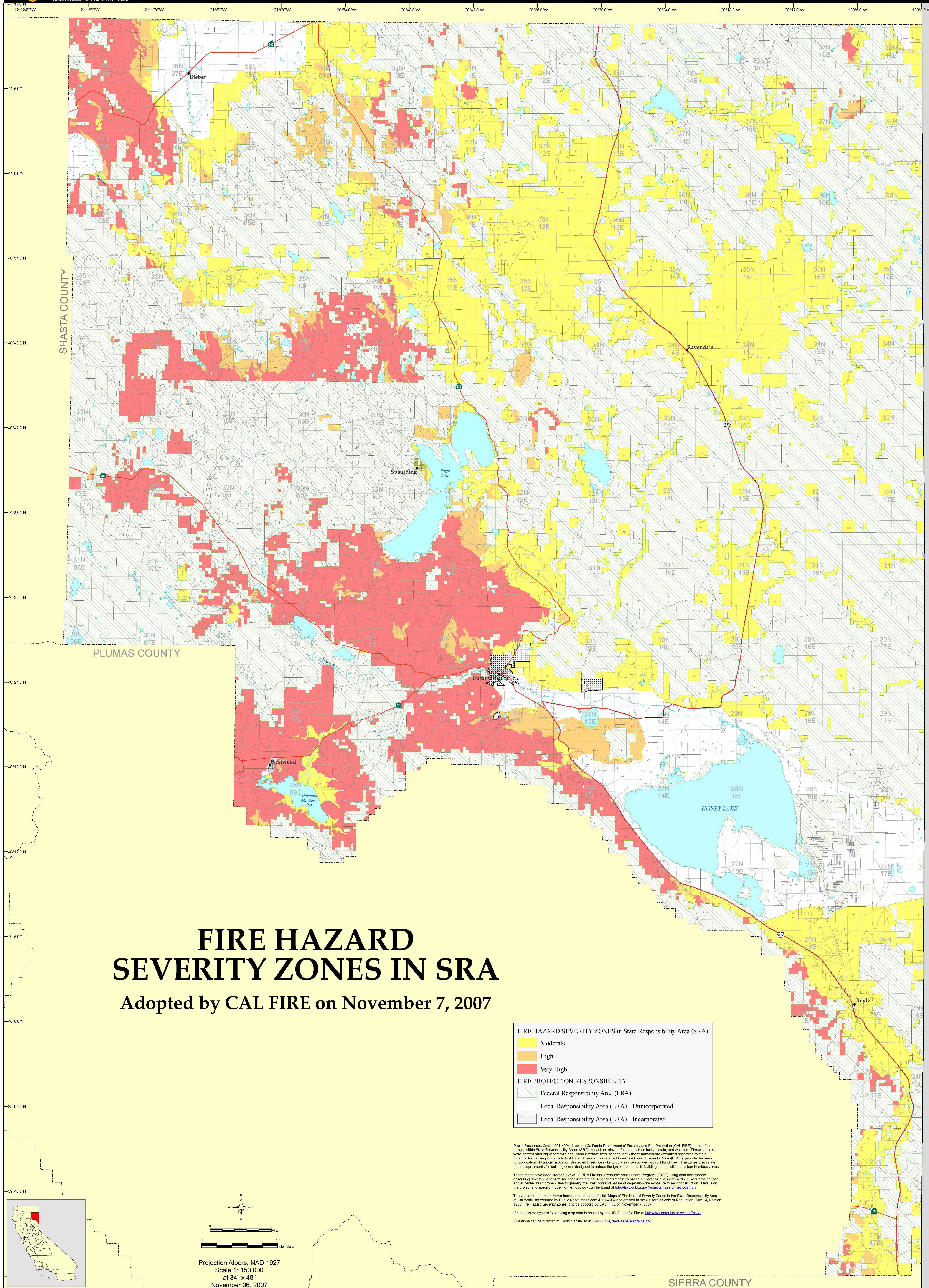
CNDDDB Quad Species List 27 records.

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	Aquila chrysaetos	golden eagle	ABNKC22010	None	None	FP , WL	-	4012032	WENDEL	Mapped and Unprocessed	Animals - Birds - Accipitridae - Aquila chrysaetos
Animals - Birds	Falco mexicanus	prairie falcon	ABNKD06090	None	None	WL	-	4012032	WENDEL	Mapped and Unprocessed	Animals - Birds - Falconidae - Falco mexicanus
Animals - Birds	Antigone canadensis tabida	greater sandhill crane	ABNMK01014	None	Threatened	FP	-	4012032	WENDEL	Unprocessed	Animals - Birds - Gruidae - Antigone canadensis tabida
Animals - Birds	Asio otus	long-eared owl	ABNSB13010	None	None	SSC	-	4012032	WENDEL	Mapped	Animals - Birds - Strigidae - Asio otus
Animals - Birds	Athene cunicularia	burrowing owl	ABNSB10010	None	None	SSC	-	4012032	WENDEL	Mapped	Animals - Birds - Strigidae - Athene cunicularia
Animals - Insects	Pseudocopaeodes eunus obscurus	Carson wandering skipper	IILEP63014	Endangered	None	-	-	4012032	WENDEL	Mapped	Animals - Insects - Hesperiidae - Pseudocopaeodes eunus obscurus
Animals - Mammals	Antilocapra americana	pronghorn	AMALD01010	None	None	-	-	4012032	WENDEL	Unprocessed	Animals - Mammals - Antilocapridae - Antilocapra americana
Animals - Mammals	Canis lupus	gray wolf	AMAJA01030	Endangered	Endangered	-	-	4012032	WENDEL	Unprocessed	Animals - Mammals - Canidae - Canis lupus
Animals - Mammals	Erethizon dorsatum	North American porcupine	AMAFJ01010	None	None	-	-	4012032	WENDEL	Mapped	Animals - Mammals - Erethizontidae - Erethizon dorsatum
Animals - Mammals	Taxidea taxus	American badger	AMAJF04010	None	None	SSC	-	4012032	WENDEL	Mapped	Animals - Mammals - Mustelidae - Taxidea taxus
Animals - Mammals	Urocitellus mollis	Piute ground squirrel	AMAFB05200	None	None	-	-	4012032	WENDEL	Unprocessed	Animals - Mammals - Scuriidae - Urocitellus mollis
Animals - Mammals	Corynorhinus townsendii	Townsend's big-eared bat	AMACC08010	None	None	SSC	-	4012032	WENDEL	Mapped	Animals - Mammals - Vespertilionidae - Corynorhinus townsendii
Plants - Vascular	Allium atrorubens var. atrorubens	Great Basin onion	PMLIL02061	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Alliaceae - Allium atrorubens var. atrorubens
Plants - Vascular	Thelypodium milleflorum	many-flowered thelypodium	PDBRA2N0A0	None	None	-	2B.2	4012032	WENDEL	Mapped	Plants - Vascular - Brassicaceae - Thelypodium milleflorum
Plants - Vascular	Astragalus geyeri var. geyeri	Geyer's milk-vetch	PDFAB0F3M1	None	None	-	2B.2	4012032	WENDEL	Mapped	Plants - Vascular - Fabaceae - Astragalus geyeri var. geyeri
Plants - Vascular	Astragalus iodanthus var. diaphanoides	snake milk-vetch	PDFAB0F4C3	None	None	-	4.3	4012032	WENDEL	Unprocessed	Plants - Vascular - Fabaceae - Astragalus iodanthus var. diaphanoides
Plants - Vascular	Lupinus pusillus var. intermontanus	intermontane lupine	PDFAB2B3B1	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Fabaceae - Lupinus pusillus var. intermontanus



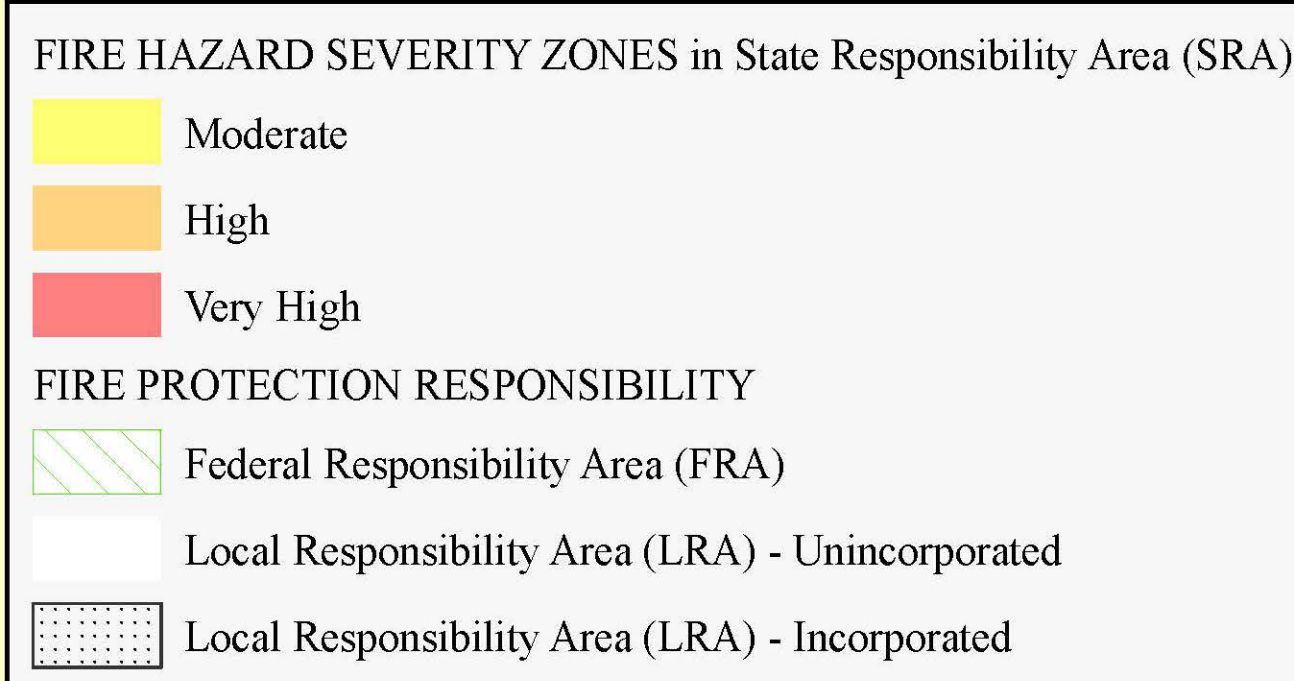
Plants - Vascular	Phacelia gymnoclada	naked-stemmed phacelia	PDHYD0C1X0	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Hydrophyllaceae - Phacelia gymnoclada
Plants - Vascular	Sidalcea multifida	cut-leaf checkerbloom	PDMAL110G0	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Malvaceae - Sidalcea multifida
Plants - Vascular	Sphaeralcea grossulariifolia	currant-leaved desert mallow	PDMAL140U0	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Sphaeralcea grossulariifolia
Plants - Vascular	Chylismia claviformis ssp. cruciformis	cruciform evening-primrose	PDONA030D4	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Onagraceae - Chylismia claviformis ssp. cruciformis
Plants - Vascular	Eremothera boothii ssp. alyssoides	Pine Creek evening-primrose	PDONA03051	None	None	-	4.3	4012032	WENDEL	Unprocessed	Plants - Vascular - Onagraceae - Eremothera boothii ssp. alyssoides
Plants - Vascular	Eremothera minor	Nelson's evening-primrose	PDONA03110	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Onagraceae - Eremothera minor
Plants - Vascular	Eriogonum nutans var. nutans	Dugway wild buckwheat	PDPGN084B2	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Polygonaceae - Eriogonum nutans var. nutans
Plants - Vascular	Rumex venosus	winged dock	PDPGN0P1K0	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Polygonaceae - Rumex venosus
Plants - Vascular	Potamogeton zosteriformis	eel-grass pondweed	PMPOT03160	None	None	-	2B.2	4012032	WENDEL	Mapped	Plants - Vascular - Potamogetonaceae - Potamogeton zosteriformis
Plants - Vascular	Ivesia baileyi var. baileyi	Bailey's ivesia	PDROS0X031	None	None	-	2B.3	4012032	WENDEL	Mapped	Plants - Vascular - Rosaceae - Ivesia baileyi var. baileyi





## FIRE HAZARD SEVERITY ZONES IN SRA

Adopted by CAL FIRE on November 7, 2007



Public Resources Code 4201.4204 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas (SRA), based on relevant factors such as fuels, terrain, and weather. These statutes were passed after significant wildland-urban interface fires, consequently these hazards are described according to their potential for causing ignitions to buildings. These zones referred to as Fire Hazard Severity Zones (FHSZ), provide the basis for application of various mitigation strategies to reduce risk to buildings associated with wildland fires. The zones also relate to the requirements for building codes designed to reduce the ignition potential to buildings in the wildland-urban interface zones.

These maps have been created by CAL FIRE's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, estimated fire behavior characteristics based on potential fuels over a 30-50 year time horizon, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to new construction. Details on the project and specific modeling methodology can be found at <http://frap.cdf.ca.gov/projects/hazardmethods.htm>.

The version of the map shown here represents the official "Maps of Fire Hazard Severity Zones in the State Responsibility Area of California" as required by Public Resources Code 4201.4204 and entitled in the California Code of Regulation, Title 14, Section 1280 Fire Hazard Severity Zones, and as adopted by CAL FIRE on November 7, 2007.

An interactive system for viewing map data is hosted by the UC Center for Fire at <http://firecenter.berkeley.edu/frap/>. Questions can be directed to David Sapsis, at 916.445.5360, [dave.sapsis@fire.ca.gov](mailto:dave.sapsis@fire.ca.gov).

SIERRA COUNTY

MAP ID: FHSZS\_MAP

DATA SOURCES

CAL FIRE Fire Hazard Severity Zones (FHSZS06\_3)

CAL FIRE State Responsibility Areas (SRA05\_3)

CAL FIRE Incorporated Cities (Incorp07\_3)

PLSS (1:100,000 USGS, Land Grants with CAL FIRE grid)

Arnold Schwarzenegger, Governor,  
State of California  
Mike Chrisman, Secretary for Resources,  
The Resources Agency  
Ruben Grijalva, Director,  
Department of Forestry and Fire Protection

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Obtain FRAP maps, data, metadata and publications on the Internet at <http://frap.cdf.ca.gov>  
For more information, contact CAL FIRE-FRAP, PO Box 944246, Sacramento, CA 94244-2460, (916) 327-3939.