

22-September-2021

David Albright
Manager, Groundwater Protection Section
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105

Sent via electronic transmission only

RE: EPA Technical Evaluation Comments and Information Request for
Underground Injection Control (UIC) Permit Application Class VI
Pre-Construction Permit Application No. R9UIC-CA6-FY20-1;
Considerations of Specific Federal Laws

Dear Mr. Albright,

Clean Energy Systems, Inc. (CES) thanks you and the staff at the United States Environmental Protection Agency (EPA) for your consideration and review of our Class VI Pre-Construction Underground Injection Control Permit Application for the Mendota site (Fresno County, California). This letter and enclosures are in response to your Technical Evaluation Comments and Information Request of the subject permit application, dated 19-August-2020, specifically addressing Considerations of Specific Federal Laws.

CES recognizes the potential applicability of certain specific Federal laws as they relate to the subject permit application. Within the attached enclosures, we address the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA); as well as the non-applicability of the Wild and Scenic Rivers Act (WSRA), the Coastal Zone Management Act (CZMA) and the Fish and Wildlife Conservation Act (FWCA). Studies were conducted by qualified consultants retained by CES, and their findings are presented herein.

These reports are submitted to the EPA in response to its requirement to show the effects on the environmental resources of activities related to development, construction, and operation of the Mendota Bioenergy Carbon Capture and Storage (BECCS) plant. The plant site is highly disturbed and was used for biomass power generation from 1987 to 2015. Proposed major activities at the BECCS plant site include site preparation, construction and operation of the biomass plant, and drilling and operation of the CO₂ geologic sequestration and monitoring wells. Other than the deep wells, the construction type and activity is typical for industrial and power plants and similar to the existing biomass power plant located at the site. Similarly,



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subsequent operation activity at the plant will be typical for industrial power plants of comparable size.

The first Enclosure is a site Biological Resources study conducted by Live Oak Associates, Inc. (LOA), San Jose, California. LOA has performed extensive work in the California Central Valley and is familiar with the Mendota area. The study objective was to identify and assess the potential for negative impacts on Federally protected plant and animal species at the site in accordance with the Federal Endangered Species Act (ESA), 50 CFR 402.2, requirements. The results are contained in Attachment A, “Biological Evaluation CES Mendota” report dated, 31-August-2021. Federal plant and animal species with the potential to be present on the site or that could otherwise potentially be affected by activities on the site were identified and tabulated in Tables 2 and 3 of the report. The conclusion reached was that none of the species of concern was present at the site. Where appropriate, the report identifies mitigation measures to be employed before and during construction and during operation. These measures consist of pre-construction surveys, construction and operations monitoring, avoidance and minimization measures and response plans.

The second Enclosure is a site Cultural Resources study conducted by ASM Affiliates, Inc. (ASM), Tehachapi, California. ASM has performed extensive work in the California Central Valley and is familiar with the Mendota area. The study objective was to assure compliance with the Federal National Historic Preservation Act (NHPA) regulations, 36 CFR 800.16(D), and the State California Environmental Quality Act, PRC 21000-21189. Results are contained in Attachment B, “Class III Inventory/Phase I Survey Mendota Carbon Capture and Storage Project” report dated, April 2021. The intensive survey demonstrated that the proposed Mendota BECCS plant site does not contain significant or unique federal or state historical resources or historic properties.

The Biological and Cultural studies were limited to an assessment of the potential effects on the environmental resources on the plant site surface, and did not address the underground CO₂ sequestration (subsurface) activity which was deemed to pose no identifiable risk to these resources. Also, the studies did not assess impacts of the project on the area beyond the 71-acre plant site where project related activities may include monitor well drilling, personnel and equipment transit for seismic testing activities, and the seismic testing activity. Desktop studies for the estimated 32-square mile 3D seismic survey area currently are being conducted and will be submitted upon completion. Additional studies for Biological and Cultural Resource effects may be required after seismic testing and well locations have been determined and the exact intensity and other characteristics of the activities are known.

The third Enclosure addresses the non-applicability of other specific federal laws including the Wild and Scenic Rivers Act (WSRA), Coastal Zone Management Act (CZMA), and the Fish and Wildlife Conservation Act (FWCA) to the proposed Mendota BECCS project site. Attachment C is a letter from LOA’s President and Senior Conservation Biologist, dated 23-April-2021, summarizing his findings of an evaluation of specific federal laws that the EPA must consider when reviewing projects.

Thank you for your time and consideration. If you have any questions related to the content of this response or wish to discuss these matters further, I can be reached via email at rhollis@cleanenergysystems.com.

Sincerely,



Rebecca M. Hollis
CES Director of Business Development – CNE

Enclosures (3)

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LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

**BIOLOGICAL EVALUATION
CES MENDOTA
CITY OF MENDOTA, FRESNO COUNTY, CALIFORNIA**



LIVE OAK ASSOCIATES, INC.

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August 31, 2021

PN 2513-02

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EXECUTIVE SUMMARY

Live Oak Associates, Inc. (LOA) conducted a reconnaissance level survey for biological resources on the approximately 71-acre proposed CES Mendota project site (hereafter referred to as the “site” or “study area”), located in the City of Mendota, Fresno County, California on December 30, 2020, and was limited to an analysis of the surface of the approximately 71-acre site itself. This report was prepared to satisfy the requirements of ESA review as required by the EPA for the underground injection UIC VI well and is not meant to include state or local laws or policies. LOA biologists conducted the survey to determine if the site supported, or had the possibility of supporting, sensitive biological resources that may potentially be impacted by the proposed construction of a biomass power plant. The site is located northeast of the intersection of Belmont Avenue and Guillan Park Drive and to the southeast of the more developed environs of Mendota. The William Robert Johnston Municipal Airport is located adjacent to and to the west and northwest of the site and the Fresno Slough is located approximately 0.6 miles to the east of the site.

Approximately 25% of the northern portion of the site is currently developed with a power plant facility along with associated plant structures and office buildings, paved parking areas, evaporation ponds, and stormwater detention ponds. The remaining southern portion of the site supports California annual grassland habitat that has been heavily disturbed by the use of the area as a “fuel yard” including staging of “fuel” (large wood piles), dirt roads and vehicle traffic, and is disced for fire suppression. The existing power plant facility has been out of use since late 2014 or early 2015.

Because of the existing conditions and past uses of the site, and the related development and disturbance, federally protected plants are considered to be absent from or unlikely to occur on the site and no federally protected plants are therefore expected to be impacted by the proposed project.

Most federally protected animals that are known to occur, or to once have occurred, in the project vicinity are considered absent or unlikely to occur on the site due to a lack of habitat. However, the site does provide potential habitat for some federally protected animals. Federally protected plant species are assessed for their potential to occur on the site in Table 2 and Federally protected animal species are assessed for their potential to occur on the site in Table 3.

The following table identifies federally protected species which have some potential to occur onsite, and therefore have some potential to be impacted by the project, a brief description as to the potential nature of that occurrence below the table.

Species (Occurrence)	Federal Status	State Status
San Joaquin kit fox (Unlikely)	Endangered	Threatened

Although the San Joaquin kit fox (SJKF) is unlikely to occur onsite, dispersing individuals have a low potential to move through the site. While the loss of foraging habitat for federally

protected animals is considered a less-than-significant impact; should SJKF occur on the site when project construction is implemented, construction activities could result in harm or mortality to this species, and this is considered a potentially significant impact of the project. Mitigation measures intended to reduce impacts to a less-than-significant level for the SJKF include pre-construction surveys, and other avoidance and minimization measures.

The project site provides nesting habitat for migratory birds and raptors. For instance, tower structures on the site currently support an active red-tailed hawk nest, and other structures could provide nesting habitat for barn owls and great-horned owls, which were both observed to be present in the structures, although not currently nesting, as well as other nesting birds. Any project-related activities that result in nest abandonment or otherwise result in harm or mortality to birds nesting on the site would be a violation of state and federal laws. Mitigations include pre-construction nesting bird surveys, and/or other avoidance and minimization measures. Additionally, the project plans to prepare a maintenance and operations manual which will include wildlife checks and phone numbers to call should any wildlife-related questions or issues arise.

Only manmade hydrological features (evaporation ponds and stormwater detention ponds) are present on the site which are maintained features, constructed in upland habitats, and that do not support wetland habitat. Additionally, these features are not likely to be considered jurisdictional waters of the U.S. by the U.S. Army Corps of Engineers (USACE) and therefore not subject to the Clean Water Act.

Lastly, the proposed project will not conflict with provisions of any regional habitat conservation plans.

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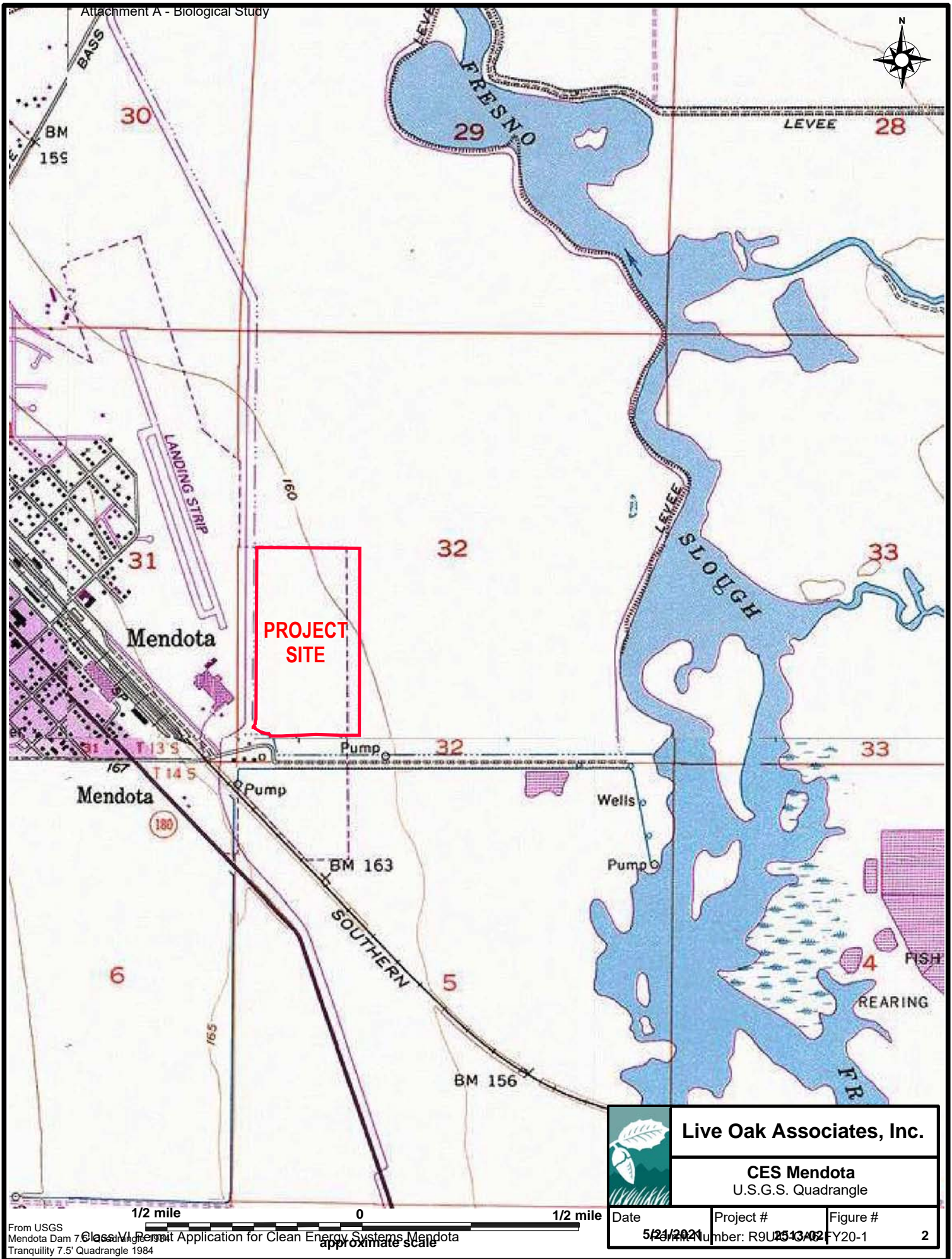
1 INTRODUCTION

Live Oak Associates, Inc. (LOA) prepared this biological evaluation to assist Clean Energy Systems (hereafter referred to as “the applicant”) in identifying federally protected biological resources that could potentially be impacted by re-development of the site and was limited to an analysis of the surface of the approximately 71-acre site itself. This report was prepared to satisfy the requirements of ESA review as required by the EPA for the underground injection UIC VI well and is not meant to include state or local laws or policies. The approximately 71-acre parcel (hereafter referred to as the “site” or “study area”) is located immediately northeast of the intersection of West Belmont Avenue and Guillan Park Drive, immediately southeast of the William Robert Johnston Municipal Airport, southeast of the more developed environs of the City of Mendota, and approximately 0.6-miles west of the Fresno Slough (Figure 1). The study area is found on the Mendota Dam U.S.G.S. 7.5-minute quadrangle in Section 32, Township 13 South, and Range 15 East (Figure 2).

The development of parcels can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by federal agencies. This report addresses issues related to: 1) federally protected biotic resources occurring on the study area; 2) the federal laws regulating such resources, and 3) mitigation measures which may be required to reduce the magnitude of anticipated impacts. As such, the objectives of this report are to:

- Summarize all site-specific information related to existing federally protected biological resources;
- Make reasonable inferences about the federally protected biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species’ known range;
- Summarize all federal natural resource protection laws that may be relevant to possible future site development;
- Identify and discuss project impacts to biological resources likely to occur on the site within the context of federal laws; and

- Identify avoidance and mitigation measures that would reduce impacts to a less-than-significant impact and are generally consistent with recommendations of the resource agencies for affected biological resources.



The analysis of federal impacts, as discussed in Section 3.0 of this report, is based on the known and potential biotic resources of the study area discussed in Section 2.0. Sources of information used in the preparation of this analysis included: (1) the *California Natural Diversity Data Base* (CDFW 2020), (2) the *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001), and (3) manuals and references related to plants and animals of the San Joaquin Valley region. LOA ecologists Pamela Peterson and Robert Shields conducted a reconnaissance-level field survey of the study area on December 20, 2020. During the field survey, LOA ecologists noted habitats and principal land uses and their associated plants and animals.

Detailed or protocol-level surveys for sensitive biological resources were not conducted for this study. The level of effort was sufficient to determine whether potentially sensitive habitats, or sensitive plant and animal species may be present on the site; however, the surveys were not sufficient to establish the extent of actual use of any of the habitats on the site by special status species. Field surveys conducted for this study were sufficient to assess the significance of biological constraints associated with the site as well as the need for more detailed studies that could be warranted if sensitive biotic resources were identified in this first round of surveys.

2 EXISTING CONDITIONS

The project site is located in the trough of the San Joaquin Valley to the south of the confluence of the San Joaquin River and the Fresno Slough in the southeastern area of the City of Mendota. Surrounding land uses include the developed environs of Mendota and the William Robert Johnston Municipal Airport adjacent to the west and northwest and west, and agricultural fields to the north, east and south. As a result of its vicinity to the San Joaquin River and Fresno Slough, the project area likely at one time would have supported large areas of riparian wetlands, however, the San Joaquin River, Fresno Slough and the Mendota Pool have been levied and much of the land is now in intensive agriculture.

The project site is topographically relatively level with elevations ranging from approximately 150 to 160 feet (46 to 49 meters) National Geodetic Vertical Datum (NGVD). There are no natural drainages or other natural hydrological features that were observed within the project site, although several manmade hydrological features including evaporation ponds and stormwater detention basins are present.

Three soil series occur on the site (Table 1, Figure 3), however, one of these soils only occurs in the extreme southeast corner, i.e., Posochanet clay loam. These soils are found on alluvial fans and flood plains, and all soils of the site have formed from alluvium derived primarily from sedimentary rocks.

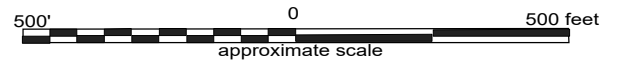
TABLE 1: SOILS OF THE CES MENDOTA PROJECT SITE, MENDOTA, CA

Soil Series	Map symbol	Drainage class	Does the soil have a hardpan or other restrictive layer?	Is the soil considered hydric?
Tranquillity clay, saline-sodic, wet, 0 to 1 percent slopes	286	Somewhat poorly drained	No	No, but hydric inclusions may occur.
Calfax clay loam, saline-sodic, wet, 0-1 percent slopes	482	Well-drained	No	No
Posochanet clay loam, saline-sodic, wet, 0-1 percent slopes	475	Moderately well-drained	No	No

Tranquillity clay, saline-sodic, wet, 0 to 1 percent slopes, is very deep and somewhat poorly drained with very slow permeability and is highly saline. Although Tranquillity clay is not considered a hydric soil, other minor soil components for this soil are considered hydric, therefore, hydric inclusions may occur.

LEGEND

- 286** TRANQUILLITY CLAY, SALINE-SODIC, WET, 0 TO 1% slopes
- 475** POSOCHANET CLAY LOAM, SALINE-SODIC, WET, 0 TO 1% slopes
- 482** CALFLAX CLAY LOAM, SALINE-SODIC, WET, 0 TO 1% slopes



Source:
 U.S. Dept. of Agriculture, Natural Resources Conservation Service
 Class VI Permit Application for Clean Energy Systems Mendota
 Aerial Photo courtesy of U.S.D.A. National Agriculture Imagery Program (NAIP) Aerial Photo Field Office 12/17/2018



Live Oak Associates, Inc.

CES Mendota
 Soils

Date	Project #	Figure #
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Calflax clay loam, saline-sodic, wet, 0 to 1 percent slopes is also a deep soil and is considered to be moderately well-drained with moderately high permeability and is also highly saline. Calflax clay loam is not considered to be a hydric soil.

The San Joaquin Valley has a Mediterranean climate with warm to hot dry summers and cool winters. Annual precipitation in the general vicinity of the site is highly variable from year to year. Annual rainfall is approximately 8 to 12 inches, almost 85% of which falls between the months of October and March. Winter rainfall infiltrates the study area's soil through the early part of the winter. During winters of average precipitation, the soils of the area reach field capacity by February or March, at which time surface runoff may be generated by some storms.

2.1 BIOTIC HABITATS

Two land uses and habitats were identified for the site, consisting of 1) developed, which includes evaporation ponds, stormwater detention basin, and linear depressions, and 2) California annual grassland (highly disturbed). The northernmost portion of the site is developed as a power plant facility, while the majority of the site in the southern portion is a California annual grassland habitat that has been highly disturbed by being utilized for fuel wood storage for the power plant. The land uses and habitats of the site are depicted in Figure 4 and described in greater detail below.

2.1.1 Developed

The northern approximately one-quarter of the site is developed as a power plant facility with associated structures, parking areas, landscaping, evaporation ponds and stormwater detention basins. The facility has not been in operation for approximately six years, but the structures and grounds are still maintained regularly. There are two evaporation basins located in the northwestern corner of the site. At the time of the December 2020 survey these basins were partially inundated as a result of recent rainfall.

Attachment A - Biological Study

LEGEND

Developed

Evaporation Ponds

Stormwater Detention Basin

Linear Depressions

CAG

California Annual Grassland
(Highly Disturbed)

Source:

A.L.T.A. Survey map courtesy of Hillwig-Goodrow, Inc.

Live Oak Associates, Inc.

CES Mendota
Land Use / Habitats

Date

5/21/2021

Project #

2513-02

Figure #

4

Class VI Permit Application for Clean Energy Systems Mendota

Permit Number: F0510 CAG FY2021

The perimeters of the basins were lined and/or primarily barren with some senesced annual grasses and forbs present. The ponds themselves did not support any vegetation. Adjacent and to the west of the evaporation ponds there was a large stormwater detention basin which was completely dry during the site visit. Vegetation within the detention basin appeared to be undifferentiated from that of the evaporation pond perimeters and other upland grassland areas of the site, described in greater detail below, in that it appeared to support only senesced non-native annual grasses and forbs. A second stormwater detention basin occurs in the southeastern portion of the developed area. The latter basin also was dry and appeared to support vegetation similar to the surrounding upland areas of the site.

One of the outside platforms of a power plant tower structure supports an active red-tailed hawk (*Buteo jamaicensis*) nest and LOA biologists flushed a barn owl (*Tyto alba*) that was roosting in another of the power plant structures during the December 2020 survey, as well as observed pellets that are believed to be of great horned owls. California ground squirrels (*Otospermophilus beecheyi*) and their burrows were observed along the banks and bottoms of the stormwater detention basins and in disturbed ground adjacent to the power plant. The desert cottontail (*Sylvilagus audubonii*) and black-tailed hare (*Lepus californicus*) were also observed on the site.

2.1.2 California Annual Grassland (Highly Disturbed)

The remaining southern portion of the study area (approximately 75%) supports ruderal California annual grasslands. The grasslands have been highly disturbed by the staging of fuel wood and by heavy vehicular traffic with barren dirt roads traversing the area. We understand that although the facility has not been operational for approximately six years, and that this area has not been used for fuel storage for that time period. However, the area is disced as needed for fire suppression, although that discing may not occur every year, but is rather based on the condition of the vegetation from year to year. Historical photos of the site from 2014 and dating back to 1998 show this ruderal area supported large stacks of fuel wood while the plant was operational. Vegetation observed within this portion of the site was completely senesced at the time of the December 2020 survey and included upland ruderal non-native

grass and forb species including farmer's foxtail (*Hordeum murinum* ssp. *leporinum*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), wild oat (*Avena* sp.), broad-leaf filaree (*Erodium bothrys*), black mustard (*Brassica nigra*), prickly lettuce (*Lactuca serriola*) and Russian thistle (*Salsola tragus*).

Within this habitat, there were several low areas, including two manmade linear depression features near the southeastern boundary. Like the detention basins described above, these features did not support wetland vegetation, and the vegetation observed within them appeared to be undifferentiated from the upland annual grasslands.

This habitat provides limited value for most terrestrial vertebrates. Lizards that may occur here include the western fence lizard (*Sceloporus occidentalis*). Ground-feeding birds such as white-crowned sparrows (*Zonotrichia leucophrys*) and golden-crowned sparrows (*Zonotrichia atricapilla*) are likely to forage in this habitat during the winter. Red-tailed hawks (*Buteo jamaicensis*) were observed flying over this habitat. Other raptors that may be attracted to this habitat include white-tailed kites (*Elanus caeruleus*), barn owls, and great-horned owls (*Bubo virginianus*) to name a few.

Dirt mounds created by Botta's pocket gophers (*Thomomys bottae*) were found throughout this habitat. Ground squirrels (*Otospermophilus beecheyi*) and their burrows were also observed here. Other mammals such as deer mice (*Peromyscus maniculatus*) and house mice (*Mus musculus*) would likely live or forage here as well.

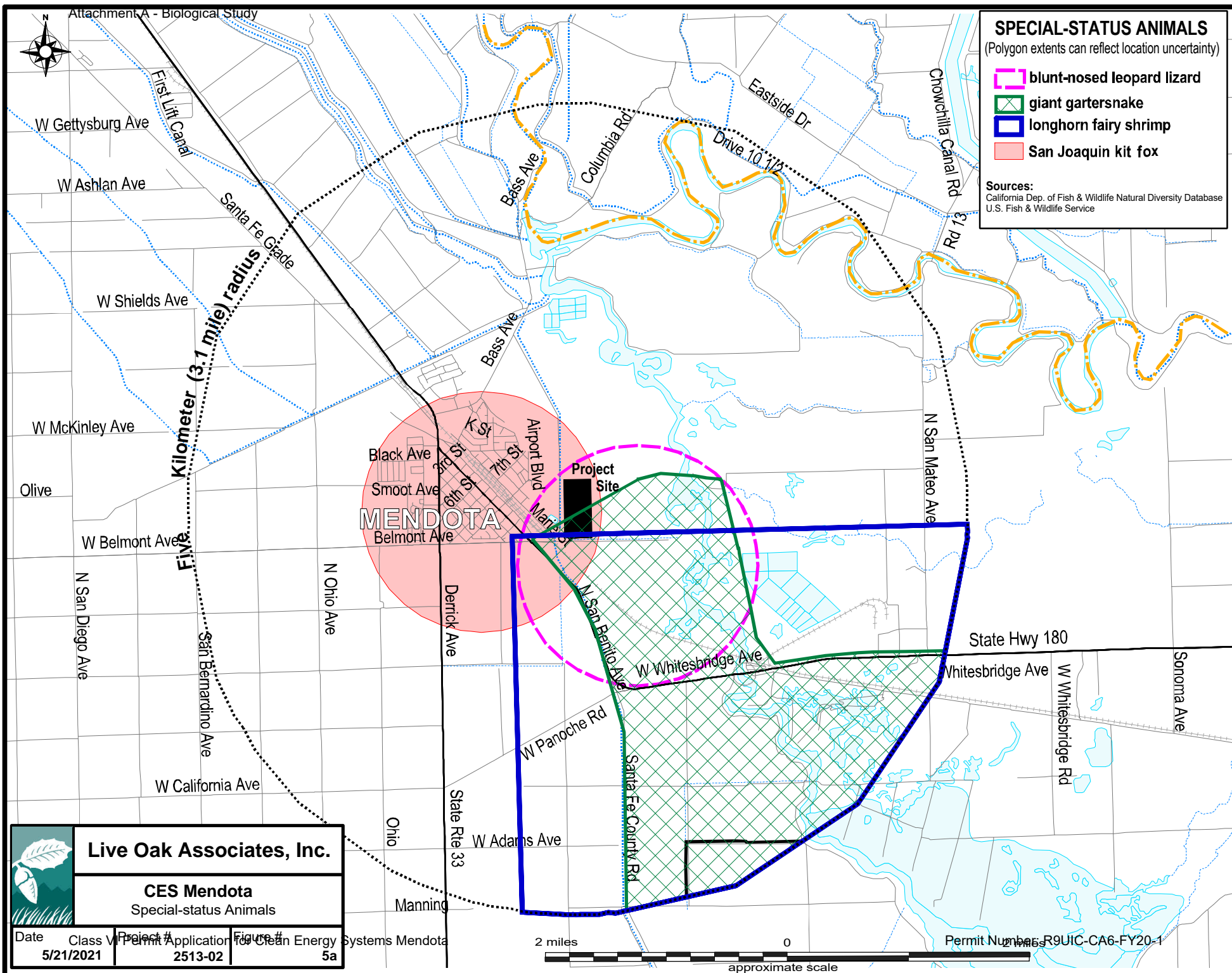
Two feral domestic dogs (*Canis familiaris*) were observed on the southern end of the grassland habitat foraging.

2.2 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and as the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.1, federal laws have provided the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and

protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as threatened or endangered under federal endangered species legislation. Others have been designated as “candidates” for such listing. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2020). Collectively, these plants and animals are referred to as “federally protected species.”


Several federally protected plant and animal species are documented as occurring, or as once occurring, in the vicinity of the study area. The locations of nearby sightings of federally protected species have been depicted in Figures 5a (Federally Protected Animals) and 5b (San Joaquin Kit Fox). The California Natural Diversity Database (CNDDB) was queried focusing on nine U.S.G.S. 7.5-minute quadrangles that surround the study area for special status plants and animals. The nine quadrangles queried include Mendota Dam (in which most of the site is located), Tranquility (in which the very southern portion of the site is located), Poso Farm, Firebaugh NE, Bonita Ranch, Firebaugh, Gravelly Ford, Coit Ranch, and Jamesan. The USFWS’s Information for Planning and Consultation (IPaC) website (<https://ecos.fws.gov/ipac/>) was also queried focusing on the project site and the vicinity of the site; the output of this query is included as Appendix C. These species, and their potential to occur in the study area, are listed in Tables 2 and 3 on the following pages. Sources of information for this table included the *California Natural Diversity Data Base* (CDFW 2020), *Endangered and Threatened Wildlife and Plants* (USFWS 2020), IPaC (USFWS 2020), and *The California Native Plant Society’s Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2020).



SPECIAL-STATUS ANIMALS
(Polygon extents can reflect location uncertainty)

- blunt-nosed leopard lizard
- giant gartersnake
- longhorn fairy shrimp
- San Joaquin kit fox

Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service



Live Oak Associates, Inc.

CES Mendota

Special-status Animals

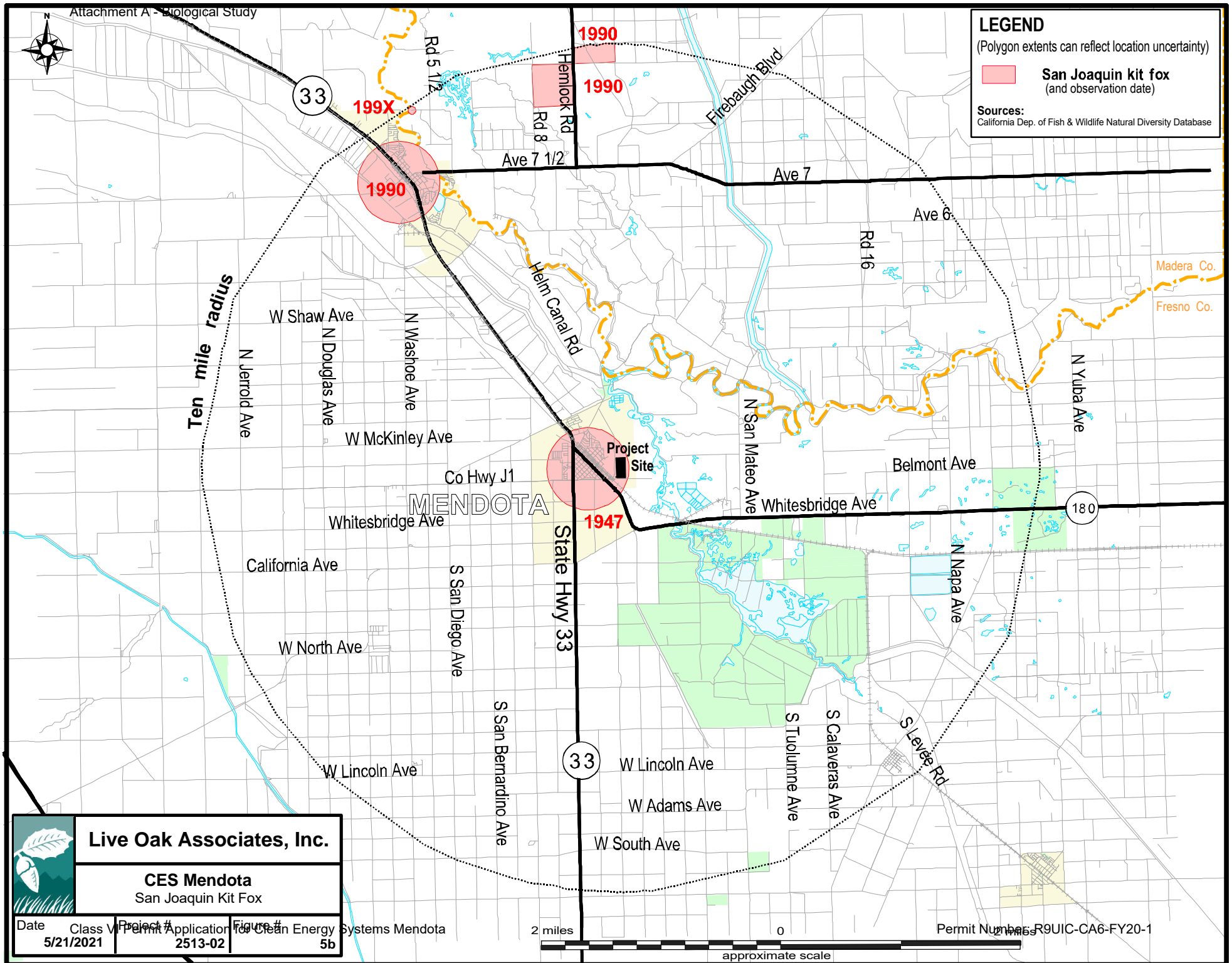
Date **5/21/2021**

Class **VI**

Project # **2513-02**

Permit Application for Clean Energy Systems Mendota

Figure # **5a**



CES Mendota
San Joaquin Kit Fox

Date	Class	Project #	Figure #
5/21/2021		2513-02	5b

Permit Number: R9UIC-CA6-FY20-1

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

PLANTS (adapted from USFWS 2020, CDFW 2020, and CNPS 2020)			
Plant Species Listed as Threatened or Endangered under the Federal Endangered Species Act			
Species	Status	Habitat	Occurrence in the Study Area*
Palmate-bracted bird's-beak <i>Chloropyron palmatum</i>	FE	<u>Habitat</u> : Alkaline soils within chenopod scrub and valley and foothill grasslands. <u>Elevation</u> : 5-155 meters. <u>Blooms</u> : Annual herb (hemiparasitic); May – October.	Unlikely. Although alkaline soils are present on the site, the site has been highly disturbed by vehicles and fuel staging, and there have been no observations of this species recorded within a three-mile radius.
San Joaquin woollythreads <i>Monolopia congdonii</i>	FE	<u>Habitat</u> : Sandy soils within chenopod scrub and valley and foothill grasslands. <u>Elevation</u> : 60-800 meters. <u>Blooms</u> : Annual herb; (January) February-May.	Unlikely. Although the site may have historically provided habitat for this species, the site has been highly disturbed by vehicles and fuel staging, and there have been no observations of this species recorded within a three-mile radius.

TABLE 3. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

ANIMALS (adapted from CDFW 2020 and USFWS 2020)			
Animal Species Listed as Threatened or Endangered under the Federal Endangered Species Act			
Species	Status	Habitat	Occurrence in the Study Area*
Longhorn fairy shrimp (LHFS) <i>Branchinecta longiantenna</i>	FE	Occurs in ephemeral wetlands and vernal pools of California.	Absent. Although the site is within the proximity polygon of the LHFS, suitable habitat for this species in the form of vernal pools is absent from the project area. The nearest recorded observation of LHFS is less than 0.5 miles to the southeast of the site.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	Lives in mature elderberry shrubs of California's Central Valley and Sierra Foothills.	Absent. There are no elderberry shrubs onsite. Therefore, this species would not occur on the site.
California tiger salamander <i>Ambystoma californiense</i>	FT	Breeds in stagnant pools with continuous inundation for a minimum of three months, which may include vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	Absent. No historic or current records of this species are known within the vicinity of the site, additionally, the site itself does not support suitable habitat for this species due to the highly disturbed nature of the site as well as the vicinity of the site.
Red-legged frog <i>Rana draytonii</i>	FT	Dense, shrubby riparian vegetation such as arroyo willow, cattails, and bulrushes with still or slow-moving water. Perennial streams or ponds are preferred, and a salinity of no more than 4.5o/o.	Absent. No historic or current records of this species are known within the vicinity of the site, additionally, the site itself does not support suitable habitat for this species due to the highly disturbed nature of the site as well as the vicinity of the site.

TABLE 3. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

ANIMALS (adapted from CDFW 2020 and USFWS 2020)

Animal Species Listed as Threatened or Endangered under the Federal Endangered Species Act

Species	Status	Habitat	Occurrence in the Study Area*
Blunt-nosed leopard lizard <i>Gambelia silas</i>	FE	Frequents grasslands, alkali meadows and chenopod scrub of the San Joaquin Valley from Merced south to Kern Co.	Absent. Although the site is within the proximity polygon centered approximately 0.5 miles to the south of the study area, the site itself does not support suitable habitat for this species due to the highly disturbed nature of the site as well as the vicinity of the site.
Giant garter snake <i>Thamnophis gigas</i>	FT	Found in freshwater marsh and low gradient streams. This species utilizes uplands for refuge and cover from floods during the snake's dormant season (winter) (USFWS 2008)	Unlikely. Although the proximity polygon for this species includes the southern portion of the site, the nearest suitable habitat is more than 0.5 mile to the southeast, a distance this species is not known to commonly travel from suitable habitat. The nearest documented occurrence is less than half a mile south of the study area by Highway 180.
Western yellow billed cuckoo <i>Coccyzus americanus occidentalis</i>	FT	Nests in dense riparian forests. Inhabits broad, lower flood bottoms of larger river systems.	Absent. Suitable habitat is absent from the site. This species has not been observed in the area since 1950. It may be extirpated from the region.
Least Bell's vireo <i>Empidonax traillii</i>	FE	Breeds in willow thickets found in montane meadows of the Sierra Nevada.	Absent. Suitable habitat is absent from the site.
Fresno kangaroo rat <i>Dipodomys nitrtoides exilis</i>	FE	Frequent alkali scrub and herbaceous habitats with scattered shrubs in the southwestern San Joaquin Valley	Absent. Suitable habitat is absent from the project site and the immediate surrounding properties.
San Joaquin kit fox (SJKF) <i>Vulpes macrotis mutica</i>	FE	Frequents desert alkali scrub, annual grasslands and may forage in adjacent agricultural habitats.	Unlikely. The project site supports areas with rodent burrows and possible coyote dens and provides moderately suitable habitat for the SJKF. Four recorded observations of the SJKF exist in the CNDDb: one record from 1947 has a proximity polygon centered in the City of Mendota with the site occurring within the proximity polygon. This record was of a male SJKF which was collected Mendota Dam more than 1.5 miles to the north of the site. The other three records are from 1990 and are nearly 10 miles to the north of the site (CDFW 2020). Due to the lack of recent recorded observations of this species in the project vicinity and due to the quality of habitat onsite and in the vicinity of the site, this species' potential to occur onsite is limited to

TABLE 3. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY

ANIMALS (adapted from CDFW 2020 and USFWS 2020)			
Animal Species Listed as Threatened or Endangered under the Federal Endangered Species Act			
Species	Status	Habitat	Occurrence in the Study Area*
			errant dispersing individuals.

*Present: Species observed on the site at time of field surveys or during recent past.

Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.

Possible: Species not observed on the site, but it could occur there from time to time.

Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient

Absent: Species not observed on the site and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE	Federally Endangered
FT	Federally Threatened
FPE	Federally Endangered (Proposed)
FC	Federal Candidate

2.2 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE).

No natural channels or wetlands appear to be present on the site based on the reconnaissance site visit of December 30, 2020. Historical Google Earth imagery was reviewed dating from 2018 (the most current aerial available) to 1998. None of the aerial imagery appear to indicate wetland signatures, although a small area of the site appears to be ponded in the 2017 aerial (the entire adjacent parcel to the east appears to be flooded on the same aerial).

There are two manmade evaporation ponds, two manmade stormwater detention basins, and two manmade linear depressions that occur on the site. None of these features appears to support wetland vegetation, and, in fact, with the exception of the two evaporation ponds, the features were completely dry and appeared to support vegetation undifferentiated from the upland ruderal grasslands of the site.

The National Wetland Inventory (NWI) was reviewed as part of the background review. It identifies the very southernmost area of the site as “Freshwater Emergent Wetland”; however,

it was confirmed during the site survey that this area of the site does not support wetlands and it appears that the designation may be for the area to the south of the site. No other areas of the site are indicated as supporting wetlands on the NWI.

3 IMPACTS AND MITIGATIONS

As noted in Section 1.0 of this report federally protected plants and animals, animal movement corridors, wetlands and other sensitive habitats are all biotic resource issues that may affect the use of private and public lands. The discussion below addresses possible constraints to the use of the subject parcel that would be associated with federally protected sensitive biological resources occurring on the site or on adjoining lands. This discussion recognizes that not all possible impacts from various forms of site use would be significant. This discussion therefore establishes the criteria by which significance is determined. The discussion also examines federal laws that may affect how sensitive habitats are developed.

3.1 RELEVANT GOALS, POLICIES, AND LAWS

3.1.1 Threatened and Endangered Species

Federal “endangered species” legislation has provided the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the federal endangered species act, candidate species for such listing, and some plants listed as endangered by the California Native Plant Society are collectively referred to as “federally protected species.” Permits may be required from the USFWS if activities associated with a proposed project will result in the “take” of a federally listed species. “Take” is defined by the federal Endangered Species Act to include “harm” (16 USC, Section 1532(19), 50 CFR, Section 17.3). The USFWS is the responding agency under the National Environmental Policy Act (NEPA). This federal agency reviews NEPA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

3.1.2 Migratory Birds

Federal law also protects most bird species. The federal Migratory Bird Treaty Act (MBTA: 16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. This act applies to all native

birds in the United States except upland game birds such as quail, grouse, and pheasants. Project implementation disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort would be considered a significant effect.

3.1.3 Federally Protected Wetlands and Other “Jurisdictional Waters”

Jurisdictional waters include waters of the United States subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE).

Clean Water Act, Section 404. The USACE regulates the filling or grading of Waters of the U.S. under the authority of Section 404 of the Clean Water Act. Drainage channels and adjacent wetlands may be considered “waters of the United States” or “jurisdictional waters” subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations and clarified in federal courts.

The definition of waters of the U.S. have changed several times in recent years. In January 2020, the Environmental Protection Agency (EPA) and USACE jointly issued the Navigable Waters Protection Rule. The new rule was published in the Federal Register on April 21, 2020, and took effect on June 22, 2020.

The Navigable Waters Protection Rule (33 CFR §328.3(a)) defines waters of the U.S. as:

Territorial Seas and Traditional Navigable Waters (TNWs)

- The territorial seas and traditional navigable waters include large rivers and lakes and tidally influenced waterbodies used in interstate or foreign commerce.

Tributaries

- Tributaries include perennial and intermittent rivers and streams that contribute surface flow to traditional navigable waters in a typical year. These naturally occurring surface water channels must flow more often than just after a single precipitation event—that is, tributaries must be perennial or intermittent.
- Tributaries can connect to a traditional navigable water or territorial sea in a typical year either directly or through other “waters of the United States,”

through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).

- Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition, and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a traditional navigable water in a typical year.

Lakes, Ponds, and Impoundments of Jurisdictional Waters

- Lakes, ponds, and impoundments of jurisdictional waters are jurisdictional where they contribute surface water flow to a traditional navigable water or territorial sea in a typical year either directly or through other waters of the United States, through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).
- Lakes, ponds, and impoundments of jurisdictional waters are also jurisdictional where they are flooded by a water of the United States in a typical year, such as certain oxbow lakes that lie along the Mississippi River.

Adjacent Wetlands

- Wetlands that physically touch other jurisdictional waters are “adjacent wetlands.”
- Wetlands separated from a water of the United States by only a natural berm, bank or dune are also “adjacent.”
- Wetlands inundated by flooding from a water of the United States in a typical year are “adjacent.”
- Wetlands that are physically separated from a jurisdictional water by an artificial dike, barrier, or similar artificial structure are “adjacent” so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature.
- An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The Navigable Waters Protection Rule also outlines what do not constitute waters of the United States. The following waters/features are not jurisdictional under the rule:

- Waterbodies that are not included in the four categories of waters of the United States listed above.

- Groundwater, including groundwater drained through subsurface drainage systems, such as drains in agricultural lands.
- Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools.
- Diffuse stormwater run-off and directional sheet flow over upland.
- Many farm and roadside ditches.

Prior converted cropland retains its longstanding exclusion but is defined for the first time in the final rule. The agencies are clarifying that this exclusion will cease to apply when cropland is abandoned (i.e., not used for, or in support of, agricultural purposes in the immediately preceding five years) and has reverted to wetlands.

- Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease.
- Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters.
- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel.
- Stormwater control features excavated or constructed in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off.
- Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention and infiltration basins and ponds, that are constructed in upland or in non-jurisdictional waters.
- Waste treatment systems have been excluded from the definition of waters of the United States since 1979 and will continue to be excluded under the final rule. Waste treatment systems include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove

pollutants, either actively or passively, from wastewater or stormwater prior to discharge (or eliminating any such discharge).

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE under Section 404 of the Clean Water Act. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued without a CWA Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards (Section 3.6.2).

Clean Water Act, Section 401. There are nine Regional Water Quality Control Boards statewide; collectively, they oversee regional and local water quality in California. The RWQCB administers Section 401 of the Clean Water Act

Pursuant to Section 401 of the Clean Water Act, the RWQCB regulates waters of the State that are also waters of the U.S. Discharges into such waters require a Section 401 Water Quality Certification from the RWQCB as a condition to obtaining certain federal permits, such as a Clean Water Act Section 404 permit (Section 3.6.1).

The RWQCB also administers the Construction Stormwater Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Stormwater Program. A prerequisite for this permit is the development of a Stormwater Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, stormwater, or other pollutants into a Water of the U.S. may require a NPDES permit.

3.2 ENVIRONMENTAL IMPACTS AND MITIGATIONS

The CES Mendota Biomass Power Plant project could result in impacts to approximately 71 acres of land supporting developed and highly disturbed annual grassland habitat. Less than significant and potentially significant impacts from the proposed project are discussed below.

Less-Than-Significant Potential Impacts of the Project

3.2.1 Potential Project Impacts to Federally Protected Plant Species

Impact. Two special status plants (Table 2) are considered unlikely to occur on the site as the site may historically have provided suitable habitat due to the presence of suitable soils and habitats, but they are considered unlikely to occur on the site due to development and ongoing significant disturbance. Therefore, the project is expected to have no effect on regional populations of any federally protected plant species.

Mitigation. No mitigation measures are required.

3.2.2 Potential Project Impacts to Special Status Animal Species from Habitat Modification

Impact. Seven federally protected animals are known to occur, or to once have occurred, in the general project vicinity (Table 3). Because the site has been significantly disturbed by the past power plant development/operation and fuel staging, as well as by current maintenance activities which include occasional discing for fire suppression, the value for federally protected animals is not substantial.

Species Absent from the Site, or Unlikely to Occur on the Site

Seven federally protected animal species potentially occurring within the general project vicinity would not occur in the study area or be unlikely to occur there due to the absence of suitable habitat or the absence of any field evidence of their presence (Table 3). These species include the longhorn fairy shrimp, Valley elderberry longhorn beetle, blunt-nosed leopard lizard, giant garter snake, least Bell's vireo, Fresno kangaroo rat, and San Joaquin kit fox. Therefore, habitat modification or disturbance associated with the project would have no effect on regionally available habitat used by these latter special status species.

Mitigation. Mitigation measures would not be warranted for impacts to habitat for these species.

However, *see Section 3.3.7* with regard to potentially significant impacts to individual San Joaquin kit foxes, below.

3.2.3 Potential Impacts to Riparian Habitats and Other Sensitive Natural Communities, Including Federally Protected Wetlands

Impact. Hydrological features present on the site are limited to manmade evaporation ponds and stormwater detention basins which support either no vegetation or vegetation similar to the upland non-native grasslands of the site. No natural wetlands or other natural hydrological features appear to be present on the site.

Additionally, the manmade features of the site are unlikely to be considered jurisdictional waters of the U.S. or state by the U.S. Army Corps of Engineers (USACE), as they are features that have been constructed in upland areas, are regularly maintained, and support no wetland vegetation.

Mitigation. No mitigation measures are warranted.

3.2.4 Project Impact to the Movements of Migratory Fish or Wildlife Species

Impact. The site does not appear to function as a corridor for regional seasonal movements of wildlife species. The site is just outside of Mendota, therefore, wildlife would not likely be moving into Mendota. The waterway to the east of the site is a more likely path wildlife would take to move through the valley. Additionally, the site is not within a regionally known wildlife corridor. The project would have little effect on such regional movements. Therefore, this project will result in a less than significant effect on regional wildlife movements.

Mitigation. No mitigation measures are warranted.

3.2.5 Project Impact to Fish and Wildlife Habitat

Impact. The highly disturbed nature of the site does not provide habitat of intrinsic value to fish or wildlife. Most wildlife species currently using the site will still be able to use the project vicinity after project construction. Therefore, the proposed project will result in a less than significant effect on fish and wildlife habitat.

Mitigation. No mitigation measures are warranted.

3.2.6 Degradation of Water Quality in Seasonal Creeks, Reservoirs and Downstream Waters

Impact. Potential grading resulting from project plans often leaves the soils of project footprint barren of vegetation and, therefore vulnerable to erosion. Eroded soil can be carried as sediment in seasonal creeks to be deposited in creek beds and adjacent wetlands. However, the study area is nearly level and onsite soils are not erodible. Therefore, the potential for erosion and the degradation of water quality in local waters is negligible.

Mitigation. Measures to mitigate impacts to water quality in local waters from erosion would not be necessary, especially if project implementation occurs during the dry season (summer and early fall). However, the applicant should be aware that projects involving the grading of large tracts of land must be in compliance with provisions of a general construction permit (a type of an NPDES permit) that is available from the Regional Water Quality Board (RWQCB).

Potentially Significant Project Impacts

3.2.7 Potential Impact to Individual Federally Protected Animals

No federally protected species, nor evidence of their presence were observed during the December 30, 2020, survey. Nonetheless, one species, the San Joaquin kit fox, has the potential to use the site for foraging or denning habitat. The San Joaquin kit fox is unlikely to occur on the site given the lack of any recent sighting within 10 miles of the project site. While noted above, the loss of foraging or denning habitat would be considered a less-than-significant impact of the project, should individuals' den on the site at the time of project construction, such activities could result in injury or mortality to individual San Joaquin kit foxes, and this would be a violation of federal laws, and may be considered a significant impact of the project. Potential project impacts to the San Joaquin kit fox as a result of project construction are discussed below.

San Joaquin Kit Fox

Impact. It is unlikely for a San Joaquin kit fox to move onto to the site prior to construction given the lack of recent sightings within 10 miles of the site (CDFW 2020). Nonetheless, an errant kit fox could pass through the site and/or establish a den within one of the existing

ground squirrel burrows. While in the unlikely event that a kit fox moved onto the site prior to project construction, project related activities could cause harm or injury to a kit fox. This would be considered a potentially significant impact. The following mitigation measures have been designed to reduce this impact to a less than significant level.

Mitigation. To reduce the likelihood of mortality to the San Joaquin kit fox, the following measures will be implemented prior to the onset of project implementation.

- *Pre-construction surveys:* Preconstruction surveys shall be conducted concurrently with burrowing owl surveys for the site.
 - If no active fox den is detected, no further action is needed.
 - If an active kit fox den is detected within or immediately adjacent to the area of work, the USFWS and CDFW shall be contacted immediately to determine the best course of action.
- *Minimization Measures* Permanent and temporary construction activities and other types of project-related activities should be carried out in a manner that minimizes disturbance to kit foxes, should their presence be detected on the site during preconstruction surveys or during construction of the project. Minimization measures include but are not limited to: restriction of project-related vehicle traffic to established roads, construction areas, and other designated areas; inspection and covering of structures (e.g., pipes), as well as installation of escape structures, to prevent the inadvertent entrapment of kit foxes; restriction of rodenticide and herbicide use; and proper disposal of food items and trash.
- *USFWS Notification:* The Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in case of the accidental death or injury to a San Joaquin kit fox during project-related activities. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and any other pertinent information.

Implementation of these measures would minimize potential impacts to kit fox to a less than significant level.

Maintenance and Operations

Although not required by the USFWS or EPA, the project plans to prepare a maintenance and operations manual which will include wildlife checks and phone numbers to call should any wildlife-related questions or issues arise. This manual is expected to be used prior to vegetation management, if staff have wildlife-related questions, or if other wildlife-related issues come up.

3.2.8 Project-related Mortality (Take) of Raptors and Other Migratory Bird Species

Impact. Suitable habitat for nesting raptors and migratory birds exist on the site, including a known red-tailed hawk nest and the potential for barn owls and great-horned owls to nest within the structures onsite. Migratory birds may also nest throughout the more natural areas of the site. Therefore, the project may result in the mortality of nesting raptors and other migratory bird species not afforded special status. The following mitigation measures have been designed to reduce this impact to a less than significant level.

Mitigation. The below measures will ensure nesting raptors and migratory birds are not impacted by the project.

- *Preconstruction Survey:* A qualified biologist will conduct a preconstruction survey for nesting raptors and migratory birds should the project begin within nesting season (February-August), additionally, as an active red-tailed hawk nest was observed during the site visit on December 30, 2020, this area should be surveyed for activity of this nest prior to any work should work begin December-August.
 - *No active nests:* If no active nests of a raptor or migratory bird are detected during preconstruction surveys then no further action is warranted.
 - *Buffers:* Should an active nest be observed during preconstruction surveys, the project biologist will establish a suitable construction-free buffer from the active nest which will remain in place until the project biologist has determined the young have fledged from the nest and are independent.

Additionally, species-specific measures for Swainson's hawks and burrowing owls are provided below which will ensure these species of nesting raptors and migratory birds are not impacted by the project.

Swainson's Hawk

Impact. Although suitable nesting habitat is absent from the site, and from the agricultural fields to the east, solar field to the north and the airport/warehouses to the west, potentially suitable nest trees exist in the five pine trees along the site's southern border. The project may disturb and active Swainson's hawk nest if a Swainson's hawk were to nest in one of these trees prior to construction. The nearest recorded observation of this species is from 2017 and is approximately 1,000 feet to the southwest of the site in the City of Mendota; additionally, LOA biologists have recently observed Swainson's hawks nesting east of Mendota Dam, which is approximately 1.5 miles to the north of the site. If an active Swainson's hawk nest (March through August) were to occur in any of these five trees prior to construction, the proximity of constructing the project could cause nest abandonment and/or harm to any fledglings which would violate the California Fish and Wildlife (CDFW) Code that protects raptors (hawks and owls) and federal law which protects active raptor nests. Thus, any project-related activity that caused nest abandonment or harm (e.g., harm or mortality) to adult Swainson's hawks or their eggs and young, would constitute a violation of both state and federal law. The occurrence of an active Swainson's hawk nest along the project's southern boundary prior to construction would constitute a potentially significant impact. The following mitigation measures have been designed to reduce this impact to a less than significant level.

Mitigation. The project could potentially result in the harm or mortality of nesting Swainson's hawks if this species is present during project implementation.

- *Avoidance:* If feasible, construction should take place during the time span of September 1 through February 28 to remain outside of Swainson's hawk nesting season (March 1 through August 31).
- *Preconstruction Survey:* During the nesting season (March 1 through August 31), prior to the commencement of any construction-related activity on the project site or off-site improvements, adequate preconstruction surveys shall be conducted on the project site and accessible adjacent lands within 0.5 mile of the site and off-site improvements to identify any active Swainson's hawk nests that may be present. These surveys shall conform

to the requirements of CDFW as presented in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley, Swainson's Hawk Technical Advisory Committee, May 31, 2000. If no nesting pairs are found on or within the vicinity of the project site or off-site improvement areas, no further action is warranted.

- *Construction-free Buffers:* Should a Swainson's hawk nest become active on or near the project site or off-site improvement area during construction, or if construction begins within the nesting season after a Swainson's hawk nest has already been established, a construction-free buffer shall be established. A minimum buffer distance of 600 feet shall be established for a nest that is already active prior to construction, and a minimum buffer distance of 150 feet shall be used for a nest that starts after construction has already initiated. These minimum distances are based on potential impact distances stated in the Swainson's Hawk Technical Advisory Committee's Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (2000). Appropriate buffer distances shall be determined on the ground by a qualified biologist and shall be based on actual observations of the nest and parent behavior, the stage of nesting, and level of potential disturbance. This buffer shall be identified on the ground with flagging or fencing and shall be maintained until a qualified biologist has determined that the young have fledged, and the nest is inactive. The biologist shall have the authority to stop construction if construction activities are likely to result in nest abandonment.

Implementation of all the measures above will mitigate impacts to Swainson's hawks to a less-than-significant level.

Western Burrowing Owl

Impact. No burrowing owls nor evidence of their presence were detected during the December 30, 2020, survey. However, scattered populations of California ground squirrels and other fossorial animals have created potential onsite burrow habitat for the burrowing owl. The project implementation during the nesting season (February through August) could result in the destruction of any nests and nestlings that may be present. Project implementation during the remainder of the year could result in mortality to resident owls located deep in their burrows.

Provisions of the California Fish and Wildlife (CDFW) Code protect raptors (hawks and owls) and active raptor nests. Project-related harm or mortality to the burrowing owl would constitute a violation of both state and federal law that would be considered a potentially significant impact to burrowing owls. The following mitigation measures have been designed to reduce this impact to a less than significant level.

Mitigation. The project could potentially result in the harm or mortality of the western burrowing owl if this species is present during project implementation.

- *Pre-construction surveys:* Pre-construction surveys will be conducted by a qualified biologist for burrowing owls within 14 days prior to the onset of construction with a follow-up survey within 24 hours prior to the onset of construction. This survey will be conducted according to methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012).
- *No Active Nests:* If no active burrowing owl nests are detected then no further action is warranted.
- *Avoidance of Active Nest Burrows:* If active nest burrows are located within the project site or adjacent to the project site, including any proposed placement of staging equipment during pre-construction surveys, a qualified biologist will place an appropriate construction-free buffer around the located nests, which will remain off-limits to construction until the breeding season is over or until the project biologist confirms the young have fledged and left the nest burrow.
- *Relocation:* During the non-breeding season (August through January), resident owls may be passively relocated. The relocation of resident owls must be according to a relocation plan prepared by a qualified biologist in consultation with the California Department of Fish and Wildlife.

Implementation of all the measures above will mitigate impacts to burrowing owls to a less-than-significant level.

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APPENDIX A: TERRESTRIAL VERTEBRATE SPECIES POTENTIALLY OCCURING ON THE PROJECT AREA

The species listed below are those, which may reasonably be expected to use the habitats of the study area. The list was not intended to include birds which are vagrants or occasional transients. Its purpose was rather to include those species that may be expected to routinely and predictably use the project area during some or all of the year. Species observed during December 30, 2020, are marked with an asterisk.

CLASS: AMPHIBIA (Amphibians)

ORDER: SALIENTIA (Frogs and Toads)

FAMILY: BUFONIDAE (True Toads)

Western Toad (*Bufo boreas*)

FAMILY: HYLIDAE (Treefrogs and relatives)

Pacific Treefrog (*Pseudacris regilla*)

FAMILY: RANIDAE (True Frogs)

Bullfrog (*Rana catesbeiana*)

CLASS: REPTILIA (Reptiles)

ORDER: SQUAMATA (Lizards and Snakes)

SUBORDER: SAURIA (Lizards)

FAMILY: IGUANIDAE (Iguanids)

Western Fence Lizard (*Sceloporus occidentalis*)

Side-blotched Lizard (*Uta stansburiana*)

FAMILY: TEIIDAE (Whiptails and relatives)

Western Whiptail (*Cnemidophorus tigris*)

FAMILY: ANGUIDAE (Alligator Lizards and relatives)

Southern Alligator Lizard (*Gerrhonotus multicarinatus*)

SUBORDER: SERPENTES (Snakes)

FAMILY: COLUBRIDAE (Colubrids)

Racer (*Coluber constrictor*)

Coachwhip (*Masticophis flagellum*)

Gopher Snake (*Pituophis melanoleucus*)

Common Kingsnake (*Lampropeltis getulus*)

FAMILY: VIPERIDAE (Vipers)

Western Rattlesnake (*Crotalus viridis*)

CLASS: AVES (Birds)

ORDER: PELICANIFORMES (Pelicans, Cormorants, Ibises, Egrets, Boobys).

FAMILY: ARDEIDAE (Herons and Bitterns)

Great Blue Heron (*Ardea herodias*)

Great Egret (*Casmerodius albus*)

FAMILY: THRESKIORNITHIDAE (Ibises and Roseate Spoonbills)

White-faced Ibis (*Plegadis chihi*)

ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)

FAMILY: CATHARTIDAE (American Vultures)

Turkey Vulture (*Cathartes aura*)

FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)

White-tailed Kite (*Elanus caeruleus*)
Northern Harrier (*Circus cyaneus*)
Sharp-shinned Hawk (*Accipiter striatus*)
Cooper's Hawk (*Accipiter cooperi*)
Swainson's Hawk (*Buteo swainsoni*)
*Red-tailed Hawk (*Buteo jamaicensis*)
Ferruginous Hawk (*Buteo regalis*)
Rough-legged Hawk (*Buteo lagopus*)
Golden Eagle (*Aquila chrysaetos*)

FAMILY: FALCONIDAE (Caracaras and Falcons)

American Kestrel (*Falco sparverius*)
Merlin (*Falco columbarius*)
Peregrine Falcon (*Falco peregrinus*)
Prairie Falcon (*Falco mexicanus*)

ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and relatives)

FAMILY: CHARADRIIDAE (Plovers and relatives)

Killdeer (*Charadrius vociferus*)

ORDER: COLUMBIFORMES (Pigeons and Doves)

FAMILY: COLUMBIDAE (Pigeons and Doves)

Rock Dove (*Columba livia*)
Mourning Dove (*Zenaida macroura*)

ORDER: STRIGIFORMES (Owls)

FAMILY: TYTONIDAE (Barn Owls)

*Common Barn Owl (*Tyto alba*)

FAMILY: STRIGIDAE (Typical Owls)

Western Screech Owl (*Otus kennicottii*)
Great Horned Owl (*Bubo virginianus*)
Short-eared Owl (*Asio flammeus*)

ORDER: CAPRIMULGIFORMES (Goatsuckers and relatives)

FAMILY: CAPRIMULGIDAE (Goatsuckers)

Common Poorwill (*Phalaenoptilus nuttalli*)

ORDER: APODIFORMES (Swifts and Hummingbirds)

FAMILY: TROCHILIDAE (Hummingbirds)

Black-chinned Hummingbird (*Archilochus alexandri*)
Anna's Hummingbird (*Calypte anna*)

ORDER: PICIFORMES (Woodpeckers and relatives)

FAMILY: PICIDAE (Woodpeckers and Wrynecks)

Downy Woodpecker (*Picoides pubescens*)
Northern Flicker (*Colaptes auratus*)

ORDER: PASSERIFORMES (Perching Birds)

FAMILY: TYRANNIDAE (Tyrant Flycatchers)

Black Phoebe (*Sayornis nigricans*)
Say's Phoebe (*Sayornis saya*)
Ash-throated Flycatcher (*Myiarchus cinerascens*)
Western Kingbird (*Tyrannus verticalis*)

FAMILY: ALAUDIDAE (Larks)

Horned Lark (*Eremophila alpestris*)

FAMILY: HIRUNDINIDAE (Swallows)

Tree Swallow (*Tachycineta bicolor*)

Violet-green Swallow (*Tachycineta thalassina*)

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)

Cliff Swallow (*Hirundo pyrrhonota*)

Barn Swallow (*Hirundo rustica*)

FAMILY: CORVIDAE (Jays, Magpies, and Crows)

Scrub Jay (*Aphelocoma coerulescens*)

American Crow (*Corvus brachyrhynchos*)

Common Raven (*Corvus corax*)

FAMILY: TROGLODYTIDAE (Wrens)

Bewick's Wren (*Thryomanes bewickii*)

House Wren (*Troglodytes aedon*)

**FAMILY: MUSCICAPIDAE (Old World Warblers, Gnatcatchers,
Kinglets, Thrushes, Bluebirds, and Wrentits)**

Western Bluebird (*Salia mexicana*)

FAMILY: MIMIDAE (Mockingbirds and Thrashers)

Northern Mockingbird (*Mimus polyglottos*)

FAMILY: MOTACILLIDAE (Wagtails and Pipits)

American Pipit (*Anthus rubescens*)

FAMILY: LANIIDAE (Shrikes)

Loggerhead Shrike (*Lanius ludovicianus*)

FAMILY: STURNIDAE (Starlings)

European Starling (*Sturnus vulgaris*)

**FAMILY: EMBERIZIDAE (Wood Warblers, Sparrows, Blackbirds,
and relatives)**

Vesper Sparrow (*Pooecetes gramineus*)

Savannah Sparrow (*Passerculus sandwichensis*)

Lark Sparrow (*Chondestes grammacus*)

Song Sparrow (*Melospiza melodia*)

Golden-crowned Sparrow (*Zonotrichia atricapilla*)

White-crowned Sparrow (*Zonotrichia leucophrys*)

Red-winged Blackbird (*Agelaius phoeniceus*)

Tricolored Blackbird (*Agelaius tricolor*)

Western Meadowlark (*Sturnella neglecta*)

Brewer's Blackbird (*Euphagus cyanocephalus*)

Brown-headed Cowbird (*Molothrus ater*)

FAMILY: FRINGILLIDAE (Finches)

House Finch (*Carpodacus mexicanus*)

Lesser Goldfinch (*Carduelis psaltria*)

American Goldfinch (*Carduelis tristis*)

FAMILY: PASSERIDAE (Old World Sparrows)

House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA (Mammals)

ORDER: MARSUPIALIA (Marsupials)

FAMILY: DIDELPHIDAE (Opossums)

Virginia Opossum (*Didelphis virginiana*)

ORDER: INSECTIVORA (Insectivores)

FAMILY: TALPIDAE (Moles)

Broad-footed Mole (*Scapanus latimanus*)

ORDER: CHIROPTERA (Bats)

FAMILY: VESPERTILIONIDAE (Evening Bats)

Western Red Bat (*Lasiurus blossevillei*)

California Myotis (*Myotis californicus*)

Western Pipistrelle (*Pipistrellus hesperus*)

Big Brown Bat (*Eptesicus fuscus*)

Pallid Bat (*Antrozous pallidus*)

FAMILY: MOLOSSIDAE (Free-tailed Bat)

Brazilian Free-tailed Bat (*Tadarida brasiliensis*)

California Mastiff Bat (*Eumops perotis* ssp. *californicus*)

ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)

FAMILY: LEPORIDAE (Rabbits and Hares)

*Desert Cottontail (*Sylvilagus audubonii*)

*Black-tailed (Hare) Jackrabbit (*Lepus californicus*)

ORDER: RODENTIA (Squirrels, Rats, Mice, and relatives)

FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)

*California Ground Squirrel (*Otospermophilus beecheyi*)

FAMILY: GEOMYIDAE (Pocket Gophers)

*Botta's Pocket Gopher (*Thomomys bottae*)

FAMILY: CRICETIDAE (Native Mice, Rats, and Voles)

House Mouse (*Mus musculus*)

Western Harvest Mouse (*Reithrodontomys megalotis*)

*Deer Mouse (*Peromyscus maniculatus*)

California Vole (*Microtus californicus*)

FAMILY: HETEROMYIDAE (Pocket Mice, Kangaroo Rats)

Little Pocket Mouse (*Perognathus longimembris*)

San Joaquin Pocket Mouse (*Perognathus inornatus*)

Heermann Kangaroo Rat (*Dipodomys heermanni*)

San Joaquin Kangaroo Rat (*Dipodomys nitratoides*)

FAMILY: MURIDAE (Old World Rats and Mice)

Norway Rat (*Rattus norvegicus*)

House Mouse (*Mus musculus*)

ORDER: CARNIVORA (Carnivores)

FAMILY: CANIDAE (Foxes, Wolves, and relatives)

Coyote (*Canis latrans*)

Gray Fox (*Urocyon cinereoargenteus*)

FAMILY: PROCYONIDAE (Raccoons and relatives)

Raccoon (*Procyon lotor*)

FAMILY: MUSTELIDAE (Weasels, Badgers, and relatives)

Long-tailed Weasel (*Mustela frenata*)

Badger (*Taxidea taxus*)

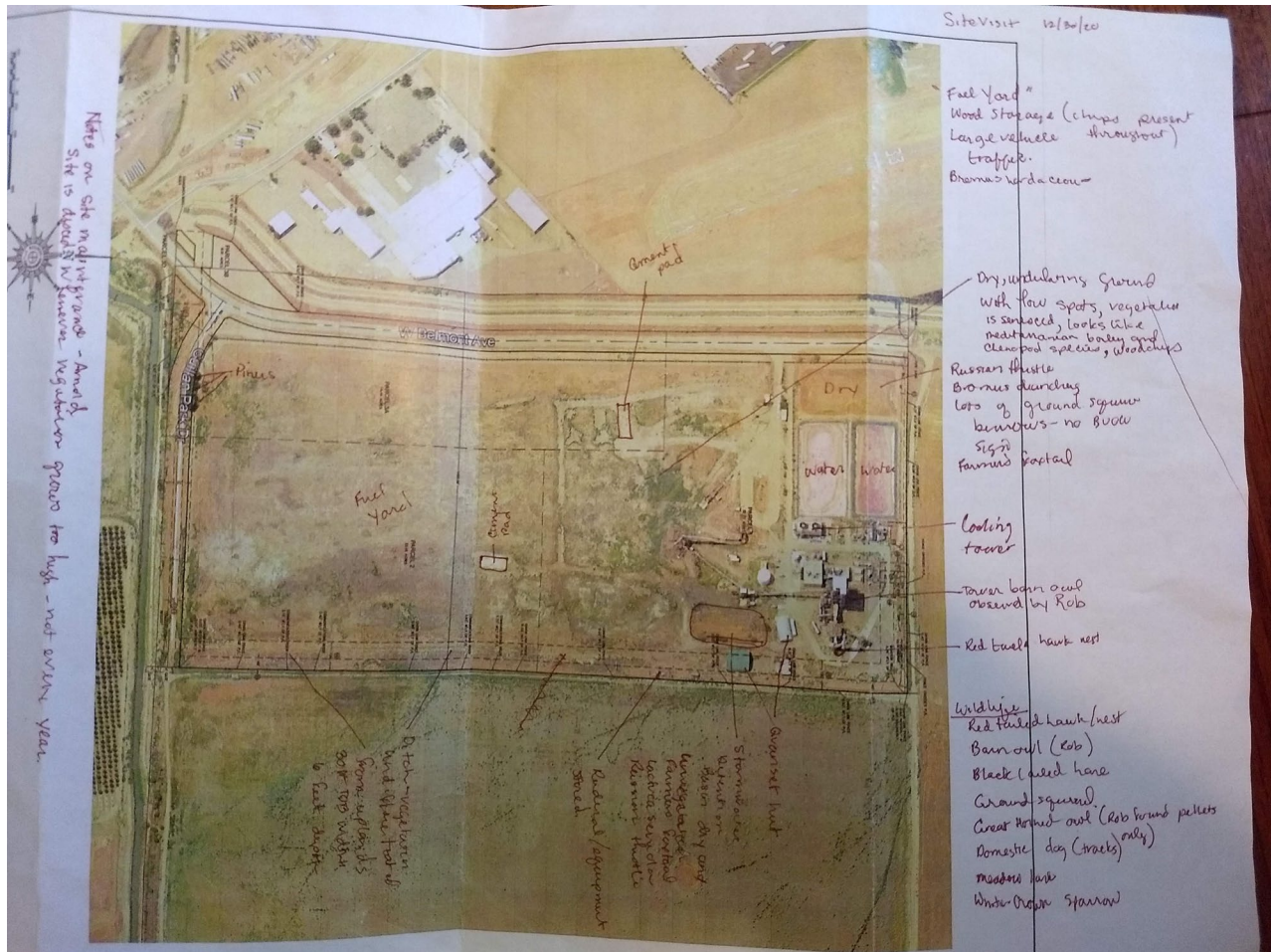
Striped Skunk (*Mephitis mephitis*)

FAMILY: FELIDAE (Cats)

Bobcat (*Lynx rufus*)

Domestic Cat (*Felis domesticus*)

APPENDIX B: FIELD NOTES



Field Data Form CES Mendota

Date: 20201230	Crew: R. Shields	Page: 1 of 1	Proj#: 2513-01
Vehicle/Miles: 244	Weather:	Start Time:	End Time:
Plant Species	Plants Cont'd	Birds	Herps
/		RTHA	
		BAND	
		HOLA	
		GHOW pellets	
		ROPI	
		WCSP	
		GCSP	
		TUVU	
		NOMD	
		SAVS	
		KILL	
		HOSP	
		HOPI	
		BLPH	
		WEME	
	YRWA		
		Mammals	
		CA Grnd Sg.	
		A. cottontail	
		Black-tailed Hare	
		Gopher sign	
		Domestic dogs (2)	
		Fly Over	
		LBCE	
		WFI	
		AWPE	

Notes: Observed Barn owl & Great-horned owl pellets in the main power plant. I flushed a barn owl. Observed a red-tailed hawk on a nest on the staircase/ladder of the tower next to the plant. With how she was protecting it, I suspect she had eggs on the nest. I found CA Grnd Squirrel burrows on the berm of a dry catchment pond just south of the power plant. One burrow appeared to have been predated by a canine. *I suggest BUOW surveys be done*. Pocket gopher burrows throughout disturbed area south of power plant. (2) German shepherds entered the project site at the southern end. Multiple hare & cottontail observed. No badger predation signs on burrows. No SWHA observed.

Site visit —

APPENDIX C: USFWS IPAC QUERY RESULT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Fresno County, California



Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📅 (916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [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.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

Attachment A - Biological Study

Fresno Kangaroo Rat *Dipodomys nitratoides exilis*

Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/5150>

San Joaquin Kit Fox *Vulpes macrotis mutica*

Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2873>

Birds

NAME

STATUS

Yellow-billed Cuckoo *Coccyzus americanus*

Threatened

There is **proposed** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/3911>

Reptiles

NAME

STATUS

Blunt-nosed Leopard Lizard *Gambelia silus*

Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/625>

Giant Garter Snake *Thamnophis gigas*

Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4482>

Amphibians

NAME

STATUS

California Red-legged Frog *Rana draytonii*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/2891>

California Tiger Salamander *Ambystoma californiense*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/2076>

Fishes

NAME

STATUS

Delta Smelt *Hypomesus transpacificus***Threatened**

There is **final** critical habitat for this species. Your location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/321>

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Palmate-bracted Bird's Beak <i>Cordylanthus palmatus</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1616	Endangered
San Joaquin Woolly-threads <i>Monolopia (=Lembertia) congdonii</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3746	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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.

Additional information can be found using the following links:

Class VI Permit Application for Clean Energy Systems Mendota

Permit Number: R9UIC-CA6-FY20-1

<https://ecos.fws.gov/ipac/location/DXF43RH27VHVVAWFHXHPOEICXFE/resources>

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Burrowing Owl *Athene cunicularia*

Breeds Mar 15 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
<https://ecos.fws.gov/ecp/species/9737>

Clark's Grebe *Aechmophorus clarkii*

Breeds Jan 1 to Dec 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Attachment A - Biological Study

Common Yellowthroat *Geothlypis trichas sinuosa*

Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/2084>

Lawrence's Goldfinch *Carduelis lawrencei*

Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9464>

Long-billed Curlew *Numenius americanus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/5511>

Marbled Godwit *Limosa fedoa*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9481>

Mountain Plover *Charadrius montanus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3638>

Nuttall's Woodpecker *Picoides nuttallii*

Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/9410>

Short-billed Dowitcher *Limnodromus griseus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9480>

Song Sparrow *Melospiza melodia*

Breeds Feb 20 to Sep 5

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee *Pipilo maculatus clementae*

Breeds Apr 15 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

<https://ecos.fws.gov/ecp/species/4243>

Attachment A - Biological Study

Tricolored Blackbird *Agelaius tricolor*

Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3910>

Whimbrel *Numenius phaeopus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9483>

Willet *Tringa semipalmata*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie *Pica nuttalli*

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9726>

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

Attachment A - Biological Study
presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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.

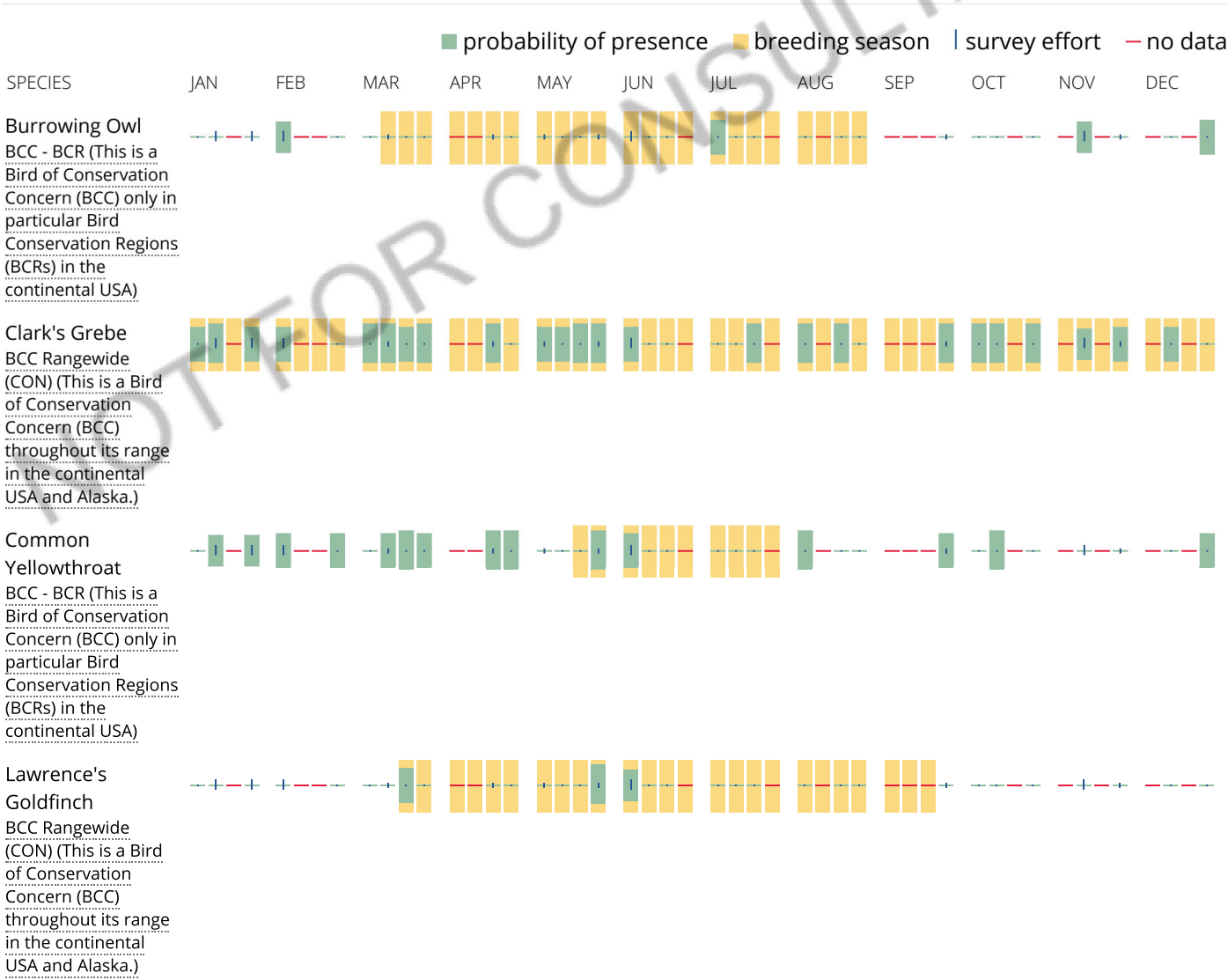
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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.







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](#) and/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 migratory birds potentially occurring 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 [AKN Phenology 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 how to interpret them, go to 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, migrating or present year-round in my project 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 refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). 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.

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.

Facilities

National Wildlife Refuge lands

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 AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1C](#)

[PEM1A](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSSA](#)

FRESHWATER POND

[PUBK](#)

[PUBF](#)

RIVERINE

[R2UBH](#)

[R5UBFx](#)

[R5UBF](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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**CLASS III INVENTORY/PHASE I SURVEY,
MENDOTA CARBON CAPTURE
AND STORAGE PROJECT,
FRESNO COUNTY, CALIFORNIA**

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MANAGEMENT SUMMARY

An intensive Class III cultural resources inventory/Phase I survey was conducted for the Mendota Carbon Capture and Storage Project (Project), Fresno County, California. The Project Area of Potential Effect (APE) is located in Sections 31 and 32, Township 13 South, Range 15 East, Mount Diablo Base and Meridian (MDBM) and totals approximately 71-acres (ac). ASM Affiliates, Inc., conducted this study, with David S. Whitley, Ph.D., RPA, serving as principal investigator. The study was undertaken to assist with compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the California Environmental Quality Act (CEQA).

A records search of site files and maps was conducted at the Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield. This investigation determined that one previous records search had covered the Project area of potential effect (APE), but the APE had not been surveyed. No previously recorded resources were known to exist within the APE. Six additional previous surveys had been conducted within 0.5-miles (mi) of the Project APE and one previously recorded resource (P-10-003930, a segment of the Biola Branch Extension Railroad) was known to exist within that same radius.

A search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was also completed. Based on the NAHC records, no sacred sites or traditional cultural places had been identified within or adjacent to the Project. Outreach letters were sent to tribal organizations on the NAHC contact-list with follow-up emails sent a month later. Only one response was received: Ron Goode, Chair, Northfork Mono responded that they did not have comments at that time but that they wished to be informed if any archaeological remains were encountered.

The Class III inventory/Phase I survey fieldwork was conducted with parallel transects spaced at 15-meter intervals walked across the APE. No cultural resources of any kind were discovered within the APE. Based on these results, the Mendota Carbon Capture and Storage Project does not have the potential to result in significant impacts or adverse effects to historical resources or historic properties. A determination of no effect/no historical resources impacted is recommended for this Project. It is further recommended that an archaeologist be contacted should an inadvertent discovery of cultural resources during the construction of this Project.

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1. INTRODUCTION AND REGULATORY CONTEXT

ASM Affiliates, Inc., was retained by the Clean Energy Systems, Inc. (CES) to conduct an intensive Class III inventory/Phase I cultural resources survey for the Mendota Carbon Capture and Storage Project. This is located in Sections 31 and 32, Township 13 South, Range 15 East, MDBM, in the City of Mendota, Fresno County, California (Figure 1). The study was undertaken to assist with compliance with Section 106 of the NHPA of 1966, as amended, and the CEQA. The investigation was conducted, specifically, to ensure that significant impacts or adverse effects to historical resources or historic properties do not occur as a result of project construction.

This current study included:

- A background records search and literature review to determine if any known cultural resources were present in the project zone and/or whether the area had been previously and systematically studied by archaeologists;
- An on-foot, intensive inventory of the APE to identify and record previously undiscovered cultural resources and to examine known sites; and
- A preliminary assessment of any such resources found within the subject property.

David S. Whitley, Ph.D., RPA, served as principal investigator and ASM Associate Archaeologist Robert Azpitarte, B.A., and Stacey Escamilla, B.A., conducted the fieldwork.

This document constitutes a report on the Class III inventory/Phase I survey. Subsequent chapters provide background to the investigation, including historic context studies; the findings of the archival records search; Native American consultation; a summary of the field surveying techniques employed; and the results of the fieldwork. We conclude with management recommendations for the APE.

1.1 PROJECT LOCATION

The Project is located on the open flats of the San Joaquin Valley on the eastern outskirts of the City of Mendota, primarily in Section 32, Township 13 South, Range 15 East, MDBM. A small portion is located in the southeast corner of Section 31, Township 13 South, Range 15 East, MDBM. Elevation within the Project area, which is flat, is approximately 155-feet (ft) above mean sea level (amsl). The Project consists of three parcels – Parcel 1, Parcel 2, and Parcel 3 – totaling approximately 71-ac. Parcel three is further subdivided into Parcels 3A, 3B, 3C, and 3D. Parcels 1, 2, and 3A are part of a contiguous block making up nearly 70 or the 71 total acres. The parcels are located north of Guillan Park Drive and east of Belmont Avenue. Parcels 3B and 3D are located on the west side of the T-intersection of Guillan Park Drive and Belmont Avenue, between Belmont Avenue and a canal. Parcel 3C is located south of the T-intersection of Guillan Park Drive and Belmont Avenue between the intersection and a canal.

1.2 PROJECT DESCRIPTION AND APE

CES proposes to build a novel biomass power plant on an idle biomass plant site within the City of Mendota. The plant will utilize advanced technology to intake woody or agricultural waste and gasify it to generate electricity with complete CO₂ capture and geological sequestration. Construction of the power plant will be on the 71-ac former Covanta biomass power plant which suspended operations in 2015. The proposed power generation facility will be similar to the previous plant with the exception of the addition of carbon capture and sequestration. It will involve the construction of a plant facility and an injection well for the geological sequestration. All ground surface disturbance, including construction work, staging and laydown areas, will be limited to the 71-ac plant site. Access will be provided by existing paved roads.

The horizontal APE for the Project, accordingly, is the 71-ac plant site. The vertical APE, consisting for the maximum depth of grading for plant foundations and infrastructure, is 10-feet.

1.3 REGULATORY CONTEXT

1.3.1 California Environmental Quality Act

CEQA is applicable to discretionary actions by state or local lead agencies. Under CEQA, lead agencies must analyze impacts to cultural resources. Significant impacts under CEQA occur when “historically significant” or “unique” cultural resources are adversely affected, which occurs when such resources could be altered or destroyed through project implementation. Historically significant cultural resources are defined by eligibility for or by listing in the California Register of Historical Resources (CRHR). In practice, the federal NRHP criteria (below) for significance applied under Section 106 are generally (although not entirely) consistent with CRHR criteria (see PRC § 5024.1, Title 14 CCR, Section 4852 and § 15064.5(a)(3)).

Significant cultural resources are those archaeological resources and historical properties that:

- (A) Are associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- (B) Are associated with the lives of persons important in our past;
- (C) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or
- (D) Have yielded, or may be likely to yield, information important in prehistory or history.

Unique resources under CEQA, in slight contrast, are those that represent:

An archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC § 21083.2(g)).

Preservation in place is the preferred approach under CEQA to mitigating adverse impacts to significant or unique cultural resources.

1.3.2 National Historic Preservation Act Section 106

NHPA Section 106 is applicable to federal undertakings, including projects financed or permitted by federal agencies regardless of whether the activities occur on federally managed or privately-owned land. Its purpose is to determine whether adverse effects will occur to significant cultural resources, defined as “historical properties” that are listed in or determined eligible for listing in the National Register of Historic Places (NRHP). The criteria for NRHP eligibility are defined at 36 CFR § 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

- (A) are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) are associated with the lives of persons significant in our past; or
- (C) embody the distinctive characteristics of a type, period, or method of construction, or that 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) have yielded or may be likely to yield, information important in prehistory or history.

There are, however, restrictions on the kinds of historical properties that can be NRHP listed. These have been identified by the Advisory Council on Historic Preservation (ACHP), as follows:

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- (a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

1. Introduction and Regulatory Context

- (b) A building or structure removed from its original location, but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.
- (d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- (e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- (f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- (g) A property achieving significance within the past 50 years if it is of exceptional importance. (<http://www.achp.gov/nrcriteria.html>)

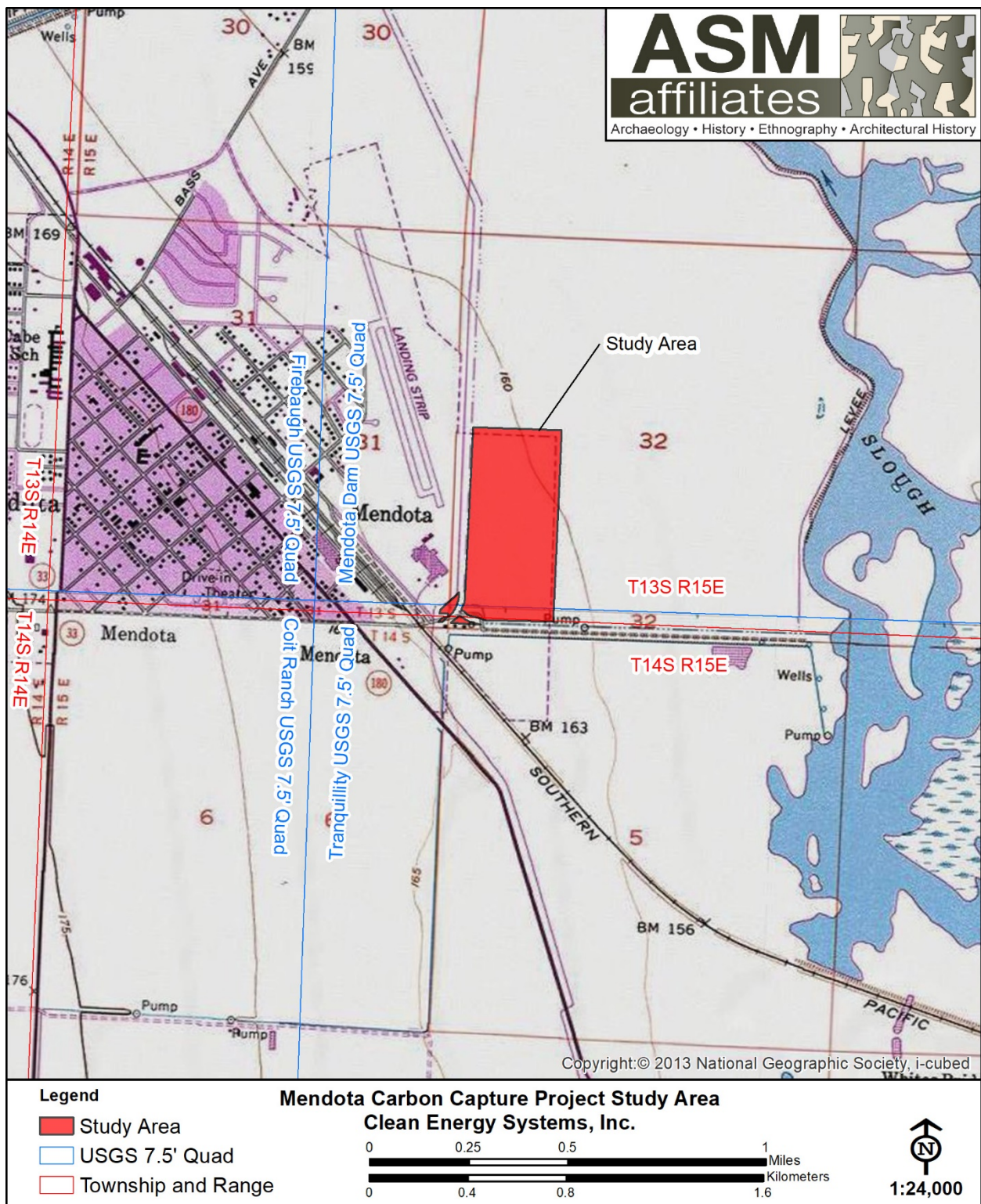


Figure 1. Location of the CES Carbon Capture and Storage Project, Mendota, Fresno County, California.

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2. ENVIRONMENTAL AND CULTURAL BACKGROUND

2.1 ENVIRONMENTAL BACKGROUND AND GEOARCHAEOLOGICAL SENSITIVITY

As noted above, the Project APE is located at approximately 155-ft amsl on the open flats of the San Joaquin Valley, roughly two-thirds of a mile west of the San Joaquin River. Prior to the appearance of agriculture, starting in the nineteenth century, this location would have been prairie grasslands, grading into riparian environments and marshlands further east towards the river, and south toward the Fresno Slough (Preston 1981). The study area and immediate surroundings have been urbanized and/or farmed and grazed for many years and no native vegetation is present. Perennial bunchgrasses such as purple needlegrass and nodding needlegrass most likely would have been the dominant plant cover in the study area prior to cultivation.

According to the geoarchaeological model developed by Meyer et al. (2010), the APE has a High potential for buried archaeological deposits. This regional model, however, does not consider previous disturbances to individual parcels. Given the previous development of the APE, the likelihood of intact subsurface archaeological remains is considered very low.

2.2 ETHNOGRAPHIC BACKGROUND

Penutian-speaking Yokuts tribal groups occupied the southern San Joaquin Valley region and much of the nearby Sierra Nevada. Ethnographic information about the Yokuts was collected primarily by Powers (1971, 1976 [originally 1877]), Kroeber (1925), Gayton (1930, 1948), Driver (1937), Latta (1977), and Harrington (n.d.). For a variety of historical reasons, existing research information emphasizes the central Yokuts tribes who occupied both the valley and particularly the foothills of the Sierra. The northernmost tribes suffered from the influx of Euro-Americans during the Gold Rush and their populations were in substantial decline by the time ethnographic studies began in the early twentieth century. In contrast, the southernmost tribes were partially removed by the Spanish to missions and eventually absorbed into multi-tribal communities on the Sebastian Indian Reservation (on Tejon Ranch), and later the Tule River Reservation and Santa Rosa Rancheria to the north, as well as other reservations in the foothills and Sierras. The result is an unfortunate scarcity of ethnographic detail on valley tribes, especially in relation to the rich information collected from the central foothills tribes where native speakers of the Yokuts dialects are still found. Regardless, the general details of indigenous life-ways were similar across the broad expanse of Yokuts territory, particularly in terms of environmentally influenced subsistence and adaptation and with regard to religion and belief, which were similar everywhere.

Following Kroeber (1925: Plate 47), the APE most likely lies in Pitkachi (Pitkache in Latta [1977:163]) territory. The village for this group nearest the APE was *Gewachiu* (*Gewachie* in Latta [1977:163]) on the south bank of the San Joaquin River, approximately 8-mi northwest of the study area.

2. Environmental and Cultural Background

Most Yokuts groups, regardless of specific tribal affiliation, were organized as a recognized and distinct tribelet; a circumstance that almost certainly pertained to the tribal groups noted above. Tribelets were land-owning groups organized around a central village and linked by shared territory and descent from a common ancestor. The population of most tribelets ranged from about 150 to 500 peoples (Kroeber 1925).

Each tribelet was headed by a chief who was assisted by a variety of assistants, the most important of whom was the *winatum*, a herald or messenger and assistant chief. A shaman also served as religious officer. While shamans did not have any direct political authority, as Gayton (1930) has illustrated, they maintained substantial influence within their tribelet.

Shamanism is a religious system common to most Native American tribes. It involves a direct and personal relationship between the individual and the supernatural world enacted by entering a trance or hallucinatory state (usually based on the ingestion of psychotropic plants, such as jimsonweed or more typically native tobacco). Shamans were considered individuals with an unusual degree of supernatural power, serving as healers or curers, diviners, and controllers of natural phenomena (such as rain or thunder). Shamans also produced the rock art of this region, depicting the visions they experienced in vision quests believed to represent their spirit helpers and events in the supernatural realm (Whitley 1992, 2000).

The centrality of shamanism to the religious and spiritual life of the Yokuts was demonstrated by the role of shamans in the yearly ceremonial round. The ritual round, performed the same each year, started in the spring with the jimsonweed ceremony, followed by rattlesnake dance and (where appropriate) first salmon ceremony. After returning from seed camps, fall rituals began in the late summer with the mourning ceremony, followed by first seed and acorn rites and then bear dance (Gayton 1930:379). In each case, shamans served as ceremonial officials responsible for specific dances involving a display of their supernatural powers (Kroeber 1925).

Subsistence practices varied from tribelet to tribelet based on the environment of residence. Throughout Native California, and Yokuts territory in general, the acorn was a primary dietary component, along with a variety of gathered seeds. Valley tribes augmented this resource with lacustrine and riverine foods, especially fish and wildfowl. As with many Native California tribes, the settlement and subsistence rounds included the winter aggregation into a few large villages, where stored resources (like acorns) served as staples, followed by dispersal into smaller camps, often occupied by extended families, where seasonally available resources would be gathered and consumed.

Although population estimates vary and population size was greatly affected by the introduction of Euro-American diseases and social disruption, the Yokuts were one of the largest, most successful groups in Native California. Cook (1978) estimates that the Yokuts region contained 27 percent of the aboriginal population in the state at the time of contact; other estimates are even higher. Many Yokut descendants continue to live in Fresno County, either on tribal reservations, or in local towns and communities.

2.3 PRE-CONTACT ARCHAEOLOGICAL BACKGROUND

The southern San Joaquin Valley region has received much less archaeological attention than other areas of the state. In part, this is because the majority of California archaeological work has concentrated in the Sacramento Delta, Santa Barbara Channel, and central Mojave Desert areas (see Moratto 1984). Although knowledge of the region's prehistory is limited, enough is known to determine that the archaeological record is broadly similar to south-central California as a whole (see Gifford and Schenk 1926; Hewes 1941; Wedel 1941; Fenenga 1952; Elsasser 1962; Fredrickson and Grossman 1977; Schiffman and Garfinkel 1981; Rosenthal et al. 2007). Indeed, Gifford and Schenk (1926) were the first to identify the similarity between southern San Joaquin Valley prehistory and the archaeological record along the Santa Barbara Channel, a specific observation that was analytically verified more recently by Siefkin (1999). This circumstance, overlooked by some subsequent researchers, has resulted in confusion in the literature due to the application of the Sacramento Delta chronology on the local archaeological record, where it has never really fit. Based on these sources and this observation, the general prehistory of the region can be outlined in south-central California terms, as follows.

Initial occupation of the region occurred at least as early as the *Paleoindian Period*, or prior to about 10,000 years before present (YBP). Evidence of early use of the region is indicated by characteristic fluted and stemmed points found around the margin of Tulare Lake, in the foothills of the Sierra, and in the Mojave Desert proper. Both fluted and stemmed points are particularly common around lake margins (e.g., Wallace and Riddell 1993), suggesting a terminal Pleistocene/early Holocene lakeshore adaptation similar to that found throughout the far west at the same time. Little else is known about these earliest peoples at this point, however, in part because the locations of their recorded sites occur in lakeshore contexts that have experienced repetitive transgressive and regressive shorelines, resulting in mixed archaeological deposits.

Substantial evidence for human occupation of California first occurs during the Early Holocene, roughly 7500 to 4000 YBP. This period is known as the *Early Horizon*, or alternatively as the Early Millingstone along the Santa Barbara Channel. In the south, populations concentrated along the coast with minimal visible use of inland areas. Adaptation emphasized hard seeds and nuts with tool-kits dominated by mullers and grindstones (manos and metates). Little evidence for Early Horizon occupation exists in most inland portions of the state with (again) the exceptions being along lakeshores, partly due to a severe cold and dry paleoclimatic period occurring at this time. Regardless of specifics, Early Horizon population density was low with a subsistence adaptation more likely tied to plant food gathering than hunting.

Environmental conditions improved dramatically after about 4000 YBP during the *Middle Horizon* (or Intermediate Period). This period known climatically as the Holocene Maximum (circa 3800 YBP) and was characterized by significantly warmer and wetter conditions than previously experienced. Archaeologically, it was marked by large population increase and radiation into new environments along coastal and interior south-central California and the Mojave Desert (Whitley 2000). In the Delta region to the north, this same period of favorable environmental conditions was characterized by the appearance of the Windmill culture, which exhibited a high degree of ritual elaboration (especially in burial practices) and perhaps even a rudimentary mound-building tradition (Meighan, personal communication 1985). Along with ritual elaboration, Middle Horizon

2. Environmental and Cultural Background

times experienced increasing subsistence specialization, perhaps correlating with the appearance of acorn processing technology. Penutian speaking peoples (including the Yokuts) are also hypothesized to have entered the state roughly at the beginning of this period and, perhaps to have brought this technology with them (cf. Moratto 1984). Likewise it appears the so-called “Shoshonean Wedge” in southern California or the Takic speaking groups that include the Gabrielino/Fernandeño, Tataviam, and Kitanemuk, may have moved into the region at this time, rather than at about 1500 YBP as first suggested by Kroeber (1925).

Evidence for Middle Horizon occupation of interior south-central California is substantial. For example, in northern Los Angeles County along the upper Santa Clara River, to the south of the San Joaquin Valley, the Agua Dulce village complex indicates occupation extending back to the Intermediate Period, when the population of the village may have been 50 or more people (King et al. n.d.). Similarly, inhabitation of the Hathaway Ranch region near Lake Piru, and the Newhall Ranch near Valencia, appears to date to the Intermediate Period (W&S Consultants 1994). To the west, little or no evidence exists for pre-Middle Horizon occupation in the upper Sisquoc and Cuyama River drainages; populations first appear there at roughly 3500 YBP (Horne 1981). The Carrizo Plain, the valley immediately west of the San Joaquin, experienced a major population expansion during the Middle Horizon (W&S Consultants 2004; Whitley et al. 2007), and recently collected data indicates the Tehachapi Mountains region was first significantly occupied during the Middle Horizon (W&S Consultants 2006). A parallel can be drawn to the inland Ventura County region where a similar pattern has been identified (Whitley and Beaudry 1991), as well as the western Mojave Desert (Sutton 1988a, 1988b), the southern Sierra Nevada (W&S Consultants 1999), and the Coso Range region (Whitley et al. 1988). In all of these areas a major expansion in settlement, the establishment of large site complexes, and an increase in the range of environments exploited appear to have occurred sometime roughly around 4,000 years ago. Although most efforts to explain this expansion have focused on local circumstances and events, it is increasingly apparent this was a major southern California-wide occurrence and any explanation must be sought at a larger level of analysis (Whitley 2000). Additionally, evidence from the Carrizo Plain suggests the origins of the tribelet level of political organization developed during this period (W&S Consultants 2004; Whitley et al. 2007). Whether this same demographic process holds for the southern San Joaquin Valley, including the study area, is yet to be determined.

The beginning of the *Late Horizon* is set variously at 1500 and 800 YBP, with a consensus for the shorter chronology. Increasing evidence suggests the importance of the Middle-Late Horizon transition (A.D. 800 to 1200) in the understanding of south-central California. This corresponds to the so-called Medieval Climatic Anomaly, a period of climatic instability that included major droughts and resulted in demographic disturbances across much of the west (Jones et al. 1999). It is also believed to have resulted in major population decline and abandonments across south-central California, involving as much as 90 percent of the interior populations in some regions including the Carrizo Plain (Whitley et al. 2007). It is not clear whether site abandonment was accompanied by a true reduction in population or an agglomeration of the same numbers of people into fewer but larger villages. What is clear is that Middle Period villages and settlements were widely dispersed across the landscape; many at locations that lack contemporary evidence of fresh water sources. Late Horizon sites, in contrast, are typically located where fresh water was available during the historical period, if not currently.

One extensively studied site that shows evidence of intensive occupation during the Middle-Late Horizons transition (~1,500 – 500 YBP) is the Redtfeldt Mound (CA-KIN-66/H), located near the Santa Rosa Rancheria, northwest of the study area. There, Siefkin (1999) reported on human burials and numerous artifacts and ecofacts excavated from a modest-sized mound. He found that both Middle Horizon and Middle-Late Horizons transition occupations were more intensive than Late Horizon occupations, which were sporadic and less intensive (Siefkin 1999:110-111).

The Late Horizon then can be best understood as a period of recovery from a major demographic collapse. One result is the development of regional archaeological cultures as the precursors to ethnographic Native California; suggesting that ethnographic life-ways recorded by anthropologists extend at least 800 years into the past.

The position of San Joaquin Valley prehistory relative to patterns seen in surrounding areas is still somewhat unknown. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the Carrizo Plain demonstrates (see Whitley et al. 2007) environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley, and determining how these trends (if present) correlate with those seen elsewhere, is a current important research objective.

2.4 HISTORICAL BACKGROUND

Spanish explorers first visited the San Joaquin Valley in 1772, but its lengthy distance from the missions and presidios along the Pacific Coast delayed permanent settlement for many years, including during the Mexican period of control over the Californian region. In the 1840s, Mexican rancho owners along the Pacific Coast allowed their cattle to wander and graze in the San Joaquin Valley. The Mexican government granted the first ranchos in the southern part of the San Joaquin Valley in the early 1840s, but these did not result in permanent settlement. It was not until the annexation of California in 1848 that the exploitation of the southern San Joaquin Valley began (Pacific Legacy 2006).

The discovery of gold in northern California in 1848 resulted in a dramatic increase of population, consisting in good part of fortune seekers and gold miners, who began to scour other parts of the state. After 1851, when gold was discovered in the Sierra Nevada Mountains in eastern Kern County, the population of the area grew rapidly. Some new immigrants began ranching in the San Joaquin Valley to supply the miners and mining towns. Ranchers grazed cattle and sheep, and farmers dry-farmed or used limited irrigation to grow grain crops, leading to the creation of small agricultural communities throughout the valley (Caltrans 2007).

After the American annexation of California, the southern San Joaquin Valley became significant as a center of food production for this new influx of people in California. The expansive unfenced and principally public foothill spaces were well suited for grazing both sheep and cattle (Boyd 1997). As the Sierra Nevada gold rush presented extensive financial opportunities, ranchers introduced new breeds of livestock, consisting of cattle, sheep and pig (Boyd 1997).

2. Environmental and Cultural Background

With the increase of ranching in the southern San Joaquin came the dramatic change in the landscape, as non-native grasses more beneficial for grazing and pasture replaced native flora (Preston 1981). After the passing of the Arkansas Act in 1850, efforts were made to reclaim small tracts of land in order to create more usable spaces for ranching. Eventually, as farming supplanted ranching as a more profitable enterprise, large tracts of land began to be reclaimed for agricultural use, aided in part by the extension of the railroad in the 1870s (Pacific Legacy 2006).

Following the passage of state wide ‘No-Fence’ laws in 1874, ranching practices began to decline, while farming expanded in the San Joaquin Valley in both large land holdings and smaller, subdivided properties. As the farming population grew, so did the demand for irrigation. Settlers began reclamation of swampland in 1866, and built small dams across the Kern River to divert water into the fields. By 1880, 86 different groups were taking water from the Kern River. Ten years later, 15 major canals provided water to thousands of acres in Kern County.

During the period of reclaiming unproductive land in the southern San Joaquin Valley, grants were given to individuals who had both the resources and the finances to undertake the operation alone. One small agricultural settlement, founded by Colonel Thomas Baker in 1861 after procuring one such grant, took advantage of reclaimed swampland along the Kern River. This settlement became the City of Bakersfield in 1869, and quickly became the center of activity in the southern San Joaquin Valley, and in the newly formed Kern County. Located on the main stage road through the San Joaquin Valley, the town became a primary market and transportation hub for stock and crops, as well as a popular stopping point for travelers on the Los Angeles and Stockton Road. The Southern Pacific Railroad reached the Bakersfield area in 1873, connecting it with important market towns elsewhere in the state, dramatically impacting both agriculture and oil production (Pacific Legacy 2006).

Three competing partnerships developed during this period which had a great impact on control of water, land reclamation and ultimately agricultural development in the San Joaquin Valley: Livermore and Chester, Haggin and Carr, and Miller and Lux, perhaps the most famous of the enterprises. Livermore and Chester were responsible, among other things, for developing the large Hollister plow (three feet wide by two feet deep), pulled by a 40-mule team, which was used for ditch digging. Haggin and Carr were largely responsible for reclaiming the beds of the Buena Vista and Kern lakes, and for creating the Calloway Canal, which drained through the Rosedale area in Bakersfield to Goose Lake (Morgan 1914). Miller and Lux ultimately became one of the biggest private property holders in the country, controlling the rights to over 22,000 square miles. Miller and Lux’s impact extended beyond Kern County, however. They recognized early-on that control of water would have important economic implications, and they played a major role in the water development of the (<http://www.mariposaresearch.net/santaclararesearch/SCBIOS/hmiller.html>). They were also embroiled for many years in litigation against Haggin and Carr over control of the water rights to the Kern River. Descendants of Henry Miller continue to play a major role in California water rights, with his great grandson, George Nickel, Jr., the first to develop the concept of water banking, thus creating a system to buy and sell water (<http://exiledonline.com/california-class-war-history-meet-the-oligarch-family-thats-been-scamming-taxpayers-for-150-years-and-counting/>).

The San Joaquin Valley was dominated by agricultural pursuits until the oil boom of the early 1900s, which saw a shift in the region, as some reclaimed lands previously used for farming were leased to oil companies. Nonetheless, the shift of the San Joaquin Valley towards oil production did not halt the continued growth of agriculture (Pacific Legacy 2006). The Great Depression of the 1930s brought with it the arrival of great number of migrants from the drought-affected Dust Bowl region, looking for agricultural labor. These migrants established temporary camps in the valley, staying on long past the end of the drought and the Great Depression, eventually settling in towns such as Bakersfield where their descendants live today (Boyd 1997).

The city of Fresno (originally “Fresno Station”), located approximately 10.6-mi east of the study area and the county seat for Fresno County, was founded in 1872 and incorporated in 1885. It was initially developed as a railway station along the Central Pacific Railroad, but quickly expanded with the development of irrigation in the region. Farmers saw success with the cultivation of wheat, grapes, and cattle. Eventually, Fresno County became one of the most agriculturally-rich counties in the United States (<https://www.fresno.gov/darm/historic-preservation/history-of-fresno/>).

The history of the City of Mendota is linked to the railroad industry. Mendota was established as a Southern Pacific Railroad storage and switching facility site in 1891, with the town subsequently growing around the rail yard. The first post office opened in 1892, and the City incorporated in 1942. Agriculture has always been the main economic activity for the city and its inhabitants (<https://www.ci.mendota.ca.us/about-mendota/>).

2.5 RESEARCH DESIGN

2.5.1 Pre-Contact Archaeology

Previous research and the nature of the pre-contact archaeological record suggest two significant NRHP themes, both of which fall under the general Pre-Contact Archaeology area of significance. These are the Expansion of Pre-Contact Populations and Their Adaptation to New Environments; and Adaptation to Changing Environmental Conditions.

The Expansion of Pre-Contact Populations and Their Adaptation to New Environments theme primarily concerns the Middle Horizon/Holocene Maximum. Its period of significance runs from about 4000 to 1500 YBP. It involves a period during which the prehistoric population appears to have expanded into a variety of new regions, developing new adaptive strategies in the process.

The Adaptation to Changing Environmental Conditions theme is partly related to the Holocene Maximum, but especially to the Medieval Climatic Anomaly. The period of significance for this theme, accordingly, extends from about 4000 to 800 YBP. This theme involves the apparent collapse of many inland populations, presumably with population movements to better environments such as the coast. It is not yet known whether the southern San Joaquin Valley, with its system of lakes, sloughs and swamps, experienced population decline or, more likely, population increase due to the relatively favorable conditions of this region during this period of environmental stress.

2. Environmental and Cultural Background

The range of site types that are present in this region include:

- Villages, primarily located on or near permanent water sources, occupied by large groups during the winter aggregation season;
- Seasonal camps, again typically located at water sources, occupied during other parts of the year tied to locally and seasonally available food sources;
- Special activity areas, especially plant processing locations containing bedrock mortars (BRMs), commonly (though not exclusively) near existing oak woodlands, and invariably at bedrock outcrops or exposed boulders;
- Stone quarries and tool workshops, occurring in two general contexts: at or below naturally occurring chert exposures on the eastern front of the Temblor Range; and at quartzite cobble exposures, often on hills or ridges;
- Ritual sites, most commonly pictographs (rock art) found at rockshelters or large exposed boulders, and cemeteries, both commonly associated with villages; and
- A variety of small lithic scatters (low density surface scatters of stone tools).

The first requisites in any research design are the definition of site age/chronology and site function. The ability to determine either of these basic kinds of information may vary between survey and test excavation projects, and due to the nature of the sites themselves. BRM sites without associated artifacts, for example, may not be datable beyond the assumption that they post-date the Early Horizon and are thus less than roughly 4,000 years old.

A second fundamental issue involves the place of site in the settlement system, especially with respect to water sources. Because the locations of the water sources have sometimes changed over time, villages and camps are not exclusively associated with existing (or known historical) water sources (W&S Consultants 2006). The size and locations of the region's lakes, sloughs and delta channels, to cite the most obvious example, changed significantly during the last 12,000 years due to major paleoclimatic shifts. This altered the area's hydrology and thus prehistoric settlement patterns. The western shoreline of Tulare Lake was relatively stable, because it abutted the Kettleman Hills. But the northern, southern and eastern shorelines comprised the near-flat valley floor. Relatively minor fluctuations up or down in the lake level resulted in very significant changes in the areal expression of the lake on these three sides, and therefore the locations of villages and camps. Although perhaps not as systematic, similar changes occurred with respect to stream channels and sloughs, and potential site locations associated with them. This circumstance has implications for predicting site locations and archaeological sensitivity. Site sensitivity is then hardest to predict in the open valley floor, where changes in stream courses and lake levels occurred on numerous occasions.

Nonetheless, the position of San Joaquin Valley prehistory relative to the changing settlement and demographic patterns seen in surrounding areas is still somewhat unknown (cf. Siefkin 1999), including to the two NRHP themes identified above. The presence of large lake systems in the valley bottoms can be expected to have mediated some of the effects of desiccation seen elsewhere. But, as the reconstruction of Soda Lake in the nearby Carrizo Plain demonstrates (see Whitley et al. 2007), environmental perturbations had serious impacts on lake systems too. Identifying certain of the prehistoric demographic trends for the southern San Joaquin Valley, and determining how

these trends (if present) correlate with those seen elsewhere, is another primary regional research objective.

Archaeological sites would primarily be evaluated for NRHP eligibility under Criterion D, research potential.

2.5.2 Historical Archaeology: Native American

Less research has been conducted on the regional historical archaeological record, both Native American and Euro-American. For Native American historical sites, the ethnographic and ethnohistoric periods in the southern San Joaquin Valley extended from first Euro-American contact, in AD 1772, to circa 1900, when tribal populations were first consolidated on reservations. The major significant historic NRHP themes during this period of significance involve the related topics of Historic-Aboriginal Archaeology, and Native American Ethnic Heritage. More specifically, these concern the Adaptation of the Indigenous Population to Euro-American Encroachment and Settlement, and their Acculturation to Western Society. These processes included the impact of missionization on the San Joaquin Valley (circa 1800 to about 1845); the introduction of the horse and the development of a San Joaquin Valley “horse culture,” including raiding onto the coast and Los Angeles Basin (after about 1810); the use of the region as a refuge for mission neophyte escapees (after 1820); responses to epidemics from introduced diseases (especially in the 1830s); armed resistance to Euro-American encroachment (in the 1840s and early 1850s); the origins of the reservation system and the development of new tribal organizations and ethnic identities; and, ultimately, the adoption of the Euro-American society’s economic system and subsistence practices, and acculturation into that society.

Site types that have been identified in the region dating to the ethnographic/ethnohistoric period of significance primarily include villages and habitations, some of which contain cemeteries and rock art (including pictographs and cupules). Dispersed farmsteads, dating specifically from the reservation period or post-1853, would also be expected. The different social processes associated with this historical theme may be manifest in the material cultural record in terms of changing settlement patterns and village organization (from traditional nucleated villages to single family dispersed farmsteads); the breakdown of traditional trading networks with their replacement by new economic relationships; changing subsistence practices, especially the introduction of agriculture initially via escaped mission neophytes; the use of Euro-American artifacts and materials rather than traditional tools and materials; and, possibly, changing mortuary practices.

Inasmuch as culture change is a primary intellectual interest in archaeology, ethnographic villages and habitations may be NRHP eligible under Criterion D, research potential. Ethnographic sites, further, may be NRHP eligible as Traditional Cultural Properties due to potential continued connections to tribal descendants, and their resulting importance in traditional practices and beliefs, including their significance for historical memory, tribal- and self-identity formation, and tribal education.

For Criteria A, C and D, eligibility requires site integrity (including the ability to convey historical association for Criterion A). These may include intact archaeological deposits for Criterion D, as well as setting and feel for Criteria C and A. Historical properties may lack physical integrity, as

2. Environmental and Cultural Background

normally understood in heritage management, but still retain their significance to Native American tribes as Traditional Cultural Properties if they retain their tribal associations and uses.

2.5.3 Historical Archaeology: Euro-American

Approaches to historical Euro-American archaeological research relevant to the region have been summarized by Caltrans (1999, 2000, 2007, 2008). These concern the general topics of historical landscapes, agriculture and farming, irrigation (water conveyance systems), and mining. Caltrans has also identified an evaluation matrix aiding determinations of eligibility. The identified research issues include site structure and land-use (lay-out, land use, feature function); economics (self-sufficiency, consumer behavior, wealth indicators); technology and science (innovations, methods); ethnicity and cultural diversity (religion, race); household composition and lifeways (gender, children); and labor relations. Principles useful for determining the research potential of an individual site or feature are conceptualized in terms of the mnemonic AIMS-R, as follows:

1. *Association* refers to the ability to link an assemblage of artifacts, ecofacts, and other cultural remains with an individual household, an ethnic or socioeconomic group, or a specific activity or property use.
2. *Integrity* addresses the physical condition of the deposit, referring to the intact nature of the archaeological remains. In order for a feature to be most useful, it should be in much the same state as when it was deposited. However, even disturbed deposits can yield important information (e.g., a tightly dated deposit with an unequivocal association).
3. *Materials* refers to the number and variety of artifacts present. Large assemblages provide more secure interpretations as there are more datable items to determine when the deposit was made, and the collection will be more representative of the household, or activity. Likewise, the interpretive potential of a deposit is generally increased with the diversity of its contents, although the lack of diversity in certain assemblages also may signal important behavioral or consumer patterns.
4. *Stratigraphy* refers to the vertically or horizontally discrete depositional units that are distinguishable. Remains from an archaeological feature with a complex stratigraphic sequence representative of several events over time can have the added advantage of providing an independent chronological check on artifact diagnosis and the interpretation of the sequence of environmental or sociocultural events.
5. *Rarity* refers to remains linked to household types or activities that are uncommon. Because they are scarce, they may have importance even in cases where they otherwise fail to meet other thresholds of importance (Caltrans 2007:209).

For agricultural sites, Caltrans (2007) has identified six themes to guide research: Site Structure and Land Use Pattern; Economic Strategies; Ethnicity and Cultural Adaptation; Agricultural Technology and Science; Household Composition and Lifeways; and Labor History. Expected site types would include farm and ranch homesteads and facilities, line camps, and refuse dumps. In general terms, historical Euro-American archaeological sites would be evaluated for NRHP

eligibility under Criterion D, research potential. However, they also potentially could be eligible under Criteria A and B for their associate values with major historical trends or individuals. Historical landscapes might also be considered.

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3. ARCHIVAL RECORDS SEARCH

In order to determine whether the APE had been previously surveyed for cultural resources, and/or whether any such resources were known to exist on any of them, an archival records search was conducted by the staff of the Southern San Joaquin Valley Information Center (IC) on January 19th, 2021. The records search was completed to determine: (i) if prehistoric or historical archaeological sites had previously been recorded within the study areas; (ii) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study; and/or (iii) whether the region of the field project was known to contain archaeological sites and to thereby be archaeologically sensitive. Records examined included archaeological site files and maps, the NRHP, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

According to the IC records search (Confidential Appendix A), one previous records search had been completed that covered the APE (Table 1), but it had not been surveyed, and no previously recorded resources were known to exist within the APE. Six additional previous surveys had been completed within 0.5-mi of the APE (Table 2), and one previously recorded resource (P-10-003930, a segment of the Biola Branch Extension Railroad) was known to exist within that same radius.

Table 1. Survey Reports within the APE

Report No.	Year	Author (s)/Affiliation	Title
FR-02501	2008	Binning, Jeanne/ California Department of Transportation	Historic Property Survey Report for Route 180 Planned Westside Expressway from I-5 to Valentine Ave, Fresno, Fresno County, California

Table 2. Survey Reports within the 0.5-mi of the APE

Report No.	Year	Author (s)/Affiliation	Title
FR-00699	1974	Sheets, Payson	Archaeological Survey of the Mendota Airport, Fresno County, California
FR-01790	2001	Coleman, Dina M and Flint, Sandra S./ Applied EarthWorks, Inc.	Extended Phase 1 Survey Near CA-FRE-536 and CA-FRE-538 for the Highway 180 Widening and Rehabilitation Project Fresno County, California
FR-02164	2004	Roper, C. Kristina/ Sierra Valley Cultural Planning	A Cultural Resources Assessment for the Proposed City of Mendota Wastewater Treatment Plant Expansion and Improvement Project, Mendota, Fresno County, California
FR-02414	2010	Leach-Palm, Laura, Brandy, Paul, King, Jay, Mikkelsen, Pat, Seil, Libby, Hartman, Lindsay, and Bradeen, Jill/ Far Western Anthropological Research Group, Inc., Davis and JRP Historical Consulting, LLC, Davis	Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties Summary of Methods and Findings

3. Archival Records Search

Report No.	Year	Author (s)/Affiliation	Title
FR-02506	2006	Brady, Jon and Bunse, Rebecca/ California Department of Transportation	Final Historic Resources Sensitivity Study Route 180 Westside Expressway Route Adoption Study
FR-02768	2002	Traxler, Vickie/ California Department of Transportation	Historic Property Survey Report Mendota East Rehabilitation Project, Fresno County, California
FR-02768A	1989	Mikesell, Stephen/ California Department of Transportation	Historical Resources Evaluation Report Whitesbridge / Jack's Resort, Fresno County, California
FR-02768B	2000	Brady, Jon/ California Department of Transportation	Historic Architectural Survey Report for the State Route 180, Fresno County, California
FR-02768C	1988	McGowan, Dana/ California Department of Transportation	Archaeological Survey Report for the Proposed Asphalt Concrete Overlay and Widening Project of FRE-180, Near Mendota, Fresno County, California

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File was also completed for the Project. The results were negative (Confidential Appendix A). Outreach letters and follow-up emails were sent to the tribal organizations on the NAHC contact list. One email response, from Ron Goode, Chair of the North Folk Mono was received. Chair Goode asked that the tribe be notified if any archaeological discoveries were made.

According to USGS topographical quadrangles, historic aerials, and Google Earth, the proposed Mendota Carbon Capture and Storage Project APE was not developed until at least the mid-1990s with the construction/activation of the Covanta Biomass Plant. The area east of the APE has remained largely undeveloped, while tract development (eastern Mendota) and the municipal airport adjacent to it were constructed around the mid-1940s and mid-1950s, respectively.

4. METHODS AND RESULTS

4.1 FIELD METHODS

An intensive Class III inventor/Phase I survey of the CES Mendota Carbon Capture and Storage Project APE was conducted by ASM Associate Archaeologist Robert Azpitarte, B.A., and ASM Assistant Archaeologist Stacey Escamilla, B.A., on 18 March 2021. The field methods employed included intensive pedestrian examination of the ground surface for evidence of archaeological sites in the form of artifacts, surface features (such as bedrock mortars, historical mining equipment), and archaeological indicators (e.g., organically enriched midden soil, burnt animal bone); the identification and location of any discovered sites, should they be present; tabulation and recording of surface diagnostic artifacts; site sketch mapping; preliminary evaluation of site integrity; and site recording, following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms. Parallel survey transects spaced at 15-m apart were employed for the inventory.

The APE consists of the existing but mothballed Covanta biomass plant and a surrounding open field, located on the eastern peripheries of Mendota, California (Figure 2). The western side of the APE abuts industrial development and the William Robert Johnston Municipal Airport. The north east and west boundaries of the APE are bordered by active solar arrays and farmland.

4.2 SURVEY RESULTS

Visibility was good to excellent for the Class III/Phase I survey. With the exception of paved areas under and surrounding the mothballed biomass plant, the APE consists of an open field. A low cover of introduced grasses was present at the time of the survey but the ground-surface, including disking scars, was visible through this low-density ground cover.

Modern refuse in the form of concrete fragments, plastic piping, clothing, and paper products were noted within the APE. No cultural resources of any kind were identified within the Project APE.

4. Methods and Results



Figure 2. Overview of the Project APE with existing plant in background, looking northeast.

5. SUMMARY AND RECOMMENDATIONS

An intensive Class III archaeological inventory/Phase I survey was conducted for the CES Mendota Carbon Capture and Storage Project, Mendota, Fresno County, California. A records search was obtained from the Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield. This indicated that the Project APE had not been previously surveyed; no sites were known within it; and that only one previously recorded resource (P-10-003930, a segment of the Biola Branch Extension Railroad) was known within a 0.5-mi radius of the APE. The NAHC Sacred Lands Files were also consulted, with negative results. Outreach letters and follow-up emails were sent to tribal organizations on the NAHC contact list. One email response, from Ron Goode, Chair of the North Fork Mono, was received, asking that the tribe be notified if any archaeological discoveries were made.

The Class III inventory/Phase I survey fieldwork was conducted with parallel transects spaced at 15-meter intervals along the APE. No cultural resources of any kind were identified within the APE.

5.1 RECOMMENDATIONS

An intensive Class III inventory/Phase I survey demonstrated that the CES Mendota Carbon Capture and Storage Project, Mendota, Fresno County, California, does not contain significant or unique historical resources or historic properties. A finding of No Historic Properties Affected is recommended. In the unlikely event that cultural resources are encountered during project construction or use, however, it is recommended that an archaeologist be contacted to assess the discovery.

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CONFIDENTIAL APPENDIX A:

Records Search and Sacred Lands File

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LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

April 23, 2021

Larry Trowsdale
Clean Energy Systems, Inc.
3035 Prospect Park Drive, Suite 120
Rancho Cordova, CA 95670-6071

SUBJECT: Information for your CES site in Mendota, regarding Specific Federal Laws that the EPA must consider when reviewing projects

Dear Mr. Trowsdale:

I have reviewed the U.S. Environmental Protection Agency's (EPA) letter dated August 19, 2020, paying particular attention to the section: Consideration of Specific Federal Laws. The EPA noted it needed information regarding the project and whether or not it will satisfy the applicable requirements of several federal laws, including the Wild and Scenic Rivers Act (WSRA), National Historic Preservation Act (NHPA), Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), and the Fish and Wildlife Conservation Act (FWCA).

- **WSRA:** The WSRA was "...created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations." The closest Scenic River is the reach of the Kings River 80 miles to the east of the project well above Pine Flat Reservoir in the Sierra Nevada Mountain. Therefore, this project will have no effect on a Wild and Scenic River and this federal law is not applicable.
- **NHPA:** Work is being completed by a qualified consultant to determine to what degree this site is governed by this law.
- **ESA:** Live Oak Associates, Inc. (LOA 2021) has prepared a report evaluating if this project would be in compliance with the ESA. The only federally listed species that has the potential to occur in the region of the project is the endangered San Joaquin kit fox. Database and literature search has provided evidence that the species has not been detected near the site (between 9 and 10 miles to the north, northwest of the site) since 1990, 21 years ago. The LOA report has concluded that the species is not likely to occur on the project site, but did provide measures to avoid harm to any errant individual were it to show up during construction – a highly unlikely event,
- **CZMA:** only deals with lands immediately adjacent to the Pacific Ocean and thus, your site occurring in the San Joaquin Valley would not be subject to any provision of the CZMA.
- **FWCA:** Fish and Wildlife Conservation Act ("Nongame Act"; [16 U.S.C. 2901-2911](#); 94 Stat. 1322) -- Public Law 96-366, approved September 29, 1980, authorizes financial and

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technical assistance to the States for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. No such plans are being sponsored on your site.

Mr. Trowsdale let us know if you need any additional information regarding the EPA's August 19, 2020 letter.

Sincerely,

A handwritten signature in dark ink, appearing to be 'A. Hopkins', followed by a horizontal line.

Rick A. Hopkins, Ph.D.
President and Senior Conservation Biologist