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### 5.2 BIOLOGICAL RESOURCES

Hydrogen Energy California LLC (HECA LLC) is proposing an Integrated Gasification Combined Cycle (IGCC) polygeneration project (HECA or Project). The Project will gasify a fuel blend of 75 percent coal and 25 percent petroleum coke (petcoke) to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, and used to generate a nominal 300 megawatts (MW) of low-carbon baseload electricity in a Combined Cycle Power Block, low-carbon nitrogen-based products in an integrated Manufacturing Complex, and carbon dioxide (CO<sub>2</sub>) for use in enhanced oil recovery (EOR). CO<sub>2</sub> from HECA will be transported by pipeline for use in EOR in the adjacent Elk Hills Oil Field (EHOF), which is owned and operated by Occidental of Elk Hills, Inc. (OEHI). The EOR process results in sequestration (storage) of the CO<sub>2</sub>.

Terms used throughout this section are defined as follows:

- **Project or HECA.** The HECA IGCC electrical generation facility, low-carbon nitrogen-based products Manufacturing Complex, and associated equipment and processes, including its linear facilities.
- **Project Site or HECA Project Site.** The 453-acre parcel of land on which the HECA IGCC electrical generation facility, low-carbon nitrogen-based products Manufacturing Complex, and associated equipment and processes (excluding off-site portions of linear facilities), will be located.
- **OEHI Project.** The use of CO<sub>2</sub> for EOR at the EHOF and resulting sequestration, including the CO<sub>2</sub> pipeline, EOR processing facility, and associated equipment.
- **OEHI Project Site.** The portion of land within the EHOF on which the OEHI Project will be located and where the CO<sub>2</sub> produced by HECA will be used for EOR and resulting sequestration.
- **Controlled Area.** The 653 acres of land adjacent to the Project Site over which HECA will control access and future land uses.

This introduction provides brief descriptions of both the Project and the OEHI Project. Additional HECA Project description details are provided in Section 2.0. Additional OEHI Project description details are provided in Appendix A of this Application for Certification (AFC) Amendment.

#### *HECA Project Linear Facilities*

The HECA Project includes the following linear facilities, which extend off the Project Site (see Figure 2-7, Project Location Map):

- **Electrical transmission line.** An approximately 2-mile-long electrical transmission line will interconnect the Project to a future Pacific Gas and Electric Company (PG&E) switching station east of the Project Site.

- **Natural gas supply pipeline.** An approximately 13-mile-long natural gas interconnection will be made with PG&E natural gas pipelines located north of the Project Site.
- **Water supply pipelines and wells.** An approximately 15-mile-long process water supply line and up to five new groundwater wells will be installed by the Buena Vista Water Storage District (BVWSD) to supply brackish groundwater from northwest of the Project Site. An approximately 1-mile-long water supply line from the West Kern Water District (WKWD) east of the Project Site will provide potable water.
- **Coal transportation.** HECA is considering two alternatives for transporting coal to the Project Site:
  - **Alternative 1, rail transportation.** An approximately 5-mile-long new industrial railroad spur that will connect the Project Site to the existing San Joaquin Valley Railroad (SJVRR) Buttonwillow railroad line, north of the Project Site. This railroad spur will also be used to transport some HECA products to market.
  - **Alternative 2, truck transportation.** An approximately 27-mile-long truck transport route via existing roads from an existing coal transloading facility northeast of the Project Site. This alternative was presented in the 2009 Revised AFC.

### *OEHI Project*

OEHI will be installing the CO<sub>2</sub> pipeline from the Project Site to the EHOFF, as well as installing the EOR Processing Facility, including any associated wells and pipelines needed in the EHOFF for CO<sub>2</sub> EOR and sequestration. The following is a brief description of the OEHI Project, which is described in more detail in Appendix A of this AFC Amendment:

- **CO<sub>2</sub> EOR Processing Facility.** The CO<sub>2</sub> EOR Processing Facility and 13 satellites are expected to occupy approximately 136 acres within the EHOFF. The facility will use 720 producing and injection wells: 570 existing wells and 150 new well installations. Approximately 652 miles of new pipeline will also be installed in the EHOFF.
- **CO<sub>2</sub> pipeline.** An approximately 3-mile-long CO<sub>2</sub> pipeline will transfer the CO<sub>2</sub> from the HECA Project Site south to the OEHI CO<sub>2</sub> EOR Processing Facility.

### **Project Area**

The Project Area discussed in this section refers to all areas of temporary and permanent disturbance, including the Project Site (defined above), the construction staging areas, the HECA Project linears, the OEHI CO<sub>2</sub> linear, and the OEHI EOR Processing Facility.

### **Biological Resources Study Area**

The Biological Resources Study Area (BRSA) evaluated in this section consists of the Project Area and the area within a 1-mile radius of the HECA Project Site, and the area within a 1,000-foot radius of the HECA linear facilities and the OEHI CO<sub>2</sub> pipeline. The HECA linear facilities, OEHI CO<sub>2</sub> pipeline, and the associated BRSA are shown on Figure 5.2-1. All of the

## 5.2 Biological Resources

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proposed HECA linear facilities, as well as the OEHI CO<sub>2</sub> pipeline north of the California Aqueduct, were evaluated by URS for biological resources. Where property access was available, field surveys of the BRSA were conducted to characterize habitat types and evaluate the presence of special-status species or jurisdictional waters. OEHI conducted the surveys for the portion of the CO<sub>2</sub> alignment south of the California Aqueduct, and the results of those surveys are presented in Appendix A-1, Section 4.4, Biological Resources; and Appendix A-2, Section 2.2, Biological Resources. Appendix A also contains the biological resource impact evaluation for the OEHI CO<sub>2</sub> EOR Processing Facility.

The HECA Project and OEHI Project components, the activity duration, the study area limit, and location of the relevant information are shown in Table 5.2-1, Project Components and Biology Resources Study Area.

In accordance with the California Energy Commission (CEC) regulations, Section 5.2, Biological Resources, describes biological resources in the vicinity of the Project Site, including wetlands, vegetation, and wildlife, in Section 5.2.1, Affected Environment. Sections 5.2.2, Environmental Consequences, 5.2.3, Cumulative Impacts Analyses, and 5.2.4, Mitigation Measures, describe the anticipated potential Project-related impacts to biological resources, and measures proposed to mitigate or compensate for those impacts. Laws, ordinances, regulations, and standards (LORS) for protection of biological resources are provided in Section 5.2.5, Laws, Ordinances, Regulations, and Standards. The subsequent sections describe agencies contacted for this evaluation, as well as permits associated with biological resources that will be obtained prior to Project construction. Through agency consultations, Project design modifications, and appropriate mitigation measures, the Project will conform to all applicable LORS for protection of biological resources.

The impact assessment for biological resources included informal consultation with resource management agencies, literature review, and field surveys. The literature search included an examination of environmental documents from adjacent and nearby areas, and a review of pertinent maps, scientific literature, and regional biological field guides. Key resources and references include the following:

- Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998)
- 2001 Special-status plant species survey results at Elk Hills Oil Field, Kern County, California (Quad Knopf, 2001)
- Coles Levee Ecosystem Preserve 2007 Annual Report (Live Oak, 2008)
- Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan 2007 Compliance Report and Management Plan (Kern Water Bank Authority, 2008)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS, 2012)
- California Natural Diversity Database (California Department of Fish and Game [CDFG], 2009-2011)

Table 5.2-2, Biological Resources Field Surveys, summarizes the biological resources surveys performed. Resumes for the primary biologists are attached in Appendix F, Biological Resources Information.

Plant and animal species observed during these field surveys are listed in Table 5.2-3, Plant Species Observed in the Biological Resources Study Area, and Table 5.2-4, Wildlife Species Observed in the Biological Resources Study Area.

## 5.2.1 Affected Environment

### *5.2.1.1 Regional Setting*

The Project is located in Kern County, California at the southern end of the Central Valley. Several biological resources conservation areas are located within 35 miles of the Project Site. These areas include public and private conservation lands and habitat conservation plan areas that are listed in Table 5.2-5, Public and Private Conservation Lands and Habitat Conservation Plan Areas near the Project Site.

### *5.2.1.2 Local Setting*

The Project Site is on the southwestern side of unincorporated Kern County, approximately 1.5 miles northwest of the unincorporated community of Tupman, and immediately south of Adohr Road. The primary land uses in the Project vicinity are agriculture, oil exploration, and oil production. The 453-acre Project Site is currently in agricultural cultivation.

The Project Site is currently used for cultivation of cotton, alfalfa, and onions. Land surrounding the Project Site, including the Controlled Area, is also cultivated for alfalfa and cotton. The West Side Canal, Kern River Flood Control Channel (KRFCC), and the California Aqueduct (State Water Project) are 250, 700, and 1,900 feet south of the Project Site, respectively. The western border of the Tule Elk State Natural Reserve is approximately 1,700 feet to the east of the Project Site.

Land uses in the vicinity of the 13-mile natural gas linear route are primarily active agricultural land with smaller areas of disturbed and developed areas, and isolated areas of undeveloped land with natural vegetation such as Allscale Scrub (Sawyer, Keeler-Wolf, and Evens, 2009). The natural gas linear crosses the East Side Canal.

Existing land uses in the vicinity of the proposed railroad spur are primarily active agricultural land with smaller areas of disturbed and developed areas. Within the same easement as the natural gas linear, the railroad spur also crosses the East Side Canal.

Land uses in the vicinity of the process water linear are primarily farming (typical crops include alfalfa, cotton, and wheat cultivation), and orchards (pistachio). Much of the land between the West Side Canal and the KRFCC is Allscale Scrub, riparian habitat, or unvegetated river cobble.

Existing land uses in the vicinity of the electrical transmission linear and potable water linear consist of water bank basins and disturbed areas, and farming (typical crops include alfalfa, cotton, oat, and wheat cultivation). Both of these linears cross the East Side Canal. Table 5.2-6, Special-Status Plant Species with Potential to Occur within 5 Miles of the Project Area, summarizes the acreage of existing habitats that could be temporarily or permanently disturbed by the proposed Project.

### *5.2.1.3 Jurisdictional Waters*

Several aquatic features are within the BRSA. These features include canals, irrigation ditches, retention/detention basins, as well as two locations with seasonally ponded claypan depressions.

#### *Waters of the United States*

Under Section 404 of the federal Clean Water Act (CWA), the United States Army Corps of Engineers (USACE) regulates the discharge of dredged and fill materials into “Waters of the United States.” Jurisdictional waters of the U.S. include intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, and wetlands adjacent to any water of the U.S. (33 Code of Federal Regulations [CFR] Section (§) 328). Certain waters of the U.S. are considered “special aquatic sites” because they are generally recognized as having particular ecological value. Such sites include sanctuaries and refuges, mudflats, wetlands, vegetated shallows, coral reefs, and riffle and pool complexes. Special aquatic sites are defined by the U.S. Environmental Protection Agency (USEPA) and may be afforded additional consideration in a project’s permit process.

The USACE also regulates navigable waters under Section 10 of the Rivers and Harbors Act as “...those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce” (33 CFR §322.2).

In reaction to several court challenges, the USACE and the USEPA issued a joint memorandum on June 5, 2007, with guidelines for establishing whether or not wetlands or other waters of the U.S. fall within USACE jurisdiction (USACE, 2007). As a result, the agencies assert jurisdiction over traditional navigable waters (TNW), wetlands adjacent to traditional navigable waters, non-navigable tributaries to TNWs that are relatively permanent waters (RPW), and wetlands that abut relatively permanent waters. The agencies may take jurisdiction over non-navigable tributaries that are not RPWs, wetlands that are adjacent to non-RPWs, and wetlands that are adjacent to, but not directly abutting, a relatively permanent non-navigable tributary. The agencies will generally not assert jurisdiction over swales, erosional features, or ditches excavated wholly in and draining only uplands, and that do not carry a relatively permanent flow of water.

#### *Waters of the State*

The State Water Resources Control Board (SWRCB) and the various Regional Water Quality Control Boards (RWQCB, collectively the “Water Boards”) protect the beneficial uses of surface water and groundwater in California under the Porter-Cologne Act, and issue water quality certifications under Section 401 of the federal CWA. California has broader jurisdiction over waters (including wetlands) than the federal government. In other words, some waters that are not jurisdictional under the federal Clean Water Act may be under California’s Porter-Cologne Water Quality Control Act. For example, the Water Boards regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. Despite the state’s broader regulatory reach, the Water Boards typically have not fully duplicated the federal process for

delineating, and permitting impacts to, jurisdictional waters. There is no approved formal protocol for delineating waters of the State; rather, the Waters Boards historically have tiered off the established federal delineation process.

However, the State Water Resources Control Board released a preliminary draft of the Water Quality Control Policy for Wetland Area Protection and Dredge and Fill Permitting on March 9, 2012 (SWRCB, 2012). If adopted in its current form, this policy would extend the jurisdiction of the Water Boards over unvegetated wetland, as well as wetlands that currently are not regulated by the USACE because they lack a significant nexus to a TNW. However, because the aforementioned policy is still in draft form, the evaluation of potential Project impacts presented in this AFC assumes that the jurisdictions of the Water Boards and USACE are the same.

### *Delineation Surveys*

Consistent with the CEC guidance, the jurisdictional delineation study area includes the Project Area plus a 250-foot buffer from the limits of disturbance for each of the Project components. A preliminary field review of potential jurisdictional waters was conducted along the natural gas linear during a site assessment survey on December 7, 2010, and formal jurisdictional delineations were conducted March 15-17, 2011 and March 27-30, 2012.

During both the March 2011 and March 2012 surveys, potential jurisdictional waters within the BRSA were delineated and mapped following the methods described in the *Corps Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Supplement* (USACE, 2008). The delineation of potential jurisdictional non-wetland waters in the BRSA followed the methods described in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley, 2008).

### *Potentially Jurisdictional Waters of the U.S.*

Potential waters of the U.S. in the delineation study area are shown on Figure 5.2-2 (Sheets 1 through 7 at a scale of 1:24000, and in Appendix F at a scale of 1:24006). These waters include the California Aqueduct, KRFCC, all drainage ditches that connect to these features, and two areas of seasonally ponded claypan depressions. The California Aqueduct conveys water from northern California to southern California for drinking water and irrigation. The California Aqueduct is a significant component of the California Department of Water Resources' State Water Project. The concrete-lined channel has a typical cross section of approximately 40 feet at the base and an average depth of approximately 30 feet. The CO<sub>2</sub> pipeline component of the OEHI Project will be installed beneath the canal using horizontal directional drilling (HDD) so that it will not affect the bed or banks of the canal. The jurisdictional status of the Aqueduct has not been confirmed by the USACE; however, this assessment assumes that the California Aqueduct is a potential jurisdictional water of the U.S., because it conveys water diverted from the San Joaquin and Sacramento rivers to other jurisdictional streams and rivers in southern California.

The KRFCC, an overflow channel of the Kern River, is located approximately 700 feet to the south of the Project Site, and the CO<sub>2</sub> pipeline would be installed beneath the KRFCC using

HDD. A portion of the Kern River was determined to be navigable by the USACE (Case ID: SPK-2008-00968)<sup>1</sup>- (USACE, 2012). The KRFCC would likely fall under the jurisdiction of the USACE because it is hydrologically connected to the Kern River, a TNW, and the bed and bank of the channel is clearly defined by levees within the BRSA.

Shallow topographic depressions, identified as claypan depressions based on the soil characteristics, are present at two locations in the delineation study area. One location was delineated in March 2011 and revisited in March 2012; and the other location was delineated in March 2012.

During the 2011 survey, sediment deposits (a distinguishable layer of sediments peeling away from the topmost soil horizon that potentially indicate ponding) were observed in the shallow, unvegetated claypans near the northern segment of the natural gas linear, but no saturation or ponding was observed. The 2012 surveys, timed approximately 10 days after a significant precipitation event (NOAA, 2012), confirmed that most of the area lacks ponding or saturation of the soil surface for greater than 5 percent of the growing season. A representative soil test pit in one of the depressions consisted of clay and clay loam soils with no visible redoximorphic features. Hydrophytic vegetation was observed along the perimeter of the claypan depressions during the 2011 surveys. Except for small areas of saturation or ponding observed during the March 2012 survey, the majority of the claypan depressions in this area do not meet USACE criteria for wetlands or waters of the U.S., based on the absence of wetland hydrology.

The second area, adjacent to SR 58, has numerous claypan depressions that were ponded or saturated with water during the March 2012 surveys. Mature Lindahl's fairy shrimp (*Branchinecta lindahli*), a common species in seasonally ponded wetlands, was observed in many of these features. This species of fairy shrimp typically requires 10-14 days of ponding to reach maturity, which provides another indicator of the duration of ponding (Eriksen and Belk, 1999). The persistence of ponded water in these features for more than 10 days after the last precipitation event is a positive indicator of wetland hydrology, because it is longer than 5 percent of the growing season in Kern County. Therefore, the extent of ponding of all pools within the BRSA was conservatively delineated as potential waters of the U.S. However, these pools were delineated as non-wetland waters of the U.S., based on the absence of hydrophytic vegetation. The only exception is the vegetated portion of one depression, which was delineated as a wetland.

### *Non-Jurisdictional Features*

Non-jurisdictional waters of the U.S. in the delineation study area include the West Side Canal, East Side Canal, all drainage ditches that connect to these features, and several retention/detention basins.

The West Side and East Side canals are irrigation canals that were constructed in uplands by Henry Miller and Charles Lux in the 1870s and 1880s. Both canals receive water from TNWs

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<sup>1</sup> It is navigable from the headwaters of the North Fork Kern River in Sequoia National Park, and the headwaters of the South Fork Kern River in Inyo National Forest through their convergence at Lake Isabella and down to its historic terminus into Buena Vista Lake.

(the Kern River, as well as two lakes in the Buena Vista Aquatic Recreation Area: Lake Evans and Lake Webb) (GoFISHn.com, 2011). However, the West Side and East Side canals are not jurisdictional waters because they are “closed” conveyance systems that do not discharge water into jurisdictional features (Bartel, 2012). These two canals are non-jurisdictional waters under the CWA because they lack a significant nexus to TNWs. In addition, all tributaries (drainage ditches) that run into the West Side and East Side Canals also lack a significant nexus and are non-jurisdictional.

Several retention/detention basins occur in—or adjacent to—the proposed natural gas linear. These basins store agricultural run-off and exhibit an ordinary high water mark. These features are not jurisdictional waters of the U.S., because artificial lakes or ponds excavated in uplands to collect and retain agricultural runoff for the purpose of irrigation are typically excluded from jurisdiction, as defined by the federal CWA (USACE, 1986).

#### *5.2.1.4 Special-Status Species*

The discussion of special-status species includes all federally and state-listed species and species proposed for listing under the Federal and California Endangered Species Acts (FESA and CESA); federal species of concern; state species of special concern; and plant species designated as rare, threatened, or endangered (Rank 1B or Rank 2) by the CNPS. Special-status species with the potential to occur within the BRSA and within 10 miles of the Project Site were identified from the following data sources:

- U.S. Fish and Wildlife Service (USFWS) species lists provided for each 7.5-minute U.S. Geological Survey (USGS) quadrangle in the BRSA (called the East Elk Hills and Tupman quadrangles).
- The California Natural Diversity Database (CNDDB) records (CDFG, 2012; see Figures 5.2-3 and 5.2-4, and Appendix F).
- The CNPS Inventory of Rare and Endangered Plants for the East Elk Hills and Tupman quadrangles (CNPS, 2012).
- 2001 Special-status plant species survey results at Elk Hills Oil Field, Kern County, California (Quad Knopf, 2001).
- Coles Levee Ecosystem Preserve 2007 Annual Report (Live Oak, 2008).
- Kern Water Bank Authority Habitat Conservation Plan/Natural Community Conservation Plan 2007 Compliance Report and Management Plan (Kern Water Bank Authority, 2008).
- Occidental Elk Hills Oil Field, Kern County, California Biological Database (2008).

Table 5.2-2, Biological Resources Field Survey, summarizes the surveys performed.

Table 5.2-3, Plant Species Observed in the Biological Resources Study Area, identifies all of the listed and sensitive plant species that were observed during surveys of the BRSA. Table 5.2-4, Wildlife Species Observed in the Biological Resources Study Area, identifies all the wildlife

species that were observed during surveys of the BRSA. Table 5.2-7, Special-Status Plant Species with Potential to Occur within 5 Miles of the Project Area, identifies all the listed and sensitive plant species that have potential to occur in the Project Area; and Table 5.2-8, Special-Status Wildlife Species with Potential to Occur within 5 Miles of the Project Area, identifies all the listed and sensitive wildlife species with the potential to occur in the Project Area. These tables summarize the preferred habitats for species with potential to occur in the BRSA. Species with no suitable habitat in the BRSA are not discussed further in this document. Figure 5.2-5 identifies the habitats and existing crop types within the Project Area.

### *Threatened and Endangered Plant Species*<sup>2</sup>

Based on review of the CNDDDB (CDFG, 2012) and CNPS (CNPS, 2012) database, as well as the 2007 Annual Monitoring Report for the Kern Water Bank, three listed plant species (Kern mallow, San Joaquin woollythreads, and California jewel-flower) have at least a low chance of being present along portions of the natural gas linear, rail line and/or electrical transmission linear. Species that have a very low chance of occurring within the BRSA are not discussed further. Species accounts are based on information from Calflora (2012) and the CNPS online database (2012).

#### **California Jewel-Flower** (*Caulanthus californicus*)

Federal/State/CNPS Status: Endangered/Endangered/Rank 1B.1

California jewel-flower is an annual herb that occurs primarily in Fresno, Kern, and Tulare counties. A member of the *Brassicaceae* family, it inhabits chenopod scrub, pinyon and juniper woodlands, and valley and foothill grasslands. Its habitat ranges in elevation from 70 to 1,000 meters. The blooming period is from February to May. The decline of this species is attributable to agriculture, urbanization, energy development, grazing, and possibly to invasion of non-native plants.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

#### **Kern Mallow** (*Eremalche kernensis* [*E. parryi* ssp. *kernensis*])

Federal/State/CNPS Status: Endangered/None/Rank 1B.2

Kern mallow is an annual herb that occurs primarily in Kern and Tulare counties. A member of the *Malvaceae* family, it inhabits chenopod scrub and valley and foothill grasslands. Its habitat ranges in elevation from 70 to 1,000 meters. The blooming period is from March to May. The decline of this species is attributable to conversion of habitat to agricultural use, as well as grazing and energy development.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

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<sup>2</sup> Note: taxonomic references are consistent with 2012 CNDDDB and CNPS Rank status designations.

**San Joaquin Woollythreads** (*Monolopia* [*Lembertia*] *congdonii*)

Federal/State/CNPS Status: Endangered/None/Rank 1B.2

San Joaquin woollythreads is an annual herb that occurs primarily in Fresno, Kern, and Kings counties. A member of the *Asteraceae* family, it inhabits chenopod scrub, as well as valley and foothill grasslands. Its habitat ranges in elevation from 60 to 800 meters. The blooming period is from February to May. The decline of this species is attributable to agriculture, urbanization, energy development, grazing, trampling, and vehicles.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

***Other Sensitive Plant Species***

Sensitive plant species were assessed concurrently with the federally and state-listed plant species. Species that have at least a low potential of occurring in the BRSA are discussed below; species with a very low potential of occurring in the BRSA are not discussed further. Species accounts are based on information available through Calflora (2012) and the CNPS website (2009).

**Horn's Milk-Vetch** (*Astragalus hornii* var. *hornii*)

Federal/State/CNPS Status: None/None/Rank 1B.1

Horn's milk-vetch is an annual herb that occurs primarily in Kern County. A member of the *Fabaceae* family, it inhabits meadows, seeps, and alkaline lake margins. Its habitat ranges in elevation from 60 to 850 meters. The blooming period is from May to October. The decline of this species is attributable to an eradication effort in the early 1900s and habitat alteration.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

**Heartscale** (*Atriplex cordulata*)

Federal/State/CNPS Status: None/None/Rank 1B.2

Heartscale has a growth form that ranges from annual herb to shrub, and occurs primarily in Kern, Madera, Merced, Solano, and Tulare counties. A member of the *Chenopodiaceae* family, it inhabits chenopod scrub, meadows and seeps, and valley and foothill grasslands. Its habitat ranges in elevation from 1 to 375 meters. The blooming period is from April to October. The decline of this species is attributable to trampling and competition with non-native plants.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

### **Subtle Orache** (*Atriplex subtilis*)

Federal/State/CNPS Status: None/None/Rank 1B.2

Subtle orache is an annual herb that occurs primarily in Kern, Madera, Merced, Fresno, and Tulare counties. A member of the *Chenopodiaceae* family, it inhabits valley and foothill grasslands. Its habitat ranges in elevation from 40 to 100 meters. The blooming period is from June to August. It is known from approximately 25 occurrences.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

### **Lost Hills Crownscale** (*Atriplex vallicola*)

Federal/State/CNPS Status: None/None/Rank 1B.2

Lost Hills crownscale is an annual herb that occurs primarily in Fresno, Kern, and San Luis Obispo counties. A member of the *Chenopodiaceae* family, it inhabits chenopod scrub, valley and foothill grasslands, and vernal pools. Its habitat ranges from 50 to 635 meters, and it blooms from April to August. The decline of this species is attributable to grazing, agricultural conversion, and energy development.

A population of Lost Hills crownscale was observed approximately 1.5 miles south of the Project Site. The Project components will avoid this population of Lost Hills crownscale. Based on the location of known populations, this species is not expected to be impacted by the Project.

### **Slough Thistle** (*Cirsium crassicaule*)

Federal/State/CNPS Status: None/None/Rank 1B.1

Slough thistle is a perennial herb that occurs primarily in King, Kern, and San Joaquin counties. A member of the *Asteraceae* family, it inhabits chenopod scrub, marshes, swamps, and riparian scrub. Its habitat ranges in elevation from 3 to 100 meters, and the blooming period is from May to August. The decline of this species is attributable to conversion of habitat to agricultural use and the introduction of non-native plants; slough thistle abundance fluctuates widely.

Based on the location of known populations, this species is not expected to be impacted by the HECA Project or OEHI Project.

### **Gypsum-loving Larkspur** (*Delphinium gypsophilum* ssp. *gypsophilum*)

Federal/State/CNPS Status: None/None/Rank 4.2

Gypsum-loving larkspur is a perennial herb that ranges from Alameda to Ventura County. A member of the *Ranunculaceae* family, it inhabits chenopod scrub, cismontane woodland, and valley and foothill grasslands. Its habitat ranges in elevation from 100 to 825 meters. The blooming period is from February to May. The decline of this species is attributable to road construction and maintenance, as well as energy development and grazing.

URS biologists identified several populations of gypsum-loving larkspur along previously considered linear Project components during botanical surveys in April 2010, approximately 1.5 miles to the south of the Project Site. These sightings were outside of the current BRSA. No populations have been observed in the current BRSA. Based on the location of known populations, this species is not expected to be impacted by the Project.

**Recurved Larkspur** (*Delphinium recurvatum*)

Federal/State/CNPS Status: None/None/Rank 1B.2

Recurved larkspur is a perennial herb that occurs primarily in Kern, Tulare, and San Luis Obispo counties. A member of the *Ranunculaceae* family, it inhabits chenopod scrub, cismontane woodland, and valley and foothill grasslands. Its habitat ranges in elevation from 3 to 750 meters. The blooming period is from March to June. The decline of this species is attributable to conversion of habitat to agricultural use, as well as grazing and trampling by livestock.

Based on the proximity of known occurrences, this species could potentially occur in natural habitats along the proposed natural gas linear alignment. However, no occurrences of this species have been identified in the BRSA. Based on the location of known populations, this species is not expected to be impacted by the Project.

**Hoover's Eriastrum** (*Eriastrum hooveri*)

Federal/State/CNPS Status: Delisted/None/Rank 4.2

Hoover's eriastrum is an annual herb that occurs primarily in Fresno, Kern, and Tulare counties. Previously listed as threatened by USFWS, Hoover's eriastrum was delisted October 2003 (CDFG). A member of the *Brassicaceae* family, it inhabits chenopod scrub, pinyon, and juniper woodlands, and valley and foothill grasslands. It ranges in elevation from 50 to 915 meters, and its blooming period is from February to May. The decline of this species is attributable to agriculture, urbanization, energy development, grazing, and possibly competition with non-native plants.

URS biologists identified several populations of Hoover's eriastrum along previously proposed Project linear alignments during botanical surveys in March 2009 and April 2010. The populations, comprised of one to 200 individuals, were located near the town of Tupman approximately 1 mile south of the Project site. Based on the proximity of this occurrence, it is possible that this species could occur in natural habitats along the proposed natural gas linear alignment. However, no occurrences of this species have been identified in the BRSA. Based on the location of known populations, this species is not expected to be impacted by the Project.

**Cottony Buckwheat** (*Eriogonum gossypinum*)

Federal/State/CNPS Status: None/None/Rank 4.2

The cottony buckwheat is an annual herb that occurs in Fresno, King, Kern, and San Luis Obispo counties. A member of the *Polygonaceae* family, it inhabits chenopod scrub and valley and

foothill grasslands. Its habitat ranges from 100 to 550 meters, and its blooming period is from March to September. The decline of this species is attributable to development.

URS biologists identified several populations of cottony buckwheat during botanical surveys of a previous CO<sub>2</sub> pipeline alignment in 2010. The populations co-occurred with populations of Hoover's eriastrum and oil neststraw. No occurrences of this species have been observed in the current BRSA, including the current CO<sub>2</sub> linear route evaluated by OEHI in Appendix A. Based on the location of known populations, this species is not expected to be impacted by the Project.

### **Tejon Poppy** (*Eschscholzia lemmonii* ssp. *kernensis*)

Federal/State/CNPS Status: None/None/Rank 1B.1

The Tejon poppy is an annual herb that is restricted to Kern County. A member of the *Papaveraceae* family, it inhabits chenopod scrub and valley and foothill grasslands. Its habitat ranges from 160 to 1,000 meters, and its blooming period is from March to May. The decline of this species is attributable to grazing, and invasion by non-native plants.

Based on the proximity of known occurrences south of the Project site, it is possible that this species could occur in natural habitats in the BRSA. However, no occurrences of this species have been identified during previous botanical surveys of the BRSA. Based on the location of known populations, this species is not expected to be impacted by the Project.

### **Oil Neststraw** (*Stylocline citroleum*)

Federal/State/CNPS Status: None/None/Rank 1B.1

Oil neststraw is a perennial herb that occurs primarily in Kern County. A member of the *Asteraceae* family, it inhabits chenopod scrub, as well as valley and foothill grasslands. Its habitat ranges in elevation from 50 to 400 meters. The blooming period is from March to April. The species is "known from fewer than twenty occurrences from the East Elk Hills quadrangle... [and may be]... threatened by energy development and urbanization" (CNPS, 2012).

URS biologists identified several populations of oil neststraw along previously proposed linear Project components during botanical surveys in 2010. The populations were found along with populations of Hoover's eriastrum in the vicinity of the proposed CO<sub>2</sub> linear alignment. Additional occurrences were documented during surveys conducted by OEHI for the current CO<sub>2</sub> linear alignment. The results of these surveys are provided in Appendix A.

### ***Threatened and Endangered Wildlife Species***

Habitat in the BRSA was evaluated for its potential to support special-status wildlife species. Threatened and endangered wildlife species with at least a low potential to occur in the BRSA are discussed below and presented in Table 5.2-8, Special-Status Wildlife Species with Potential to Occur within 5 Miles of the Project Area. Species with a very low chance of being in the BRSA are not discussed further.

*Reptiles***Blunt-Nosed Leopard Lizard** (*Gambelia sila*)

Federally Endangered/State Endangered, Fully Protected

The blunt-nosed leopard lizard inhabits sparsely vegetated alkali and desert scrub habitats. Blunt-nosed leopard lizards are carnivorous. They forage opportunistically on the ground, catching grasshoppers, cicadas, and small lizards, including smaller leopard lizards. They commonly hunt by slowly stalking prey, then rapidly dashing in to capture it. Leopard lizards typically find shelter by using mammal burrows, shrubs, or structures such as fence posts. *G. sila* do not dig their own burrows. Females can create nests by altering unused mammal burrows to form a closed chamber below the soil surface (Tollestrup, 1983). Leopard lizard habitat is characterized by sparsely vegetated scrub and grassland habitats in flat areas. *G. sila* hibernate during the winter and are active from late March to late June or July. Metabolic rates and activity are regulated by ambient temperatures. *G. sila* mate from late April through May, and the females usually lay eggs between May and June. The usual clutch size is three eggs, but can range from two to six. Females usually produce one clutch per year, although occasionally a second is produced. The incubation period is approximately 57 days. Females may breed during their first spring, but males may not breed until they are large enough to secure a territory (Tollestrup, 1982; 1983). Blunt-nosed leopard lizard populations are located in scattered sites in the San Joaquin Valley and adjacent foothills, and are found between elevations of 100 to 2,400 feet (Stebbins, 2003) on alkali flats, large washes, arroyos, canyons, and low foothills. The decline of this species is attributable to conversion of habitat to agricultural land.

No habitat for blunt-nosed leopard lizards is present in the Project Site. However, this species has been observed in the vicinity of the CO<sub>2</sub> linear and the natural gas linear. Figure 5.2-6 shows the documented blunt-nosed leopard lizard observations and the current understanding of occupied habitat in the BRSA and vicinity. In addition to CNDDDB records, blunt-nosed leopard lizards have been observed by URS biologists at several other locations in the vicinity of the Project:

- In August 2008, blunt-nosed leopard lizards were observed on the southwestern side of the California Aqueduct, near the proposed carbon dioxide linear.
- In late August 2010, one blunt-nosed leopard lizard was observed approximately 0.4 mile east of the Buttonwillow Ecological Reserve.

A small segment of the natural gas pipeline would be constructed approximately 0.5 mile from where blunt-nosed leopard lizards were documented in 2007. Another segment of the natural gas pipeline would be constructed adjacent to degraded natural habitat that is approximately 0.75 mile south of a documented occurrence of blunt-nosed leopard lizard from 1992 (Figure 5.2-6).

The Kern Water Bank properties, 1 mile to the east of the Project Site, are potentially suitable for blunt-nosed leopard lizard, but may not be occupied due to the abundance of grass cover and past management activities (i.e., disking or tilling and periodic flooding). The CNDDDB has records

of blunt-nosed leopard lizard in 1990 on the Tule Elk Reserve, which is approximately 1,700 feet east of the Project Site and 0.5 mile south of the potable water linear and the electric transmission linear alignments.

This species is assumed to be present in areas that have suitable habitat. However, protocol surveys for adult blunt-nosed leopard lizards will be conducted in 2012 in areas with potential habitat, and survey results will be provided to the CEC. The Project would minimize impacts to natural habitats. Direct interactions with this species would not be likely due to the limited amount of suitable habitat in the Project Area.

### **Giant Garter Snake** (*Thamnophis gigas*)

Federal/State Status: Threatened/Threatened

The giant garter snake is one of the largest garter snakes; attaining a total length of at least 63 inches. Females tend to be slightly longer and proportionately heavier than males. Its diet consists of small fish, tadpoles, and frogs. Adequate water during the early spring through mid-autumn to provide food and cover is an essential habitat requirement. During its active season, wetland vegetation such as cattails and bulrushes provide essential cover and foraging habitat; openings alongside waterways facilitate basking. During the dormant season of winter, *T. gigas* require higher-elevation uplands for cover and safety from flood water. Throughout the dormant season, *T. gigas* inhabits small mammal burrows that lie above flood elevations. Giant garter snakes breed through March and April, and females give birth to live young from late July through early September. Brood size ranges from 10 to 46 young, with an average brood size of 23. Young immediately disperse into dense cover and absorb their yolk sacs, after which they begin foraging independently. Sexual maturity averages 3 years for males and 5 years for females (Stebbins, 2003).

The giant garter snake lives in agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low-gradient streams, and adjacent uplands in the Central Valley. Due to the direct loss of natural habitat, the giant garter snake relies heavily on rice fields in the Sacramento Valley, but also uses managed marsh areas in Federal National Wildlife Refuges and State Wildlife Areas. Giant garter snakes are usually absent from larger rivers due to a dearth of suitable habitat and emergent vegetative cover, and from areas with sand, gravel, or rock substrates. There have been few recent sightings of giant garter snakes in the San Joaquin Valley.

The species is assumed to be extirpated or very rare in most of the former range in the San Joaquin Valley. Surveys in the 1970s and 1980s yielded some previously unknown localities and several cases of extirpation, or at least severe population declines (USFWS, 1993). The area of occupancy, number of sub-populations, and population size are probably continuing to decline, but the rate of decline is unknown. The decline of this species is primarily attributable to loss and degradation of habitat (USFWS, 1999a). Activities that may degrade habitat include maintenance of flood control and agricultural waterways, weed abatement, rodent control, discharge of contaminants into wetlands and waterways, and overgrazing in wetland or streamside habitats. Factors that may be significant in some areas include predation by and competition with introduced species, parasitism, and road kills (USFWS, 1999a). USFWS

(1993) listed threats as habitat loss, flooding (in rice production areas), pollutants, vehicular traffic, livestock grazing, and introduced predators such as house cats and bullfrogs.

No habitats suitable for giant garter snakes were observed during the 2008, 2009, 2010, or 2011 surveys. Based on input from USFWS and CDFG, this species is presumed to be extirpated from the BRSA due to the absence of suitable habitats. Therefore, no impacts to this species are anticipated.

### *Birds*

#### **Golden Eagle** (*Aquila chrysaetos*)

No Federal Status/State Fully Protected

The golden eagle is found throughout Eurasia, Africa, and North America. In North America, they live in the western part of the continent, ranging from Alaska to central Mexico. Small populations exist in the eastern United States and Canada. *A. chrysaetos* inhabit open to semi-open areas from sea level to 3,600 meters in elevation. They are found in open and semi-open areas, including tundra, shrublands, woodlands, grasslands, and coniferous forests. Golden eagles primarily inhabit mountainous areas, but can also nest in wetland, riparian, and estuarine habitats. Their diet consists primarily of small mammals, but they also eat birds, reptiles, and fish. *A. chrysaetos* form monogamous pairs, which can persist for several years. Pairs raise one brood annually, and the females lay one to four eggs (Birdweb, 2008).

No golden eagles have been observed during the wildlife or botanical surveys, and there are no documented nest sites within 40 miles of the Project Site.

#### **Swainson's Hawk** (*Buteo swainsoni*)

Federal Species of Concern/State Threatened

The Swainson's hawk is found throughout the Western United States from southwestern Canada south to western Texas. *B. swainsoni* breeds in the western United States and Canada, and winters in South America as far south as Argentina (England et al., 1997). Swainson's hawks inhabit open grasslands and desert-like habitats, including agricultural areas. Their diet consists of insects, small birds, mammals, reptiles, and amphibians. *B. swainsoni* form monogamous pairs, which breed and raise a brood once annually. The female lays from two to four eggs. Threats to the Swainson's hawk include loss of foraging and breeding habitat in California; and the use of pesticides by Argentine farmers.

In 2010, URS biologists identified two potential Swainson's hawk nest sites (Tule Elk Reserve and KRFCC) and documented fledged young at the KRFCC nest site (Figure 5.2-7). In 2011, four potential and one confirmed Swainson's hawk nest site were documented. The 2010 KRFCC nest site was occupied again in 2011. A pair of Swainson's hawks was observed near the 2010 Tule Elk Reserve nest site, but the nest structure was occupied by great-horned owls. The other potential Swainson's hawk nest structures were observed near the northern end of the process water linear study area within the KRFCC.

Protocol surveys for nesting Swainson's hawks have been initiated for the 2012 season. The entire BRSA will be surveyed, except for the CO<sub>2</sub> linear segment south of the California Aqueduct, which lacks potential nest trees.

### **Western Snowy Plover** (*Charadrius alexandrinus nivosus*)

Federally Threatened/California Species of Special Concern

The western snowy plover breeds on the Pacific Coast of the United States from southern Baja California, Mexico, to southern Washington. It also breeds in the interior areas of Oregon, California, Nevada, Utah, New Mexico, Colorado, Kansas, Oklahoma, and Texas.

*C. alexandrinus nivosus* inhabits sandy or gravelly coastal beaches, estuarine salt ponds, alkali lakes, and the Salton Sea. At the coast, their diet consists of amphipods and insects collected from dry sand; whereas inland, it is primarily comprised of brine flies. Western snowy plovers nest in depressions in the sand. Adults have high breeding-site fidelity. Broods range from two to six offspring, averaging three. Habitat degradation is the primary cause of the decline of this species, as well as nest failure due to predation, nest abandonment, and weather (Page et al., 1995).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

### **Yellow-Billed Cuckoo** (*Coccyzus americanus*)

Federal Species of Concern and Candidate Species/California Endangered

The yellow-billed cuckoo is somewhat common in the eastern United States, but is rare in California. The bird breeds in North America, migrates through Central America, and winters in South America. *C. americanus* inhabit open woodlands with a dense shrub layer. Their diet consists primarily of large insects, but also includes bird eggs, snails, and small reptiles and amphibians. Yellow-billed cuckoos are likely monogamous, and usually raise one brood per year—occasionally two. Females lay one to five eggs, usually two to three. The decline of this species in California is attributed to development disrupting riparian woodlands where it lives (Birdweb, 2008).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

### **White-Tailed Kite** (*Elanus leucurus*)

No Federal Status/California Fully Protected

The white-tailed kite inhabits the western United States, including California, Arizona, Oregon, and into Washington. *E. leucurus* frequent open grasslands with scattered trees for nesting and perching. These birds can be easily seen hovering in search of small mammals such as voles, which make up the majority of their diet. White-tailed kites have no known migration pattern, although they do wander widely when prey is scarce. Monogamous pairs are formed in December, and remain together year round. The pair builds a nest in January, and the female incubates four eggs while the male hunts for the pair. After fledging, the pair may raise a second brood. During the 1930s and 1940s, *E. leucurus* were threatened by extinction due to hunting

and egg collecting. Since that time, however, the species has been recovering and expanding its range (Birdweb, 2008).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

**Southwestern Willow Flycatcher** (*Empidonax traillii extimus*)

Federally Endangered/California Endangered

The Southwestern willow flycatcher breeds across southern Canada through the southern United States, and winters from Central to South America. It inhabits moist, shrubby areas and its diet consists of insects. *E. traillii extimus* are generally monogamous, with polygyny being occasionally reported. One brood is raised per year, more rarely two broods are reared. Clutch size ranges from two to four eggs, averaging three (Craig and Williams, 1998). The Southwestern willow flycatcher was placed on the Federal Endangered Species List in 1995. The Southwestern willow flycatcher has declined over the last 100 years primarily as a result of the extent of habitat fragmentation and degradation of riparian habitats. The largest remaining population in California is on the South Fork Kern River, Kern County (Unitt, 1987).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

**American Peregrine Falcon** (*Falco peregrinus*)

No Federal Status/State Endangered, Fully Protected

*Falco peregrinus* are found worldwide except for rainforests and arctic regions. They are one of the world's most widespread terrestrial vertebrate species. Peregrine falcons migrate long distances between breeding and winter ranges; typically moving along coastal regions or mountain ranges. They inhabit open habitats, including grasslands, tundra, and meadows. Their diet consists almost entirely of birds. They also prey upon reptiles and small mammals, including bats. Peregrine falcons form monogamous pairs that often persist through several breeding seasons. They have high nest-site fidelity. *F. peregrinus* raise one brood annually, laying from two to six eggs, averaging four. The use of DDT threatened the peregrine falcon with extinction; however, the ban of the chemical in the United States resulted in a remarkable recovery of the species (Birdweb, 2008).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

**Least Bell's Vireo** (*Vireo bellii pusillus*)

Federally Endangered/California Endangered

The least Bell's vireo was listed as endangered in 1986. At that time, the species had been extirpated from much of its historic range. In the last 10 years, least Bell's vireos have recovered somewhat, recolonizing the Santa Clara River in Ventura County to the north, and the Mojave River in San Bernardino County to the northeast. A large population of *V. bellii pusillus* inhabit the drainages of Marine Corps Base Camp Pendleton in San Diego County. They inhabit dense, shrubby vegetation, woodlands, scrub oak, coastal chaparral, and mesquite brushlands, often near

water in arid regions. Their diet consists of a wide array of insects, including caterpillars. Least Bell's vireos are monogamous, but they can switch mates between nesting attempts within seasons and between years. Clutch size ranges from two to five eggs, most commonly three to four. The primary reasons for the decline of least Bell's vireos are the loss of riparian habitat and nest parasitism by cowbirds (Brown, 1993).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

### *Mammals*

#### **Nelson's Antelope Squirrel** (*Ammospermophilus nelsoni*)

No Federal Status/California Threatened

Nelson's antelope squirrels are permanent residents of the western San Joaquin Valley. Their habitat is generally composed of sandy loam soils, widely spaced alkali scrub vegetation, and dry washes. Their diet consists of insects, vegetation, small vertebrates, and seeds. They have been known to cache seeds underground (Hawbecker, 1947). Nelson's antelope squirrels dig burrows or use kangaroo rat burrows for shelter, and use rocks and vegetation for cover (Grinnell and Dixon, 1919). Activity is diurnal, yet declines during elevated mid-day temperatures. Breeding occurs from February to May, peaking in April. Nests are constructed within burrows. Nelson's antelope squirrels typically range from elevations of 200 to 1,200 feet from southern Merced County south to Kern, Kings, and Tulare counties, as well as portions of eastern San Luis Obispo and Santa Barbara counties. In 1979, only about 20 percent of the original range was occupied (CDFG, 1980). The decline of this species is attributable to loss of habitat to cultivation and overgrazing, and the use of rodenticides (CDFG, 1980). Badgers, kit foxes, red-tailed hawks, golden eagles, coyotes, and various snakes prey on Nelson's antelope squirrel. California ground squirrels (*Spermophilus beechyi*) have been known to displace *A. nelsoni* from burrows (Harris and Stearns, 1991).

Nelson's antelope squirrels were identified in August 2008 along Tupman Road west of the town of Tupman, and in March 2009 along a previously proposed alignment of the potable water and natural gas linears south of the California Aqueduct. Occurrences of the species have been previously documented in the vicinity of the HECA Project Area near the proposed process water pipeline, the Buttonwillow Ecological Reserve west of the natural gas pipeline, and east of the Project Site on the Tule Elk Reserve. However, there were no sightings of Nelson's antelope squirrel during surveys in 2010 or 2011 in the HECA Project Area. Nelson's antelope squirrels are known from the vicinity of the OEHI Project Area. Based on the absence of observations of this diurnal (daytime active) species during the 2010 and 2011 surveys of the HECA Project Area, this species is not expected to occur in the BRSA north of the California Aqueduct. Nelson's antelope squirrels are assumed to occur in the OEHI Project Area.

#### **Giant Kangaroo Rat** (*Dipodomys ingens*)

Federally Endangered/California Endangered

Giant kangaroo rats are nocturnal rodents occurring in scattered colonies along the western side of the San Joaquin Valley. They are typically found on fine, sandy loam soils with sparse annual grass and forb vegetation, and marginally found in low-density alkali desert scrub. Their diet primarily consists of seeds, which are cached in burrows (Shaw, 1934), and green vegetation in spring. Level terrain and sandy loam soils are needed for burrowing. Optimal cover consists of areas with almost no shrub overstory, and very few physiographic variations (Grinnell, 1932; Shaw, 1934; Hawbecker, 1951).

Breeding season lasts from January to May, peaking in early spring. Litter size ranges from four to six individuals, and young are born and reared in the burrows. Predators include kit foxes, badgers, coyotes, barn owls, rattlesnakes, and gopher snakes. *D. ingens* currently occupies about 2 percent of its former range (CDFG, 1980). The decline of this species is attributable to loss of habitat to cultivation and overgrazing, and the use of rodenticides (CDFG, 1980).

No giant kangaroo rats or precincts were observed in the BRSA during the 2008, 2009, 2010, or 2011 surveys. Based on discussions with CDFG, giant kangaroo rats are not expected in the valley floor area north of the California Aqueduct. However, this species is assumed to be present in the vicinity of the CO<sub>2</sub> linear route south of the California Aqueduct, as described in Appendix A.

#### **Tipton Kangaroo Rat** (*Dipodomys nitratoides nitratoides*)

Federally Endangered/California Endangered

Tipton kangaroo rats are typically found in arid-land vegetative communities with flat or gently sloping terrain, in the floor of the Tulare Basin in the southern San Joaquin Valley. Tipton kangaroo rats generally occupy grassland with scattered shrubs and desert-shrub associations on friable soils. Burrows are commonly located in slightly elevated earth, canal embankments, and bases of shrubs and fences where mobile soils gather above the level of surrounding terrain. Soft soils generally support higher densities of Tipton kangaroo rats than other soil types (Williams and Kilburn, 1992). Tipton kangaroo rats require terrain that is not subject to flooding to support a sustainable population. Reproduction occurs in the winter months, with most females giving birth to only two young.

The historical geographic range of Tipton kangaroo rats encompassed over 1.7 million acres of arid land. Their populations occupied the valley floor of the Tulare Basin throughout level or nearly level terrain. Current occurrences are restricted to scattered, isolated areas. In the southern San Joaquin Valley, this includes the Kern National Wildlife Refuge, Delano, and other scattered areas within Kern County. Agricultural and residential development and the widespread use of rodenticides are principally responsible for the decline of the species (Williams and Kilburn, 1992).

No Tipton kangaroo rats were observed during the 2008, 2009, 2010, or 2011 surveys. However, signs of kangaroo rats (burrows, tail drag, foot prints, and scat) were observed in areas with suitable habitat along the natural gas linear alignment. A local small mammal expert noted that 2010 had the highest capture rate for Tipton kangaroo rats ever recorded for the area (Warrick, 2010). Tipton kangaroo rats could be present throughout the BRSA in areas where suitable

habitat is present. Figure 5.2-8, Tipton Kangaroo Rat occurrences near the Biological Resources Study Area, shows the locations of known Tipton kangaroo rat. Many of these records are very broad and non-specific, and/or older than 20 years, but Tipton kangaroo rats could be present in the Project Area in suitable habitats, north of the California Aqueduct.

### **Buena Vista Lake Shrew** (*Sorex ornatus relictus*)

Federally Endangered/No State Status

The Buena Vista Lake shrew inhabits the marshes of the southern San Joaquin Valley. It is a subspecies of the ornate shrew, *S. ornatus ornatus*. Shrews primarily feed on invertebrates; particularly insects. The Buena Vista Lake shrew does not cache food in burrows, and must forage frequently throughout the day and night to maintain its rapid metabolic rate. During the hottest months, activity is mostly confined to cooler periods of the day and night. The reproductive period stretches from late February through September and early October. Females of this species may have from one to eight offspring per litter, although four to six is typical. Nothing is known about the reproductive and mating system of the Buena Vista Lake shrew, but the breeding season may begin in autumn and end with the onset of the dry season in May or June (Williams and Kilburn, 1992).

The Buena Vista Lake shrew formerly occupied the marshlands of the San Joaquin Valley and the Tulare Basin. Its range has diminished due to the loss of lakes and sloughs in the area. It has been recorded from the Kern Lake Preserve area and the Kern National Wildlife Refuge. Its current distribution is unknown, but likely to be very restricted due to the loss of habitat. The decline of this species is attributable to loss of habitat due to agricultural conversion (Williams and Kilburn, 1992).

No Buena Vista Lake shrews or habitats suitable for this species were observed during the 2008, 2009, 2010, or 2011 surveys of the BRSA. Established riparian habitat that is potentially suitable for this species is approximately 1 mile south of the Project Site. This species was observed approximately 3.5 miles south of the Project Site in 1999 (CDFG, 2012); however, this species is not expected to be impacted because the Project would not impact riparian habitat.

### **San Joaquin Kit Fox** (*Vulpes macrotis mutica*)

Federally Endangered/California Threatened

The San Joaquin kit fox historically ranged throughout the San Joaquin Valley from Contra Costa County to northern Santa Barbara County. San Joaquin kit foxes remain widely dispersed but have greatly reduced numbers and isolated populations (Williams and Kilburn, 1992). San Joaquin kit foxes primarily live in grassland; and to a lesser extent, shrub and agricultural habitats. They predominantly eat rodents, ground squirrels, rabbits, hares, and ground-nesting birds. The pups are born in late winter and early spring, and the male provides most of the food for the female while she is nursing. Kit foxes change dens frequently; often enlarging existing ground squirrel burrows to create new dens. Predation or competitive exclusion of kit foxes may occur in the presence of coyotes, introduced red foxes, domestic dogs, bobcats, and large raptors. Human threats to the San Joaquin kit fox include destruction of habitat, habitat degradation, predator and pest control programs, and accidents caused by proximity to humans such as

electrocution, road-kills, and suffocation from accidental burial in dens (Williams and Kilburn, 1992). Finally, natural factors such as drought, flooding, and rabies cause a significant percent of kit fox deaths. The San Joaquin kit fox is currently listed as a Federally Endangered Species and a State of California Threatened Species (USFWS, 1998).

San Joaquin kit foxes could occur throughout the region of the Project Site and the proposed linear Project components; however, dens, scat, and burrows indicate that the Elk Hills area south of the California Aqueduct is the most intensively used area in the BRSA (Figure 5.2-10, San Joaquin Kit Fox Occurrences Near the Project Area). Very few kit foxes have been recorded north of the California Aqueduct near the Project Site and linears in the last 20 years, based on CNDDDB records and site assessments of burrows, sign, and scat. No active kit fox dens were seen in 2008, 2009, 2010, or 2011 in areas northeast of the California Aqueduct; numerous historic burrows were evident along the proposed natural gas linear alignment, but none of the burrows showed signs of recent use.

### **Other Sensitive Wildlife Species**

Other sensitive wildlife species were assessed concurrently when the federally and state-listed wildlife species were assessed. Other sensitive wildlife species with at least a low potential to occur in the study area are discussed below and presented in Table 5.2-8, Special-Status Wildlife Species with Potential to Occur within 5 miles of the Project Area. Species with a very low potential to occur in the Project Area are not discussed further.

#### *Amphibians*

#### **Western Spadefoot (*Spea hammondi*)**

No Federal Status/California Species of Special Concern

The Western spadefoot is a California Species of Special Concern (CDFG, 2011) found from the Central Valley south to Baja California. It prefers open areas with sandy or gravelly soils. It is found in a variety of habitats, including mixed woodlands, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. The Western spadefoot is primarily nocturnal and terrestrial, only entering water bodies to breed. It spends the majority of its time burrowed in the ground. Breeding season depends on weather conditions, but typically occurs between January and May. Eggs laid and attached to submerged vegetation are externally fertilized and mature in up to 6 days. Depending on temperature and food availability, tadpoles morph in 3 to 11 weeks. Adults are stout-bodied, with relatively smooth skin and green or gray dorsum, with skin tubercles tipped with orange. They are white in color below and have a wedge-shaped black spade on each hind foot. Their eyes are pale gold with distinct vertical pupils. Juveniles are similar but have more distinct spotting. The Western spadefoot visually locates its invertebrate prey and captures it with its swift tongue. The decline of this species is attributable to loss of habitat to urbanization and agricultural land (Stebbins, 2003).

Western spadefoot tadpoles were observed along the KRFCC, less than 1 mile south of the Project Site. No direct impacts to this species are expected because the Project will not impact the KRFCC.

### *Reptiles*

#### **Southwestern Pond Turtle** (*Actinemys marmorata pallida*)

No Federal Status/California Species of Special Concern

The Southwestern pond turtle is the only native terrestrial turtle found in California and is listed as a California Species of Special Concern. It is an aquatic turtle usually found in and around riparian areas or closely associated with freshwater. Its carapace is brown to olive-colored, without distinct markings. The plastron is light-colored, with light or dark markings. Males have a light, unmottled throat and lower facial area. The females and juveniles have mottled, dark-colored throats with varying degrees of dark and light markings. The southwestern pond turtle is distributed throughout the Pacific slope drainages from Klickitat County, Washington, to Baja California, Mexico. It occupies slow-flowing valley rivers with adjacent upland habitat for breeding. The mating season begins in late April and extends into May. The females migrate to an upland location, at times 400 meters from the aquatic site. The female excavates a shallow nest and deposits 1 to 13 thinly calcified eggs. Southwestern pond turtles become sexually mature in 7 to 11 years, and are generally long-lived. As general opportunists, their diet consists of slow-moving aquatic invertebrates, larvae, carrion, and aquatic vegetation (Stebbins, 2003).

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

#### **Silvery Legless Lizard** (*Anniella pulchra pulchra*)

No Federal Status/California Species of Special Concern

The silvery legless lizard is a subspecies of the California legless lizard, appearing gray or beige on top with a dark mid-dorsal line, and yellow below with fine lengthwise lines between scale rows. Legless lizards are most commonly found in coastal ranges, but low-density populations have been found along the San Joaquin Valley floor. They use several habitat types: coastal dune, valley-foothill, chaparral, and coastal scrub—seeking out loose, moist, organic soils. Silvery legless lizards burrow in the soil for shelter and forage for insect larvae, small adult insects, and spiders. It is a Forest Service Sensitive species and a California Species of Special Concern (CDFG, 2011). Agriculture, the introduction of exotic vegetation, housing development, sand-mining, golf courses, and off-road-vehicle use threaten its existence.

This species is not expected to occur in the Project Area due to a lack of suitable habitat.

#### **San Joaquin Whipsnake** (*Masticophis flagellum ruddocki*)

No Federal Status/California Species of Special Concern

The San Joaquin whipsnake is slender with smooth scales, large eyes and head, and thin neck. It can range from tan, olive-brown to yellowish brown. The whipsnake is diurnal and can be

observed basking on roadsides. Its habitat is open, dry, treeless grasslands or chenopod scrub. The species is endemic to California and ranges from Sacramento Valley to San Joaquin Valley. It takes refuge in rodent burrows, beneath vegetation, or other objects providing shade. The San Joaquin whipsnake feeds on small mammals, bats, nestlings, adult birds, bird eggs, lizards, snakes, amphibians, and carrion. The San Joaquin whipsnake is threatened by the conversion of its habitat to row crops and urban development within its limited range (Stebbins, 2003).

This species may occur along portions of the natural gas linear or KRFCC, where there is natural habitat.

**California Horned Lizard** (*Phrynosoma coronatum*)

No Federal Status/California Species of Special Concern

The California horned lizard is a flat-bodied lizard covered with spikes. Its historic range extended from Baja California, along the Pacific Coast to the Bay Area, and inland as far north as the Shasta Reservoir. Its range is currently fragmented due to habitat destruction, development, and agriculture. Populations are also threatened by displacement of native ants, a primary prey item that are threatened by the introduction of non-native ants. Prior to 1981, capture for the pet trade depleted population numbers. California horned lizards may be found in grasslands, woodlands, and chaparral that contain areas of loose, sandy soils from sea level to 8,000 feet (Stebbins, 2003).

The electrical transmission linear route is within the historical range of the California horned lizard; however, the habitat has been substantially modified and is now poorly suited for this species. The natural gas linear route is also within the historical range of the California horned lizard. Scat that is typical for horned lizards (consisting entirely of ant bodies) was found in the BRSA for the natural gas linear in 2011 during blunt-nosed leopard lizard surveys. The allscale scrub habitats along the proposed natural gas linear supports an ant-prey base that is suitable habitat for the California horned lizard.

*Birds*

**Tricolored Blackbird** (*Agelaius tricolor*)

Federal Species of Concern/California Species of Special Concern

This species occurs throughout the Central Valley, Inner Coast, and Coast ranges from the Sacramento Valley southward into northwestern Baja California Norte, Mexico. Seasonal breeding aggregations also occur in the Klamath Basin of northern California and southern Oregon, and in northern Oregon (National Geographic, 2001). Although the overall breeding distribution of this species in California has remained relatively constant from historical to present times, the size of most colonies has declined dramatically during the past century. The principal factors for their decline are widespread destruction of wetland habitat and increased use of pesticides, which have negatively affected prey populations. Shuford and Gardali (2008) list tricolored blackbirds as a first priority (high vulnerability) species in California.

Tricolored blackbirds prefer to nest in dense colonies in freshwater marshes with an extensive bed of emergent vegetation, such as tules and cattails. This species is also known to nest in other types of vegetation, including sedges, nettles, willows, thistles, mustard, blackberry, wild rose, and dense grass (Grinnell and Miller, 1944; Kudrak, 1999). Their nests are constructed of mud and plant material and are generally placed on the ground or in emergent aquatic vegetation, either over or within a few feet of fresh water. Nesting occurs from mid-April through late July, during which time they typically raise two broods of young. Clutch size ranges from one to five eggs, averaging three to four. Nesting colonies are typically located adjacent to agricultural fields, pastures, and short grass habitats, in which they feed (Lehman, 1994). Their diet consists of insects, particularly grasshoppers. After the nesting season, they concentrate in mixed flocks with other species of blackbirds to forage on the ground in open, grassy fields, agricultural lands, flooded fields, stock pens, pastures, and along the margins of ponds (Grinnell and Miller, 1944; Lehman, 1994).

This species has not been detected during surveys and is not expected to occur in the Project Area due to a lack of suitable breeding habitat.

### **Burrowing Owl (*Athene cunicularia*)**

No Federal Status/California Species of Special Concern

Burrowing owls were formerly a common, even locally abundant, resident throughout much of California; however, Grinnell and Miller (1944) noted a decline before the early 1940s. Populations have declined significantly throughout California; and now, the highest densities appear to be found in state and federal wildlife refuges (Remsen, 1978). Burrowing owls depend heavily on the presence of burrowing rodents, coyotes, badgers, and other mammals to create the burrows that they use for roosting and nesting. Man-made structures, such as cement culverts and debris piles, may also be used (Kudrak, 1999). Early in this century, efforts to control small mammal populations and predators led to a noticeable decline in this species (Grinnell and Miller, 1944; Garrett and Dunn, 1981). Negative pressures on owl populations have been supplemented by widespread conversion of grassland habitats to agriculture or other development. Shuford and Gardali (2008) list burrowing owls as a first priority (high vulnerability) species in California. Regional declines have been so dramatic that the CDFG has recently been petitioned to list this species as threatened in the state under the CESA.

Burrowing owls prefer dry, open, grassy, usually treeless plains and gently rolling hills. They also inhabit man-made features, such as agricultural fields, airports, roadsides, golf courses, drainage ditches, and vacant lots, if prey and burrow sites are available. Their diet consists of insects, small frogs, lizards, and rodents. Burrowing owls typically nest between early April and late June, with most activity occurring in April in Kern County. Clutch size ranges from seven to nine eggs. Fledging occurs approximately 2 months after the eggs are laid (early June to late August), but family groups stay together at least into fall. Only one brood is raised each year.

In 2011, three different areas south of the proposed electrical transmission/potable water linears had burrowing owl sightings; all three sightings coincide with the potential nesting period for the species. A pair of adults was seen east of Morris Road, south of the proposed alignment, but no young or burrows were detected (Figure 5.2-9). Burrowing owl family groups consisting of

adults and fledged young were observed near the northern end of the natural gas linear, east of the Buttonwillow Ecological Reserve, and along the proposed railroad and natural gas alignments.

**Mountain Plover** (*Charadrius montanus*)

Federal and California Species of Special Concern

USFWS listed mountain plovers as threatened in 1999. Mountain plovers nest from northern Montana and North Dakota, southward through the Great Plains into southeastern New Mexico and Texas (National Geographic, 2001). This species does not nest in California; however, most of these populations overwinter primarily in California, but with smaller numbers in Texas, Arizona, and Mexico, between mid-September and mid-March. In California they are found in interior valleys and plains at low elevations from the Sacramento Valley southward to San Diego County and eastward to the Mojave and Colorado deserts (Grinnell and Miller, 1944). Both breeding and wintering grounds are characterized as short grass prairie, shrub-steppe landscapes, low, rolling, grassy foothills, and agricultural fields. Mountain plovers are rarely found near water. Mountain plovers begin to arrive on their wintering grounds in California by September, but do not appear in large numbers until November, and leave in late March and early April. The primary wintering sites in California are the Central Valley, Carrizo Plain, and Imperial Valley. The mountain plover is insectivorous. Clutch size ranges from one to six eggs, averaging three. The decline of this species is attributable to loss of nesting habitat, and habitat alteration due to the loss of primary grazers (Knopf, 1996).

This species has not been detected during surveys, and is not expected to occur in the Project Area.

**Fulvous Whistling-Duck** (*Dendrocygna bicolor*)

No Federal Status/California Species of Special Concern

The fulvous whistling-duck breeds across the world's tropical regions, including the U.S. Gulf Coast. Fulvous whistling-ducks breed once yearly, with clutches ranging in size from eight to sixteen eggs. Nests are built on a stick platform in reeds. *D. bicolor* habitat includes freshwater lakes, rice fields, or reservoirs. Plentiful vegetation is necessary, because the ducks feed primarily on seeds and other plant parts. This species was in decline in the early 1960s due to pesticide application on rice fields. However, since that time, populations of *D. bicolor* have stabilized (Hohman and Lee, 2001).

This species has not been detected during surveys, and is not expected to occur in the Project Area due to a lack of suitable breeding habitat.

**California Horned Lark** (*Eremophila alpestris actia*)

No Federal or State Status/DFG Watch List

The California horned lark ranges from Humboldt County in the north to northern Baja California in the south. *E. alpestris actia* inhabit open habitat, usually where trees and large

shrubs are absent. They prefer to breed in short grasslands, rangelands, and open fields. Their diet consists of seeds, insects, spiders, and snails, as well as fruit, occasionally. California horned larks form monogamous pairs, but the pairs do not persist for more than one season. They frequently raise two broods per season. Clutches range from two to five eggs. The greatest threat to California horned larks is loss of habitat due to destruction and fragmentation (Beason, 1995).

Horned larks were sighted in and around the Project Site and associated linears. Breeding is likely, yet unconfirmed.

### **Loggerhead Shrike** (*Lanius ludovicianus*)

No Federal Status/California Species of Special Concern

The loggerhead shrike is most common in Central Canada through the Greater Midwest of the United States. During its spring-to-summer migration, it can travel as far southwest as California, although the species is seen in decreasing numbers in that region. The loggerhead Shrike inhabits open spaces bordered by vegetation. It is the only known predatory songbird. Because it does not possess talons, it must impale its prey with its beak against a hard surface, such as a tree trunk. Its diet consists primarily of mice, but it will also eat insects, small amphibians, and small birds. Clutch size ranges from one to nine eggs, most commonly five to six (Birdweb, 2008).

Loggerhead shrikes were observed around the KRFCC, as well as the study areas for previously considered linear Project components. It is likely that loggerhead shrikes breed in the BRSA, but breeding is unconfirmed. Both breeding and foraging are more likely near areas of natural habitat.

### **Le Conte's Thrasher** (*Toxostoma lecontei*)

Federal Species of Special Concern/California Species of Special Concern

Le Conte's thrasher is an uncommon to rare, non-migratory resident of southern California deserts from southern Mono County south to the Mexican border, and in western and southern San Joaquin Valley. This species primarily inhabits open-desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats, and also occurs in Joshua-tree habitat with scattered shrubs. In the San Joaquin Valley, they are found primarily in habitats dominated by saltbush (*Atriplex* spp.), and areas of desert washes and flats with scattered bushes. Their diet consists of a variety of insects and other terrestrial arthropods, occasionally seeds, small lizards, and other small vertebrates (Bent, 1948; Sheppard, 1970). Their foraging activity is mostly limited to probing and digging in the soil and litter with their bill.

The Le Conte's thrasher nests in large saltbushes that can support a nest approximately 26 to 38 inches above the ground. Their breeding season begins in late January and lasts through early June, peaking from mid-March to mid-April. Breeding pairs remain together throughout the year. Female thrashers may have up to three broods during a breeding season, each with two to four eggs. The parents share the incubation of the eggs, which lasts 14 to 20 days. The young fledge 14 to 18 days after hatching.

The historic distribution of the San Joaquin Le Conte's thrasher included the western side of the San Joaquin Valley, from the Panoche Mountains, Fresno County, south to Maricopa, Kern County (USFWS, 1998). The current distribution of the San Joaquin Le Conte's thrasher is largely determined by the presence and structure of saltbush, extent of habitat fragmentation, and presence of competitors. The existing populations are within a set of habitat islands with large distances of unsuitable habitat separating them. Degradation, fragmentation, and loss of habitat to agriculture, irrigation, urbanization, oil and gas development, fire, and over-grazing are the primary causes for the decline of the San Joaquin Le Conte's thrasher (Remsen, 1978).

This species has not been detected during surveys, and is not expected to occur in the Project Area.

### *Mammals*

#### **Tule Elk** (*Cervus elaphus nannodes*)

No Federal or State Status

Although the tule elk is not identified as a sensitive species, due to its proximity to the Project Site and historical near-extinction, this paragraph is included to further address this species.

The tule elk is a California endemic species. During the 1800s, they were almost extirpated due to hunting and loss of habitat, but populations have recovered, now inhabiting more than 20 different areas in California (McCullough, et al., 1996). These large mammals travel in herds that range from just a few individuals to several hundred. Their diet consists of grasses, herbaceous plants, and conifer leaves. Females generally have one calf per year. The calves are generally nursed for about 5 months, but they begin eating vegetation within the first week of their lives (McCullough, 1969). The primary predators of tule elk were mountain lions and bears, but humans were the only significant predator in the last 200 years.

Tule elk currently inhabit the Tule Elk Reserve approximately 1,700 feet east of the Project Site. Herds average in size about 30 individuals. The Project would not affect the tule elk.

#### **Short-Nosed Kangaroo Rat** (*Dipodomys nitratooides brevinasus*)

No Federal Status/California Species of Special Concern

Short-nosed kangaroo rats inhabit flat or gently sloping terrain and on hilltops in desert-shrub associations; primarily, saltbushes and California ephedra. Short-nosed kangaroo rats generally occupy grassland with scattered shrubs and desert-shrub associations on friable soils.

*D. nitratooides brevinasus* are nocturnal and active throughout the year. Life history is similar to other species of kangaroo rat (Williams and Kilburn, 1992). Like other subspecies of the San Joaquin kangaroo rat, populations of the short-nosed kangaroo rat undergo dramatic population fluctuations, and sometimes disappear from an area (Williams et al., 1993).

Short-nosed kangaroo rats historically occupied arid lands along the western half of the San Joaquin Valley floor and hills from Merced County south to the foothills of the Tehachapi Range, and east and north inland, north of Bakersfield. Current populations mostly are small and

fragmented. Approximations for the current range of *D. nitratoides brevinasus* estimate the occupied area is only about 3.75 percent of historical habitat. The decline of this species is attributable to loss of habitat to cultivation and overgrazing, and the use of rodenticides (CDFG, 1980).

Signs of common small mammal species (such as gopher and ground squirrel) were observed along the proposed electrical transmission linear route; potential signs of sensitive mammals, such as short-nosed kangaroo rat, were seen in the Kern Water Bank properties adjacent to the proposed electric transmission linear route, and are expected to be present south of the California Aqueduct along the proposed CO<sub>2</sub> linear route.

### **Tulare Grasshopper Mouse (*Onchomys torridus tularensis*)**

No Federal Status/California Species of Concern

The Tulare grasshopper mouse inhabits arid shrublands, particularly alkali sink, saltbush scrub, and upper Sonoran subshrub-scrub. The historic range extended from western Merced and eastern San Benito counties to Madera County and south to the Tehachapi Mountains. Current development and increased agricultural production have caused fragmentation, reduction, and degradation of its habitat (Williams and Kilburn, 1992). Tulare grasshopper mouse has a stout body and short, relatively thick tail. The head, back, and upper sides range in color from pale-brown to grayish or pinkish cinnamon, while the underparts are distinctly white. The grasshopper mouse diet is composed of small animals and seeds, including grasshoppers, scorpions, pocket mice, western harvest mice, spiders, and frogs. The mouse is nocturnal, and active year round. Males have a home range of 3.2 hectares and females range for 2.4 hectares. Both male and female mice care for their young. Up to three litters are produced per year, with two to six young. Most litters are born from May to July (Williams and Kilburn, 1992).

This species has not been detected during surveys; however, this species could potentially be present in natural habitats adjacent to the natural gas linear, electrical transmission linear, and the process water linear.

### **San Joaquin Pocket Mouse (*Perognathus inornatus*)**

No Federal or State Status/BLM Sensitive Species

The San Joaquin pocket mouse inhabits dry, open grasslands or scrub areas on fine-textured soils between elevations of 1,100 and 2,000 feet in the Central and Salinas valleys. Their diet consists primarily of seeds, with green vegetation and insects as a minor component. *P. inornatus* caches gathered seeds in their burrows. San Joaquin pocket mice inhabit shrubby ridge tops and hillsides (Hawbecker, 1951). Burrows are excavated for shelter, with young born and reared within them. Reproduction likely takes place throughout the spring and early summer. The San Joaquin pocket mouse is nocturnal, and may become torpid during extreme heat or cold. Badgers, owls, weasels, skunks, kit foxes, and domestic cats likely prey on San Joaquin pocket mice.

This species has not been detected during surveys of the BRSA; however, this species could potentially be present in natural habitats adjacent to the natural gas linear, electrical transmission linear, and the process water linear.

### **American Badger** (*Taxidea taxus*)

No Federal Status/California Species of Special Concern

Badgers are distributed throughout the western and midwestern U.S., and from Canada southward to Mexico (Hall, 1981). In California, they historically occurred over most of the arid and semi-arid portions of the state (Ingles, 1965). Badger populations have declined drastically in California since the early 1900s, especially in the Central Valley, where they were once considered numerous (Grinnell et al., 1937). They are now restricted to grassland and scrub habitats around the periphery of the valley because of agricultural conversion of grassland habitats (Williams, 1986). Populations have been eliminated from much of the Coast Range and throughout most of the coastal plain of southern California due to poisoning, trapping, and shooting on grazing lands; agricultural development; and urbanization (Williams, 1986).

Badgers inhabit a variety of habitats, including grasslands, savannas, mountain meadows, coastal sage scrub, and riparian scrub. A common feature of these habitats is friable soils and a high density of burrowing rodents such as gophers (*Thomomys*), kangaroo rats (*Dipodomys*), and ground squirrels (*Spermophilus*, *Ammospermophilus*), and marmots (*Marmota*). They also eat a variety of other wildlife, including mice, reptiles, birds, eggs, bees, and grasshoppers (Williams, 1986). *T. taxus* litters range from one to five offspring, averaging three.

An American badger carcass was observed southwest of the town of Tupman in March 2009. No occurrences of badgers have been documented in the Project Area or the BRSA. However, this species could potentially be present in natural habitats adjacent to the natural gas linear and the process water linear.

### *Bats*

The following special-status bats are known to occur in California in the Project vicinity:

- Pallid bat (*Antrozous pallidus*) – California state species of concern
- Townsend's big-eared bat (*Corynorhinus townsendii townsendii*) – California state species of concern
- Western mastiff bat (*Eumops perotis*) – California state species of concern

These bat species are generally widespread throughout the western United States and Mexico, but are sensitive to human-related impacts. Suitable roosting and nesting areas include caves, mines, tree snags, buildings, bridges, and other human-made structures. In California, these species generally mate during the late fall, and give birth to their young between early May and the end of July (Eder, 2005).

Some of these bat species may forage over the Project Site. The BRSA lacks natural bat roost habitat such as mines, cliffs, or caves. Impacts to breeding and roosting habitat present the biggest threat to declining bat populations in the state.

### **Pallid Bat** (*Antrozous pallidus*)

No Federal Status/California State Species of Concern

The pallid bat inhabits rocky, outcrop areas where they commonly roost in rock crevices, caves, and mine tunnels. They also roost in attics, barns, behind signs, in hollow trees, and in abandoned adobe buildings. *Antrozous pallidus* ranges from Canada to Mexico and east to Utah, Colorado, and Texas (Eder, 2005).

### **Townsend's Big-eared Bat** (*Corynorhinus townsendii townsendii*)

No Federal Status/California State Species of Concern

The Townsend's big-eared bat inhabits desert scrub, mixed-conifer forest, and pinyon-juniper, or pine forest habitat. Within these communities, they are associated with caves, mines, lava tubes, and buildings. *Corynorhinus townsendii townsendii* ranges from British Columbia to central Mexico and east to Texas (Eder, 2005).

### **Western Mastiff Bat** (*Eumops perotis californicus*)

No Federal Status/California State Species of Concern

The Western mastiff bat is the largest bat in North America, found in arid regions from central California to central Mexico. The Western mastiff bat roosts in rock crevices, particularly exfoliating slabs of granite or sandstone, or buildings that provide similar structures. The roosts must be at least 2 to 3 meters above ground to enable sufficient drop time to achieve flight. Bees, wasps, and moths dominate its diet, along with larger insects like cicadas, dragonflies, and grasshoppers. Western mastiff bats commonly forage 100 to 200 feet above ground, but occasionally forage above 2,000 feet (Eder, 2005). It is a California Species of Special Concern, most likely threatened by loss of habitat due to urbanization, marsh drainage, and cultivation of foraging fields (CDFG, 2011). The use of insecticides may also be responsible through the decline of its food source and indirect poisoning.

## 5.2.2 Environmental Consequences

The Project will have significant impacts on vegetation and wildlife if it will:

- Cause a fish or wildlife population to drop below self-sustaining levels (CEQA Guidelines, §15065 [a])
- Threaten to eliminate a plant or animal community (CEQA Guidelines, §15065 [a])

- Substantially affect, reduce the number, or restrict the range of unique, rare, or endangered species of animal or plant, or the habitat of the species (CEQA Guidelines, §15065 [a], Appendix G [c], Appendix I [II.4.b] and [II.5.b])
- Substantially diminish or reduce habitat for fish, wildlife, or plants (CEQA Guidelines, §15065 [a], Appendix G [t])
- Interfere substantially with the movement of resident or migratory fish or wildlife species (CEQA Guidelines, Appendix G [d])
- Change the diversity of species, or number of any species of plants (including trees, shrubs, grass crops, and aquatic plants) or animals (birds; land animals, including reptiles, fish and shellfish; benthic organisms; or insects) (CEQA Guidelines, Appendix I [II.4.1] and [II.5.a])
- Introduce new species of plants or animals into an area, or act as a barrier to the normal replenishment of existing species (CEQA Guidelines, Appendix I [II.4.c] and [II.5.c])
- Increase the rate of use of any natural resources (CEQA Guidelines, Appendix I [II.9])
- Deteriorate existing fish or wildlife habitat (CEQA Guidelines, Appendix I [II.5.d])

These criteria have been used to evaluate the Project's impact on vegetation and wildlife. Impacts to biological resources are discussed below. Impacts primarily related to construction of the Project, or specific to one plant or animal species, are described first under specific resource headings. Impacts primarily related to Project operation, or that will affect a wider group of resources, are described in Section 5.2.3, Cumulative Impacts Analyses.

#### *5.2.2.1 Waters of the U.S.*

The Project construction and operation will avoid nearly all of the potential jurisdictional waters in the Project Area. HDD will be used to avoid non-wetland waters of the U.S. crossed by the CO<sub>2</sub> linear, including the California Aqueduct, KR FCC, and Outlet Canal. The approximately 100-foot by 150-foot entry/exit pits required for HDD would be located to avoid potential waters of the U.S.

Wetland features adjacent to the proposed natural gas linear right-of-way will be avoided. Non-wetland potential waters of the U.S. within the natural gas pipeline construction limits are degraded, seasonally ponded claypan depressions. If avoidance of non-wetland waters is not feasible, the feature(s) will be temporarily disturbed by the construction activities during installation of the natural gas pipeline, and the site will be restored to pre-construction condition. Therefore, the Project would not permanently impact jurisdictional waters of the U.S. or potential waters of the state. Potential temporary impacts to non-wetland waters are summarized in Table 5.2-9.

Potential impacts to non-wetland waters of the U.S. would qualify for authorization under Nationwide Permit (NWP) 12 for Utility Line Activities and NWP 33 for Temporary Construction Access. The Project is expected to affect less than 0.2 acre of permanent impact to

waters of the U.S. Implementation of mitigation measure BIO-20 would reduce potential impacts to a less-than-significant level.

### *5.2.2.2 Waters of the State*

The Central Valley RWQCB may require a CWA Section 401 certification and/or Waste Discharge Requirements for temporary placement of fill in waters of the state. This permit will be transmitted to the CEC once it has been approved by the Central Valley RWQCB.

### *5.2.2.3 Special-Status Species*

The following section evaluates the impacts to special-status species. HECA will seek a 2081 Incidental Take Permit from CDFG if any state-listed species are impacted by the Project. DOE will consult with USFWS on effects to federally-listed species. It is anticipated that a Biological Opinion will be issued by USFWS.

### *Threatened and Endangered Plant Species*

No threatened or endangered plant species were observed during surveys conducted to date, nor are there any historic records of listed plant species in the BRSA northeast of the California Aqueduct<sup>3</sup>; however, three species of listed plant species, Kern mallow (*Eremalche kernensis*), California jewel-flower (*Caulanthus californicus*), and San Joaquin woolythreads (*Monolopia congdonii*), have the potential to occur with the study areas for the linear facilities. No other federally or state-listed threatened or endangered plant species were identified as potentially occurring at the Project Site or linear facilities.

In order to avoid impacts to threatened or endangered plant species, pre-construction surveys will be conducted prior to disturbance (see mitigation measure BIO-1 in Section 5.2.4). If threatened or endangered plant species are detected, the population will be avoided to the extent feasible (see mitigation measure BIO-2). With the implementation of mitigation measures BIO-1 and BIO-2, the impacts to threatened and endangered plant species from the Project will be less than significant.

### *Other Sensitive Plant Species*

Based on the results of plant surveys conducted in the BRSA to date, a literature review of observances of these species, and impact assessment documents for adjacent projects, eight non-listed special-status plant species have the potential to be found in the BRSA for the linear Project components, including Horn's milk-vetch, heartscale, Lost Hills crownscale, slough thistle, recurved larkspur, Hoover's eriastrum, Tejon poppy, and oil neststraw. To avoid significant effects to non-listed special-status plant populations, rare plant surveys will be conducted prior to disturbance (see mitigation measure BIO-1). To the extent feasible, populations of sensitive plant species will be avoided (see mitigation measure BIO-2), but mitigation for impacts to sensitive plants will be required for certain species in specific areas (see

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<sup>3</sup> Refer to Appendix A for a summary of special-status plant species observed in the study area of the CO<sub>2</sub> pipeline.

mitigation measure BIO-3). With the implementation of mitigation measures BIO-1, BIO-2, and BIO-3, potential impacts to non-listed special-status plant species would be less than significant.

### *Threatened, Endangered, and Sensitive Wildlife Species*

Three threatened or endangered wildlife species (blunt-nosed leopard lizard, Tipton kangaroo rat, and San Joaquin kit fox) are likely to occur along the off-site linear facilities. In addition, six non-listed special-status wildlife species (burrowing owl, loggerhead shrike, short-nosed kangaroo rat, Tulare grasshopper mouse, San Joaquin pocket mouse, and American badger) are also likely to occur along the natural gas linear and/or electrical transmission/potable water linears.

The following discussion identifies species-specific avoidance and mitigation measures to minimize impacts to sensitive species to less-than-significant levels.

### *Reptiles*

No take of special-status reptiles is anticipated; however, avoidance and minimization measures will be implemented, as appropriate.

### **Blunt-Nosed Leopard Lizard**

Avoidance and mitigation measures will be employed to avoid direct or indirect mortality of blunt-nosed leopard lizards by construction or operation of the Project. During a meeting on June 4, 2008 with CDFG, HECA was provided a draft map that indicates sightings of the lizard. The draft map also identifies a “core population” in the surrounding area, which includes the HECA Project Site originally proposed in the 2008 AFC (south of the California Aqueduct) and the carbon dioxide linear (CDFG, 2008). This information is not available in the CNDDDB data URS reviewed for the Project. To assess the population, URS conducted protocol surveys in 2008 to assess hatchling and sub-adult numbers along the previously considered carbon dioxide linear alignments. Biologists conducted additional protocol surveys for adults and juveniles in 2009 between April 15 and July 15 south of Tupman Road, and within the KRFCC drainage. Juvenile blunt-nosed leopard lizard surveys were conducted along the proposed natural gas linear alignment in 2010; if required, adult surveys will be conducted between April 15 and July 15, 2012.

Protocol surveys for blunt-nosed leopard lizard within the Project Site are not necessary because the area is comprised of row crops, and therefore does not include any habitat suitable for blunt-nosed leopard lizard.

To avoid harming, harassing, injuring, or killing any individuals or eggs, a series of silt fence “walls” will be erected prior to construction in habitats that are suitable for the blunt-nosed leopard lizard. Ground disturbance will be allowed only when an area is deemed clear (see mitigation measure BIO-5). The Project will temporarily disturb blunt-nosed leopard lizard habitat during construction of the natural gas pipeline and the CO<sub>2</sub> pipeline south of the California Aqueduct. In addition, efforts will be made to reduce alterations to the Project Area that would benefit avian predators (see mitigation measure BIO-6).

To further protect this species, mitigation measures BIO-7 will be implemented to ensure Project construction and operation personnel are aware of the threats to this species, and how to respond if they encounter any lizards during construction or operations.

With implementation of avoidance and mitigation measures BIO-5, BIO-6, BIO-7, BIO-8, BIO-16, and BIO-18, there will be no Project-related impacts to this species, and impacts to potential habitat will be less than significant.

### *Birds*

No take is anticipated for any bird species described below; however, an incidental take permit will be obtained from federal and/or state agencies, as appropriate.

#### **White-Tailed Kite**

This species is not expected to be in the Project Area; CNDDDB records indicate this species was observed in 1992, approximately 10 miles east of the Project Site. If this species is found in the Project Area, impacts to this species can be avoided by the implementation of avoidance and mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

#### **Swainson's Hawk**

Swainson's hawks are known to occur in the area around Tule Elk Preserve and along the KRFCC. There is a potential nest structure in the tall cottonwoods in the Tule Elk Reserve south of the main buildings, and documented fledged young at the KRFCC nest site. The Tule Elk Preserve nest was not confirmed by URS biologists in 2010. In 2011, four potential and one confirmed Swainson's hawk nest sites were documented; follow-up surveys are proposed for 2012. Based on proximity of known individuals and habitat assessment, Swainson's hawks are presumed to occur along the off-site Project linear facilities, and the Project Site. If this species is found within the Project Area, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, BIO-11, and BIO-13.

#### **Golden Eagle**

This species is not expected to be in the Project Area. If this species is found in the Project Area, impacts to this species can be avoided by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

#### **American Peregrine Falcon**

This species is not expected to be in the Project Area because the area has poor foraging and nesting habitat for this species. If this species is found in the Project Area, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

**Least Bell's Vireo**

This species is not expected to be in the Project Area because the area has poor foraging and nesting habitat for this species; however, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

*Mammals*

No mortality is anticipated for any mammal species described below; however, an incidental take permit will be obtained from federal and/or state agencies, as required to relocate animals out of work areas.

**San Joaquin Kit Fox**

Construction of the Project could directly affect San Joaquin kit foxes in the region. Direct effects could include temporary and permanent habitat loss, vehicle strikes, and entrapment in open trenches or within burrows during the installation and maintenance of the natural gas and process water linears. In addition, portions of the Project would be located in the Western Kern County Core recovery area identified in the Recovery Plan for Upland Species of the San Joaquin Valley (USFWS, 1998).

As shown on Figure 5.2-11, the USFWS Recovery Plan identifies several kit fox recovery areas in the Project vicinity, including:

- Western Kern County Core
- Antelope Plain/Semitropic Kern Satellite
- Urban Bakersfield Satellite

The Project Site is adjacent to the northeastern edge of the Western Kern County Core recovery area. In addition, portions of the carbon dioxide linear and process water linear are located in this area (Figure 5.2-11 and Table 5.2-10). The Project would temporarily disturb or remove habitats in these areas that are already degraded by existing activities (i.e., dirt roads, active agriculture, and canals), and are not likely to provide habitat for breeding or denning kit foxes. These areas are also not high-quality habitat for kangaroo rats, and kit foxes appear to be strongly linked ecologically to kangaroo rats (Cypher, 2006).

The Project Site is actively farmed and is unlikely to provide foraging or movement habitat for San Joaquin kit fox. Although the Project Site is approximately 1 mile from the margin of the Elk Hills area, the likelihood that kit fox would be present in this area is reduced by the presence of the California Aqueduct, roads, and other barriers, in addition to human activity associated with cultivated fields. Therefore, permanent loss of 453 acres at the Project Site would have a minimal direct effect on San Joaquin kit fox in the region, because this species is not likely to regularly use the affected fields.

The portion of the Western Kern County Core recovery area impacted by the process water linear is generally poor habitat for denning, foraging, and dispersal due to the level of

disturbance (i.e., graded dirt roads, agricultural canals, and actively farmed lands) and proximity to other types of human disturbance (i.e., dumping, target shooting, and spraying; Table 5.2-10).

Traffic associated with construction and operations would pass through portions of habitat for the Western Kern County Core recovery area, the Antelope Plain/Semitropic/Kern and Urban Bakersfield Satellite recovery area, and potential habitat linkages along I-5 (Figure 5.2-11). The existing average daily traffic (ADT) and the Project-related increase to the ADT were evaluated for the road segments inside of the San Joaquin Kit Fox recovery areas (Table 5.2-11). Most of the increases in traffic during construction were minimal, with the exception of the increase in traffic on Tupman Road and Stockdale Highway. Operation-related traffic includes the workforce for the Project and the delivery of the feedstock. Coal and petcoke deliveries are included in the operation-related traffic impacts because the trucks delivering the feedstock pass through portions of the Antelope Plain/Semitropic/Kern Satellite Population.

The existing mortality of San Joaquin kit fox in the western Bakersfield area was determined through the 6-year study *Urban Roads and the Endangered San Joaquin Kit Fox* by Bjurlin et al., 2005. Existing, construction, and operations traffic levels were determined using Section 5.10 of this AFC Amendment and Caltrans traffic estimates. Based on known mortality rates and traffic levels, the Project-related impacts to San Joaquin kit fox were estimated between 14.0 and 28.9 foxes over the course of 20 years (Table 5.2-12), based on the method of delivering fuel for the power plant. The model used to estimate fox mortality is conservative and has a high estimate, because the time of day during which the increased traffic would be on the road was not considered in the estimate; most Project-related traffic would be on the roads during daylight hours when kit fox are less likely to be present. Kit foxes tend to travel during the evenings, at night, or near dawn.

The railroad line does not pass through any of the core, satellite, or linkage components of the kit fox recovery area. The design speed of the trains that would access the Project Site is 25 mph, and the average speed will be 18 to 20 mph. Due to the slow speed of the trains and the location of the railroad lines, no kit fox mortality is expected. In addition, use of the rail line would reduce the number of truck trips that would be required, which would reduce the potential for road mortality of kit fox in the region due to the Project.

Impacts to the San Joaquin kit fox will be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, -BIO-7, BIO-8, BIO-13, and BIO-18.

### **Tipton's Kangaroo Rat**

Tipton's kangaroo rats are known to occur to the south of the Project Site and along Project linear facilities. Based on proximity of known individuals, habitat assessment, and sign, Tipton's kangaroo rats are presumed to occur along the off-site Project linear facilities, but are not expected to occur within the Project Site. Pre-construction surveys will be conducted (see mitigation measure BIO-4), and live trapping and relocation of small mammals (see mitigation measure BIO-15) will be conducted to minimize impacts. Other potential impacts will be mitigated by measures BIO-7, and BIO-8.

With implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-15, and BIO-18 Project impacts to this species will be less than significant.

### *Other Special-Status Wildlife Species*

#### *Amphibians*

##### **Western Spadefoot**

This species may be found in the Project Area; however, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-16, BIO-18, and BIO-19.

#### *Reptiles*

##### **Silvery Legless Lizard**

This species is not expected to be in the Project Area; however, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, and BIO-16.

##### **California Horned Lizard**

The current natural gas linear route is within the historical range of the California horned lizard. Salt brush scrub supporting an ant-prey base is suitable habitat for the California horned lizard. Although the species is not expected to be in the Project Area, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-16, and BIO-18.

##### **San Joaquin Whipsnake**

This species is not expected to be in the Project Area. The closest documented sighting in the CNDDDB of this species was approximately 10 miles south of the Project Site in 2006; however, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, and BIO-16.

##### **Southwestern Pond Turtle**

This species is not expected to be in the Project Area, though there is a slight chance that it could be found adjacent to work areas near canals or the California Aqueduct. Potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-16, and BIO-18.

### *Birds*

#### **Prairie Falcon**

This species is not expected to be in the Project Area. If this species is found in the Project Area, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

#### **Mountain Plover**

This species is not expected to be in the Project Area because the area has poor foraging and nesting habitat; CNDDDB records indicate this species was observed in 1990 approximately 1 mile east of the Project Site. If this species is found in the Project Area, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

#### **Burrowing Owl**

Burrowing owls were observed at three different areas south of the proposed electrical transmission linear in 2010; all three sightings coincided with the potential nesting period for this species. A pair of adults was seen east of Morris Road, south of the proposed alignment, but no young or burrows were detected. In addition, burrowing owl family groups consisting of adults and fledged young were observed along the proposed natural gas linear. Additionally, burrowing owls were observed between SR 58 and Stockdale Highway; breeding was not confirmed, but the timing of the observations coincided with the breeding period.

Direct impacts to burrowing owls could occur during preparation of the construction laydown area or linear routes/access road corridor. Destruction or degradation of burrows and destruction or degradation of foraging habitat within approximately 300 feet of occupied nest burrows is considered a potentially significant impact to this species (CDFG, 1995; CDFG, 2012).

Project construction activities during the breeding season (February 1 through August 31) could indirectly affect nesting and foraging burrowing owls if occupied nest burrows are present within 300 feet of the limits of construction. Project construction activities during the non-breeding season (September 1 through January 31) could indirectly affect burrowing owls if occupied burrows are within 150 feet of the limits of construction activities. Noise and visual disturbance from Project construction activities could displace burrowing owls from burrows located within these distances from the construction limits. To reduce potential impacts to a less-than-significant level, mitigation measures BIO-7, BIO-8, BIO-12, and BIO-18 will be implemented.

#### **Loggerhead Shrike**

Loggerhead shrikes were seen during the 2008 and 2009 site assessments. The shrikes could have been breeding in the area, although breeding was not confirmed. No significant impacts to this species are anticipated in association with the development of the Project Site; therefore, no species-specific mitigation is recommended. Mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11 will minimize the potential impacts to this species, and all nesting bird species.

**Le Conte's Thrasher**

This species is not expected to be in the Project Area because the area has poor foraging and nesting habitat; CNDDDB records indicate this species was observed in 1989 approximately 1 mile south of the Project Site. If this species is found in the Project Area, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

**California Horned Lark**

This species was seen at the Project Site and along the process linears during the 2008 and 2009 site assessments. No evidence of breeding was detected at that time, although there is suitable habitat; however, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9-, BIO-10, and BIO-11.

**Tricolored Blackbird**

This species is not expected to be in the Project Area because the area has poor foraging and nesting habitat; CNDDDB records indicate this species was observed in 2005 approximately 5 miles south of the Project Site. If this species is found in the Project Area, potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11.

*Migratory Bird Species*

No direct impacts are anticipated to any species of native birds, their nests, or eggs. No species-specific mitigation is recommended. However, implementation of mitigation measures BIO-7, BIO-8, BIO-9, BIO-10, and BIO-11 will avoid impacts to all nesting migratory bird species.

*"Pest" Bird Species*

To ensure that the Project does not contribute to the expansion and population growth of "pest" bird species (i.e., European starlings, house sparrows, common ravens, American crows, rock doves, brown-headed cowbirds, etc.), mitigation measures BIO-6 and BIO-10 will be implemented. If pest species become established due to the Project, adaptive management techniques will be implemented to reduce the indirect impacts to listed, sensitive, and/or native species of plants and animals.

*Mammals***Short-Nosed Kangaroo Rat**

This species is not expected to be found north of the California Aqueduct, based on taxonomic delineations of this species. If individuals of this species are found north of the aqueduct, impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-15, and BIO-18.

### **Tulare Grasshopper Mouse**

This species is expected to be found along the Project linear facilities and access routes based on habitat requirements and sign. Impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-15 and BIO-18.

### **San Joaquin Pocket Mouse**

This species is expected to be found along the Project linear facilities and access routes based on habitat requirements and sign. Potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-15, and BIO-18.

### **Tule Elk**

This species is not expected to be in the Project construction areas, but a herd was found to the east of the Project Site at the Tule Elk State Natural Reserve. Noise and lighting are the only expected potential indirect impacts to the tule elk. Mitigation for these impacts have been incorporated (see Section 5.5, Noise, and Section 5.11, Visual Resources), reducing these potential impacts to a less-than-significant level. Additional mitigation (BIO-4, BIO-7, and BIO-8) is also proposed to ensure the protection of the tule elk and Tule Elk Natural Preserve.

### **American Badger**

This species was not observed at the Project Site. Although it may traverse the area, this species is not expected to be in the Project Area once construction activity levels increase. Potential impacts to this species can be mitigated to a less-than-significant level by the implementation of mitigation measures BIO-4, BIO-7, BIO-8, BIO-16, and BIO-18.

### **Bats**

No impacts to any bat species are anticipated; therefore, no mitigation is recommended.

#### ***5.2.2.4 Loss of Sensitive Habitat***

To compensate for impacts to threatened and/or endangered plants or wildlife resulting from the temporary loss of habitat during Project construction, and permanent loss along Project linear facilities, HECA LLC is considering a variety of mitigation options for loss of sensitive habitat, as described in mitigation measure BIO-18

#### ***5.2.2.5 Noise***

The Project will produce noise during both construction and operation, as described in Section 5.5, Noise. During construction, minimal noise will be generated in the evening and nighttime until operations are initiated. Noise may disturb some wildlife using adjacent areas. However, wildlife in the adjacent areas has likely already become accustomed to habitual noise associated with existing development and highway traffic. Noise impacts to biological resources are expected to be less than significant.

### *5.2.2.6 Electrocutation Hazard*

The addition of the approximately 2-mile transmission line for the Project will increase collision and electrocution hazard for raptors. Although the potential for electrocution exists if birds collide with transmission lines or if raptors perch on towers in such a manner as to complete an electrical contact (touching two or more live electrical conductors or a live conductor and a grounded surface), electrocution is unlikely to occur on the transmission line associated with the Project because of their design. The distance between conductors or between conductors and the ground wire is such that it is unlikely a bird could complete a circuit and be electrocuted. The transmission line to be constructed for the Project will have a minimum distance greater than the wingspan of any birds in the area. Therefore, impacts with regard to bird electrocutions at the HECA transmission line route are expected to be less than significant.

### *5.2.2.7 Collision Hazard*

The transmission line interconnection (addressed previously with respect to electrocution hazard) could also pose some collision hazard to avian species that may simply fly into the lines. Approximately 2 miles of new transmission line will be installed within an area with numerous existing overhead lines. However, the new transmission line will be in an area that does not bisect avian usage areas (nesting, forage, loafing), and is currently developed with several power transmission line routes. Therefore, this impact will be less than significant.

The height of several Project structures (e.g., heat recovery steam generator stack, carbon dioxide vent, Air Separation Unit, gasification structure, etc.) will also increase collision potential for avian species. Some migrating bird species that fly at night are guided in part by constellations and can become confused by brightly lit tall structures. Fog or low cloud cover can further add to collision potential, although fog does not occur with much frequency in the Project study area. However, the stacks will not be adjacent to aquatic habitat that attracts large numbers of migratory birds. Although the number of potential collisions cannot be quantified, collision will likely occur relatively infrequently. Therefore, this impact will be less than significant.

### *5.2.2.8 Air Pollutant Emissions*

Two primary potential air pollution issues are associated with the Project. The first potential issue involves the use of “raw water” in the cooling towers. This “raw water” contains salts that will be released into the air in the cooling tower vicinity and may be spread downwind. The second potential issue pertains to the release of potentially harmful emissions; namely, carbon monoxide, nitrogen oxides, and particulate matter less than 10 microns in diameter.

As discussed in greater detail in Section 5.1, Air Quality, particulates from the cooling towers, particularly salts, will be dispersed outside of the Project Site. These particulates are likely to accumulate in the soils and on vegetation, causing a slow buildup of salt in the region. However, the majority of plant species in the area are halophytic, and the rate of accumulation is anticipated to be slow. The impact associated with salt accumulation is anticipated to be less than significant.

As discussed in greater detail in Section 5.1, Air Quality, and Section 5.6, Public Health, the emissions associated with this Project will not pose a human health and safety issue. Based on the lack of human health and safety concerns, it is anticipated that there will be no significant impacts to the plants and animals found in the region.

### *5.2.2.9 Open Water/Wildlife Attractive Nuisances*

The near proximity of the California Aqueduct (a permanent source of water), and the various water bank percolation ponds (large, ephemeral sources of water) to the Project Site reduces the likelihood that wildlife will be attracted to open bodies of water associated with the Project. The storm-water retention basins have the potential to attract wildlife if the retention basin holds water for an extended period of time. Retention basins and storm-water collection/conveyance systems will be designed in accordance with the Kern County Development Standards. Storm water from outside the process plant area but within the Project Site should be relatively clean. Storm water from this portion of the Project Site will be collected in unlined retention basins located throughout the Project Site and allowed to percolate or evaporate. Storm water from inside the process plant area will be routed to lined retention basins and retained temporarily in basins before it is reused. Water will be tested to determine an appropriate destination for reuse. Depending on the water quality, it may be used for cooling tower makeup or processed in the zero liquid discharge (ZLD) system at the wastewater treatment plant. Accounting for expected percolation and evaporation rates plus potential re-use, the basins would be expected to be empty within approximately 10 days, if no storm events occur within this time. Because the storm water will be retained only temporarily following a storm event and other water sources beyond the Project Site will be available, wildlife is not likely to be attracted to the storm-water retention basins on site.

### *5.2.2.10 OEHI Project*

The OEHI Project includes the CO<sub>2</sub> pipeline and the CO<sub>2</sub> EOR Processing Facility. The CO<sub>2</sub> EOR Processing Facility and satellites are expected to occupy approximately 136 acres within the EHOF. In addition, the facility will use producing and injection wells. New pipelines will also be installed in the EHOF. The OEHI Project also includes an approximately 3 mile-long CO<sub>2</sub> pipeline that will transfer the CO<sub>2</sub> captured from the HECA Project to the OEHI CO<sub>2</sub> EOR Processing Facility.

The impacts of the OEHI Project on biological resources are analyzed in Appendix A-1, Section 4.4, Biological Resources; and Appendix A-2, Section 2.2, Biological Resources. The analysis in Appendix A concludes that, with implementation of proposed mitigation measures, the OEHI Project will not result in significant adverse impacts to biological resources.

## 5.2.3 Cumulative Impacts Analyses

Under certain circumstances, CEQA requires consideration of a project's cumulative impacts (CEQA Guidelines Section 15130). A "cumulative impact" consists of an impact which is created as a result of the combination of the project under review together with other projects causing related impacts (CEQA Guidelines Section 15355). CEQA requires a discussion of the cumulative impacts of a project when the project's incremental effect is cumulatively

considerable (CEQA Guidelines Section 15130[a]). "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CEQA Guidelines Section 15065 [a][3]).

When the combined cumulative impact associated with a project's incremental effect and the effects of other projects is not significant, further discussion of the cumulative impact is not necessary (CEQA Guidelines Section 15130[a]). It is also possible that a project's contribution to a significant cumulative impact is less than cumulatively considerable and thus not significant (CEQA Guidelines Section 15130[a]).

The discussion of cumulative impacts should reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great a level of detail as is provided for the effects attributable to the project under consideration (CEQA Guidelines Section 15130[b]). The discussion should be guided by standards of practicality and reasonableness (CEQA Guidelines Section 15130[b]).

A cumulative impact analysis starts with a list of past, present, and probable future projects within a defined geographical scope with the potential to produce related or cumulative impacts (CEQA Guidelines Section 15130[b]). Factors to consider when determining whether to include a related project include the nature of the environmental resource being examined, the location of the project, and its type (CEQA Guidelines Section 15130[b]). For purposes of this AFC Amendment, Kern County was contacted to obtain a list of related projects, which is contained in Appendix I. Depending on its location and type, not every project on this list is necessarily relevant to the cumulative impact analysis for each environmental topic.

One of the potential future projects identified in Appendix I could contribute to the biological resource impacts identified for the Project: the dairy farm proposed to the north and west of the Project Site.

The proposed dairy farm would occupy approximately 1,057 acres of existing agricultural lands. Of the total project area, approximately 121 acres would be utilized for cattle yards and milking facilities. Development of the dairy facility would have similar effects to Swainson's hawk foraging and San Joaquin kit fox movement as the proposed project. The incremental effects of the proposed dairy farm on San Joaquin kit fox movement, Swainson's hawk foraging, or blunt-nosed leopard lizard are not cumulatively considerable when viewed in connection with the impacts of the Project. Although the affected species are sensitive, the affected habitats and species are widespread in the Project vicinity and are not likely to be significantly affected by the cumulative impacts of the Project and the proposed dairy farm.

The cumulative impacts of the OEHI Project on biological resources are analyzed in Appendix A-1, Section 4.4, Biological Resources; and Appendix A-2, Section 2.2, Biological Resources. The analysis in Appendix A concludes that, with implementation of proposed mitigation measures, the OEHI Project will not result in significant adverse cumulative impacts to biological resources.

### 5.2.4 Mitigation Measures

This section discusses mitigation measures proposed by HECA that will be implemented to avoid and reduce Project-related impacts to biological resources to less-than-significant levels. The mitigation measures would be implemented within the entire project area, including the portions of the CO<sub>2</sub> pipeline that will be constructed by OEHI. Impacts to biological resources and corresponding mitigation measures are summarized in Table 5.2-13, Project Proposed Avoidance and Mitigation Summary.

#### 5.2.4.1 *Special-Status Species*

##### *Special-Status Plant Species*

Based on information gathered to date, special-status plant species will be temporarily affected by Project construction. The following measures will be implemented to reduce impacts to special-status plants to a less-than-significant level.

##### **BIO-1 Rare Plant Pre-Construction Survey**

Approved biologists will conduct a rare plant survey of the Project Area and adjacent areas within 200 feet of the affected areas, or to the property boundary if less than 200 feet, and permission from the adjacent landowner cannot be obtained. Surveys will be conducted according to Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFG, 2009). Special-status plants will be identified, counted, and mapped. Populations of special-status plants will be monitored through the course of the year to determine how many mature and bloom. The results of all pre-construction surveys will be documented, and submitted to the CEC, USFWS, and the CDFG (see conservation measure BIO-17).

##### **BIO-2 Rare Plant Avoidance**

If listed plant species are present that will be affected by work within the Project Site, gas pipeline corridor, water pipeline corridor, or transmission line, direct impacts to the plants will be avoided, to the greatest extent feasible. Avoidance measures may include relocating tower footings or realignment of linear facilities.

##### **BIO-3 Rare Plant Mitigation**

Vehicles and other equipment will be cleaned to remove dirt and seeds of noxious weeds. Native plants will be reestablished in areas where construction activities temporarily disturb natural vegetation. Post-construction monitoring will be conducted, and additional control measures such as hand removal, mowing, or herbicide application will be implemented as needed to minimize the establishment of noxious or invasive species (as defined by the California Agricultural Department and/or the California Invasive Plant Council) in areas where natural vegetation was removed during construction.

For permanent impacts to populations of CNPS-Ranked plant species that cannot be avoided, disturbance will be timed until after all available seeds can be collected from the parent plant or

plants. These seeds will be properly stored, and then scattered over a suitable area near the “parental site” just prior to the first rains of the season.

Temporary disturbances that cannot be avoided will be timed for after the blooming period; the seeds from the special-status plants will be collected and properly stored, and the topsoil will be salvaged. After work is completed in that area, the topsoil will be replaced and the seeds will be redistributed just prior to the first rains of the season.

Both types of the abovementioned re-seeded areas will be demarcated in the field, mapped, and monitored for 5 years. Monitoring will be conducted during the early spring to determine whether the target species are present and whether weed species are common. Weeding will occur if weed species appear abundant or are adversely impacting the target species. Weeding will be done in a fashion that will minimize impacts to special-status plant or animal species and other native species, but may include hand-weeding, weed-whacking, or spraying with an agency-approved herbicide. A follow-up monitoring effort will be conducted each year to determine how many of the target species set seeds.

As part of the Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP), an annual report will be submitted to the CEC and CDFG documenting the status of each population, weeding efforts that have been undertaken, and suggested work for the next season (see conservation measure BIO-17); these reports will be available to USFWS, if requested.

It is anticipated that these measures will be sufficient to avoid significant impacts to any special-status plant species that may be present.

### *Threatened and Endangered Wildlife Species*

Based on surveys conducted to date, habitat used by listed wildlife species will be affected by the Project. The following measures will be implemented to ensure impacts to sensitive and listed species are less than significant, and mitigated to the greatest extent feasible.

### *Sensitive Wildlife Species Surveys*

#### **BIO-4 Terrestrial Wildlife Pre-Construction Survey**

The HECA Project will conduct biological surveys of the affected areas, and adjacent areas within 200 feet of the affected areas, or to the property boundary if less than 200 feet, and permission from the adjacent landowner cannot be obtained. Efforts will include surveys for blunt-nosed leopard lizard, San Joaquin kit fox, Tipton kangaroo rat, burrowing owl, loggerhead shrike, LeConte’s thrasher, and any other sensitive animals. Qualified biologists will conduct protocol-level presence/absence surveys for the above species as necessary. All sightings and/or sign of listed wildlife will be mapped, and data will be input to a global positioning system. The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFG (see conservation measure BIO-17).

The Project will conduct protocol-level presence/absence surveys of the affected areas and adjacent areas within 200 feet of the affected areas, or to the property boundary if less than

200 feet, and permission from the adjacent landowner cannot be obtained. Efforts will include looking for blunt-nosed leopard lizard; giant garter snake; San Joaquin kit fox; Giant, Short-nosed, and Tipton's kangaroo rats; Nelson's antelope squirrel; burrowing owl; loggerhead shrike; Le Conte's thrasher; horned lark; and any other sensitive animals. All sightings and/or sign of sensitive wildlife will be mapped and data input to a global positioning system. The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

### *Blunt-Nosed Leopard Lizard*

Blunt-nosed leopard lizards may be present along the proposed natural gas linear. Measures to ensure that there is no mortality of blunt-nosed leopard lizards are described below. Kit fox clearance is the first proposed step, followed by concurrent removal of small mammals and exclusion of blunt-nosed leopard lizards. All reasonable and prudent minimization and avoidance measures have been included as follows:

#### **BIO-5 Site Clearance Prior to Ground Disturbance**

To ensure that no blunt-nosed leopard lizards are taken during the initial site preparation, each area with potential habitat will need to be cleared prior to any ground disturbance. Areas will be secured as they are cleared to ensure that no wildlife re-enters. To ensure that wildlife will not enter the work areas, exclusionary fencing consisting of tin flashing (or another material approved by CDFG and USFWS) will be buried at least 9 inches underground and rise at least 2 feet above the ground.

Beginning in mid-April, exclusion fencing will be established to secure the work zone. Once the exclusion fencing has been established, the area will be visually surveyed during the day for wildlife, and "trapped out" small mammals (see conservation measure BIO-9) during the night. All surveying and trapping efforts will be conducted in a manner that minimizes collapsing any small mammal burrows. Tracking stations will be used to determine whether there are additional individuals in the area.

The construction areas will be surveyed daily for blunt-nosed leopard lizards when soil and air temperatures are within CDFG survey protocol limits. An area will be deemed clear of any blunt-nosed leopard lizards after there have been no signs or sightings for 5 survey days. If a blunt-nosed leopard lizard is observed within the construction area, the exclusion fencing will be opened to allow the lizard to leave on its own accord. Once the lizard has left the area, the exclusion fencing will be closed and surveyed until there are no signs or sightings of blunt-nosed leopard lizards for 5 consecutive days.

Exclusionary fencing will be left in place only for as long as needed to complete the work. For installation of the Project linears, no one area is likely to be closed for more than 6 months.

If the exclusion fencing is compromised (by wind or other means) and left "open," an approved biologist will confirm with USFWS to determine if the area will need to be re-surveyed and/or re-trapped for wildlife.

To check that BIO-5 is successful, ground disturbance will be monitored (see conservation measure BIO-16).

The results of the blunt-nosed lizard surveys and area clearance will be documented and submitted to the CEC, USFWS, and CDFG (see conservation measure BIO-17).

### **BIO-6 Predatory Bird Minimization Measures**

Several species of raptors and corvids (such as common ravens, American crows, and red-tailed hawks) are known to prey on blunt-nosed leopard lizards; common ravens are the most abundant potential avian predator in the Project Area. Project features would be modified, as needed, to minimize potential perches for common ravens in the Project Site and along the Project transmission linear. Transmission design has been modified to incorporate elements to discourage raven nesting. Instead of lattice-style transmission towers, the Project will use a single-pole transmission line design that minimizes potential perches and nesting sites. The proposed single-pole design is consistent with the Avian Power Line Interaction Committee's suggested practices for avian protection on power lines (APLIC, 2006).

To minimize the number of common ravens in the area, no raven will be allowed to nest in the Project transmission towers within 1 mile of known blunt-nosed leopard lizard habitat. Raven nests will be removed prior to egg-laying in early spring. For all bird nests removed, documentation will be prepared and submitted to the CEC, USFWS, and CDFG (see conservation measure BIO-17).

### **BIO-7 Worker Education Program**

A worker education program will be implemented for all construction personnel, regular drivers, and operation personnel. All personnel will be required to read an educational brochure and attend an education class given by the approved biologist(s). The brochure and class will describe the special-status species that could be encountered at the Project, the regulatory protection of the species, and appropriate measures to take upon discovery of a special-status species or active bird nest.

Site personnel will be instructed to set equipment off the ground when possible to minimize access to small mammals. All work areas will be kept clear of trash and food items to minimize attracting wildlife. Construction techniques to minimize potential adverse impacts will also be presented, such as filling or covering excavations. If excavations are to be left open overnight, ramps will be installed to allow wildlife to escape.

The names and affiliations of all people trained will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

### **BIO-8 Operations and Maintenance Activities**

The worker education program will be implemented for operations and maintenance activities along the Project linears (i.e., access road, transmission line). Personnel will be instructed to be alert to and aware of the presence of special-status wildlife. If any special-status wildlife is

spotted, activities in the vicinity of the sighting will be halted and the animal will be allowed to move away from the activity area.

### *Threatened or Endangered Bird Species*

The following feasible and prudent minimization and avoidance measures have been included to reduce the potential impacts to most bird species:

#### **BIO-9 Bird Pre-Construction Surveys**

Approved biologists will conduct focused avian surveys of the affected areas and adjacent areas within 200 feet of the affected areas, or to the property boundary if less than 200 feet, and permission from the adjacent landowner cannot be obtained. Efforts will focus on rare and/or sensitive species and high-quality habitat, but will identify all bird species present. Surveys will be conducted between 10 minutes before dawn and 10:30 a.m. under favorable weather conditions.

If listed species are detected, additional surveys will be conducted to determine whether the rare or listed species have remained in the area. Surveys will continue twice weekly until the status of the individual(s) has been determined, and surveys will continue as often as necessary to document potential impacts on the species. If there appears to be an adverse impact to the species, additional measures will be put in place to ensure impacts are less than significant. Additional measures may include stopping all work in the vicinity of the listed species, erecting visual barriers, limiting the duration of work in the area, or other measures set forth by the approved biologist or regulatory representative.

The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

#### **BIO-10 Bird Nesting Activity Surveys**

Every effort will be made to ensure that birds do not nest in or adjacent to active work zones. Areas that will be attractive nest sites should be made less appealing and be examined regularly by a biologist. During the height of the breeding season, all work areas, laydown sites, and equipment should be checked three times a week.

An approved biologist will also conduct focused searches for nesting birds of the affected areas and adjacent areas within 200 feet of the affected areas, or to the property boundary if less than 200 feet, and permission from the adjacent landowner cannot be obtained. All bird species protected under the Migratory Bird Treaty Act (MBTA) will be surveyed for and all nests will be recorded. Particular attention will be paid to habitat that is suitable for nesting by listed birds species.

The results of all nesting surveys will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17), including nest fate and cause of all nest failures.

**BIO-11 Bird Nest Protection**

In work areas and laydown sites that will be disturbed during the anticipated breeding season, nests will be removed if they are found prior to egg-laying, in compliance with the MBTA. If eggs or young are in a nest, the nest will be protected. A suitable buffer will be established and demarcated based on the species of bird, nest location, and types of activity with the area as determined by the approved biologist. Once the young have fledged or the nest has failed, as determined by an approved biologist, the nest will be removed and normal activities will resume.

In areas that will not be disturbed during the breeding season, no nest surveys will be required. Any activity that is proposed within these areas will need to be assessed by an approved biologist to ensure that no nests or nestlings protected by the MBTA will be harmed.

The status of all nests being protected and/or monitored will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17), including nest fate and cause of all nest failures.

**BIO-12 Burrowing Owl Pre-Construction Surveys**

Prior to ground-disturbing activities, the construction areas and adjacent areas within 500 feet of the work sites, or to the edge of the property if less than 500 feet, will be surveyed by an acceptable biologist for burrows that could be used by burrowing owl. If a burrow is determined to be occupied, the following avoidance/minimization measures will be implemented:

- **During the Non-Breeding Season (August 1 – February 28):** If a burrow can be avoided until the burrowing owl naturally abandons it, a buffer zone of 160 feet from the burrow will be demarcated and work within the buffer zone avoided. If the burrow cannot be avoided, then passive relocation techniques will be employed. Once it is confirmed the burrowing owl has abandoned the burrow, the burrow will be examined with a “burrow scope” and excavated by hand to ensure that no harm or mortality befalls any wildlife possibly remaining in the burrow.
- **During the Breeding Season (March 1 – July 31):** If the burrow can be avoided, a 250-foot buffer will be demarcated around the burrow, and no work activities will be conducted within the buffer until the young are no longer dependent on the burrow, or the burrow has been abandoned. If the burrow is in a critical work area, the nest will be examined with a burrow scope to determine whether eggs and/or young are present; if eggs or young are present, the burrow will be protected until the young are no longer dependent on the burrow. If no young or eggs are present, passive relocation techniques will be employed. Once it is confirmed the burrowing owl has abandoned the burrow, it will be excavated by hand to ensure that no harm or mortality befalls any wildlife possibly remaining in the burrow.

The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

### **BIO-13 Swainson's Hawk Avoidance and Minimization**

The following avoidance and minimization measures have been developed using the information contained in the "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley" by the Swainson's Hawk Technical Advisory Committee dated May 31, 2000.

Where possible, major ground disturbance would be scheduled to occur between August 1 and December 31 at the Project Site when the hawks are not in the area. The Project Site and a 0.5-mile buffer would be surveyed weekly between late February and April 20 to determine whether any hawks are nesting in the area. If any nests are found, they would be monitored through the breeding season to determine if the ongoing work is affecting the pair. If there appear to be any adverse effects, the CEC and CDFG will be contacted to address the potential impact. No new ground disturbance will occur within 0.5 mile of an active Swainson's hawk nest without concurrence from the CEC and CDFG.

To the greatest extent feasible, work along all linears will occur when Swainson's hawks are absent; in the time period between August 1 and December 31. Work between January 1 and March 1 would continue, with periodic biological monitoring until Swainson's hawks have returned. If work to linears is required during the time period of March 1 to July 30, surveys will be conducted out to 1 mile from the work zone prior to initiation of work. If no sign of Swainson's hawk breeding is observed within 0.5 mile of the work zone (including laydown and staging areas) after four surveys, work would be permitted. Additional surveys would be conducted for as long as the work continues, following the frequencies described in Table 5.2-14, BIO-22 Survey Periods and Frequencies; if nesting is detected, work would be halted while CEC and CDFG are consulted.

The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

#### *Threatened or Endangered Mammal Species*

Based on surveys conducted to date, San Joaquin kit fox, and Tipton's kangaroo rat will be affected by the Project. Due to the habitat requirements and their rarity, there should be no impacts to the giant kangaroo rat, Nelson's antelope squirrel, or Buena Vista Lake shrew. The following measures will be implemented to ensure that impacts to sensitive and listed species are less than significant and mitigated to the greatest extent feasible.

### **BIO-14 San Joaquin Kit Fox Mitigation**

Disturbance (including any excavation and/or destruction) to all San Joaquin kit fox dens shall be avoided to the maximum extent possible, and shall only occur in accordance with the protocol described in the Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS, 1999b), or as approved by the wildlife agencies. In essence, the following hierarchy shall be adhered to:

1. Preconstruction surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project Site, and evaluate use by kit fox; and if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens will be determined and mapped, and all appropriate equipment exclusion zones (per den type) will be demarcated in a manner that sufficiently alerts Project equipment operators of the exclusion zone.
2. Regardless of time of year, no natal kit fox dens will be excavated unless authorized by the Wildlife Agencies. Other den types may be excavated only by agency-approved biologists, and only after occupancy status has been determined. Excavation and/or destruction of dens would then be allowed in accordance with the procedures specified in Standardized Recommendations (USFWS, 1999b), or as approved by the wildlife agencies.
3. All known and natal kit fox dens that are slated for destruction will be replaced. Prior to destruction of an active den, artificial replacement dens will be constructed outside the project buffer zone. Replaced dens will be constructed according to protocols set forth by the Wildlife Agencies. The replacement ratio will be 1:1 for non-natal dens. If excavation or destruction is approved by the Wildlife Agencies, replacement ratios will be 2:1 for natal dens.

The results of all den assessments, burrow scoping, and excavation activities will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

#### **BIO-15 Small Mammal Mitigation**

Construction work areas will be surveyed and small mammals will be relocated as necessary prior to any ground disturbance to minimize impacts to small mammals during the initial site preparation; work areas will be cleared in accordance with the USFWS-approved Field Protocols for Kangaroo Rats. Areas will be secured prior to this effort so that wildlife species cannot re-enter the area (in conjunction with conservation measure BIO-5).

Small mammal trapping will be conducted for five consecutive nights, or until no animals are caught on two consecutive nights per area. Traps will be set according to “sign” (burrows, trails, scat, etc.) and/or in areas of high habitat quality. Trapping will not be conducted on nights where nighttime temperatures are expected to drop below 50 degrees Fahrenheit. The results of the small mammal trapping and area clearance will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

#### **5.2.4.2 Sensitive Wildlife Species Monitoring**

#### **BIO-16 Ground-Disturbance Monitoring for Terrestrial Wildlife**

An approved biologist will be present when the top 18 inches of soil are initially disturbed within areas with some habitat value along the linear construction areas. The biologist(s) will watch for any special-status animals and will have the authority to stop work if a listed wildlife species is

encountered in the construction area. If authorized to remove and/or relocate the species, biologists will relocate the animal to the nearest safe location. If the species cannot be legally relocated, work at that location will be shut down and all personnel will be required to leave the area. The approved biologist will watch the wildlife in question from a distance until the individual has left the area. The results of all construction monitoring will be documented and submitted to the CEC, USFWS, and CDFG (see mitigation measure BIO-17).

### **BIO-17 Reporting to Agencies**

A quarterly BRMIMP report will be submitted to the CEC, CDFG, and USFWS. The report will be submitted by the 20th of the following month (i.e., the report for May will be submitted by June 20). If the 20th falls on a weekend or holiday, the report will be due the first business day following the 20th. To reduce the use of paper, the BRMIMP may be submitted on CD or electronically, as directed by each agency.

Biologists involved with the monitoring and surveying for special-status species will receive written and/or verbal approval from the CEC, CDFG, and USFWS prior to conducting survey work. Biologists will be approved for specific tasks and/or species.

During construction, an approved biologist will examine active work areas every day prior to the onset of activities to ensure that no special-status species are in the area and that all wildlife barriers are still in place. Biologists will inform the construction crews when areas are clear, and report significant observations of wildlife to the agencies within 24 hours.

The BRMIMP will include all relevant information associated with BIO-1, BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, BIO-9, BIO-10, BIO-11, BIO-12, BIO-14, BIO-15, BIO-16, BIO-19, and BIO-13.

### **5.2.4.3 Sensitive Habitat**

#### **BIO-18 Sensitive Habitat Mitigation**

A variety of options will be considered to compensate for the permanent and temporary loss of habitats potentially used by federally and state-listed species. HECA is evaluating potential off-site compensation opportunities in western Kern County and Tulare County, based on guidance from the USFWS and the CDFG. To the extent feasible, properties would be acquired and preserved that are occupied by multiple federally or state-listed species affected by the Project.

HECA LLC would provide compensation at the following ratios:

- 2.1:1 for temporary impacts to habitats potentially used by federally or state-listed species; and
- 0.1:1 for permanent impacts to agricultural land potentially used by San Joaquin kit fox for movement and migration habitat.

In addition, cultivated land or other suitable property would be acquired, preserved, and managed to provide foraging and nesting habitat for Swainson's hawks. Future nesting habitat would be established by planting cottonwoods or other suitable trees on the property.

HECA LLC proposes to acquire land that meet the habitat and/or species requirements of the federally and/or state-listed species that would be affected by the proposed action. The compensation proposal consists of the following components:

- Compensation for temporary habitat loss associated with construction of the natural gas pipeline: a total of 8.0 acres would be acquired to compensate for 3.8 acres of Allscale Scrub that would be temporarily removed during construction (2.1:1 ratio).
- Compensation for permanent habitat loss associated with construction of the Project Site: a total of 45 acres would be acquired to compensate for the permanent loss of 453 acres of cultivated fields that may be used by San Joaquin kit fox for movement and migration (0.1:1 ratio).

#### *5.2.4.4 Wetlands and Waters of the U.S.*

**BIO-19 Protection Measures for Wetlands and Waters** Work within 100 feet of waters of the U.S. and/or waters of the State will incorporate Best Management Practices (BMPs) to minimize fill and/or degradation of waters. BMPs might include the following:

- Orange fencing to demarcate the extent of work zones;
- During storm events, use of weed-free erosion control mechanisms;
- Periodic inspection of work zones by qualified biologists to ensure that BMP practices are being adhered to.

Reporting on work adjacent to wetlands will be included in the BRMIMP (BIO-17).

#### **BIO-20 Onsite Restoration of Non-Wetland Waters**

Non-wetland waters affected during construction of the natural gas pipeline will be restored following installation of the pipeline. Consistent with standard pipeline construction techniques, the upper 6 inches of soil (topsoil) excavated within non-wetland waters will be segregated and stockpiled separately from the subsoil material. The pipeline trench will be backfilled in the order in which it was removed, and topsoil will be deposited last. Trenches will be slightly overfilled to account for future soil settlement. Backfilled soil will be compacted to a bulk density consistent with the adjacent soil.

#### **5.2.5 Laws, Ordinances, Regulations, and Standards**

The Project will be constructed and operated in accordance with all LORS applicable to biological resources. Federal, state, and local LORS applicable to biological resources are discussed below in Table 5.2-15, Summary of LORS – Biological Resources.

### 5.2.5.1 Federal

#### *Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq., Title 50 CFR §17.1 et seq., Title 50 CFR Part 402*

The FESA includes provisions for the management and protection of federally listed threatened or endangered plants and animals and their designated critical habitats. Section 10(1)(A) of the FESA requires a permit to take threatened or endangered species during lawful project activities. If there is not a federal nexus for the project, a Habitat Conservation Plan may be necessary. The administering agency of the above authority is the USFWS for terrestrial, avian, and most aquatic species, and the National Marine Fisheries Service (NMFS) for anadromous species.

#### *Fish and Wildlife Coordinating Act, 16 USC 742 et seq., 16 USC 1531 et seq., and 50 CFR 17*

The Fish and Wildlife Coordinating Act requires coordination with USFWS for federal actions that would result in the control or modification of a natural stream or body of water.

#### *Section 404 of the Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323)*

This section of the CWA gives the USACE authority to regulate discharges of dredge or fill material into waters of the U.S., including wetlands.

The administering agency of this authority is the USACE.

#### *Section 401 of the Clean Water Act of 1977*

This section of the CWA requires applicants for a federal license or permit to provide a certification that any discharges will comply with applicable provisions of the CWA, including water quality standards for discharges to waterways. A 401 water quality certification is required for Section 404 permits and other federal permits.

The administering agency of this authority is the Central Valley Regional Water Quality Control Board.

#### *Migratory Bird Treaty Act 16 USC §§703-711*

The Migratory Bird Treaty Act includes provisions for protection of migratory birds, including the non-permitted take of migratory birds.

The administering agencies for this authority are the USFWS and CDFG.

### 5.2.5.2 State

#### *California Endangered Species Act of 1984, Fish and Game Code, §§2050 – 2098*

The CESA includes provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. The Act includes

a consultation requirement “to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existence of the species” (§2090). Plants of California declared to be endangered, threatened, or rare are listed at 14 California Code of Regulations [CCR] §670.5. The types and extent of information required to evaluate the effects of a Project on biological resources of a project site are described in 14 CCR §15000 *et seq.*

The administering agency for this authority is CDFG.

### ***Fish and Game Code Fully Protected Species***

- §3511: Fully Protected Birds
- §4700: Fully Protected Mammals
- §5050: Fully Protected Reptiles and Amphibians
- §5515: Fully Protected Fishes

The Fish and Game Code prohibits the taking of listed plants and animals that are Fully Protected Species in California.

The administering agency for this authority is CDFG.

### ***Fish and Game Code, §1930 Significant Natural Areas***

This section of the code designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools and significant wildlife habitats. These Significant Natural Areas are listed in the CNDDDB.

The administering agency for the above authority is CDFG.

### ***Fish and Game Code, §1580, Designated Ecological Reserves***

The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study.

The administering agency for the above authority is CDFG.

### ***Fish and Game Code, §1600, Streambed Alteration Agreement***

This section of the code reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.

The administering agency for the above authority is CDFG.

### ***Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.***

This 1977 Act designates state rare and endangered plants and provides specific protection measures for identified populations.

The administering agency for the above authority is CDFG.

### *CDFG Policies and Guidelines, Wetlands Resources Policy*

This policy provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools.

The administering agency for the above authority is CDFG, California Environmental Protection Agency (Cal/EPA), and the Colorado River Basin Regional Water Quality Control Board.

### *Public Resources Code, §§25500 & 25527*

According to the Public Resources Code, the siting of facilities in certain areas of critical concern for biological resource, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or ecological value, is prohibited. If there is no alternative, strict criteria are applied.

The administering agencies for the above authority are the USFWS and CDFG.

### *Title 20 CCR §§1702 (q) and (v)*

This title protects “areas of critical concern” and “species of special concern” identified by local, state, or federal resource agencies within the project area.

### *Title 14 CCR §15000 et seq.*

This title describes the types and extent of information required to evaluate the effects of a project on biological resources of a project site.

The administering agencies for the above authority are the USFWS and CDFG.

### *California Desert Native Plant Act, Food and Agriculture Code §80001 through §80006*

The California Desert Native Plant Act protects California desert native plants from unlawful harvesting on both privately and publicly owned lands. The Act protects specific species of native desert plants from being harvested from their natural state for sale, possession, replanting, or other purposes. The removal of plants on one’s own property for the purpose of construction or developing the property is allowed.

#### *5.2.5.3 Local*

##### *Kern County General Plan*

The Kern County General Plan provides guidance on the types of development activity, and allowable uses for those areas within the county limits. In particular Section 1.10.5 pertains to the protection and management of threatened and endangered species and riparian areas within the county (Kern County Planning Department, 2007).

### 5.2.6 Involved Agencies and Agency Contacts

Table 5.2-16, Agency Contacts, identifies agencies contacted for this evaluation. Due in part to the timing of the Project start and personnel schedules, meetings with USFWS and CDFG did not occur at the beginning of the 2008 field season; however, as detailed below, numerous meetings with CDFG and USFWS have been conducted to ensure information is being shared in a timely fashion.

- April 22, 2008, electronic mail from David Kisner (URS) to Susan Jones (USFWS) and James Diven (URS) regarding biological aspects in the vicinity of the proposed Project. Julie Vance (CDFG), Tim Kuhn (USFWS), and Rick York (CEC) were included in follow-up electronic mails regarding a meeting to discuss the former Project Site when it was located in Elk Hills.
- July 10, 2008, Project meeting in Fresno, California at CDFG office with Julie Vance (CDFG), Susan Jones, and Peter Cross (USFWS; remote). This discussion again involved the former Project Site when it was located in Elk Hills.
- October 14, 2008, Project meeting in Fresno, California at CDFG office with Julie Vance (CDFG), Susan Jones, and Peter Cross (USFWS; remote). This discussion again involved the former Project Site when it was located in Elk Hills.
- June 6, 2009, site visit with Tim Kuhn (USFWS) and Julie Vance (CDFG) to review Project linears and biological constraints.
- April 12, 2010, CEC Data Response and Issue Resolution Workshop in Tupman, California. Public meeting with CEC (Amy Golden), USFWS (Tim Kuhn), and CDFG (Julie Vance) to discuss biological aspects of the Project.
- June 9, 2010, USFWS email correspondence to CEC and CDFG regarding comments on the February 5, 2010 Biological Assessment for the Project.
- August 6, 2010, USFWS comment letter regarding the February 8, 2010 Biological Assessment for the Project. Comment letter was electronically forwarded to Julie Vance (CDFG) and Amy Golden (CEC).
- February 6, 2012 Project meeting in Fresno, California at CDFG office with Julie Vance (CDFG), and Annee Ferranti (CDFG). This discussion involved introducing the new Project team and identifying new Project components; the new Project elements were discussed with regards to the known and potential biological resources in the area.

### 5.2.7 Permits Required and Permit Schedule

Additional details on information required for each permit application and where the required information can be found in this document are provided in Table 5.2-17, Biological Permits Required and Scheduled Timing.

### 5.3 REFERENCES

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**Table 5.2-1  
Project Components and Biology Resources Study Area**

<b>Project Area Components</b>	<b>Activity Duration</b>	<b>Biological Resources Study Area Limits</b>	<b>Location of Biological Resource Information in AFC</b>
Project Site	Permanent	1-mile buffer	Section 5.2
Project Site staging and laydown area	Temporary	1-mile buffer	Section 5.2
Electrical Transmission Linear	Permanent/ Temporary	1,000-foot buffer	Section 5.2
Natural Gas Supply Linear	Temporary (except valve stations)	1,000-foot buffer	Section 5.2
Process Water Linear	Temporary	1,000-foot buffer	Section 5.2
Potable Water Linear	Temporary	1,000-foot buffer	Section 5.2
Railroad Spur	Permanent/ Temporary	1,000-foot buffer	Section 5.2
CO <sub>2</sub> EOR Processing Facility	Permanent/ Temporary	1,000-foot buffer	Appendix A
CO <sub>2</sub> Linear	Temporary	1,000-foot buffer	Appendix A

**Table 5.2-2  
Biological Resources Field Surveys**

<b>Resource</b>	<b>Field Surveys Completed</b>	<b>Conducted by URS Biologists(s)</b>
General biology	Habitat assessment, small mammal evaluation, general reconnaissance conducted for the process water linear on April 13 and April 24, 2008	Alex Brown and Julian Valenzuela
General biology	Habitat assessment, small mammal evaluation, general reconnaissance conducted for the carbon dioxide gas linear route on May 20, 2008 <sup>1</sup>	David Kisner
Potential jurisdictional wetlands	Habitat assessment of the carbon dioxide linear route, conducted on March 5, 6, and 20, 2008 and May 28, 2008 <sup>1</sup>	David Kisner and Alyssa Berry
General biology	Habitat assessment of the Project Site on December 30, 2008	David Kisner and Cletis England
General biology	Habitat assessment of the Project Site on January 8 and 9, 2009	Cletis England, Alyssa Berry, Robin Murray, Ronald Cummings, David Compton, and Jessica Birnbaum
Special-status wildlife, and potential jurisdictional wetlands	Rare plant, wildlife, and potential jurisdictional wetlands surveys of the carbon dioxide linear on March 17, 18, and 26, 2009 <sup>1</sup>	David Kisner, Wayne Vogler, Alyssa Berry, and Robin Murray
Special-status plant, wildlife, and potential jurisdictional wetlands	Rare plant, wildlife, and potential jurisdictional wetlands surveys of the Project Site on March 23, 2009	David Kisner and Cletis England
Protocol blunt-nosed leopard lizard surveys and special-status plant and wildlife	April through July 2009 protocol surveys were conducted in areas within or south of the Kern River Flood Control Channel.	Wayne Vogler, Kate Eldredge, Alyssa Berry, Cletis England, Robin Murray, Ronald Cummings, Jessica Birnbaum, David Kisner, and Andy Evans
Rare plant survey	April 6 through 9, 2010 Surveys were conducted along the carbon dioxide linear <sup>1</sup>	David Kisner, Kate Eldredge, and Kelly Kephart
General biology survey	April 5 through 9, 19 through 21, and 28, 2010 Surveys were conducted along the electrical transmission linear	David Kisner, Kate Eldredge, Alyssa Berry, and Kelly Kephart
General biology survey	July 27 and 28, 2010 Surveys were conducted along the natural gas linear alignment	David Kisner, Ronald Cummings, Dave Compton, and Kelly Kephart
Protocol juvenile blunt-nosed leopard lizard	August 5 through September 15, 2010 surveys along natural gas linear alignment	David Kisner, Ronald Cummings, Dave Compton, Kate Eldredge, Jolie Henricks, Melissa Newman, Jane Donaldson, Mark Wilson, and Gilda Barboza,
Field Reconnaissance for Wetlands and Other Waters	December 7, 2010 Field review of the natural gas linear alignment	David Kisner, Jan Novak

**Table 5.2-2  
Biological Resources Field Surveys**

<b>Resource</b>	<b>Field Surveys Completed</b>	<b>Conducted by URS Biologists(s)</b>
Rare plant survey	March 15, 16, and 17, 2011 The survey was conducted along the natural gas linear alignment	David Kisner, Kelly Kephart, Johanna Kisner, Chris Julian, and Jamie Deutsch
Wetland delineation survey	March 15, 16, and 17, 2011 The survey was conducted along the natural gas linear alignment	David Kisner, Kelly Kephart, Johanna Kisner, Chris Julian, and Jamie Deutsch
Habitat Assessment Survey/Swainson's Hawk Winter Nest Structure Survey	February 23, 2012 The survey was conducted along the revised natural gas linear alignment, rail spur, and process water linear alignments.	David Kisner and Steve Zembsch
Rare Plant Survey, Wetland Delineation and Habitat Assessment	March 27-30, 2012 The surveys evaluated the entire BRSA, including the Project site and all Project linears, including the industrial rail spur alignment.	Kelly Kephart, Jan Novak, and Jane Donaldson

Notes:

1. These surveys were conducted for the previously proposed CO<sub>2</sub> linear alignment. Although the CO<sub>2</sub> linear alignment has changed, these surveys provide information regarding the general area.

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**Table 5.2-3  
Plant Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Native/ Exotic	Wetland Indicator Status <sup>1</sup>	CNPS Status <sup>2</sup>
<i>Acroptilon repens</i>	Russian knapweed	E	NI	None
<i>Allenrolfea occidentalis</i>	iodine bush	N	NI	None
<i>Ambrosia dumosa</i>	Burrobush	N	NI	None
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Fiddleneck	N	NI	None
<i>Amsinckia menziesii</i> var. <i>menziesii</i>	Fiddleneck	N	NI	None
<i>Anethum graveolens</i>	Dill	E	NI	None
<i>Aster</i> sp.	N/A	N/A	NI	None
<i>Astragalus lentiginosus</i>	freckled milkvetch	N	NI	None
<i>Atriplex lentiformis</i>	Quailbush	N	NI	None
<i>Atriplex phyllostegia</i>	leaf cover saltweed	N	FACW	None
<i>Atriplex polycarpa</i>	desert saltbush	N	FACU	None
<i>Atriplex triangularis</i>	spear leaved saltbrush	N	FACW	None
<i>Atriplex vallicola</i>	Lost Hills saltbush	N	NI	1B.2
<i>Avena fatua</i>	Common wild oats	E	NI	None
<i>Baccharis salicifolia</i>	mule fat	N	NI	None
<i>Bassia hyssopifolia</i>	five hook bassia	E	NI	None
<i>Brassica nigra</i>	black mustard	E	NI	None
<i>Bromus hordeaceus</i>	soft chess	E	NI	None
<i>Bromus madritensis</i> ssp. <i>Rubens</i>	red brome	E	NI	None
<i>Calycadenia spicata</i>	spiked western rosinweed	N	NI	None
<i>Camissonia boothii</i> ssp. <i>Decorticans</i>	shredding evening primrose	N	NI	None
<i>Camissonia campestris</i>	Mojave suncup	N	NI	None
<i>Capsella bursa-pastoris</i>	shepherd's purse	E	FAC-	None
<i>Castilleja exserta</i> ssp. <i>exserta</i>	purple owl's clover	N	NI	None
<i>Centaurea melitensis</i>	Tocalote	E	NI	None
<i>Centaurea solstitialis</i>	yellow star thistle	E	NI	None
<i>Centromadia pungens</i> ssp. <i>pungens</i>	common tarweed	N	NI	None
<i>Chaenactis</i> sp.	N/A	N/A	NI	None
<i>Chenopodium berlandieri</i>	Berlandier's goosefoot	N	NI	None
<i>Chenopodium</i> sp.	N/A	N/A	NI	None

**Table 5.2-3  
Plant Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Native/ Exotic	Wetland Indicator Status <sup>1</sup>	CNPS Status <sup>2</sup>
<i>Chloracantha</i> sp.	N/A	N/A	NI	None
<i>Convolvulus arvensis</i>	Bindweed	E	NI	None
<i>Crassula connata</i>	sand pygmy weed	N	NI	None
<i>Cuscuta</i> sp.	Dodder	N/A	NI	None
<i>Cynodon dactylon</i>	Bermuda grass	E	NI	None
<i>Datura stramonium</i>	jimson weed	E	NI	None
<i>Deinandra pallida</i>	Kern tarweed	N	NI	None
<i>Deschampsia danthonioides</i>	annual hairgrass	N	FACW	None
<i>Delphinium hesperium</i> ssp. <i>hesperium</i>	Western larkspur	N	NI	None
<i>Delphinium gypsophilum</i>	gypsum loving larkspur	N	NI	4.2
<i>Descurainia incisa</i>	mountain tansy mustard	N	NI	None
<i>Dichelostemma capitatum</i>	blue dicks	N	NI	None
<i>Distichlis spicata</i>	salt grass	N	NI	None
<i>Eastwoodia elegans</i>	yellow mock aster	N	NI	None
<i>Encelia actoni</i>	Acton encelia	N	NI	None
<i>Eremalche parryi</i>	Parry's mallow	N	NI	None
<i>Eriastrum hooveri</i> *	Hoover's eriastrum	N	NI	4.2
<i>Eriastrum pluriflorum</i>	Tehachapi woollystar	N	NI	None
<i>Eriogonum angulosum</i>	anglestem buckwheat	N	NI	None
<i>Eriogonum gossypinum</i>	cottony buckwheat	N	NI	4.2
<i>Eriogonum gracillimum</i>	Slender-stemmed buckwheat	N	NI	None
<i>Erodium botrys</i>	Broad-leaf filaree	E	NI	None
<i>Erodium cicutarium</i>	redstem stork's bill	E	NI	None
<i>Euphorbia chamaesyce</i>	prostrate spurge	E	NI	None
<i>Filago californica</i>	California filago	N	NI	None
<i>Frankenia salina</i>	alkali heath	N	NI	None
<i>Galium</i> sp.	Bedstraw	N	NI	None
<i>Gilia tricolor</i> ssp. <i>diffusa</i>	bird's eye Gilia	N	NI	None
<i>Guillenia lasiophylla</i>	California mustard	N	NI	None
<i>Helianthus annuus</i>	common sunflower	N	NI	None

## 5.2 Biological Resources

**Table 5.2-3  
Plant Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Native/ Exotic	Wetland Indicator Status <sup>1</sup>	CNPS Status <sup>2</sup>
<i>Heliotropium curassavicum</i>	Heliotrope	N	NI	None
<i>Hemizonia</i> sp.	N/A	N/A	NI	None
<i>Hordeum brachyantherum</i>	meadow barley	N	NI	None
<i>Hordeum intercedens</i>	bobtail barley	N	NI	3.2
<i>Hordeum marinum</i>	seaside barley	E	NI	None
<i>Hymenoclea salsola</i>	Cheesebrush	N	NI	None
<i>Isocoma acradenia</i> var. <i>bracteosa</i>	alkali goldenbush	N	NI	None
<i>Isomeris arborea</i>	Bladderpod	N	NI	None
<i>Juncus/Carex</i> sp.	N/A	N/A	NI	None
<i>Kochia californica</i> ( <i>Bassia californica</i> )	Mojave red sage	N	FACW	None
<i>Lactuca serriola</i>	prickly lettuce	E	NI	None
<i>Lastarriaea coriacea</i>	leather spineflower	N	NI	None
<i>Lasthenia californica</i>	Goldfields	N	NI	None
<i>Lasthenia chrysantha</i>	alkali goldfields	N	NI	None
<i>Layia glandulosa</i>	white tidytips	N	NI	None
<i>Layia pentachaeta</i> ssp. <i>albida</i>	Sierra tidytips	N	NI	None
<i>Lepidium dictyotum</i>	alkali pepperweed	N	OBL	None
<i>Lepidium nitidum</i>	Peppergrass	N	NI	None
<i>Lessingia glandulifera</i>	valley lessingia	N	NI	None
<i>Lupinus bicolor</i>	bi-color lupine	N	NI	None
<i>Lycium cooperi</i>	Cooper's box thorn	N	NI	None
<i>Malacothrix californica</i>	desert dandelion	N	NI	None
<i>Malacothrix coulteri</i>	snake's head	N	NI	None
<i>Malva parviflora</i>	Cheeseweed	E	NI	None
<i>Malvella leprosa</i>	alkali mallow	N	NI	None
<i>Marrubium vulgare</i>	Horehound	E	NI	None
<i>Matricaria discoidea</i>	pineapple weed	E	NI	None
<i>Melilotus indicus</i>	annual yellow sweetclover	E	NI	None
<i>Mentzelia affinis</i>	yellow blazing stars	N	NI	None
<i>Mesembryanthemum crystallinum</i>	crystalline ice plant	E	NI	None

**Table 5.2-3  
Plant Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Native/ Exotic	Wetland Indicator Status <sup>1</sup>	CNPS Status <sup>2</sup>
<i>Mesembryanthemum nodiflorum</i>	slender-leaf iceplant	E	NI	None
<i>Monolopia stricta</i>	Crum's monolopia	N	NI	None
<i>Mucronea perfoliata</i>	perfoliate spineflower	N	NI	None
<i>Nicotiana glauca</i>	tree tobacco	E	NI	None
<i>Oligomeris linifolia</i>	Oligomeris	N	NI	None
<i>Pectocarya heterocarpa</i>	hairy-leaved comb bur	N	NI	None
<i>Pectocarya linearis ssp. ferocula</i>	slender comb seed	N	NI	None
<i>Phacelia distans</i>	common phacelia	N	NI	None
<i>Phacelia tanacetifolia</i>	lacy phacelia	N	NI	None
<i>Phalaris aquatica</i>	Harding grass	E	NI	None
<i>Plagiobothrys canescens</i>	valley popcorn flower	N	NI	None
<i>Plagiobothrys trachycarpus</i>	Rough-fruit popcorn flower	N	NI	None
<i>Plantago elongata</i>	Long-leaf plantain	N	FACW*	None
<i>Plantago ovata</i>	wooly plantain	N	NI	None
<i>Poa annua</i>	annual bluegrass	E	NI	None
<i>Polygonum argyrocoleon</i>	silversheath knotweed	E	NI	None
<i>Portulaca oleracea</i>	Purslane	E	NI	None
<i>Prosopis glandulosa</i>	honey mesquite	N	NI	None
<i>Psilocarphus tenellus</i>	Woolyheads	N	NI	None
<i>Psilocarphus tenellus var. tenellus</i>	Woolyheads	N	FAC	None
<i>Psilocarphus oregonus</i>	Oregon woolyheads	N	OBL	None
<i>Rumex crispus</i>	curly dock	E	NI	None
<i>Rumex sp.</i>	N/A	N/A	NI	None
<i>Salicornia virginica</i>	Pickleweed	N	OBL	None
<i>Salix nigra</i>	black willow	N	NI	None
<i>Salsola tragus</i>	Russian thistle	E	NI	None
<i>Salvia carduacea</i>	thistle sage	N	NI	None
<i>Salvia columbariae</i>	Chia	N	NI	None
<i>Schismus barbatus</i>	Mediterranean grass	E	NI	None
<i>Senecio vulgaris</i>	common groundsel	E	NI	None

**Table 5.2-3  
Plant Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Native/ Exotic	Wetland Indicator Status <sup>1</sup>	CNPS Status <sup>2</sup>
<i>Sisymbrium altissimum</i>	tumble mustard	E	NI	None
<i>Solanum lanceolatum</i>	lance-leaf nightshade	E	NI	None
<i>Sonchus asper</i>	spiny sow thistle	E	NI	None
<i>Sonchus oleraceus</i>	sow thistle	E	NI	None
<i>Spergularia marina</i>	salt sandspurry	N	NI	None
<i>Spergularia</i> sp.	N/A	N/A	NI	None
<i>Stephanomeria exigua</i>	small wirelettuce	N	NI	None
<i>Stylocline citroleum</i>	oil nest straw	N	NI	1B.1
<i>Stylomecon heterophylla</i>	wind poppy	N	NI	None
<i>Suaeda moquinii</i>	Seablite	N	NI	None
<i>Tamarisk</i> sp.	salt cedar	E	NI	None
<i>Trifolium</i> sp.	Clover	N/A	NI	None
<i>Trichostema ovatum</i>	San Joaquin bluecurls	N	NI	4.2
<i>Typha</i> sp.	Cattail	N	NI	None
<i>Urtica urens</i>	dwarf nettle	E	NI	None
<i>Uropappus lindleyi</i>	silver puffs	N	NI	None
<i>Vulpia myuros</i>	foxtail fescue	E	NI	None
<i>Vulpia microstachys</i>	small fescue	N	NI	None
<i>Vulpia</i> sp.	Fescue	E	NI	None
<i>Xanthium strumarium</i>	Cocklebur	N	NI	None

Notes:

1. Wetland indicator status (Reed 1988) of plant species is defined as follows:
  - UPL (upland) – greater than 99 percent of a species’ occurrences are in non-wetlands;
  - FACU (facultative-upland) – 67-99 percent of a species’ occurrences are in non-wetlands;
  - FAC (facultative) – 33-67 percent of a species’ occurrences are in wetlands;
  - FACW (facultative-wetland) – 67-99 percent of a species’ occurrences are in wetlands;
  - OBL (obligate) – greater than 99 percent of a species’ occurrences are in wetlands;
  - NL (not listed) – treated as upland because not on wetland plant list.
2. CNPS status “ranks” are defined as follows:
  - 1B (formerly List 1B) are plants that are rare, threatened, or endangered in California and elsewhere
    - i. 1B.1 – seriously threatened in California
    - ii. 1B.2 fairly threatened in California
  - 3 (formerly List 3) a watch list of plants that require more information
    - i. 3.2 fairly threatened in California
  - 4 (formerly List 4) plants that have limited distribution in California
    - i. 4.2 fairly threatened in California

**Table 5.2-4  
Wildlife Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Observation Type	Federal/State/Other Listing Status <sup>1</sup>
<b>Invertebrates</b>			
<i>Pogonomyrmex californicus</i>	California harvester ant	Visual	NA
Family: Hymenoptera	“furry black” bee	Visual	NA
<i>Apis mellifera</i>	honey bee	Visual	NA
Family: Tenebrionidae	stink beetle	Visual	NA
Family: Coccinellidae	lady beetle	Visual	NA
Family: Sphingidae	sphinx moth	Visual	NA
Order: Scorpionidae	Scorpion	Visual	NA
<b>Amphibians</b>			
<i>Rana catesbiana</i>	bullfrog	Visual	Non-native
<i>Hyla regilla</i>	Pacific treefrog	Visual	NA
<i>Bufo boreas</i>	Western toad	Visual	NA
<i>Spea hammondi</i>	Western spadefoot (tadpoles)	Visual	SSC
<b>Reptiles</b>			
<i>Uta stansburiana</i>	side blotch lizard	Visual	NA
<i>Gambelia sila</i>	blunt-nosed leopard lizard	Visual	CE, Fully Protected/FE
<i>Aspidoscelis tigris tigris</i>	Great Basin whiptail	Visual	NA
<i>Coluber constrictor</i>	Racer	Visual	NA
<i>Pituophis melanoleucus</i>	Gopher snake	Visual	NA
<i>Crotalus viridis</i>	Western rattlesnake	Visual	NA
<b>Birds</b>			
<i>Ardea alba</i>	great egret	Visual	NA
<i>Circus cyaneus</i>	northern harrier	Visual	NA
<i>Accipiter striatus</i>	sharp-shinned hawk	Visual	NA
<i>Accipiter cooperii</i>	Cooper’s hawk	Visual	SSC (nesting)
<i>Buteo lineatus</i>	red-shouldered hawk	Visual	WL (nesting)
<i>Falco sparverius</i>	American kestrel	Visual	WL (nesting)
<i>Falco columbarius</i>	merlin	Visual	NA
<i>Callipepla californica</i>	California quail	Visual	NA
<i>Gallinago delicata</i>	Wilson’s snipe	Visual	NA

## 5.2 Biological Resources

**Table 5.2-4  
Wildlife Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Observation Type	Federal/State/Other Listing Status <sup>1</sup>
<i>Numenius americanus</i>	long-billed curlew	Visual	WL (wintering)
<i>Tringa melanoleuca</i>	greater yellowlegs	Visual	NA
<i>Tringa flavipes</i>	lesser yellowlegs	Visual	WL/BCC (nesting)
<i>Charadrius vociferus</i>	killdeer <sup>2</sup>	Visual	NA
<i>Larus argentatus</i>	herring gull	Visual	NA
<i>Columba livia</i>	rock pigeon <sup>2</sup>	Visual	Non-native
<i>Zenaida macroura</i>	mourning dove <sup>2</sup>	Visual	NA
<i>Geococcyx californianus</i>	greater roadrunner <sup>2</sup>	Visual	NA
<i>Bubo virginianus</i>	great-horned owl <sup>2</sup>	Pellets, feathers	NA
<i>Athene cunicularia</i>	burrowing owl	Visual	SSC (nesting)
<i>Lanius ludovicianus</i>	loggerhead shrike <sup>2</sup>	Visual	SSC (nesting)
<i>Corvus corax</i>	common raven	Visual	NA
<i>Toxostoma</i> sp.	thrasher species	Visual	NA
<i>Salpinctes obsoletus</i>	rock wren <sup>2</sup>	Visual	NA
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow <sup>2</sup>	Visual	NA
<i>Hirundo rustica</i>	barn swallow <sup>2</sup>	Visual	NA
<i>Petrochelidon pyrrhonota</i>	cliff swallow <sup>2</sup>	Visual	NA
<i>Sturnus vulgaris</i>	European starling	Visual	Non-native
<i>Mimus polyglottos</i>	Northern mockingbird <sup>2</sup>	Visual	NA
<i>Eremophila alpestris</i>	horned lark <sup>2</sup>	Visual	SSC
<i>Spizella breweri</i>	Brewer's sparrow	Visual	NA
<i>Sayornis saya</i>	Say's phoebe <sup>2</sup>	Visual	NA
<i>Sayornis nigricans</i>	black phoebe <sup>2</sup>	Visual	NA
<i>Passer domesticus</i>	house sparrow <sup>2</sup>	Visual	Non-native
<i>Anthus rubescens</i>	American pipit	Visual	NA
<i>Carpodacus mexicanus</i>	house finch <sup>2</sup>	Visual	NA
<i>Chondestes grammacus</i>	lark sparrow <sup>2</sup>	Visual, call	NA
<i>Zonotrichia leucophrys</i>	white-crowned sparrow	Visual	NA
<i>Passerculus sandwichensis</i>	savannah sparrow	Visual	NA
<i>Amphispiza belli</i>	sage sparrow <sup>2</sup>	Visual	NA

**Table 5.2-4  
Wildlife Species Observed in the Biological Resources Study Area**

Scientific Name	Common Name	Observation Type	Federal/State/Other Listing Status <sup>1</sup>
<i>Vermivora celata</i>	orange-crowned warbler	Visual	NA
<i>Dendroica coronata</i>	yellow-rumped warbler	Visual	NA
<i>Icterus bullockii</i>	Bullock's oriole	Visual	NA
<i>Sturnella neglecta</i>	Western meadowlark <sup>2</sup>	Visual	NA
<i>Euphagus cyanocephalus</i>	Brewer's blackbird <sup>2</sup>	Visual	NA
<i>Agelaius phoeniceus</i>	red-winged blackbird <sup>2</sup>	Visual	NA
<i>Molothrus ater</i>	brown-headed cowbird <sup>2</sup>	Visual	NA
<b>Mammals</b>			
<i>Canis latrans</i>	coyote	Tracks, Scat	NA
<i>Canis lupus familiaris</i>	domestic dog	Tracks/Visual	NA
<i>Ovis</i> sp.	domestic sheep	Visual/carcass	NA
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	Tracks, scat, and active dens	FE, CT
<i>Spermophilus beecheyi</i>	California ground squirrel	Visual/burrows	NA
<i>Ammospermophilus nelsonii</i>	Nelson's antelope squirrel	Visual	CT
<i>Thomomys</i> sp.	pocket gopher	Burrows	NA
<i>Dipodomys</i> sp.	short-nosed kangaroo rat	Burrows, tracks, and scat	SSC
<i>Lepus californicus</i>	black-tailed jackrabbit	Visual	NA
<i>Sylvilagus audubonii</i>	Audubon's cottontail	Visual	NA
<i>Taxidea taxa</i>	American badger	Digs, carcass	SSC
<i>Procyon lotor</i>	Raccoon	Visual/tracks	NA

Source: CDFG, 2011

Notes:

NA = Not Applicable.

- Status designations per CDFG, 2011:
  - BCC = Bird of Conservation Concern (USFWS)
  - CE = California Endang
  - CT = California Threatened
  - FE = Federally Endangered
  - SSC = California Species of Special Concern (CDFG)
  - WL = Watch List (CDFG)
- Bird species indicating nesting behavior and/or expected to breed in the study area.

**Table 5.2-5  
Public and Private Conservation Lands and Habitat Conservation Plan Areas  
near the Project Site**

<b>Natural Area</b>	<b>Approximate Distance (miles)</b>	<b>Direction from Project Site</b>
Lokern Ecological Reserve	0.5	South
California Aqueduct San Joaquin Draft Habitat Conservation Plan (developed by Department of Water Resources)	0.3	Southeast
Tule Elk State Reserve	0.3	East
Occidental of Elk Hills, Inc., Elk Hills Unit Draft Habitat Conservation Plan	1.0	South
Kern Water Bank	1.0	East
Coles Levee Ecosystem Preserve	3.5	Southeast
Buttonwillow Ecological Reserve	6.5	North
Buena Vista Aquatic Recreation Area	7.8	Southeast
Northern Semitropic Ridge Ecological Reserve	22.5	Northwest
Carrizo Plain National Monument	22.7	West
Kern and Pixley National Wildlife Refuges	33.4	Northwest

**Table 5.2-6  
Area of Habitats and Existing Land Use Types within the Project Area**

	Project Site		Construction Staging Area		Railroad		Rail Laydown Yard		Natural Gas		Process Water		Transmission		OEHI CO <sub>2</sub> Pipeline (Refer to Appendix A)		Total	
	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
Alfalfa		118.2	59.7		7	5.3	1.9		3.4		4.2		9.7	0.07	0		86.7	123.57
Other Row Crop		312.7	19.9		21.4	17.6			12.1	2.2	1.7		0.1		0	0	60.6	332.56
Orchards					1.6	4.5	5.6		0.6		2			0.01			9.8	4.51
Natural/Ruderal Vegetation									3.6								3.6	0.06
Developed/Disturbed		15.6	6.7		15.7	12.4	0.7		30.1		79.5		12.9	0.07	0		159.8	28.07
<b>Total</b>	<b>0</b>	<b>446.5</b>	<b>86.3</b>	<b>0</b>	<b>45.7</b>	<b>39.8</b>	<b>8.2</b>	<b>0</b>	<b>49.8</b>	<b>2.2</b>	<b>87.4</b>	<b>0</b>	<b>22.7</b>	<b>0.15</b>	<b>0</b>	<b>0</b>	<b>320.5</b>	<b>488.77</b>

Note:

Areas not designated as crop land or Natural/Ruderal vegetated land have been classified as Developed/Disturbed.

**Table 5.2-7  
Special-Status Plant Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations and Flowering/Greatest Activity Period for Area
		Federal	State	Other		
<b>Plants</b>						
Horn’s milk-vetch	<i>Astragalus hornii</i> var. <i>hornii</i>	—	—	CNPS 1B.1	Low Recorded 5 miles south of the Project Site	Meadows, seeps, alkaline lake margins; May-October
Heartscale	<i>Atriplex cordulata</i>	—	—	CNPS 1B.2	Low Found approximately 5 miles to south of the Project Site	Chenopod scrub, meadows, seeps, valley and foothill grassland; April-October
Subtle orache	<i>Atriplex subtilis</i>	—	—	CNPS 1B.2	Moderate Recorded approximately 5 miles north of the Project Site	Valley and foothill grassland; June-August
Bakersfield smallscale	<i>Atriplex tularensis</i>	—	E	CNPS 1B.1	Very Low Not recorded in area	Chenopod scrub; June-October
Lost Hills crownscale	<i>Atriplex vallicola</i>	—	—	CNPS 1B.2	Moderate Found in the Project vicinity, approximately 1.5 miles to the south of the Project Site	Chenopod scrub, vernal pools, valley and foothill grassland; April-August
Alkali mariposa lily	<i>Calochortus striata</i>	—	—	CNPS 1B.2	Very Low Found approximately 10 miles to the south of the Project Site	Chenopod scrub, Mojavean desert scrub, chaparral, meadows and seeps; April-June
California jewel-flower	<i>Caulanthus californicus</i>	E	E	CNPS 1B.1	Low Recorded approximately 8 miles south of the Project Site	Chenopod scrub, pinyon and juniper woodlands, valley and foothill grasslands; February-May
Slough thistle	<i>Cirsium crassicaule</i>	—	—	CNPS 1B.1	Moderate Recorded within one-half mile of the Project Site	Chenopod scrub, riparian scrub, marshes and swamps; May-August
Gypsum-loving larkspur	<i>Delphinium gypsophilum</i> ssp. <i>Gypsophilum</i>	—	—	CNPS 4.2	High Found within a mile southwest of the Project Site	Chenopod scrub, cismontane woodland, valley and foothill grassland; February-May

**Table 5.2-7  
Special-Status Plant Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations and Flowering/Greatest Activity Period for Area
		Federal	State	Other		
Recurved larkspur	<i>Delphinium recurvatum</i>	—	—	CNPS 1B.2	Moderate Recorded near the Project Site and in the vicinity of linear Project components	Chenopod scrub, cismontane woodland, valley and foothill grassland; March-June
Kern mallow	<i>Eremalche kernensis</i>	E	—	CNPS 1B.2	Low Recorded near the northern portion of the potable water linear	Chenopod scrub, valley and foothill grassland; March-May
Hoover's eriastrum	<i>Eriastrum hooveri</i>	—	—	CNPS 4.2	Moderate Found approximately 1.5 miles to the southwest of the Project Site	Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland; February-May
Cottony buckwheat	<i>Eriogonum gossypinum</i>	—	—	CNPS 4.2	Moderate Found approximately 3 miles to the southwest of the Project Site	Chenopod scrub, valley and foothill grassland, March-September
Tejon poppy	<i>Eschscholzia lemmonii</i> ssp. <i>Kernensis</i>	—	—	CNPS 1B.1	Moderate Numerous populations have been recorded just over 1 mile from the Project Site	Chenopod scrub, valley and foothill grassland; March-May
Showy madia	<i>Madia glabrata</i>	—	—	CNPS 1B.1	Very Low Found over 10 miles to the northwest of the Project Site	Cismontane woodland, valley and foothill grassland; March-May
San Joaquin woollythreads	<i>Monolopia [Lembertia] congdonii</i>	E	—	CNPS 1B.2	Moderate Found approximately 2 miles to east of the Project Site	Chenopod scrub, valley and foothill grassland; February-May
Bakersfield cactus	<i>Opuntia basilaris</i> var. <i>treleasei</i>	E	E	CNPS 1B.1	Very Low Not recorded in area	Chenopod scrub, cismontane woodland, valley and foothill grassland; April-May

**Table 5.2-7  
Special-Status Plant Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations and Flowering/Greatest Activity Period for Area
		Federal	State	Other		
California chalk moss	<i>Pterygoneurum californicum</i>	—	—	CNPS 1B.1	Very Low Not recorded in area	Chenopod scrub, valley and foothill grassland
Oil neststraw	<i>Stylocline citroleum</i>	—	—	CNPS 1B.1	High Numerous observations within 1 mile of the Project Site	Chenopod scrub, valley and foothill grassland; March-April
Mason’s neststraw	<i>Stylocline masonii</i>	—	—	CNPS 1B.1	Very Low Not recorded in area	Chenopod scrub, pinyon and juniper woodland; March-May

Notes:

- |         |  |   |                                    |
|---------|--|---|------------------------------------|
| E       | Federal/State Endangered                                       | 1 | Seriously endangered in California |
| CNPS 1B | Plants that are rare or endangered in California and elsewhere | 2 | Fairly endangered in California    |
| CNPS 4  | Plants that have limited distribution in California            | 3 | Not very endangered in California  |

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
<b>Invertebrates</b>						
Kern shoulderband	<i>Helminthoglypta callistoderma</i>	—	—	IUCN:EN	Very Low No known occurrences within 5 miles of the Project Area	Unknown
<b>Amphibians</b>						
Western spadefoot	<i>Spea hammondi</i>	—	SC	—	Present Tadpoles observed in 2009 along KRFCC less than 1 mile south of the Project Site	Inhabits sparsely vegetated alkali and desert scrub habitats in areas of low topographic relief. Preferred habitat includes semiarid grasslands, alkali flats, and washes.
<b>Reptiles</b>						
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	E	E and FP	—	Present Observed in 2008 within 1 mile south of the Project Site along previously proposed CO <sub>2</sub> linear and in 2010 near the northern terminus of the natural gas linear	Inhabits sparsely vegetated alkali and desert scrub habitats in areas of low topographic relief. Preferred habitat includes semiarid grasslands, alkali flats, and washes.
Silvery legless lizard	<i>Anniella pulchra pulchra</i>	—	SC	—	Very Low No known occurrences within 5 miles of the Project Area	Inhabits coastal dune, valley foothill, chaparral, and coastal sage scrub habitats. Prefers sandy or loose organic soil suitable for burrowing. Soil moisture is essential to legless lizard success.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
California horned lizard	<i>Phrynosoma coronatum</i>	—	SC	—	Low No known occurrences within 5 miles of the Project Area	Inhabits a wide range of habitats including grassland, oak woodland, and riparian habitats. Requirements include an exposed gravelly-sandy substrate.
Giant garter snake	<i>Thamnophis gigas</i>	T	T	—	Low Last recorded in 1940 within the region. Likely extirpated from Kern County	Requires adequate water during its active season, herbaceous wetland vegetation as cover, openings in wetland vegetation for basking, and higher elevations for refuge from flood waters during the dormant season. Adapted to irrigation ditches and canals.
San Joaquin whipsnake	<i>Masticophis flagellum ruddocki</i>	—	SC	—	Low No known occurrences within 5 miles of the Project Site	Inhabits valley grassland and saltbush scrub habitats. Uses mammal burrows for refuge.
Southwestern pond turtle	<i>Actinemys marmorata pallida</i>	—	SC	—	Moderate One recorded occurrence within 1 mile of Project Site in 1990	Inhabits riparian zone and fresh water bodies; known to use associated upland habitats.
<b>Birds</b>						
Fulvous whistling-duck	<i>Dendrocygna bicolor</i>	—	SC	—	Very Low No known occurrences within 5 miles of the Project Area	Inhabits freshwater marshes, lakes, ponds, and rice fields.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
White-tailed kite	<i>Elanus leucurus</i>	—	FP	—	Very Low No known occurrences within 5 miles of the Project Area	Inhabits open grasslands with scattered trees for nesting and perching. Often frequent tree-lined river valleys with adjacent open areas.
Swainson’s hawk	<i>Buteo swainsoni</i>	SC	T	—	Present Individuals observed foraging over the Tule Elk Preserve, with potential nest structures 1 mile east of Project Site. Active nest confirmed in 2011 approximately 500 feet south of process water linear and less than 3 miles west of the Project Site	Inhabits open grasslands and desert-like habitats, as well as agricultural areas.
Golden eagle	<i>Aquila chrysaetos</i>	SC	FP	—	Moderate Limited nesting habitat; individuals may pass through Project Area	Found in open and semi-open areas including tundra, shrublands, woodlands, grasslands, and coniferous forests. Primarily inhabits mountainous areas, but can also nest in wetland, riparian and estuarine habitats.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
Prairie falcon	<i>Falco mexicanus</i>	SC	—	—	Low Nesting habitat is not present in the Project Area or vicinity; migrants may pass through area	Inhabits arid and semi-arid plains. Nests on rock cliffs in river gorges as well as mountainous regions.
American peregrine falcon	<i>Falco peregrinus</i>	—	E	FP	Low Nesting habitat is not present in the Project Area; migrants may pass through area	Prefer open habitats such as grasslands, tundra and meadows. Nests on cliff faces and crevices.
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	T	SC	—	Very Low No known occurrences within 5 miles of Project Area	Breeds above high tide line on coastal beaches, sand spits, sparsely vegetated dunes, and beaches at creek or river mouths.
Mountain plover	<i>Charadrius montanus</i>	SC	SC	—	Low Uncommon in Project vicinity during winter; outside of breeding range. One observation within 1 mile of the Project Area in 1990	Inhabits open grasslands, plowed fields and open sagebrush areas. Often roosts in depressions in the ground. Avoids areas with high or dense vegetative cover.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC and C	E		Very Low Poor nesting habitat; migrants may pass through area	Inhabits open woodlands with clearings and a dense shrub layer. Often frequent woodlands near streams, rivers or lakes.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
Burrowing owl	<i>Athene cunicularia</i>	—	SC	—	Present Individuals detected in the BRSA at several locations during surveys in 2008, 2010 and 2011	Inhabits open, dry grasslands, deserts, and sometimes, ruderal areas along ditch levees. Requires burrows, principally those made by California ground squirrels.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	E	—	Very Low Poor nesting habitat; migrants may pass through area	Breeds in dense riparian habitats along rivers, streams or other wetlands.
Loggerhead shrike	<i>Lanius ludovicianus</i>	—	SC	—	Present Individuals observed during survey in 2008 at the Project Site and along linear Project components	Inhabits open spaces bordered by vegetation.
Least Bell's vireo	<i>Vireo bellii pusillus</i>	E	E	—	Very Low Poor nesting habitat; migrants may pass through area	Prefers dense, shrubby vegetation, woodlands, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions.
LeConte's thrasher	<i>Toxostoma lecontei</i>	SC	SC	—	Moderate Potential breeding habitat on edges of Project Site and along previously proposed linear alignments. One record within 1 mile of the Project Area in 1989	Open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats, also occurs in Joshua tree habitat with scattered shrubs.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
California horned lark	<i>Eremophila alpestris actia</i>	—	—	DFG:WL	Present Individuals detected during survey in 2008	Inhabits open habitat, usually where trees and large shrubs are absent. Prefers to breed in short grasslands, rangelands and open fields.
Tricolored blackbird	<i>Agelaius tricolor</i>	SC	SC	—	Low Typical nesting habitat for this species is not present in the Project Area; foraging possible	Nests in emergent wetland vegetation or near it. Roosts in large flocks in wetland vegetation or in trees.
<b>Mammals</b>						
Buena Vista lake shrew	<i>Sorex ornatus relictus</i>	E	SC	—	Low Habitats in the Project Area are not suitable for this species; no freshwater marsh wetlands or riparian habitats with dense cover in the Project Area	Inhabits valley freshwater marsh with dense wetland vegetative cover and detritus.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
Nelson's antelope squirrel	<i>Ammospermophilus nelsoni</i>	—	T	—	High Documented occurrences are only known to the west of the California Aqueduct (Elk Hills area). Individuals observed in vicinity of CO <sub>2</sub> linear in 2008 and 2009 approximately 2 miles south of the Project Site. No habitat for this species at Project Site or along other linear components, except CO <sub>2</sub> linear alignment west of California Aqueduct.	Dry, sparsely vegetated loam soils. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes
Giant kangaroo rat	<i>Dipodomys ingens</i>	E	E	—	High Observed approximately 1 mile south of the Project Site in 1990. Per February 2012 communication with CDFG, this species is expected on west side of California Aqueduct, but not likely to occur east of the Aqueduct.	Saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Requires soft friable soils, which escape seasonal flooding where it will dig burrows in elevated soil mounds at the base of shrubs.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
Short-nosed kangaroo rat	<i>Dipodomys nitratoides brevinasus</i>	—	SC	—	High Previously documented within 1 mile of the Project Site	Western San Joaquin Valley in grassland and shrub associations, especially <i>Atriplex</i> . Favors flat to gently sloping terrain. Requires soft friable soils, which escape seasonal flooding where it will dig burrows in elevated soil mounds at the base of shrubs
Tipton kangaroo rat	<i>Dipodomys nitratoides nitratoides</i>	E	E	—	High Previously documented within 1 mile of the Project Site and within the BRSA for the linear Project components	Valley sink scrub and valley saltbush scrub in the Tulare basin. Sparse top moderate shrub cover is associated with high-density populations. Terrain not subject to flooding is an important factor for permanent occupancy.
Tulare grasshopper mouse	<i>Onychomys torridus tularensis</i>	—	SC	—	Moderate Previously documented within 5 miles of the Project Site in 2004	Arid shrub-land communities in hot, arid grassland and shrub-land associations
Tule elk	<i>Cervus elaphus nannodes</i>	—	—	—	Low Restricted to the Tule Elk Preserve approximately 1 mile east of Project Site	Typically found in grasslands and oak savannas.
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E	T	—	Present Active dens observed near in vicinity of CO <sub>2</sub> linear in 2008 and potential tracks/sign observed KRFCC in 2009	Chenopod scrub, grasslands, and other habitats. Sometimes forage in agricultural areas.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
American badger	<i>Taxidea taxus</i>	—	SC	—	High Carcass and other evidence of this species identified along previously proposed linear alignments in 2008; potential to occur in Project Site and linear components of Project Area	Abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils.
San Joaquin pocket mouse	<i>Perognathus inornatus</i>	—	—	BLM	High Occurrences documented within 1 mile of the Project Site	Inhabits dry, open grasslands or scrub areas in the Central and Salinas valleys. Inhabits shrubby ridgetops and hillsides.
Pallid bat	<i>Antrozous pallidus</i>	—	SC	—	Very Low No occurrences documented within 5 miles of Project Area. However, this species may forage within the Project Area	Inhabits rocky, outcrop areas where they commonly roost in rock crevices, caves, and mine tunnels.
Townsend's big-eared bat	<i>Corynorhinus townsendii townsendii</i>	—	SC	—	Very Low No occurrences documented within 5 miles of the Project Area. However, potential for this species to forage and roost within the Project Area	Inhabits desert scrub, mixed conifer forest and pinyon-juniper, or pine forest habitat. Associated with caves, mines, lava tubes, and buildings.

**Table 5.2-8  
Special-Status Wildlife Species with Potential to Occur within the Project Area**

Common Name	Scientific Name	Listing Status			Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State	Other		
Western mastiff bat	<i>Eumops perotis californicus</i>	—	SC	—	Very Low No occurrences documented within 5 miles of the Project Area. However, potential for this species to forage and roost within the Project Area	Inhabits dry washes, flood plains, chaparral, oak woodland, grassland, montane meadows, and agricultural areas. Western mastiff bat primarily roosts on cliffs generally under exfoliating rock slabs (e.g., granite, sandstone or columnar basalt) but also utilizes crevices in large boulders and buildings.

Notes:

- |    |                                       |         |  |
|----|---------------------------------------|---------|--|
| E  | Federal/State Endangered              | FP      | State Fully Protected  |
| T  | Federal/State Threatened              | IUCN:EN | International Union for Conservation of Nature and Natural Resources: Endangered |
| SC | Federal/California Species of Concern | DFG:WL  | Department of Fish and Game Watch List   |
| C  | Candidate Species                     | BLM     | Bureau of Land Management Sensitive Species                                      |

**Table 5.2-9**  
**Temporary Impacts to Non-Wetland Waters of the United States (WUS)<sup>1</sup>**

<b>Feature ID</b>	<b>Temporary Impact Area (Square Feet)</b>
WUS 27	373
WUS 28	648
WUS 29	4,203
WUS 33	2,636
WUS 34	8
Total (square feet)	7,868
Total (acres)	0.18

Note:

<sup>1</sup> Impacts are estimated using a 30-foot-wide construction right-of-way.

**Table 5.2-10  
Overlap of Project Components and the San Joaquin Kit Fox  
Western Kern County Core Recovery Area**

<b>Project Component</b>	<b>Area (Acres) within the Western Kern County Core Recovery Area</b>
Project Site	7.0 <sup>1</sup>
Carbon Dioxide Pipeline	20.0 <sup>2</sup>
Process Water Pipeline	42.2 <sup>3</sup>
<b>Total</b>	<b>69.2</b>

Notes:

- <sup>1</sup> Acreage is actively farmed and is poor habitat for the San Joaquin kit fox.
- <sup>2</sup> See Appendix A for additional information on CO<sub>2</sub> linear.
- <sup>3</sup> Acreage is included in the Project Site area, is actively farmed, and is poor habitat for the San Joaquin kit fox.

# SECTION FIVE

## Environmental Information

**Table 5.2-11  
Existing and Project-Related Traffic Estimates within the  
San Joaquin Kit Fox Recovery Area**

Roadway	Current ADT <sup>1</sup>	Construction		Operations Alternative 1 (rail transportation) <sup>2</sup>		Operations Alternative 2 (truck transportation) <sup>2</sup>		Product Deliveries During Alternative 1 (rail transportation) <sup>3</sup>		Product Deliveries During Alternative 2 (truck transportation) <sup>3</sup>	
		Current + Project ADT	Project Increase	Current + Project ADT	Project Increase	Current + Project ADT	Project Increase	Current + Project ADT	Project Increase	Current + Project ADT	Project Increase
I-5 (north of SR-46)	30,500	30,759	0.8%	30,708	0.7%	30,876	1.2%	30,648	0.5%	30,702	0.7%
I-5 (south of SR-119)	30,000	30,396	1.3%	30,230	0.8%	30,416	1.4%	30,166	0.6%	30,226	0.8%
Tupman Road (Tupman Town) <sup>4</sup>	490	1,474	200.8%	614	25.3%	614	25.3%	490	0.0%	490	0.0%
SR 119 (Bakersfield – east of I-5)	6,800	7,554	11.1%	6,900	1.5%	6,918	1.7%	6,816	0.2%	6,822	0.3%
SR 119 (Taft – west of Tupman Rd)	11,800	11,924	1.1%	11,816	0.1%	11,816	0.1%	11,800	0.0%	11,800	0.0%
Stockdale Highway (west of I-5) <sup>4</sup>	2,520	3,683	46.2%	3,132	24.3%	3,504	39.0%	2,851	13.1%	4,321	71.5%
SR 46 (west of I-5)	10,000	10,136	1.4%	10,000	0.0%	10,000	0.0%	10,000	0.0%	10,000	0.0%

Notes:

<sup>1</sup> Unless otherwise stated, ADT values were obtained from Caltrans 2010 Traffic Data.

<sup>2</sup> Project employees or by product trucks only

<sup>3</sup> Petcoke/Coal delivery to the Project Site by truck only. (Does not include employees or product trucks.)

<sup>4</sup> Calculated from 2012 peak hour counts assuming that PM peak hour equates to 10% of ADT.

ADT = average daily traffic

SR = State Route

**Table 5.2-12  
Project Construction and Operations Traffic Impact to San Joaquin Kit Fox**

Roadways	Length (miles)	San Joaquin kit fox Recovery Area	Type	Baseline take (fox/yr/mi)	Baseline annual take (fox/year)	Project vehicles (% increase)	Project Take (fox/yr)	Cumulative Take (fox/yr)
<b>Construction</b>								
I-5 (north)	14.00	Antelope Plain/ Semitropic/Kern	Satellite	0.01 <sup>1</sup>	0.14	0.8	0.00	0.14
I-5 (south)	5.65	Western Kern County	Core	0.03 <sup>1</sup>	0.17	1.3	0.00	0.17
SR 119 (Taft)	13.22	Western Kern County	Core	0.02 <sup>1</sup>	0.26	200.8	0.52	0.78
Stockdale Highway	5.09	Urban Bakersfield	Satellite	0.20 <sup>1</sup>	1.02	1.1	0.01	1.03
Tupman Road	5.41	Western Kern County	Core	0.14 <sup>2</sup>	0.76	34.2	0.26	1.02
<b>Subtotal</b>				0.40	2.35		<b>0.80</b>	3.15
<b>Construction-related take over 3 years</b>							2.39	
<b>Operations Alternate 1</b>								
I-5 (north)	14.00	Antelope Plain/ Semitropic/Kern	Satellite	0.01 <sup>1</sup>	0.14	0.7	0.00	0.14
I-5 (south)	5.65	Western Kern County	Core	0.03 <sup>1</sup>	0.17	0.8	0.00	0.17
SR 119 (Taft)	13.22	Western Kern County	Core	0.02 <sup>1</sup>	0.26	0.1	0.00	0.26
Stockdale Highway	5.09	Urban Bakersfield	Satellite	0.20 <sup>1</sup>	1.02	24.3	0.25	1.27
Tupman Road	5.41	Western Kern County	Core	0.14 <sup>2</sup>	0.76	25.3	0.19	0.95
<b>Subtotal</b>	0.44			0.40	2.35		<b>0.44</b>	2.79
<b>Operations-related take over 20 years</b>							8.85	
<b>Operations Alternate 2</b>								
I-5 (north)	14.00	Antelope Plain/ Semitropic/Kern	Satellite	0.01 <sup>1</sup>	0.14	1.2	0.00	0.14

**Table 5.2-12  
Project Construction and Operations Traffic Impact to San Joaquin Kit Fox**

<b>Roadways</b>	<b>Length (miles)</b>	<b>San Joaquin kit fox Recovery Area</b>	<b>Type</b>	<b>Baseline take (fox/yr/mi)</b>	<b>Baseline annual take (fox/year)</b>	<b>Project vehicles (% increase)</b>	<b>Project Take (fox/yr)</b>	<b>Cumulative Take (fox/yr)</b>
I-5 (south)	5.65	Western Kern County	Core	0.03 <sup>1</sup>	0.17	1.4	0.00	0.17
SR 119 (Taft)	13.22	Western Kern County	Core	0.02 <sup>1</sup>	0.26	0.1	0.00	0.26
Stockdale Highway	5.09	Urban Bakersfield	Satellite	0.20 <sup>1</sup>	1.02	39.0	0.40	1.42
Tupman Road	5.41	Western Kern County	Core	0.14 <sup>2</sup>	0.76	25.3	0.19	0.95
<b>Subtotal</b>				0.40	2.35		<b>0.59</b>	2.94
<b>Operations-related take over 20 years</b>							<b>11.89</b>	
<b>Product Delivery Alternate 1</b>								
I-5 (north)	14	Antelope Plain/ Semitropic/Kern	Satellite	0.01 <sup>1</sup>	0.14	0.5	0.00	0.14
I-5 (south)	5.65	Western Kern County	Core	0.03 <sup>1</sup>	0.17	0.6	0.00	0.17
SR 119 (Bakersfield)	4.28	Western Kern County	Core	0.07	0.3	0.2	0.00	0.30
Stockdale Highway	5.09	Urban Bakersfield	Satellite	0.2	1.02	13.1	0.13	1.15
<b>Subtotal</b>				0.42	1.63		0.14	1.77
<b>Petcoke-related take over 20 years</b>							<b>2.72</b>	
<b>Product Delivery Alternate 2</b>								
I-5 (north)	14	Antelope Plain/ Semitropic/Kern	Satellite	0.01 <sup>1</sup>	0.14	0.7	0.00	0.14
I-5 (south)	5.65	Western Kern County	Core	0.03 <sup>1</sup>	0.17	0.8	0.00	0.17
SR 119 (Bakersfield)	4.28	Western Kern County	Core	0.07	0.3	0.3	0.00	0.30

**Table 5.2-12  
Project Construction and Operations Traffic Impact to San Joaquin Kit Fox**

Roadways	Length (miles)	San Joaquin kit fox Recovery Area	Type	Baseline take (fox/yr/mi)	Baseline annual take (fox/year)	Project vehicles (% increase)	Project Take (fox/yr)	Cumulative Take (fox/yr)
Stockdale Highway	5.09	Urban Bakersfield	Satellite	0.2	1.02	71.5	0.73	1.75
<b>Subtotal</b>				0.42	1.63		<b>0.73</b>	<b>2.36</b>
<b>Petcoke-related take over 20 years</b>							<b>14.65</b>	
<b>Total Project-related take over 20 years</b>							<b>between 13.96 and 28.93</b>	

Notes:

- <sup>1</sup> Mortality calculated from data presented in: [esrp.csustan.edu/publications/pdf/esrp\\_urbanroad\\_sjkgf.pdf](http://esrp.csustan.edu/publications/pdf/esrp_urbanroad_sjkgf.pdf).
- <sup>2</sup> Mortality estimated based on road type described in: [esrp.csustan.edu/publications/pdf/esrp\\_urbanroad\\_sjkgf.pdf](http://esrp.csustan.edu/publications/pdf/esrp_urbanroad_sjkgf.pdf).
- <sup>3</sup> Baseline take for SR 46 was estimated based on home range size from <http://humboldt-dspace.calstate.edu/xmlui/bitstream/handle/2148/36/Frost.pdf?sequence=1> compared to “urban” kit fox. Link populations were assumed to be half of the Satellite population.

I-5 = Interstate 5  
SR = State Route

**Table 5.2-13  
Project Proposed Avoidance and Mitigation Summary**

<b>Avoidance and Mitigation Measure</b>	<b>Name</b>	<b>Action</b>	<b>Timing</b>	<b>Documentation</b>
BIO-1	Rare Plant Pre-Construction Survey	Rare plant survey(s) will be conducted within the construction limits and adjacent areas within 200 feet of the construction limits.	Early spring and through the course of the year	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-2	Rare Plant Avoidance	Rare plants will be avoided, to the greatest extent feasible.	not applicable	not applicable
BIO-3	Rare Plant Mitigation	For impacts to plant species that cannot be avoided, an appropriate area will be reseeded.	Seeds will be collected according to species; area will be monitored for 5 years	Annually through BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-4	Terrestrial Wildlife Pre-Construction Survey	Wildlife survey(s) will be conducted within the construction limits and adjacent areas within 200 feet of the construction limits.	Prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-5	Site Clearance Prior to Ground Disturbance	Prior to initial site preparation, the entire site will be passively cleared of blunt-nosed leopard lizard.	March through April (dependent on weather), prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-6	Predatory Bird Minimization Measures	Minimize the number and advantages birds will have near the Project Site and along the transmission line	Ongoing from the onset of construction	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-7	Worker Education Program	Worker education program will be implemented for all construction personnel, regular drivers, and operation personnel	Ongoing from the onset of construction	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)

## 5.2 Biological Resources

**Table 5.2-13  
Project Proposed Avoidance and Mitigation Summary**

Avoidance and Mitigation Measure	Name	Action	Timing	Documentation
BIO-8	Operations and Maintenance Activities	Training for operation and maintenance personnel	Ongoing from the onset of construction	
BIO-9	Bird Pre-Construction Surveys	Avian survey(s) will be conducted within the construction limits and adjacent areas within 200 feet of the construction limits. If listed species are detected, additional surveys will be conducted	Prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-10	Bird Nesting Activity Surveys	Areas that will be attractive nest sites should be made “less appealing” and be regularly examined by a biologist	During the height of the breeding season, all work areas, laydown sites, and equipment should be checked three times a week	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-11	Bird Nest Protection	If eggs or young are in the nest, the nest will be protected	Once the young have fledged or the nest has failed, as determined by an approved biologist, the nest will be removed and normal activities will resume	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-12	Burrowing Owl Pre-Construction Surveys	The construction areas and adjacent areas within 500 feet of the work sites will be surveyed by an approved biologist for burrows that could be used by burrowing owl.	Prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-13	Swainson’s Hawk Avoidance and Minimization	To the greatest extent feasible, major ground disturbance would be scheduled to occur between August 1 and December 31.	Surveys and/or avoidance may be required between January 1 through August 1	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)

**Table 5.2-13  
Project Proposed Avoidance and Mitigation Summary**

<b>Avoidance and Mitigation Measure</b>	<b>Name</b>	<b>Action</b>	<b>Timing</b>	<b>Documentation</b>
BIO-14	San Joaquin Kit Fox Mitigation	Dens will be examined and if vacant, excavated and collapsed.	Prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-15	Small Mammal Mitigation	During the initial site preparation of the Project Site (BIO-6), the entire area will need to be cleared.	March to April, prior to ground disturbance	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-16	Ground Disturbance Monitoring for Terrestrial Wildlife	Approved biologists will be present when the top 18 inches of soil are initially disturbed at the Project Site and along linears.	During ground disturbance of the top 18 inches	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-17	Reporting to Agencies	A monthly BRMIMP report will be submitted to the CEC, CDFG, and USFWS.	Monthly from the onset of construction activities.	BIO-17: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)
BIO-18	Sensitive Habitat Mitigation	Permanent loss of habitat will be replaced at a ratio established with USFWS and CDFG.	Prior to ground disturbance.	Legal agreement in place prior to ground disturbance.
BIO-19	Wetland Protection Measures	Work within 100 feet of waters of the U.S. and/or water of the State will incorporate Best Management Practices for ensuring against fill and/or degradation of waters.	Concurrent with construction adjacent to wetland and/or water features	BIO-20: Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP)

**Table 5.2-14**  
**BIO-22 Survey Periods and Frequencies**

<b>Survey Period</b>	<b>Survey Time</b>	<b>Survey Frequency</b>	<b>Proposed Action</b>
January 1 to March 1	All day	Weekly	Identify old nests and potential competitors.
March 1 to Mar. 20	All day	Twice weekly	Assess hawk activity and territoriality.
March 20 to April 5	Sunrise to 10:00 16:00 to sunset	Twice weekly	Determine potential nesting territories and nest structures.
April 5 to April 20	Sunrise to 12:00 16:30 to sunset	Thrice weekly	Confirm pairs and nest structures.
April 20 to June 10	All day	Weekly	Tracking known nest sites only.
June 10 to July 30	Sunrise to 12:00 16:00 to sunset	Twice weekly	Confirm fledging and nesting success.
July 31 to December 31	n/a	None	Preferred construction window.

**Table 5.2-15  
Summary of LORS – Biological Resources**

LORS	Administering Agency	Applicability	AFC Section
<b>Federal</b>			
Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 <i>et seq.</i> (16 USC 1531 <i>et seq.</i> ), Title 50 Code of Federal Regulations (CFR) §17.1 <i>et seq.</i> (50 CFR 17.1 <i>et seq.</i> )	U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service	Designates and protects federally threatened and endangered plant and animals and their critical habitat.	5.2.1.4, 5.2.2.3, and 5.2.2.4
Fish and Wildlife Coordinating Act, 16 USC 742 <i>et seq.</i> , 16 USC 1531 <i>et seq.</i> , and 50 CFR 17.	USFWS	The Fish and Wildlife Coordinating Act requires coordination with USFWS for federal actions that would result in the control or modification of a natural stream or body of water.	5.2.1.4 and 5.2.2.3
Section 10(a)(1)(A) of the FESA	USFWS	Requires a permit to “take” threatened or endangered species during lawful project activities. If there is no federal nexus for the project, a Habitat Conservation Plan (HCP) may be required.	5.2.1.4 and 5.2.2.3
Section 404 of the Clean Water Act of 1977 (33 USC 1251 <i>et seq.</i> , 33 CFR §§ 320 and 323)	U.S. Army Corps of Engineers (USACE)	Gives USACE authority to regulate discharge of dredge or fill material into Waters of the U.S., including wetlands	5.2.1.3 and 5.2.2.1
Section 401 of the Clean Water Act of 1977	Regional Water Quality Control Board	Requires applicant to conduct water quality impact analysis for the project when using 404 permits and for discharge to waterways.	5.2.1.3, 5.2.2.1, and 5.2.2.2
Migratory Bird Treaty Act 16 USC §§703-711	USFWS	Prohibits the non-permitted “take” of native migratory birds, their nests, or eggs.	5.2.2.3 and 5.2.4
<b>State</b>			
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098	California Department of Fish and Game (CDFG)	Protects California’s endangered and threatened plant and animal species.	5.2.1.4 and 5.2.2.3
Title 14, California Code of Regulations (CCR) §§670.2 and 670.5	CDFG	Lists plant and animals of California declared to be threatened or endangered.	5.2.1.4 and 5.2.2.3

**Table 5.2-15  
Summary of LORS – Biological Resources**

<b>LORS</b>	<b>Administering Agency</b>	<b>Applicability</b>	<b>AFC Section</b>
Fish and Game Code Fully Protected Species §3511: Fully Protected Birds §4700: Fully Protected Mammals §5050: Fully Protected Reptiles and Amphibians §5515: Fully Protected Fishes	CDFG	Prohibits the taking of listed plants and animals that are Fully Protected in California.	5.2.1.4 and 5.2.2.3
Fish and Game Code, §1930 Significant Natural Areas	CDFG	Identifies and protects Significant Natural Areas of California.	5.2.1
Fish and Game Code, §1580, Designated Ecological Reserves	CDFG	Identifies Designated Ecological Reserves of California.	5.2.1
Fish and Game Code, §1600, Streambed Alteration Agreement	CDFG	Reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	5.2.1.3, 5.2.2.1, and 5.2.2.2
Native Plant Protection Act of 1977, Fish and Game Code, §1900 <i>et seq.</i>	CDFG	Designates state rare and endangered plants and provides specific protection measures for identified populations.	5.2.1.4, 5.2.2.3, and 5.2.4
CDFG Policies and Guidelines, Wetlands Resources Policy	CDFG	Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools	5.2.1.3, 5.2.2.1, and 5.2.2.2
Public Resources Code, §§25500 & 25527	CDFG, USFWS	Prohibits siting of facilities in certain areas of critical concern for biological resource, such as ecological preserves, refuges, etc.	5.2.1.1, 5.2.1.2, 5.2.1.4, and 5.2.2.3
Title 20 CCR §§1702 (q) and (v)	CDFG, USFWS	Protects “areas of critical concern” and “species of special concern” identified by local, state, or federal resource agencies within the project area, including the California Native Plant Society.	5.2.1.4 and 5.2.2.3
Title 14 CCR Section 15000 <i>et seq.</i>	CDFG, USFWS	Describes the types and extent of information required to evaluate the effects of a proposed project on the biological resources of a project site.	5.2

**Table 5.2-15  
Summary of LORS – Biological Resources**

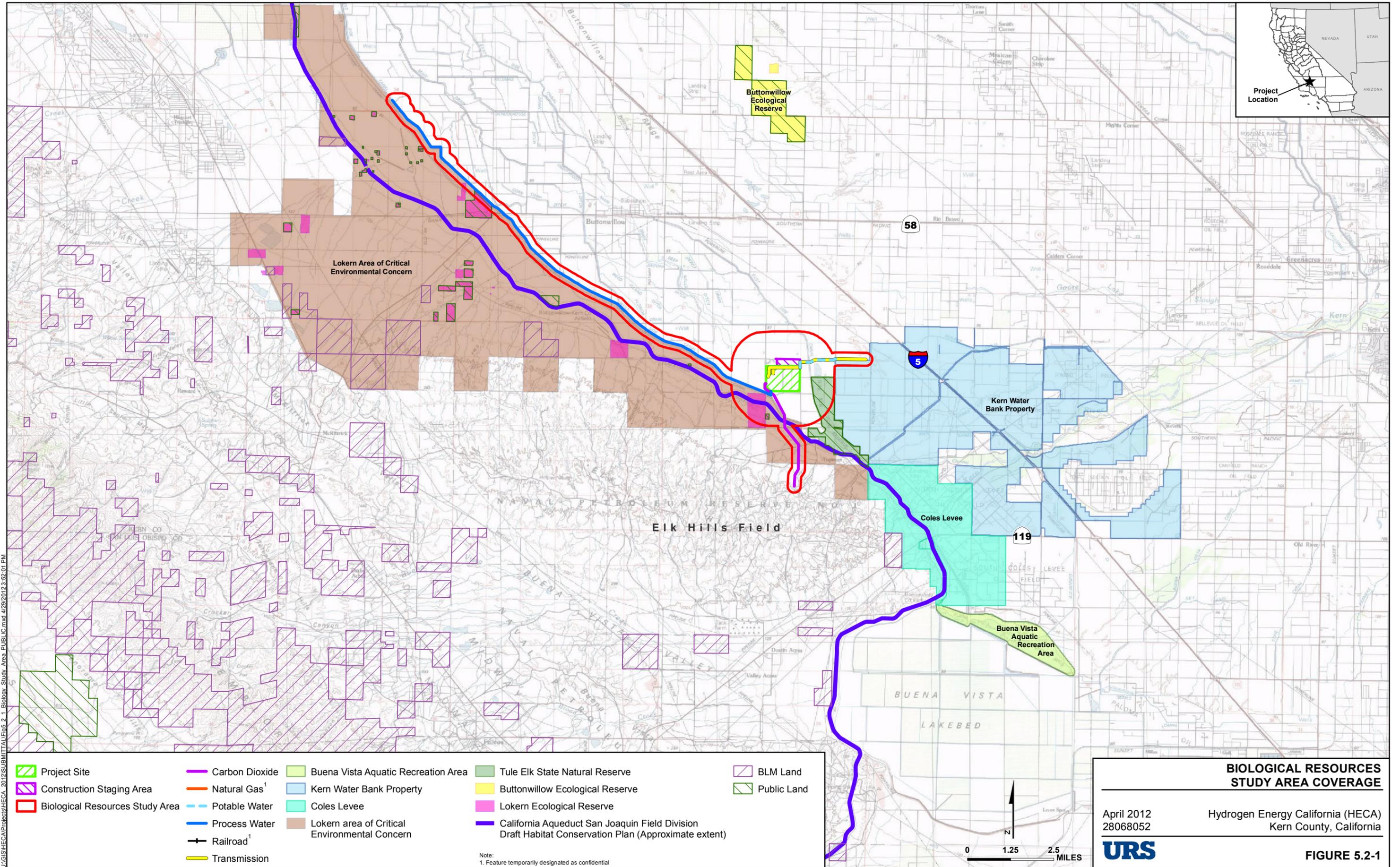
<b>LORS</b>	<b>Administering Agency</b>	<b>Applicability</b>	<b>AFC Section</b>
California Desert Native Plant Act, Food and Agriculture Code §80001 through §80006	California Agricultural Commission	Protects California desert native plants from unlawful harvesting on both privately and public owned lands.	5.2.1.4 and 5.2.2.3
<b>Local</b>			
Kern County General Plan	Kern County	Provides guidance on the types of development activity and allowable uses for those areas within the county limits.	5.2.1 and 5.2.2

**Table 5.2-16  
Agency Contacts**

<b>Issue</b>	<b>Agency</b>	<b>Contact/Title</b>	<b>Telephone</b>	<b>E-mail</b>
Initial Section 7 Consultation/ Survey protocols	U.S. Fish and Wildlife Service	Bill Pelle and Thomas Leeman, San Joaquin Valley Branch	(916) 414-6600	William_Pelle@fws.gov Thomas_Leeman@fws.gov
Occidental of Elk Hills HCP/ Survey protocols	California Department of Fish and Game	Annee Ferranti and Julie Vance, Central Region	(559) 243-4014 x 227 (Ferranti) x 222 (Vance)	AFERRANTI@dfg.ca.gov JVANCE@dfg.ca.gov
Survey protocols	California Energy Commission	Rick York	(916) 654-3945	ryork@energy.state.ca.us

**Table 5.2-17**  
**Biological Permits Required and Scheduled Timing**

<b>Responsible Agency</b>	<b>Permit/Approval</b>	<b>Schedule</b>
U.S. Fish and Wildlife Service	Section 7 biological opinion for incidental take of federally listed species	Fall 2012
California Department of Fish and Game	2081 Incidental Take Permit	Fall 2012
California Department of Fish and Game	Streambed Alteration Agreement	Fall 2012 (if required)
Regional Water Quality Control Board	Section 401 Water Quality Certification	Fall 2012



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Sources: USGS (30'x60' quads: Taft 1982, Delano 1982). Created using TOPOI, ©2006 National Geographic Maps, All Rights Reserved. HECA Project Team (Biological Data, 2009)

Note:  
1. Feature temporarily designated as confidential

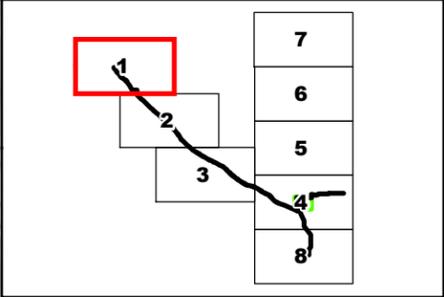
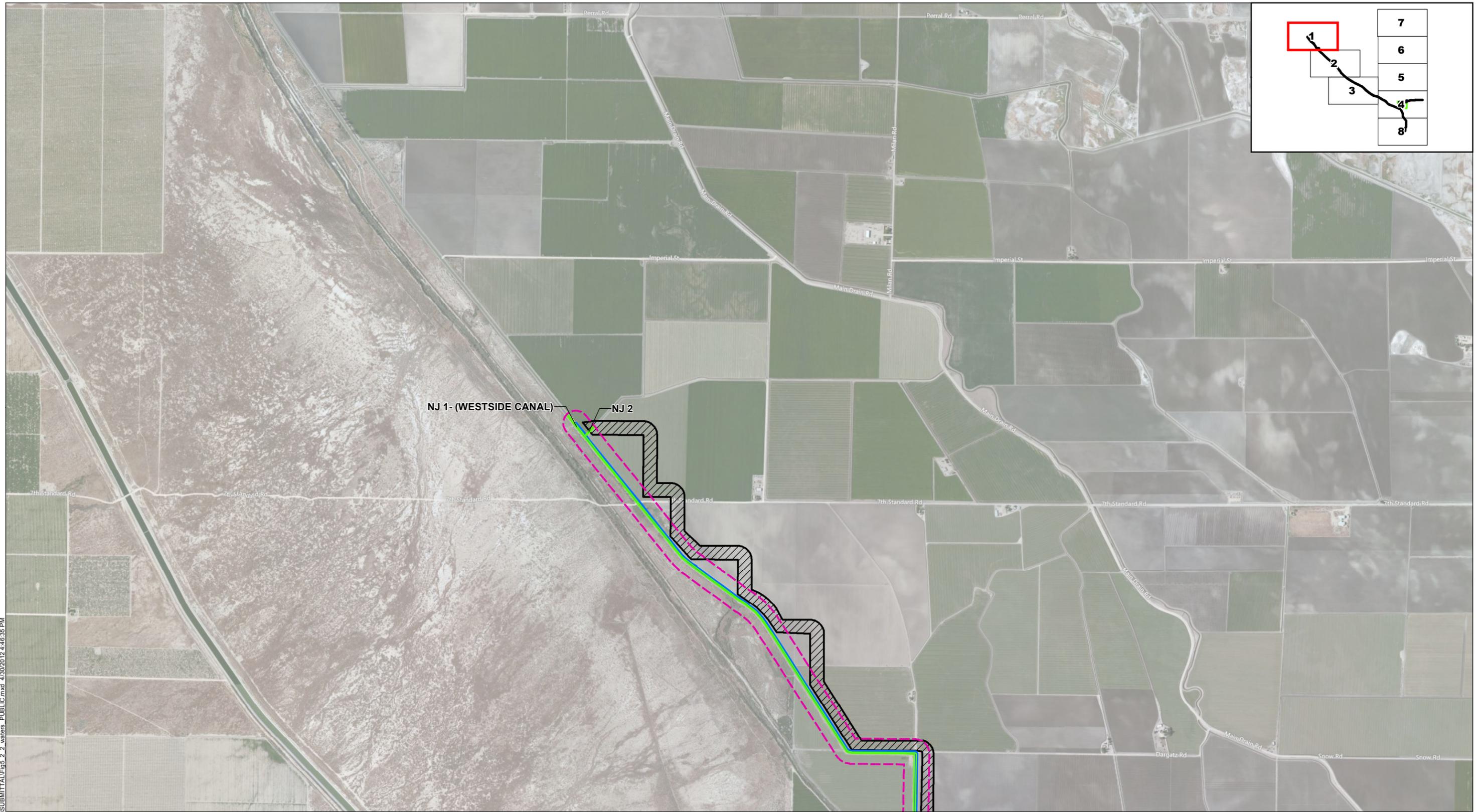
**BIOLOGICAL RESOURCES  
STUDY AREA COVERAGE**

April 2012  
28068052

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Kern County, California

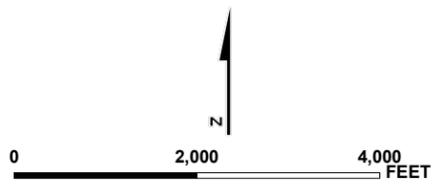
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**FIGURE 5.2-1**



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- |                                       |                          |  |
|---------------------------------------|--------------------------|--|
| Project Site                          | Carbon Dioxide           | <b>Waters</b>                              |
| Construction Staging Area             | Natural Gas <sup>1</sup> | Non-jurisdictional waters of the U.S. (NJ) |
| Controlled Area                       | Potable Water            | Other waters of the U.S. (WUS)             |
| BVWSD Well Field                      | Process Water            | Wetland (WL)                               |
| 250-foot Buffer from Disturbance Area | Railroad <sup>1</sup>    |  |
| HDD Entry/Exit Pits                   | Transmission             |  |
- Note:  
 1. Feature temporarily designated as confidential



**WATERS OF THE U.S.**

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 Kern County, California

**FIGURE 5.2-2 (1)**

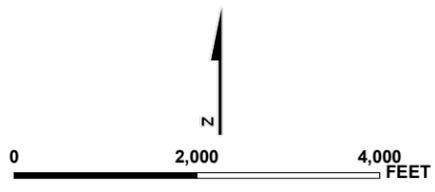
Source: Aerial Imagery, Bing Maps, 2009.



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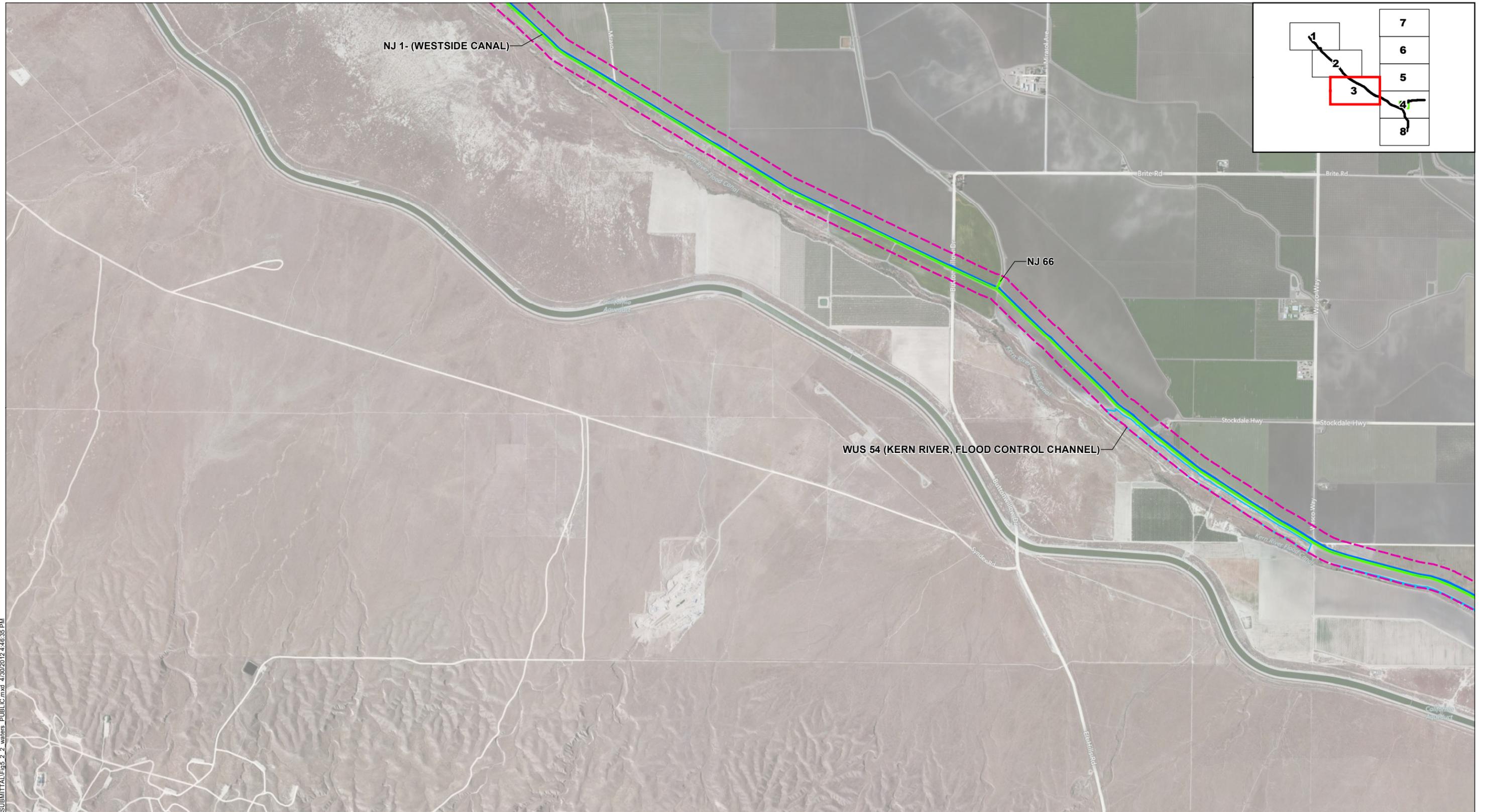
- |                                       |                          |  |
|---------------------------------------|--------------------------|--|
| Project Site                          | Carbon Dioxide           | <b>Waters</b>                              |
| Construction Staging Area             | Natural Gas <sup>1</sup> | Non-jurisdictional waters of the U.S. (NJ) |
| Controlled Area                       | Potable Water            | Other waters of the U.S. (WUS)             |
| BVWSD Well Field                      | Process Water            | Wetland (WL)                               |
| 250-foot Buffer from Disturbance Area | Railroad <sup>1</sup>    |  |
| HDD Entry/Exit Pits                   | Transmission             |  |

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 1. Feature temporarily designated as confidential



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 Kern County, California  
**FIGURE 5.2-2 (2)**

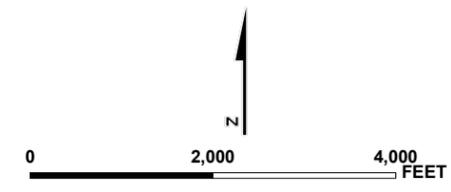
Source: Aerial Imagery, Bing Maps, 2009.



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Project Site	Carbon Dioxide	<b>Waters</b>
Construction Staging Area	Natural Gas <sup>1</sup>	Non-jurisdictional waters of the U.S. (NJ)
Controlled Area	Potable Water	Other waters of the U.S. (WUS)
BVWSD Well Field	Process Water	Wetland (WL)
250-foot Buffer from Disturbance Area	Railroad <sup>1</sup>	
HDD Entry/Exit Pits	Transmission	

Note:  
 1. Feature temporarily designated as confidential

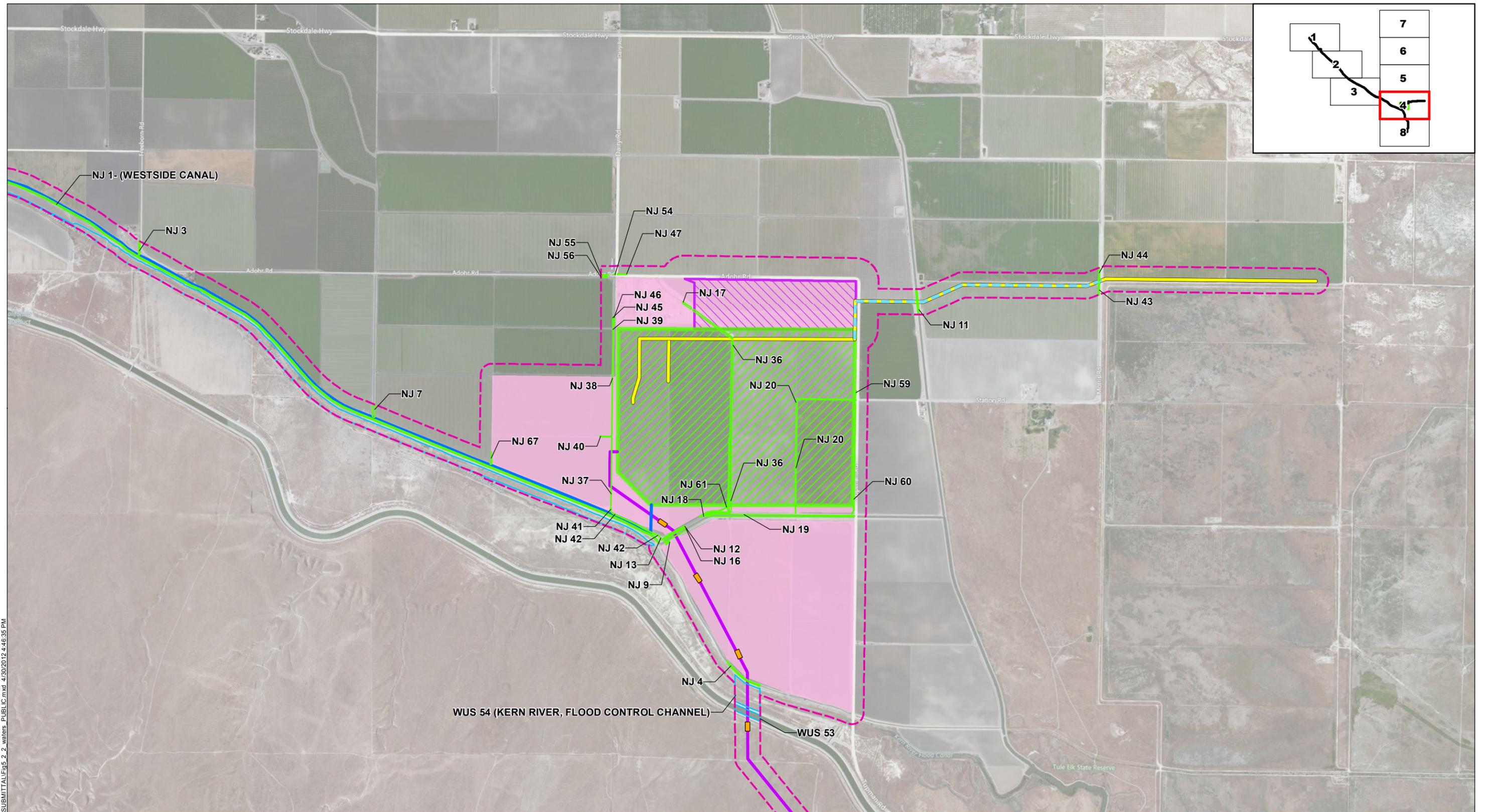


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April 2012  
 28068052

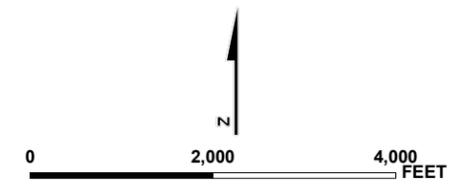
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 Kern County, California

**FIGURE 5.2-2 (3)**



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 Source: Aerial Imagery, Bing Maps, 2009.

- |  |                                       |  |                          |               |
|--|---------------------------------------|--|--------------------------|---------------|
|  | Project Site                          |  | Carbon Dioxide           | <b>Waters</b> |
|  | Construction Staging Area             |  | Natural Gas <sup>1</sup> |               |
|  | Controlled Area                       |  | Potable Water            |               |
|  | BVWSD Well Field                      |  | Process Water            |               |
|  | 250-foot Buffer from Disturbance Area |  | Railroad <sup>1</sup>    |               |
|  | HDD Entry/Exit Pits                   |  | Transmission             |               |
|  |                                       |  |                          |               |
|  |                                       |  |                          |               |
- Note:  
 1. Feature temporarily designated as confidential



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 28068052  

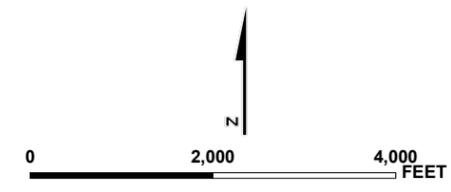
 Hydrogen Energy California (HECA)  
 Kern County, California

**FIGURE 5.2-2 (4)**



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- |                                       |                          |  |
|---------------------------------------|--------------------------|--|
| Project Site                          | Carbon Dioxide           | <b>Waters</b>                              |
| Construction Staging Area             | Natural Gas <sup>1</sup> | Non-jurisdictional waters of the U.S. (NJ) |
| Controlled Area                       | Potable Water            | Other waters of the U.S. (WUS)             |
| BVWSD Well Field                      | Process Water            | Wetland (WL)                               |
| 250-foot Buffer from Disturbance Area | Railroad <sup>1</sup>    |  |
| HDD Entry/Exit Pits                   | Transmission             |  |
- Note:  
1. Feature temporarily designated as confidential



**WATERS OF THE U.S.**

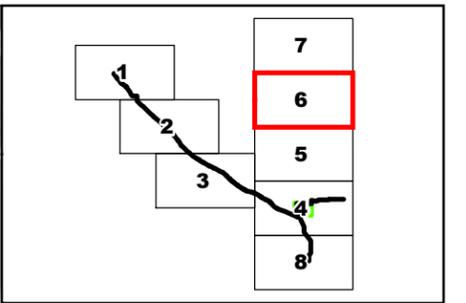
April 2012  
28068052

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Kern County, California

**URS**

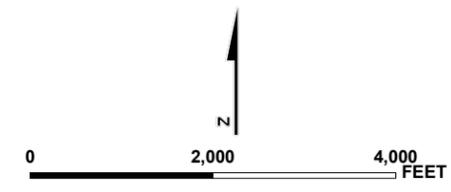
**FIGURE 5.2-2 (5)**

Source: Aerial Imagery, Bing Maps, 2009.



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- |                                       |                          |  |
|---------------------------------------|--------------------------|--|
| Project Site                          | Carbon Dioxide           | <b>Waters</b>                              |
| Construction Staging Area             | Natural Gas <sup>1</sup> | Non-jurisdictional waters of the U.S. (NJ) |
| Controlled Area                       | Potable Water            | Other waters of the U.S. (WUS)             |
| BVWSD Well Field                      | Process Water            | Wetland (WL)                               |
| 250-foot Buffer from Disturbance Area | Railroad <sup>1</sup>    |  |
| HDD Entry/Exit Pits                   | Transmission             |  |
- Note:  
 1. Feature temporarily designated as confidential



**WATERS OF THE U.S.**  
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Hydrogen Energy California (HECA)  
 Kern County, California  
**FIGURE 5.2-2 (6)**

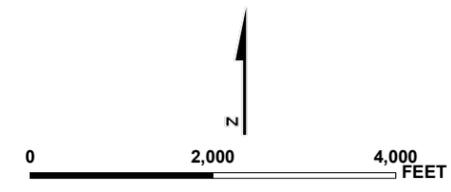
Source: Aerial Imagery, Bing Maps, 2009.



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Project Site	Carbon Dioxide	<b>Waters</b>
Construction Staging Area	Natural Gas <sup>1</sup>	Non-jurisdictional waters of the U.S. (NJ)
Controlled Area	Potable Water	Other waters of the U.S. (WUS)
BVWSD Well Field	Process Water	Wetland (WL)
250-foot Buffer from Disturbance Area	Railroad <sup>1</sup>	
HDD Entry/Exit Pits	Transmission	

Note:  
 1. Feature temporarily designated as confidential



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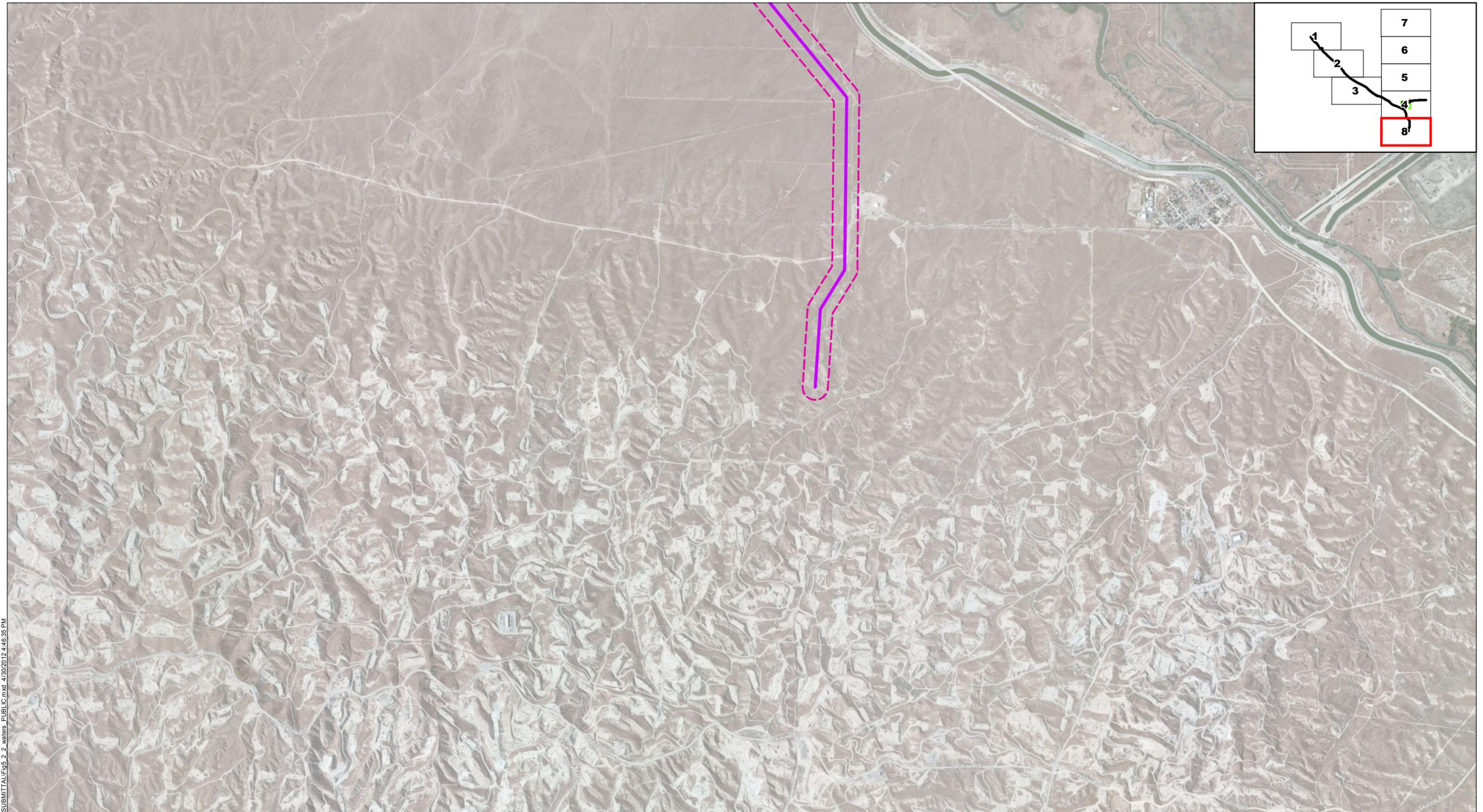
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 28068052

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 Kern County, California

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**FIGURE 5.2-2 (7)**

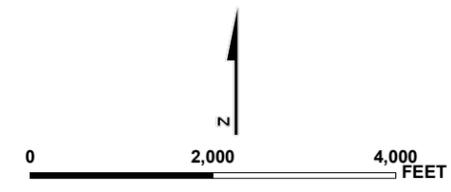
Source: Aerial Imagery, Bing Maps, 2009.



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Project Site	Carbon Dioxide	<b>Waters</b>
Construction Staging Area	Natural Gas <sup>1</sup>	Non-jurisdictional waters of the U.S. (NJ)
Controlled Area	Potable Water	Other waters of the U.S. (WUS)
BVWSD Well Field	Process Water	Wetland (WL)
250-foot Buffer from Disturbance Area	Railroad <sup>1</sup>	
HDD Entry/Exit Pits	Transmission	

Note:  
 1. Feature temporarily designated as confidential



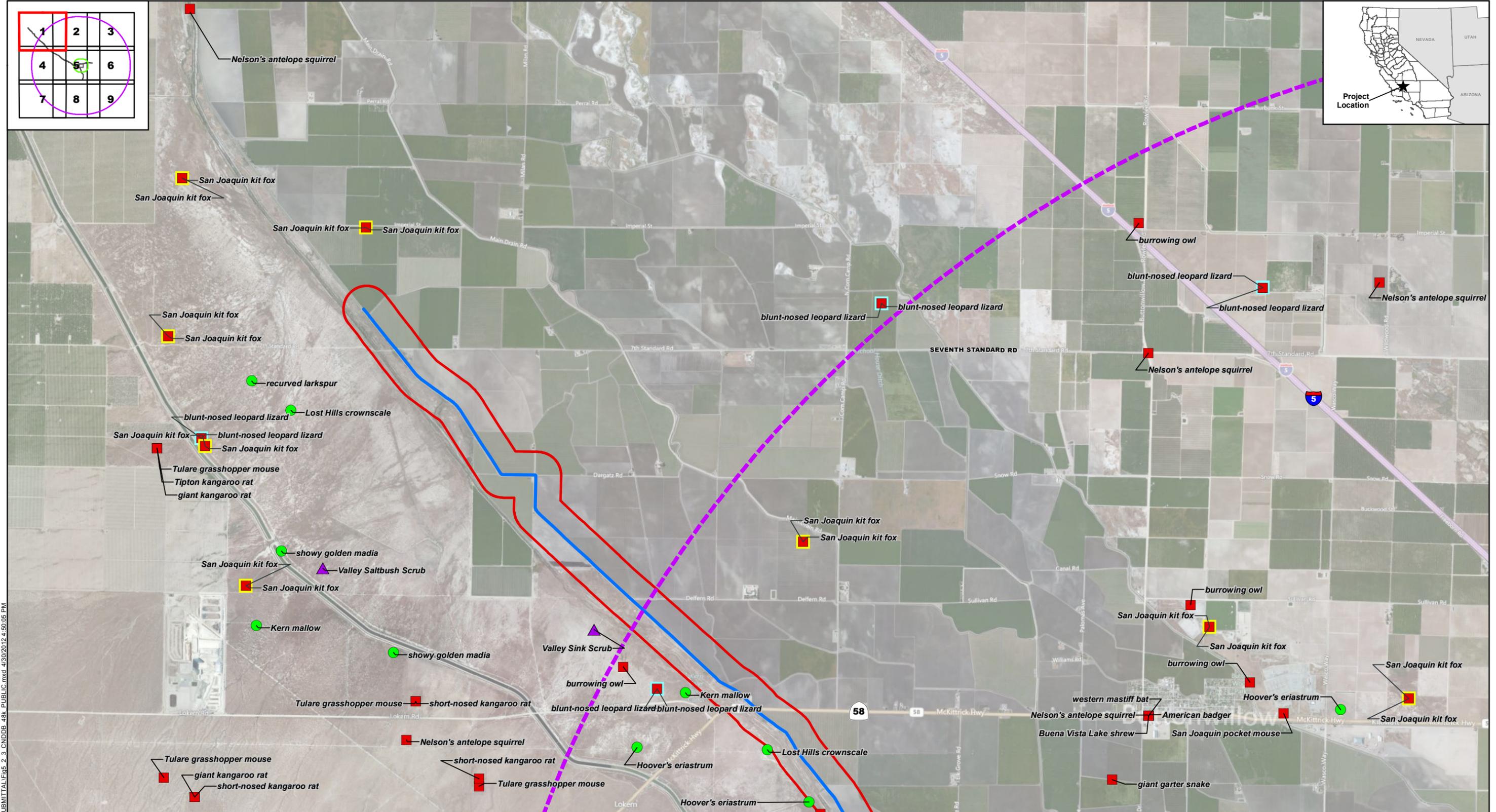
**WATERS OF THE U.S.**

April 2012  
 28068052

Hydrogen Energy California (HECA)  
 Kern County, California

**FIGURE 5.2-2 (8)**

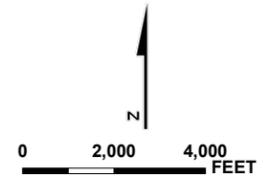
Source: Aerial Imagery, Bing Maps, 2009.



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	Project Site		Carbon Dioxide	<b>CNDDDB Species - March 2012</b>		All Other Plants	
	Construction Staging Area		Natural Gas <sup>1</sup>		blunt-nosed leopard lizard		All Other Animals
	1-Mile Radius from Project Site		Potable Water		San Joaquin kit fox		Terrestrial Communities
	10-Mile Radius from Project Site		Process Water		oil neststraw		
	1,000-Foot Radius from Project Site		Transmission				
	Railroad <sup>1</sup>						

Note: 1. Feature temporarily designated as confidential



**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

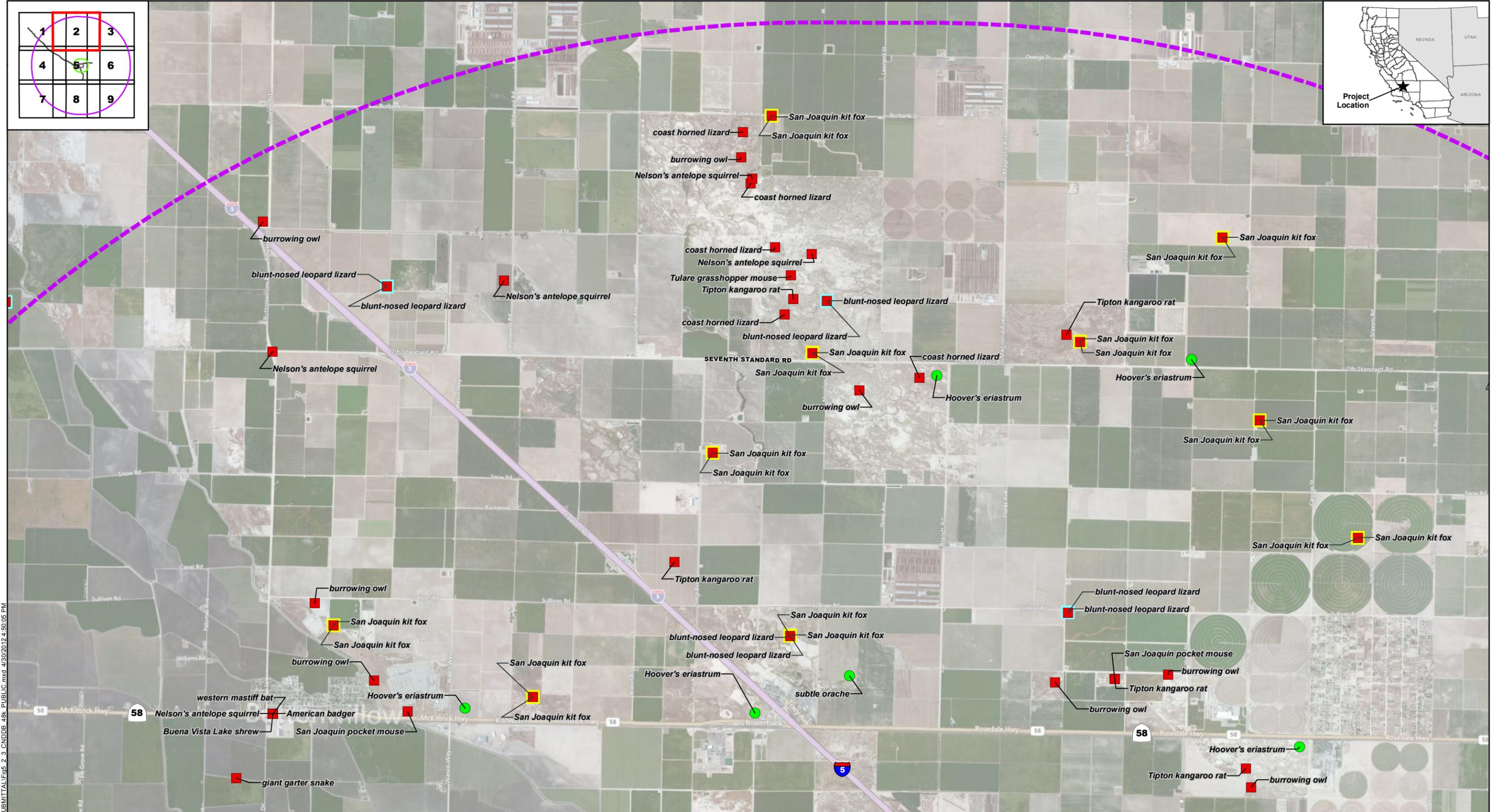
April 2012  
28068052

Hydrogen Energy California (HECA)  
Kern County, California



**FIGURE 5.2-3 - SHEET 1**

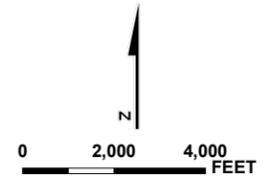
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |  |                                     |  |                          |                                    |                            |                  |                         |
|--|-------------------------------------|--|--------------------------|------------------------------------|----------------------------|------------------|-------------------------|
|  | Project Site                        |  | Carbon Dioxide           | <b>CNDDDB Species - March 2012</b> |                            | All Other Plants |                         |
|  | Construction Staging Area           |  | Natural Gas <sup>1</sup> |                                    | blunt-nosed leopard lizard |                  | All Other Animals       |
|  | 1-Mile Radius from Project Site     |  | Potable Water            |                                    | San Joaquin kit fox        |                  | Terrestrial Communities |
|  | 10-Mile Radius from Project Site    |  | Process Water            |                                    | oil neststraw              |                  |                         |
|  | 1,000-Foot Radius from Project Site |  | Transmission             |                                    |                            |                  |                         |
|  | Railroad <sup>1</sup>               |  |                          |                                    |                            |                  |                         |

Note: 1. Feature temporarily designated as confidential



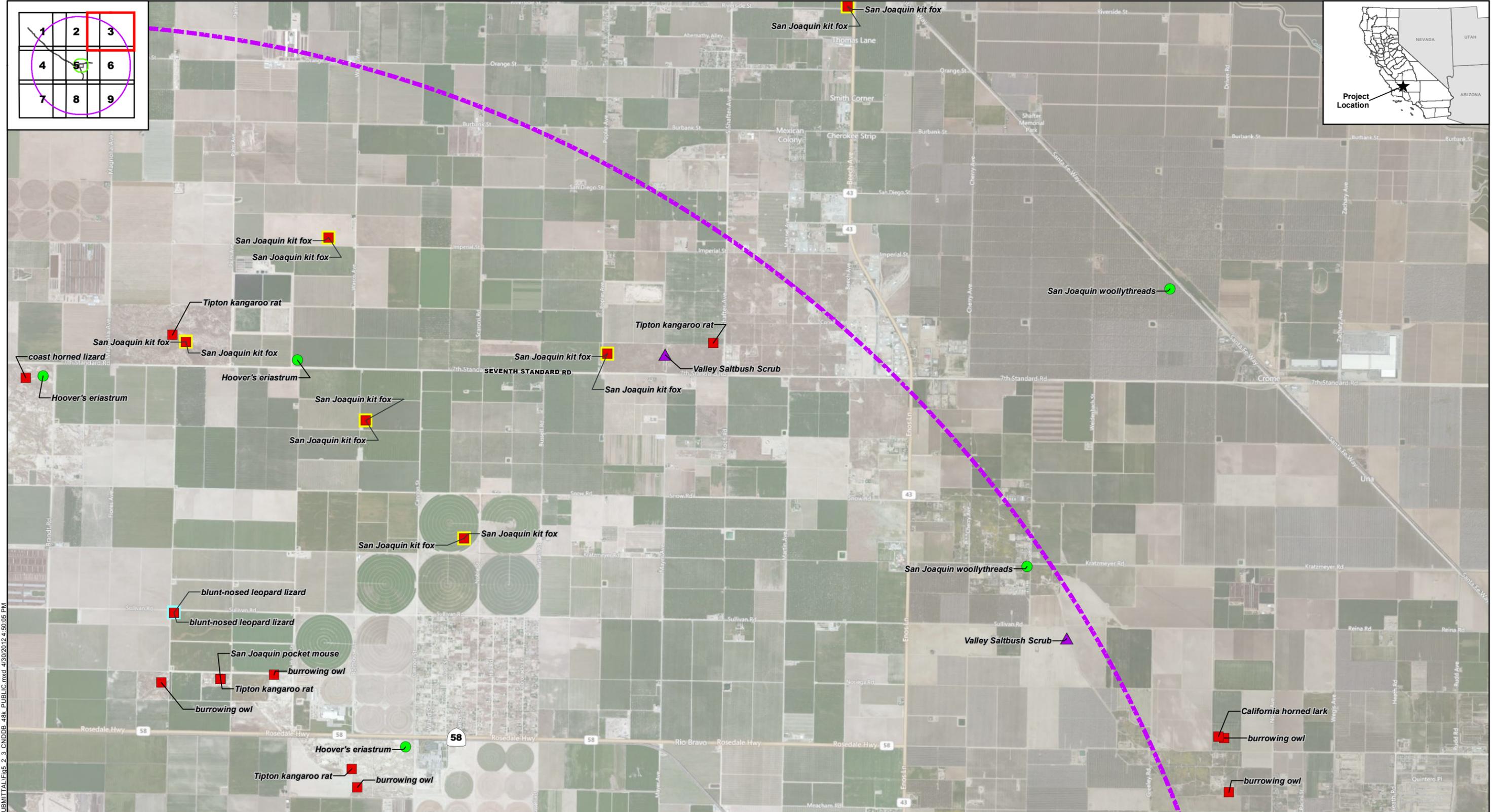
**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 2**

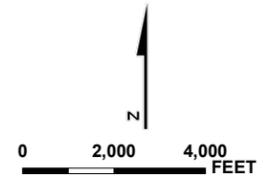
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |  |                                     |  |                          |                                   |                            |                  |                         |
|--|-------------------------------------|--|--------------------------|-----------------------------------|----------------------------|------------------|-------------------------|
|  | Project Site                        |  | Carbon Dioxide           | <b>CNDDB Species - March 2012</b> |                            | All Other Plants |                         |
|  | Construction Staging Area           |  | Natural Gas <sup>1</sup> |                                   | blunt-nosed leopard lizard |                  | All Other Animals       |
|  | 1-Mile Radius from Project Site     |  | Potable Water            |                                   | San Joaquin kit fox        |                  | Terrestrial Communities |
|  | 10-Mile Radius from Project Site    |  | Process Water            |                                   | oil neststraw              |                  |                         |
|  | 1,000-Foot Radius from Project Site |  | Transmission             |                                   |                            |                  |                         |
|  |                                     |  | Railroad <sup>1</sup>    |                                   |                            |                  |                         |

Note: 1. Feature temporarily designated as confidential



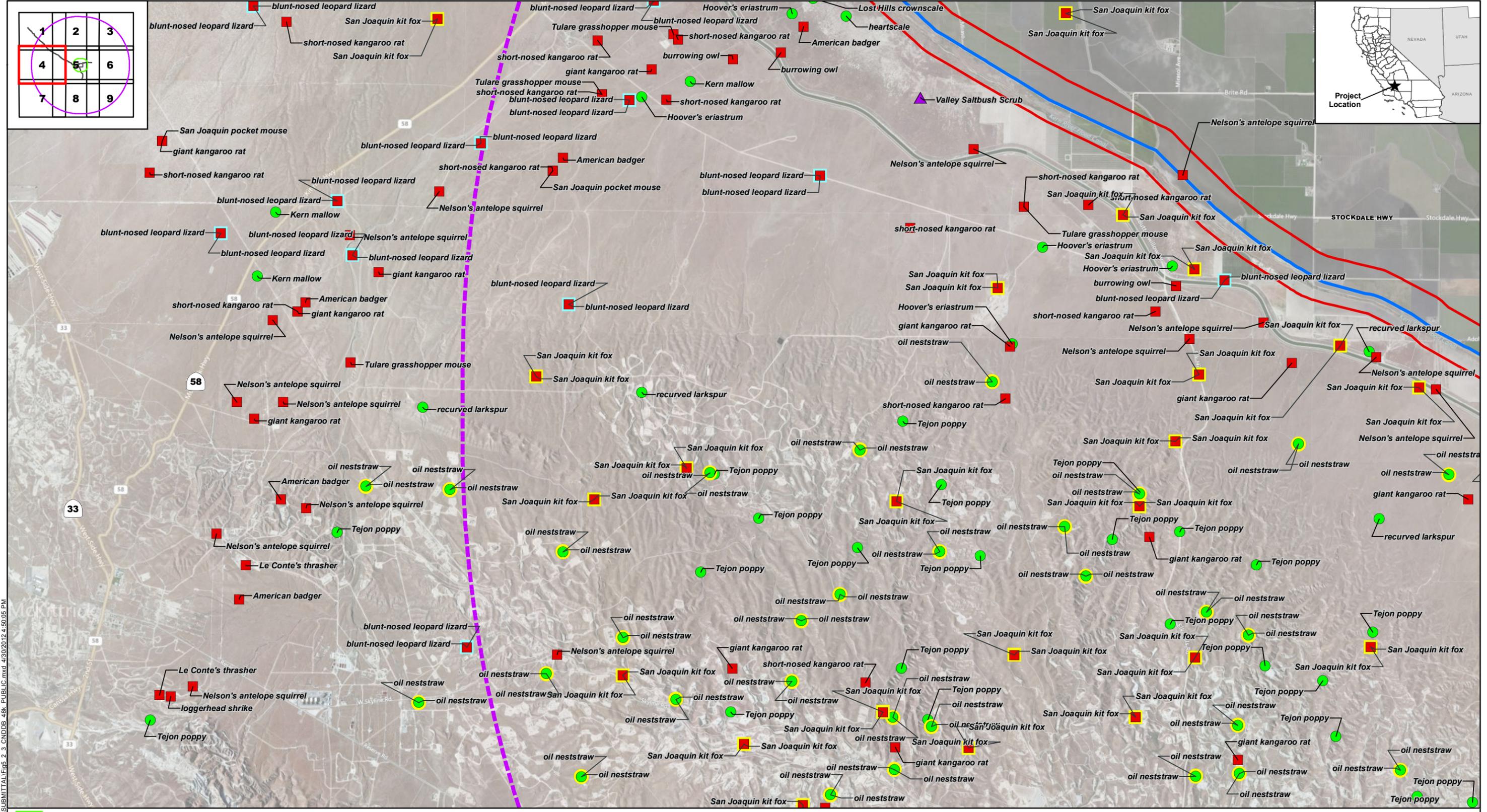
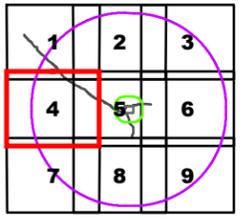
**CNDDB SENSITIVE SPECIES 1:48,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 3**

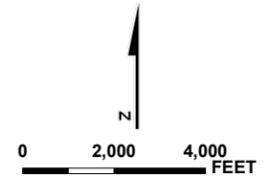
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |  |                                     |  |                          |                                    |                            |                  |                         |
|--|-------------------------------------|--|--------------------------|------------------------------------|----------------------------|------------------|-------------------------|
|  | Project Site                        |  | Carbon Dioxide           | <b>CNDDDB Species - March 2012</b> |                            | All Other Plants |                         |
|  | Construction Staging Area           |  | Natural Gas <sup>1</sup> |                                    | blunt-nosed leopard lizard |                  | All Other Animals       |
|  | 1-Mile Radius from Project Site     |  | Potable Water            |                                    | San Joaquin kit fox        |                  | Terrestrial Communities |
|  | 10-Mile Radius from Project Site    |  | Process Water            |                                    | oil neststraw              |                  |                         |
|  | 1,000-Foot Radius from Project Site |  | Transmission             |                                    |                            |                  |                         |
|  | Railroad <sup>1</sup>               |  |                          |                                    |                            |                  |                         |

Note: 1. Feature temporarily designated as confidential



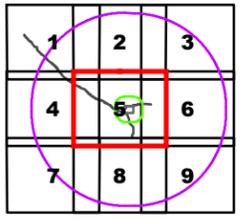
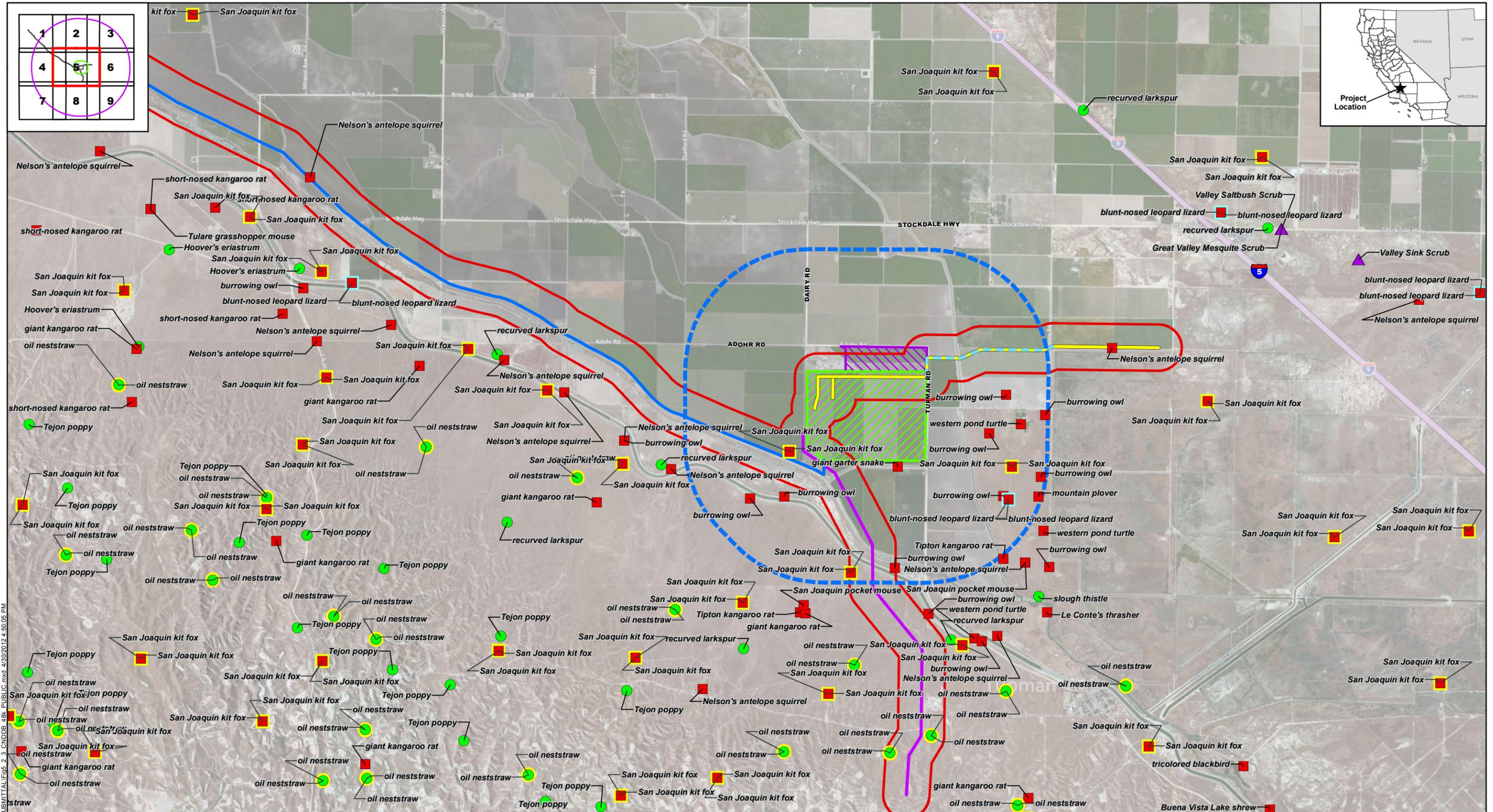
**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 4**

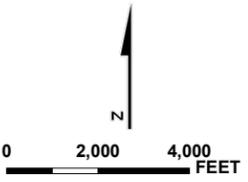
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |  |                                     |  |                            |
|--|-------------------------------------|--|----------------------------|
|  | Project Site                        |  | All Other Plants           |
|  | Construction Staging Area           |  | blunt-nosed leopard lizard |
|  | 1-Mile Radius from Project Site     |  | San Joaquin kit fox        |
|  | 10-Mile Radius from Project Site    |  | oil neststraw              |
|  | 1,000-Foot Radius from Project Site |  | All Other Animals          |
|  | Natural Gas <sup>1</sup>            |  | Terrestrial Communities    |
|  | Potable Water                       |  |                            |
|  | Process Water                       |  |                            |
|  | Transmission                        |  |                            |
|  | Railroad <sup>1</sup>               |  |                            |

Note: 1. Feature temporarily designated as confidential



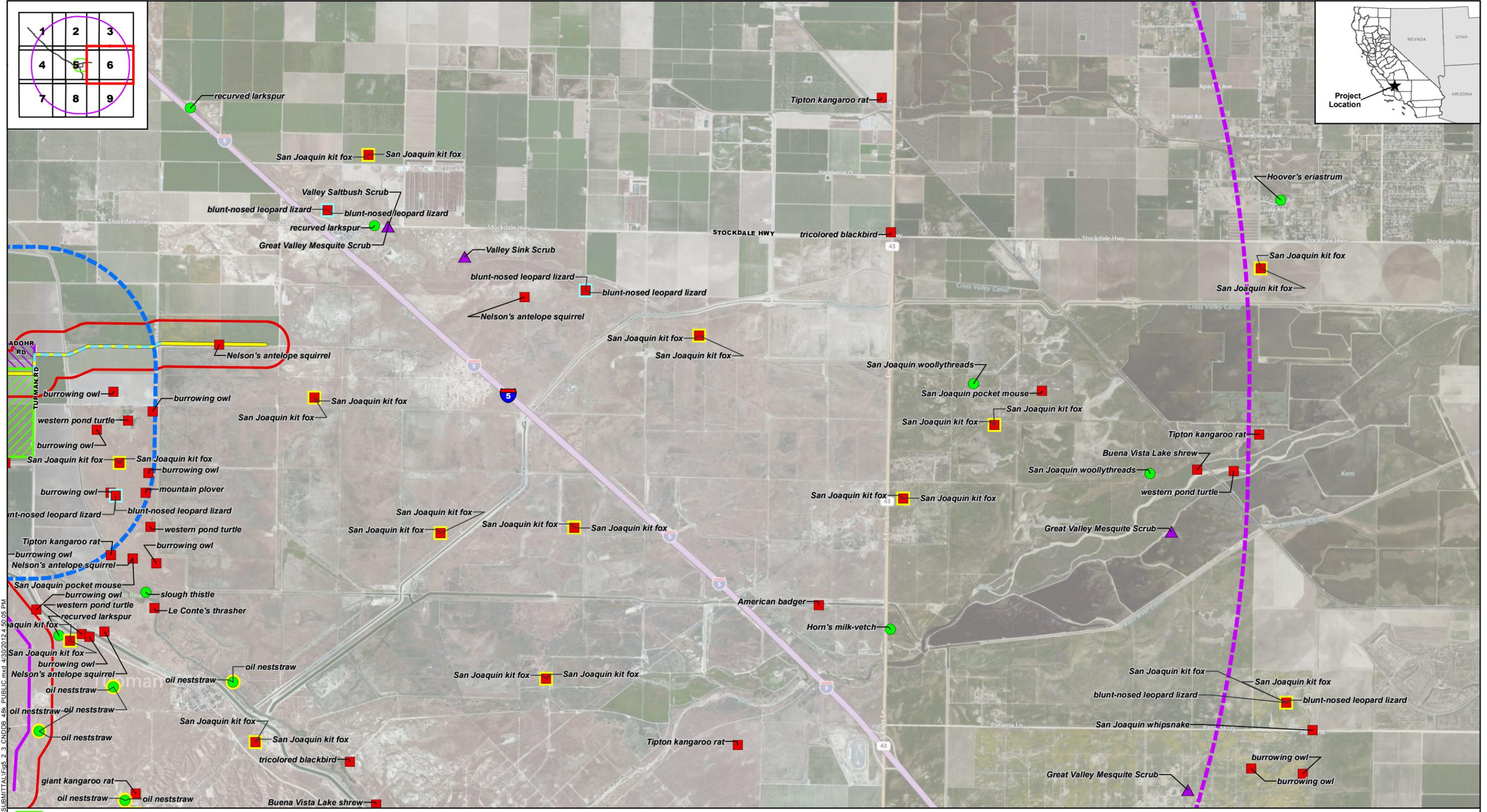
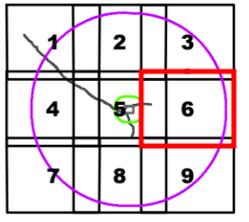
**CNDDB SENSITIVE SPECIES 1:48,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 5**

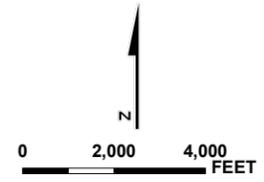
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |                                     |                          |                                    |                         |
|-------------------------------------|--------------------------|------------------------------------|-------------------------|
| Project Site                        | Carbon Dioxide           | <b>CNDDDB Species - March 2012</b> | All Other Plants        |
| Construction Staging Area           | Natural Gas <sup>1</sup> | blunt-nosed leopard lizard         | All Other Animals       |
| 1-Mile Radius from Project Site     | Potable Water            | San Joaquin kit fox                | Terrestrial Communities |
| 10-Mile Radius from Project Site    | Process Water            | oil neststraw                      |                         |
| 1,000-Foot Radius from Project Site | Transmission             |                                    |                         |
|                                     | Railroad <sup>1</sup>    |                                    |                         |

Note: 1. Feature temporarily designated as confidential



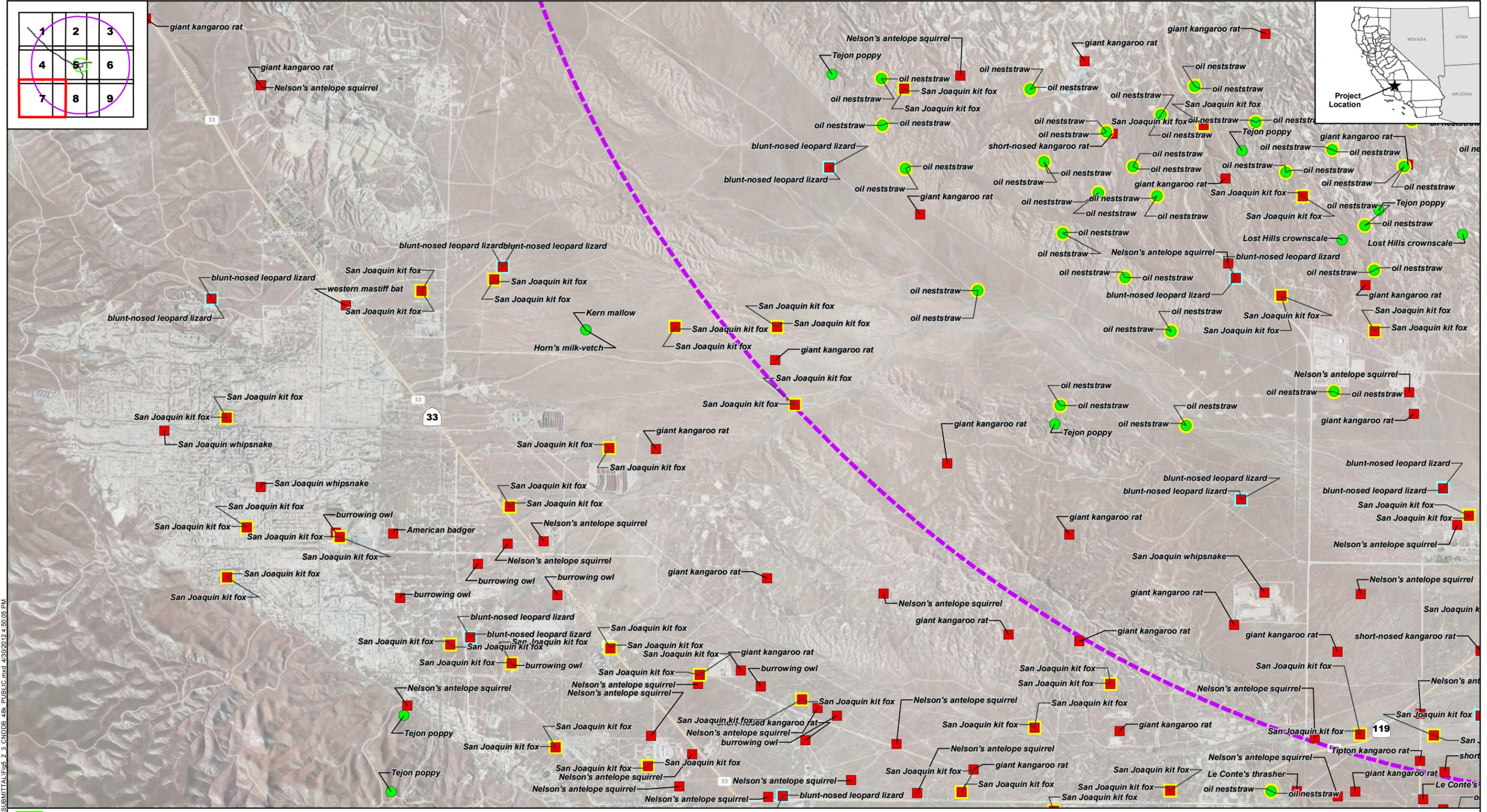
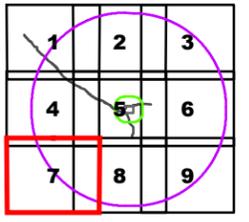
**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 6**

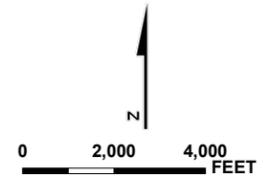
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



- Project Site
- Construction Staging Area
- 1-Mile Radius from Project Site
- 10-Mile Radius from Project Site
- 1,000-Foot Radius from Project Site
- Railroad<sup>1</sup>
- Carbon Dioxide
- Natural Gas<sup>1</sup>
- Potable Water
- Process Water
- Transmission

- CNDDDB Species - March 2012
- All Other Plants
  - blunt-nosed leopard lizard
  - San Joaquin kit fox
  - oil neststraw
  - All Other Animals
  - Terrestrial Communities

Note: 1. Feature temporarily designated as confidential



**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

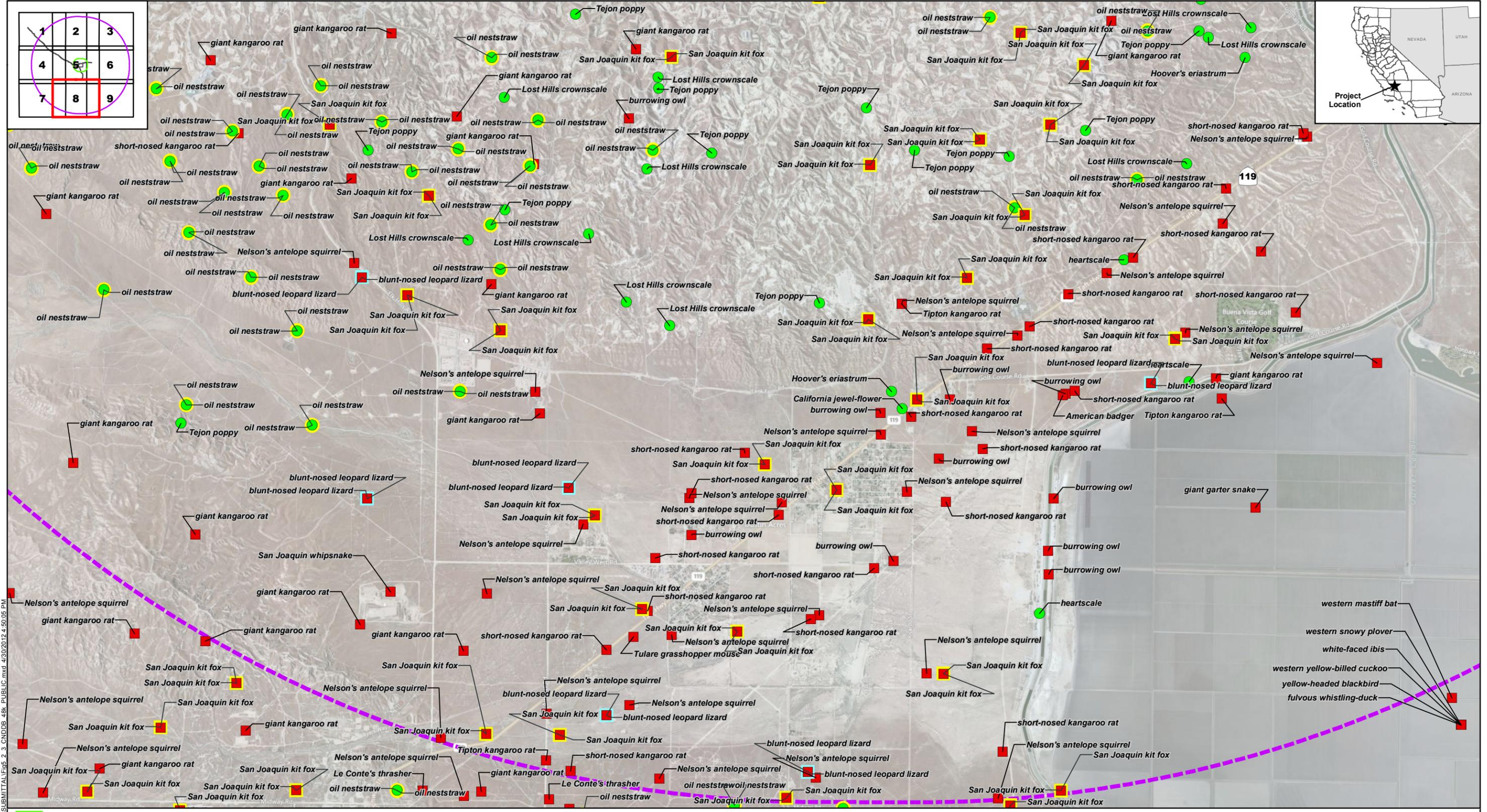
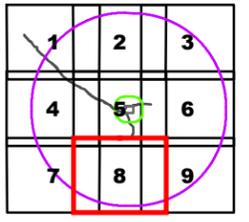
April 2012  
28068052

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Kern County, California

**FIGURE 5.2-3 - SHEET 7**

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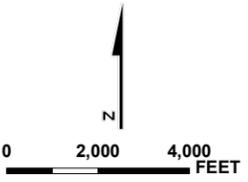
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |  |                                     |  |                          |  |                             |  |                         |
|--|-------------------------------------|--|--------------------------|--|-----------------------------|--|-------------------------|
|  | Project Site                        |  | Carbon Dioxide           |  | CNDDDB Species - March 2012 |  | All Other Plants        |
|  | Construction Staging Area           |  | Natural Gas <sup>1</sup> |  | blunt-nosed leopard lizard  |  | All Other Animals       |
|  | 1-Mile Radius from Project Site     |  | Potable Water            |  | San Joaquin kit fox         |  | Terrestrial Communities |
|  | 10-Mile Radius from Project Site    |  | Process Water            |  | oil neststraw               |  |                         |
|  | 1,000-Foot Radius from Project Site |  | Transmission             |  |                             |  |                         |
|  | Railroad <sup>1</sup>               |  |                          |  |                             |  |                         |

Note: 1. Feature temporarily designated as confidential



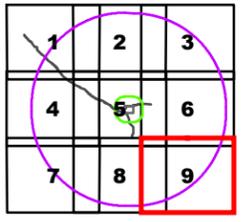
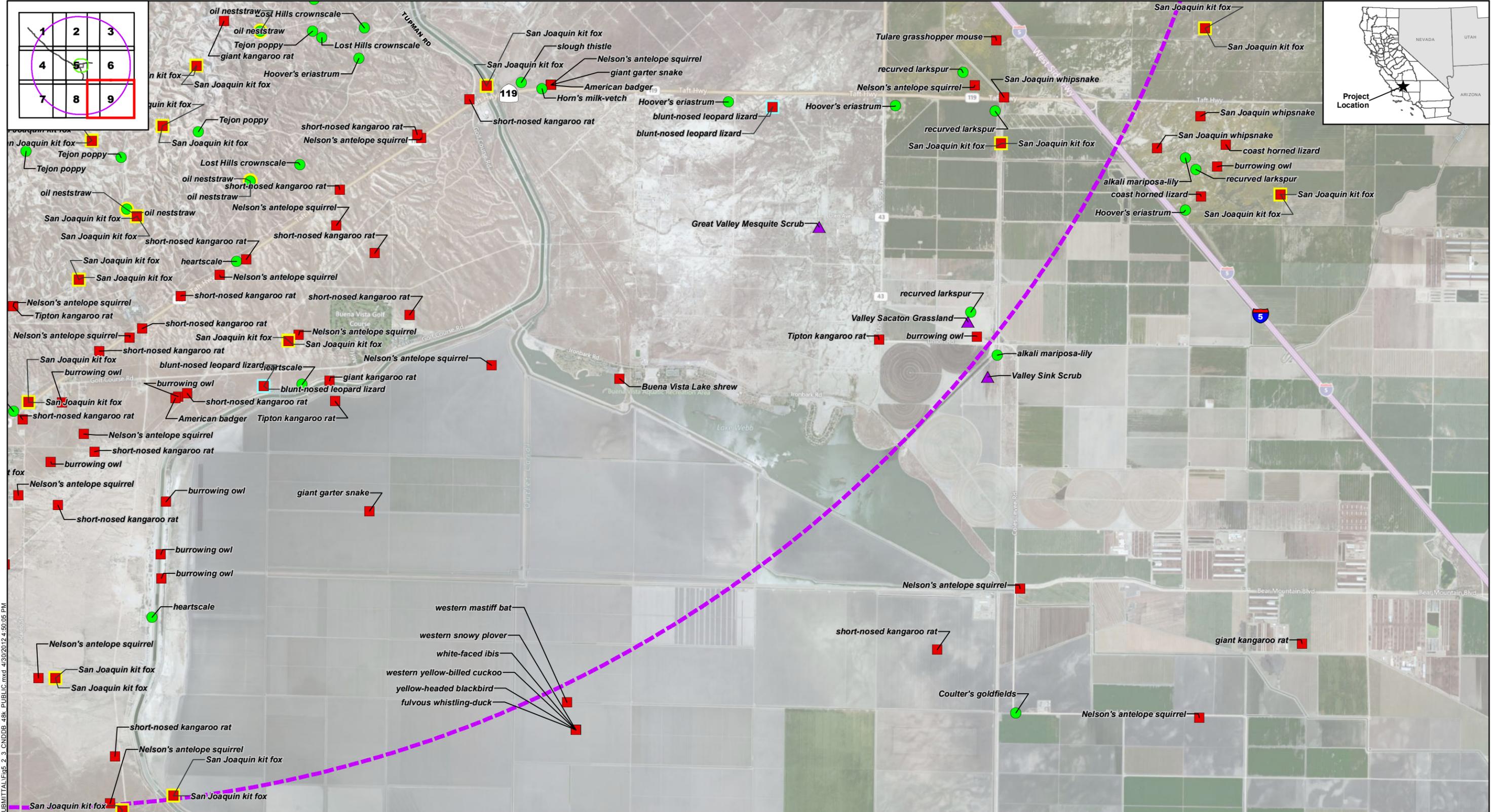
**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

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 28068052 Kern County, California



**FIGURE 5.2-3 - SHEET 8**

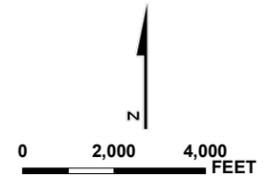
Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- |                                     |                          |                                    |                         |
|-------------------------------------|--------------------------|------------------------------------|-------------------------|
| Project Site                        | Carbon Dioxide           | <b>CNDDDB Species - March 2012</b> | All Other Plants        |
| Construction Staging Area           | Natural Gas <sup>1</sup> | blunt-nosed leopard lizard         | All Other Animals       |
| 1-Mile Radius from Project Site     | Potable Water            | San Joaquin kit fox                | Terrestrial Communities |
| 10-Mile Radius from Project Site    | Process Water            | oil neststraw                      |                         |
| 1,000-Foot Radius from Project Site | Transmission             |                                    |                         |
|                                     | Railroad <sup>1</sup>    |                                    |                         |

Note: 1. Feature temporarily designated as confidential



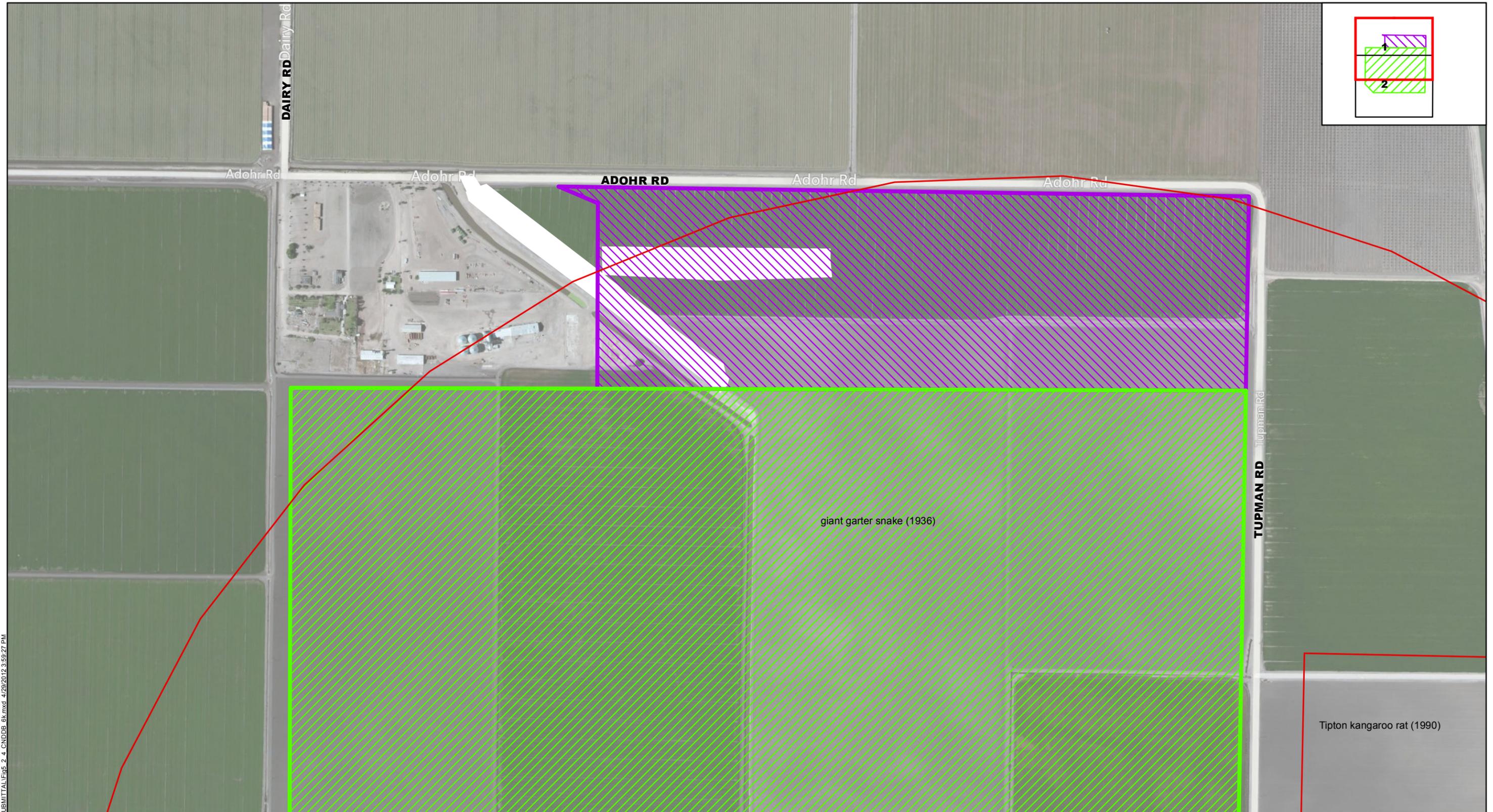
**CNDDDB SENSITIVE SPECIES 1:48,000-SCALE**

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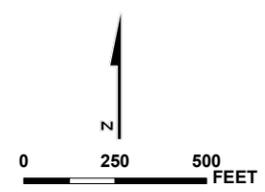
**FIGURE 5.2-3 - SHEET 9**

Sources: Aerial imagery, Bing Maps, 2010; California Natural Diversity Database, January 2012.



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- Project Site
- Construction Staging Area
- CNDDDB Occurrence Records



**BIOLOGICAL RESOURCES AT PROJECT SITE  
1:6,000-SCALE**

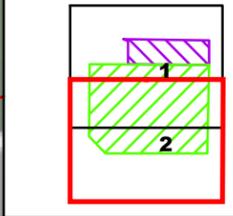
April 2012  
28068052

Hydrogen Energy California (HECA)  
Kern County, California



**FIGURE 5.2-4 - SHEET 1**

Sources: USGS (7.5' quads: East Elk Hills 1977, Tupman 1977). The East Elk Hills, CA Quad (Rev. 1973) has been edited to reflect current condition). California Natural Diversity Database, January 2012.



Tipton kangaroo rat (1990)

San Joaquin kit fox (1990)

giant garter snake (1936)

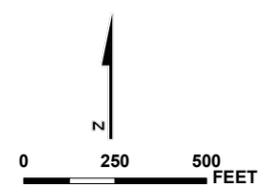
West Side Canal  
Kern River Flood Control Channel

TUPMAN RD

burrowing owl (1997) giant kangaroo rat (1990) Tipton kangaroo rat (1988)

ed U:\GIS\HECA\Projects\HECA\_2012\SUBMITTAL\Fig5\_2\_4\_CNDDDB\_6k.mxd 4/29/2012 3:59:27 PM

-  Project Site
-  Construction Staging Area
-  CNDDDB Occurrence Records



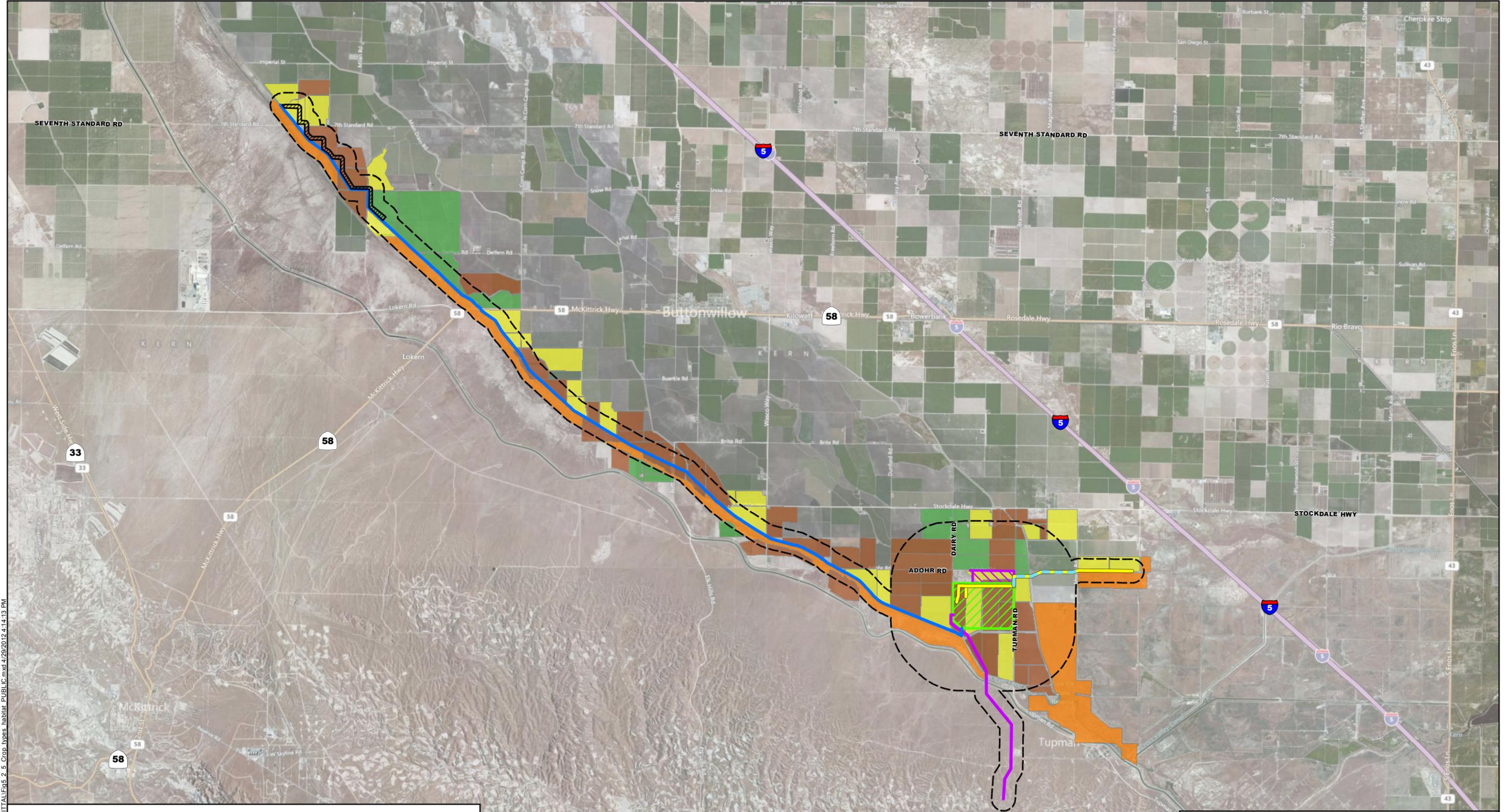
**BIOLOGICAL RESOURCES AT PROJECT SITE  
1:6,000-SCALE**

April 2012 Hydrogen Energy California (HECA)  
28068052 Kern County, California



**FIGURE 5.2-4 - SHEET 2**

Sources: USGS (7.5' quads: East Elk Hills 1977, Tupman 1977). The East Elk Hills, CA Quad (Rev. 1973) has been edited to reflect current condition). California Natural Diversity Database, January 2012.



**Legend:**

- Project Site
- Construction Staging Area
- BWSD Well Field
- Biological Resources Study Area
- Carbon Dioxide
- Natural Gas<sup>1</sup>
- Potable Water
- Process Water
- Railroad<sup>1</sup>
- Transmission
- Natural/Ruderal Vegetation
- Alfalfa
- Orchard
- Other Row Crops

**Note:**  
1. Feature temporarily designated as confidential

0 0.75 1.5  
MILES

**HABITAT AND CROP TYPES  
WITHIN THE PROJECT AREA**

April 2012  
28068052

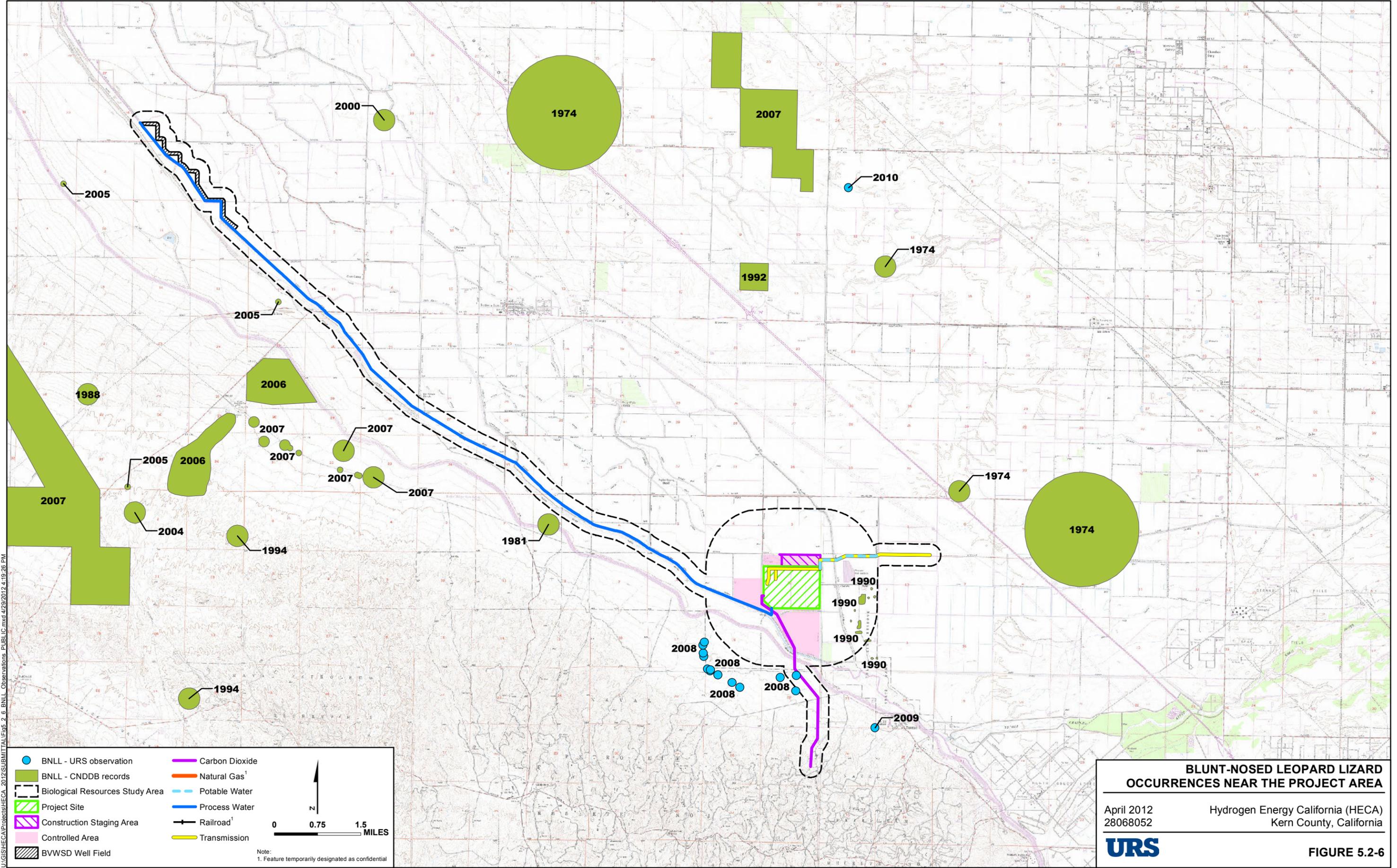
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Kern County, California

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**FIGURE 5.2-5**

L:\GIS\HECA\Projects\HECA\_2012\SUBMITTALS\Fig 5.2-5\_Crop\_Types\_habitat\_PUBLI\_C.mxd 4/29/2012 4:14:13 PM

Source: Aerial Imagery, Bing Maps, 2009.



L:\GIS\HECA\Professionals\HECA\_2012\SUBMITTALS\Figs\_2\_6\_BNLL\_Observations\_PUBLIC.mxd 4/29/2012 4:19:26 PM

BNL - URS observation	Carbon Dioxide
BNL - CNDDB records	Natural Gas <sup>1</sup>
Biological Resources Study Area	Potable Water
Project Site	Process Water
Construction Staging Area	Railroad <sup>1</sup>
Controlled Area	Transmission
BVWSD Well Field	

0    0.75    1.5
   
 MILES

Note:  
 1. Feature temporarily designated as confidential

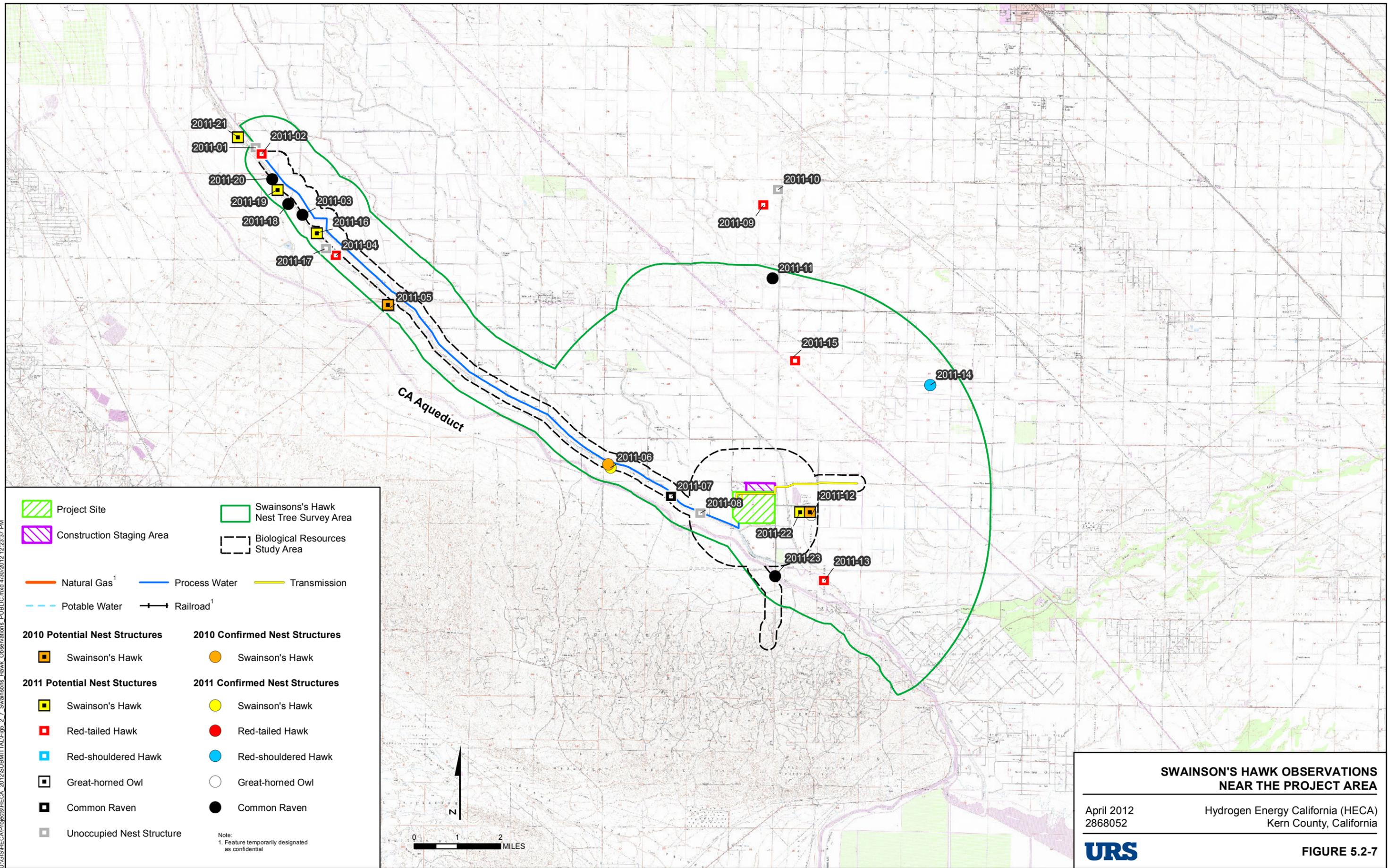
**BLUNT-NOSED LEOPARD LIZARD  
 OCCURRENCES NEAR THE PROJECT AREA**

April 2012                      Hydrogen Energy California (HECA)  
 28068052                      Kern County, California

**FIGURE 5.2-6**

Source: USGS 7.5-minute quadrangles: Buttonwillow, published 1973 (rev 1976), East Elk Hills, published 1973 (rev 1977), Lokern, published 1973 (rev 1976), Tupman, published 1973 (rev 1977), West Elk Hills, published 1973 (rev 1976); Species data, CNDDB, 2012.

U:\GIS\HECA\Projects\HECA\_2012\SUBMITTAL\Figs 2-7 Swainsons Hawk Observations PUBLIC.mxd 4/30/2012 12:23:37 PM



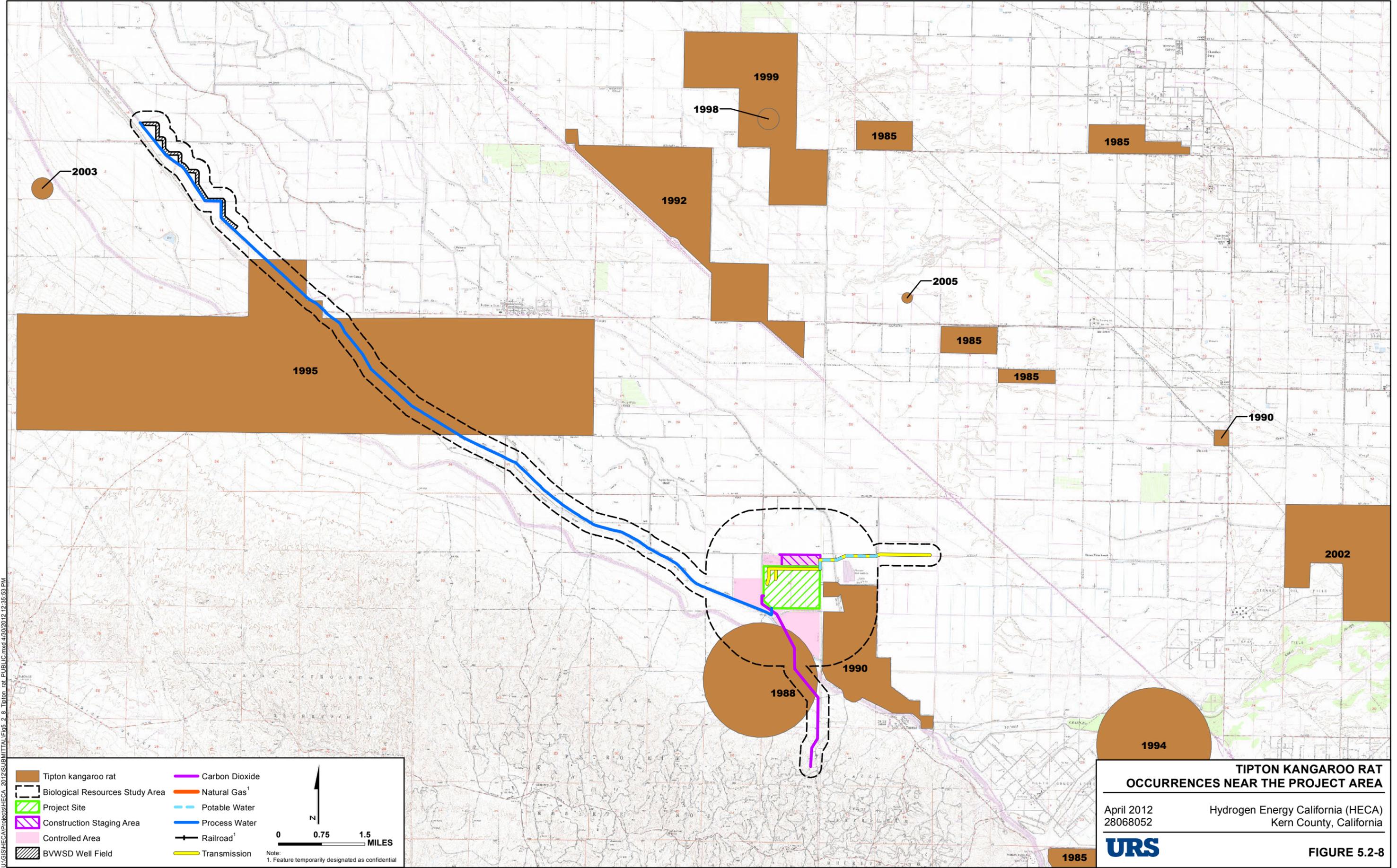
**SWAINSON'S HAWK OBSERVATIONS  
NEAR THE PROJECT AREA**

April 2012  
2868052

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Kern County, California



**FIGURE 5.2-7**



J:\GIS\HECA\Professionals\HECA\_2012\SUBMITTALS\Figs\_2\_8\_Tipton\_rat\_PUBLIC.mxd 4/30/2012 12:35:53 PM

Tipton kangaroo rat	Carbon Dioxide
Biological Resources Study Area	Natural Gas <sup>1</sup>
Project Site	Potable Water
Construction Staging Area	Process Water
Controlled Area	Railroad <sup>1</sup>
BVWSD Well Field	Transmission

0      0.75      1.5  
 MILES

Note:  
 1. Feature temporarily designated as confidential

**TIPTON KANGAROO RAT  
OCCURRENCES NEAR THE PROJECT AREA**

April 2012  
 28068052

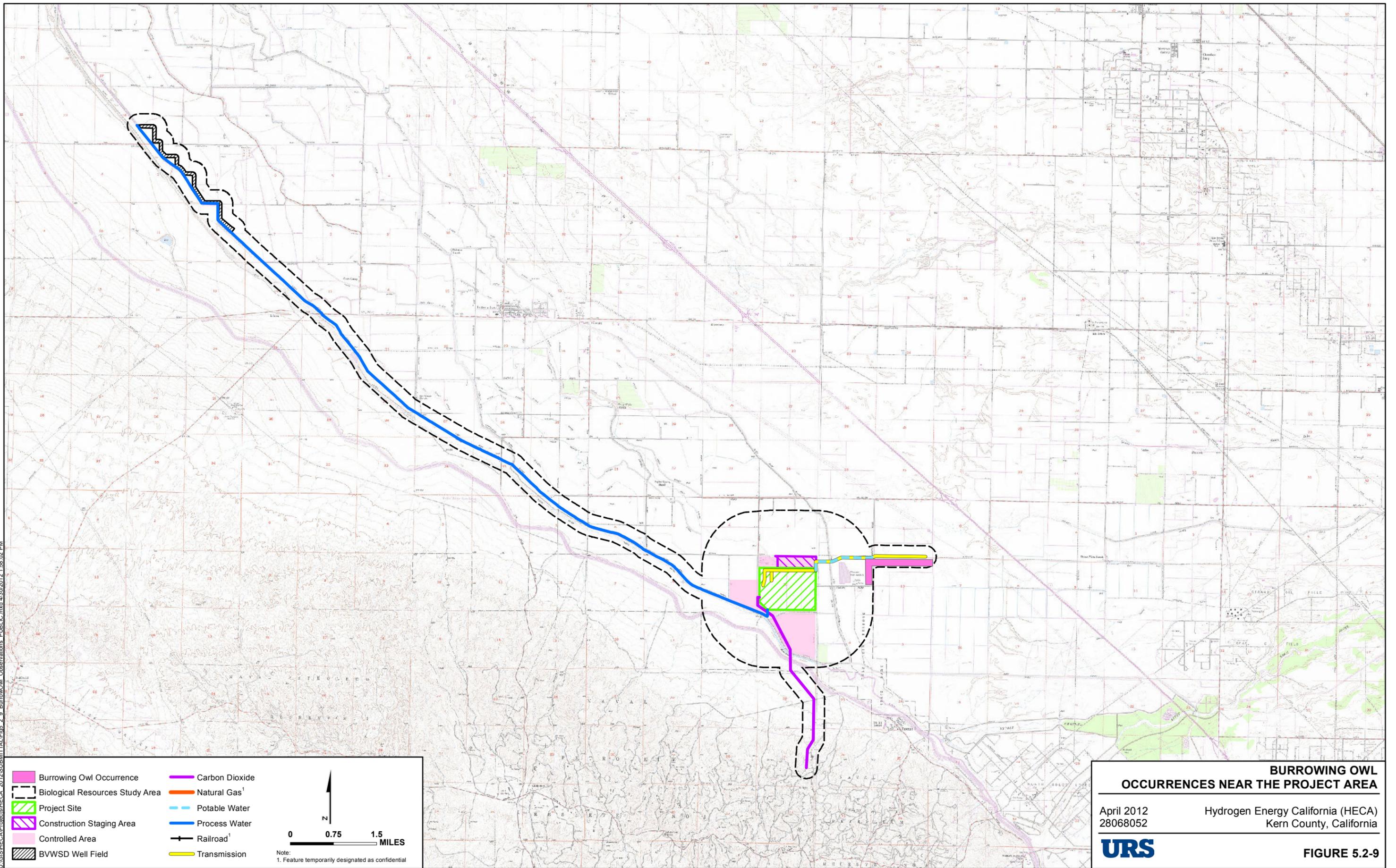
Hydrogen Energy California (HECA)  
 Kern County, California

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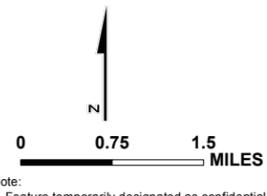
FIGURE 5.2-8

Source: USGS 7.5-minute quadrangles: Buttonwillow, published 1973 (rev 1976), East Elk Hills, published 1973 (rev 1977), Lokern, published 1973 (rev 1976), Tupman, published 1973 (rev 1977), West Elk Hills, published 1973 (rev 1976); Species data, CNDDB, 2012.

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- |                                 |                          |
|---------------------------------|--------------------------|
| Burrowing Owl Occurrence        | Carbon Dioxide           |
| Biological Resources Study Area | Natural Gas <sup>1</sup> |
| Project Site                    | Potable Water            |
| Construction Staging Area       | Process Water            |
| Controlled Area                 | Railroad <sup>1</sup>    |
| BVWSD Well Field                | Transmission             |



**BURROWING OWL  
OCCURRENCES NEAR THE PROJECT AREA**

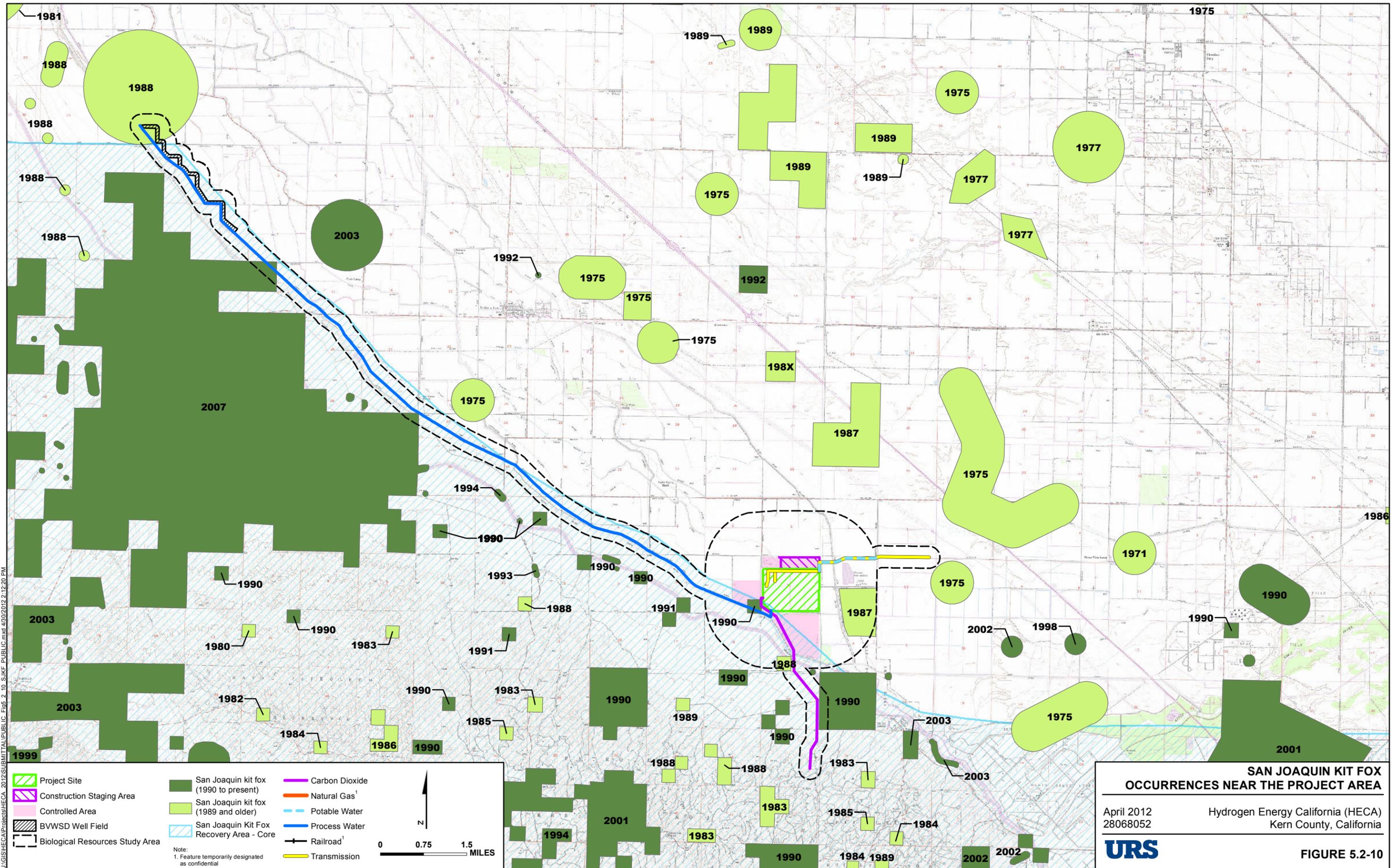
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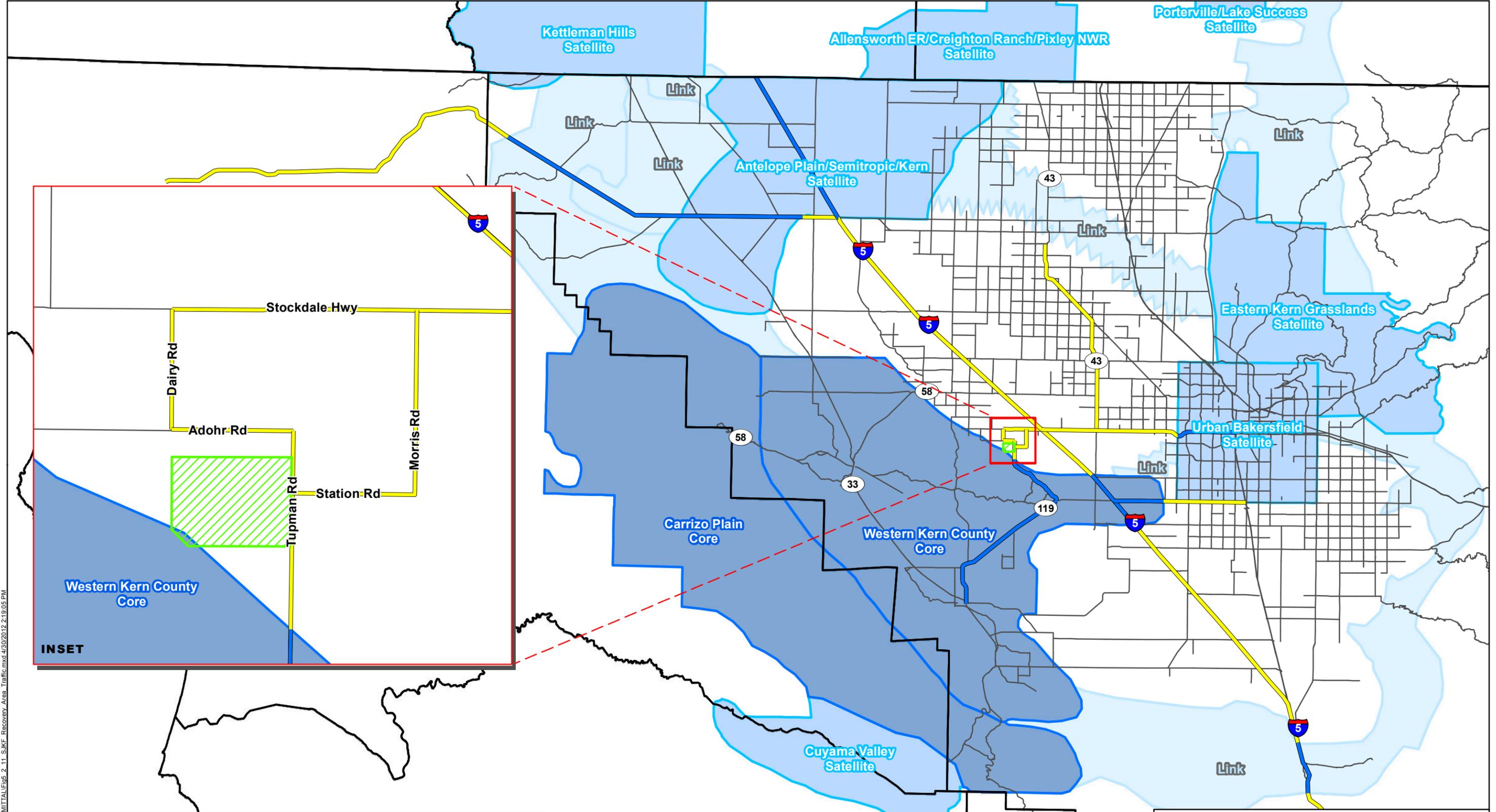
**FIGURE 5.2-9**

Source: USGS 7.5-minute quadrangles: Buttonwillow, published 1973 (rev 1976), East Elk Hills, published 1973 (rev 1977), Lokern, published 1973 (rev 1976), Tupman, published 1973 (rev 1977), West Elk Hills, published 1973 (rev 1976).



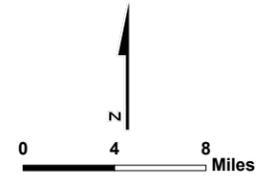
U:\GIS\HECA\Prof\HECA\_2012\SUBMITTAL\PUBLIC\Fig 2-10\_SJKF\_PUBLIC.mxd 4/30/2012 2:12:20 PM

Source: USGS 7.5-minute quadrangles: Buttonwillow, published 1973 (rev 1976), East Elk Hills, published 1973 (rev 1977), Lokern, published 1973 (rev 1976), Tupman, published 1973 (rev 1977), West Elk Hills, published 1973 (rev 1976); Species data, CNDDB, 2012.



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 Project Site	<b>Roads Utilized By Project Vehicles</b>	<b>SJ Kit Fox Recovery Area (FWS 2007)</b>
 County Boundaries	 Within Recovery Area	 Core
	 Outside Recovery Area	 Satellite
		 Link



**SAN JOAQUIN KIT FOX RECOVERY AREA**

April 2012  
28068052

Hydrogen Energy California (HECA)  
Kern County, California

**URS**

**FIGURE 5.2-11**