

## **3.0 AFFECTED ENVIRONMENT**

### **3.0.1 Introduction to the Affected Environment**

This chapter describes the environment that may be affected by the proposed action. As described in Chapter 1, Purpose and Need for Action, the proposed action considered in this EIS is the U.S. Fish and Wildlife Service's (Service) response to the application for an incidental take permit (ITP) submitted by Maricopa Sun, LLC for the Covered Activities associated with the Maricopa Sun Soar Complex HCP.

Thirteen resource areas are described in the individual sections of this chapter, as follows:

- Aesthetics/Visual Resources
- Agriculture
- Air Quality/Greenhouse Gas
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Public Services
- Traffic and Transportation
- Environmental Justice

Each section includes a summary of the sources of information used to describe the affected environment and a detailed description of both the regulatory and environmental setting in the study area pertinent to the resource area. This information forms the basis for the description of potential effects of the Proposed Action and Alternatives provided in Chapter 4, Environmental Consequences.

As was indicated in Section 2.0 of this Draft EIS, the project description for the Maricopa Sun Solar Complex project was analyzed in an Environmental Impact Report (EIR) prepared for the County of Kern (Kern County, 2010). Subsequent to certification of the EIR, the project proponent for the Solar Complex has elected to reduce the amount of land within the project for which the draft HCP has been prepared. The Permit Area described in the EIR totaled 6,046 acres, whereas the Permit Area in the draft HCP and this EIS totals 5,784.3 acres. The description of the Affected Environment in this section of the EIS is based on the Environmental

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Chapter 3.0 Affected Environment**

---

Setting and Regulatory Setting sections of the EIR, updated where appropriate to reflect changed regulations, conditions, and circumstances.

**3.0.2 Covered Lands and Study Area**

A description of the Covered Lands and Covered Activities is contained in Chapter 2.0. The Covered Lands reflect the area where activities associated with the Proposed Action and Alternatives considered in this EIS would be implemented. The study area, as the term is used in this chapter, represents the area considered in characterizing the affected environment, and varies by resource topic (as listed above). In some cases, the study area is the same as the Covered Lands. For other resource areas, the study area extends beyond the boundary of the Covered Lands to account for potential effects on resources affected by the Covered Activities. For example, the study area for the air quality section encompasses the entire airshed where the proposed action would occur. For resource topics that require evaluation of a study area that is different from the Covered Lands, a description of that study area is provided in the introduction to that section.

### **3.1 AESTHETICS/VISUAL RESOURCES**

This section describes the existing conditions pertaining to aesthetics and visual resources. Because this is a highly specialized area of analysis, a discussion of concepts and terminology precedes the descriptions of the regulatory and environmental setting.

#### **3.1.1 Concepts and Terminology**

Identifying a project area's visual resources and conditions involves three steps:

1. Objective identification of the visual features (visual resources) of the landscape;
2. Assessment of the character and quality of those resources relative to overall regional visual character; and
3. Determination of the importance to people or sensitivity, of views of visual resources in the landscape.

According to the U.S. Department of Transportation, Federal Highway Administration, the aesthetic value of an area is a measure of its visual character and quality, combined with the viewer response to the area. The U.S. Bureau of Land Management states that scenic quality can best be described as the overall impression that an individual viewer retains after driving through, walking through, or flying over an area. Viewer response is a combination of viewer exposure and viewer sensitivity. Viewer exposure is a function of the number of viewers, number of views seen, distance of the viewers, and viewing duration. Viewer sensitivity relates to the extent of the public's concern for a particular viewshed. These terms and criteria are described in detail below.

##### **3.1.1.1 Visual Character**

Natural and artificial landscape features contribute to the visual character of an area or view. Visual character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features are those associated with landscape settlements and development. Included are roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly seasonally and even hourly, as weather, light, shadow, and elements that compose the viewshed change. According to the Federal Highway Administration, the basic components used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features. The appearance of the landscape is described in terms of the dominance of each of these components.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

**3.1.1.2 Visual Quality**

Visual quality is evaluated using the well-established approach to visual analysis adopted by the Federal Highway Administration, employing concepts of vividness, intactness, and unity, which are described below:

- Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscape, and in natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the landscape.

The evaluation of visual quality is based on the relative degree of vividness, intactness, and unity, as modified by visual sensitivity. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

**3.1.1.3 Viewer Exposure and Sensitivity**

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity or concern is based on the visibility of resources in the landscape, proximity of viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

The importance of a view is related in part to the position of the viewer to the resource; accordingly visibility and visual dominance of landscape elements depend on their placement within the viewshed. According to the Federal Highway Administration, a viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway). To identify the importance of views of a resource, a viewshed must be broken into distance zones. The following distance zones (foreground, middle ground, and background) are used to characterize the dominant visual character from each vantage point and describe views in terms that can be analyzed and compared. As discussed below, sensitivity of views modified from the natural environment is defined in order to establish thresholds for analysis of potential visual impacts resulting from the implementation of the proposed project.

- **Foreground Views.** These views include elements that can be seen at a close distance and that dominate the entire view. Impacted views at this distance are generally considered potentially adverse when viewed by a sensitive viewer group, such as surrounding residents, workers, pedestrians, or regular motorists;
- **Middle Ground Views.** These views include elements that can be seen at a middle distance and that partially dominate the view. Impacted views at this distance are generally considered potentially adverse when viewed by a sensitive viewer group; and,
- **Background Views.** These views include elements that are seen at a long distance and typically do not dominate the view, but they are part of the overall visual composition of the view. Impacted views at this distance are generally considered not to be an adverse impact when viewed by a sensitive viewer group.

### **3.1.2 Regulatory Setting**

#### **3.1.2.1 Federal**

##### *National Scenic Byways Program*

The National Scenic Byways (NSB) Program is part of the Federal Highway Administration. The NSB Program was established under the Intermodal Surface Transportation Efficiency Act of 1991, and was reauthorized in 1998 under the Transportation Equity Act for the 21st Century. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities.

#### **3.1.2.2 State**

##### *California Scenic Highway Program*

The California Department of Transportation (Caltrans) manages the California Scenic Highway Program, which was created in 1963 by the California legislature to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The program includes a list of highways that are eligible for designation as scenic highways or that have been designated as such. A highway may be designated as scenic based on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes on the traveler's enjoyment of the view. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

**3.1.2.3 Local**

*Kern County General Plan*

The Kern County General Plan includes the following policies goals and policies which are relevant to the project:

Chapter 1. Land Use, Open Space, and Conservation Element (page 71)

1.10.7 Light and Glare

Policy 47. Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48. Encourage the use of low-glare lighting to minimize nighttime glare effects on neighboring properties.

*Kern County Zoning Ordinances*

19.80.030 Development and performance Standards – Commercial and industrial districts. All development in the CO, C-1, C-2, CH, M-1, M-2, and M-3 districts, and, where specified, in the A and NR districts, shall comply with the following standards:

J. All exterior lighting shall be directed away from adjacent properties and roads. When lighting will be visible from a residential district or adjacent public roads, the lighting standards shall be equipped with glare shields or baffles and shall not exceed 40 feet in height above grade.

Chapter 19.81 Outdoor Lighting “Dark Skies Ordinance”: In order to maintain the existing character of Kern County, a minimal approach shall be taken to outdoor lighting, as excessive illumination can create a glow that may obscure the night sky and excessive illumination or glare may constitute a nuisance. The purpose of this chapter is to provide requirements for outdoor lighting within specified unincorporated areas of Kern County in order to accomplish the following objectives:

1. Encourage a safe, secure, and less light-oriented nighttime environment for residents, businesses, and visitors.
2. Promote a reduction in unnecessary light intensity and glare, and to reduce light spillover onto adjacent properties.
3. Protect the ability to view the night sky by restricting unnecessary upward projections of light.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

4. Promote energy conservation and a reduction in the generation of greenhouse gases by reducing wasted electricity that can result from excessive or unwanted outdoor lighting.

19.81.040 General Requirements.

A. Shielding. All outdoor lighting fixtures which utilize one hundred (100) watts or more (based on a incandescent bulb), or emit one thousand six hundred (1,600) lumen or more per fixture shall be fully fielded per the definition listed in this chapter, unless the fixture is exempted by this chapter. All floodlights which utilize less than one hundred (100) watts per fixture must be at least partially shielded to reduce light spillover onto adjacent properties.

Additionally, the light source within all lighting fixtures shall be oriented downward to prevent direct lighting, except as permitted by Section 19.81.040(F).

B. Prohibited light source types: The following exterior light source types shall be prohibited in and within twenty five (25) feet of all residential zone districts: metal halide, mercury vapor, and quartz.

C. Maintenance: Outdoor light fixtures shall be kept in good working order and shall be continuously maintained in a manner that serves the original design intent of the system and ensures continued compliance with this chapter.

D. Fixture Height: All light fixtures that are mounted on a building or structure, and all lighting fixtures that are not attached shall conform to mounting height limitations as listed in this chapter. Freestanding lighting within a non-residential zone shall not exceed 30 feet in height, and attached lighting shall not exceed the height of the building.

### **3.1.3 Environmental Setting**

#### **3.1.3.1 Regional Setting**

The Covered Lands consist of approximately 5,784 acres of currently vacant, undeveloped agricultural land fashioned in clusters of noncontiguous parcels in the Westside Subarea of the San Joaquin Valley within Kern County's Valley Region. The Covered Lands are situated within the Maricopa Flat near the foothills of the San Emigdio Mountains. The San Emigdio Mountains form the southern wall of the San Joaquin Valley and connect the Temblor Range to the northwest with the Tehachapi Mountain to the northeast. The Carrizo and Elkhorn plains are located to the distant west; the Cuyama Valley is located to the southwest, past the Emigdio Mountains and Temblor Range. The Los Padres National Forest surrounds the program area to the south, and to the north, a long, flat expanse of the southern San Joaquin Valley dominates the landscape.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

The aesthetic features of the regional visual environment are relatively uniform, with expansive, flat landscapes leading to nearby mountains to the south and more distant mountains to the east and west. Because there is little topographic variation to the north and the large topographic features of the San Emigdio Mountains surround the program area to the south, the regional visual environment extends approximately 40 miles around the Covered Lands. This landscape area is referred to herein as the Maricopa Flat Viewshed.

The Maricopa Flat Viewshed, which trends west to east, is an expansive area that encompasses approximately 40 square miles and is dominated by agricultural uses and oil and natural gas extraction activities. This viewshed affords visual receptors minor topographic relief (in the form of Buena Vista Hills) and a variety of vegetative over-covers (i.e., grazing grasses, native shrubs, and croplands). The views in this type of visual setting are sometimes described as “big-sky country.” Because the viewshed lacks foreground and middle ground focal points that would capture a viewer’s attention, the landscape is classified as panoramic.

Several local travel ways and regional thoroughfares provide motorists with visual access to the project sites. State Route (SR) 33, which generally trends northwest to southeast approximately 2.5 miles west of the Covered Lands, provides regional access to the unincorporated community of Maricopa and the city of Taft. This route also links the Los Angeles Basin and the southern San Joaquin Valley. SR-166, which runs west to east and intersects with Interstate (I) 5, West Side Freeway) also provides regional access to and from Maricopa. SR-166 borders the Covered Lands to the south and SR-119 (Taft Highway), which trends southwest to northeast approximately 7 miles north–northwest of the Covered Lands, provides regional access to the communities of Dustin Acres and Valley Acres and to the city of Taft. Finally, northwest to southeast-trending I-5 runs diagonally approximately 1.25 miles east–northeast of the Covered Lands and provides regional access to the southern San Joaquin Valley.

**3.1.3.2 Local Setting**

The Covered Lands occupy approximately 5,784 acres in unincorporated, southwestern Kern County and extend from west to east in a fairly contiguous and predictable pattern. The Covered Lands extend from approximately 6 to 20 miles east–southeast of the city of Taft and from approximately 5 to 17.5 miles northeast of the unincorporated community of Maricopa.

Surrounding land uses are active and inactive farmland, residential communities and scattered rural residences, small- and large-scale agricultural operations (mostly nut trees), ecological preserves, utility easements, oil and natural gas production, a prison, manufacturing and industrial production facilities, and streets and roadways.

Offsite anthropogenic changes to the area are similar to those surrounding the Covered Lands. The most common and notable modifications are agricultural infrastructure, such as storage

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

tanks and accessory buildings; oil extraction infrastructure, such as pump jacks and pipelines; and roadways. These are noticeable elements that interrupt the continuous natural landscape created by the area's topographic and vegetative characteristics.

*North Views*

Views to the north of the Covered Lands include the following uses: vacant land (land that has not been utilized for farming, residential, commercial or other use), active farmland (currently under cultivation) and inactive farmland (fallow farmland not currently under production), agricultural production infrastructure, oil extraction activities, an electrical transmission corridor, industrial operations at the South Kern Industrial Center, the Buena Vista Golf Course; the Buena Vista Aquatic Recreation Area (BVARA), scattered residences, and roadways.

*East Views*

Views to the east of the Covered Lands include active and inactive farmland; a few rural residences; infrastructure and equipment for agriculture, electrical, and oil production activities; and roadways.

*South Views*

Views to the south of the Covered Lands include active and inactive farmland, agricultural infrastructure, rural residences, vacant land, electrical transmission lines, a quarry, roadways, and the Wind Wolves Preserve at the base of the San Emigdio Foothills and Mountains, approximately six miles distant.

*West Views*

Western views from the Covered Lands include a mixture of active and inactive farmland, disturbed land used for oil and natural gas production, residential development, infrastructure and equipment for agriculture, electrical, and oil production activities, a prison, a manufacturing facility, and the Temblor Range.

*Lighting Environment*

The Covered Lands are currently vacant and undeveloped agricultural land. A few structures, such as electrical transmission and distribution poles and lines, as well agricultural accessory infrastructure, are located on some of the lands, however, few emit light. Existing onsite lighting results almost exclusively from the widely scattered residential structures, security and safety lighting at well pads, and industrial agriculture operations.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

The Covered Lands are surrounded by the following land uses: (1) vacant, undeveloped farmland; (2) small- and large-scale agricultural operations; (3) oil and natural gas extraction activities; (4) the Taft Correctional Institution; (5) the Johnny Cat Litter manufacturing facility; (6) the communities of Maricopa, Taft, Valley Acres, and Dustin Acres; (7) ecological preserves; (8) scattered rural residential uses; (9) the BVARA; (10) industrial uses within the South Kern Industrial Center (SKIC); and (11) highly used highways and roadways. As such, there are multiple sources of light and glare throughout the Maricopa Flat Viewshed.

The largest contributors to nighttime lighting are the communities of Maricopa, Taft, Valley Acres, and Dustin Acres. After nightfall, these communities appear as clusters of bright yellow and white lights to the southwest, west, northwest, and north; and their lights can be seen from over 12 miles away. Additionally, security lighting at the Taft Correctional Institution, Johnny Cat Litter plant, and South Kern Industrial Center contributes to ambient light conditions in the Covered Lands, as does small-scale security lighting used by the scattered rural residences and farming activities. Finally, motor vehicles on SR-166, SR-33, I-5, Cadet Road, Copus Road, Old River Road, Gardner Field Road, Kerto Road, and South Lake Road create sporadic bidirectional moving nighttime light.

Daytime glare conditions are less prevalent and far-reaching than nighttime lighting conditions in the Covered Lands, but include the California Aqueduct, Lake Webb, and Lake Evans; agricultural accessory structures; moving vehicles; oil and natural gas pipelines; and holding ponds and water retention basins. Sunlight reflecting off the California Aqueduct, Lake Webb, Lake Evans, and other holding ponds and water retention basins is easily detectable at various times of day, depending on the elevation and proximity of the viewer. However, from a distance, their glare diminishes significantly. Also, the luminosity of the metallic oil and natural gas pipelines in the program area reflect sunlight and create concentrated glare conditions from certain perspectives. Finally, cars and trucks traveling on roadways cause bidirectional moving daytime glare.

*Visual Character and Scenic Quality*

The 2010 EIR evaluation of the visual impacts of the Maricopa Sun PV facility identified the existing scenic quality of the visual setting (County of Kern, 2010, page 4.1-19). For this evaluation, the Bureau of Land Management (BLM) Visual Resources Management (VRM) methodology was used so that various landscape elements could be quantified and rated, reducing ambiguity or subjectivity. Seven landscape features; landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications are used in the inventory process. The landscape features were rated numerically on a comparative basis with similar features within the viewshed. A maximum of 32 points is possible, and lands are given an A, B, or C rating based on the total score. Views that scored 19 points or more were considered to have an A rating and

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.1 Aesthetics/Visual Resources**

---

an overall “very high level” of scenic quality; those that scored 12 to 18 points were considered a B rating, and a “high level” of scenic quality; and views at scored 11 or fewer points were considered to have a C rating and an “average to low” scenic quality.

The visual integrity of the Covered Lands has been compromised by various anthropogenic alterations to the natural landscape. As described under “Local Character” and “Landscape Character Units” above, numerous modifications throughout the project area have compromised the intactness and unity of the viewshed. The project area is largely disturbed, with no unique aesthetic features, scenic vistas, or focal points. The landscape in which the proposed project resides is expansive, with few distinctive natural features that provide scenic quality. While the expansive agricultural lands create a somewhat bucolic ambiance, there is a lack of visual diversity. Because the views of the Covered Lands lack vividness, and possess, to some degree, a low degree of visual unity, the visual quality and scenic quality would be considered low.

*This page intentionally left blank.*

## **3.2 AGRICULTURE**

This section describes the affected environment and regulatory setting for agricultural resources. The description of the Affected Environment in this section of the EIS is based on the Environmental Setting and Regulatory Setting sections of the Maricopa Sun Solar Complex EIR (Kern County, 2010), updated where appropriate to reflect changed regulations, conditions, and circumstances.

### **3.2.1 Regulatory Setting**

#### **3.2.1.1 Federal**

##### *Farmland Protection Act*

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact that federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, federal programs are administered to be compatible with state and local units of government and with private programs and policies and procedures to implement the FPPA.

For the purposes of the FPPA, farmland comprises prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not need to be currently used for cropland (it can be forest land, pastureland, cropland, or other land), but it cannot be water or urban built-up land.

The FPPA does not cover private construction subject to federal permitting and licensing on non-federal land or projects proposed on land already in or committed to urban development or water storage.

#### **3.2.1.2 State**

##### *Farmland Mapping and Monitoring Program (FMMP)*

In 1975, the Soil Conservation Service (since renamed Natural Resources Conservation Service [NRCS]) of the United States Department of Agriculture began farmland mapping efforts across the nation, with the goal of producing agricultural resource maps based on soil quality and land use. As part of this nationwide agricultural land use mapping effort, the NRCS developed a series of definitions known as Land Inventory Monitoring (LIM) criteria. The LIM criteria classify the land's suitability for agricultural production; suitability includes both the physical and chemical characteristics of soils and the actual land use. In the early 1980s, to continue these farmland mapping efforts in California, the Farmland Mapping and Monitoring Program (FMMP) was created within the California Department of Conservation (DOC). The FMMP

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

maintains these mapping activities on a continuing basis and with a continually greater level of detail using a modified LIM criteria. These criteria utilize the NRCS and soils ratings (Storie Index Rating Systems), but also consider physical conditions such as a dependable water supply for agricultural production, soil temperature range, depth of the ground water table, flooding potential, rock fragment content, and rooting depth. The FMMP prepares Important Farmlands maps for all counties in California, using the modified LIM criteria as well as current land use information.

The Important Farmlands maps identify four agriculture listings and three additional land use designations: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban Land, and Other Land. Other land includes wetlands, timber/brush, borrowpits, and other uses that fit no other category.

- Prime Farmland: Land with the best combination of physical and chemical features able to sustain the long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields;
- Unique Farmland: Land of lesser-quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but it may include non-irrigated orchards or vineyards, as are found in some climactic zones in California;
- Farmland of Statewide Importance: Land similar to Prime Farmland, but with minor shortcomings, such as greater slopes or less ability to hold and store moisture; and,
- Farmland of Local Importance: Land of importance in the local agricultural economy, as determined by each county's Board of Supervisors and a local advisory committee.

*Williamson Act*

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code Sections 51200–51297.4, and therefore is applicable only to specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas is eligible for enrollment under Williamson Act contracts. However, an agricultural preserve must consist of no fewer than 100 acres, but, in order to meet this requirement two or more parcels may be combined if they are contiguous, or if they are in common ownership.

The Williamson Act program is administered by the DOC, in conjunction with local governments, which administer the individual contract arrangements with landowners. The

landowner commits the parcel to a 10-year period wherein no conversion from agricultural use is permitted. Each year the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county or city. Non-renewal or immediate cancellation does not change the zoning of the property. Participation in the Williamson Act program is dependent on county adoption and implementation of the program and is voluntary for landowners.

As defined by the Williamson Act, prime agricultural land includes: (1) Class I and II soils as classified by the NRCS; (2) land that qualifies for rating 80 through 100 in the Storie Index Rating by the University of California, Division of Agricultural Sciences; (3) land that supports livestock used for the production of food and fiber and with at least one animal unit per acre; 4) land planted with fruit or nut-bearing crops that yield not less than \$200 per acre annually during commercial bearing periods; or (5) land that has returned from the production of unprocessed agricultural plant products and annual gross value of not less than \$200 per acre for three of the previous five years (Government Code, Section 51201(c)(1)-(5)).

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit.

California Government Code Section 51238 states that, unless otherwise decided by a local board or council, the erection, construction, alteration, or maintenance of electric and communication facilities, as well as other facilities, are determined to be compatible uses within any agricultural preserve. Also, Section 51238 states that board of supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with Section 51238.1.

Further, California Government Code Section 51238.1 allows a board or council to allow as compatible any use that without conditions or mitigations would otherwise be considered incompatible. However, this may occur only if that use meets the following conditions:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels on other contracted lands in agricultural preserves;

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping; and,
- The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

*Farmland Security Zone Act*

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is part of public policy. Farmland Security Zone Act contracts are sometimes referred to as “Super Williamson Act Contracts.” Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35 percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into nonagricultural uses.

*Senate Bill 618*

In October 2011, Governor Brown signed Senate Bill 618, which authorizes parties already entered into a Williamson Act contract, to, under certain circumstances, rescind the contract on agricultural lands of limited agricultural value in order to simultaneously enter into a solar-use easement. In most cases, the easement will require that the land be used for solar photovoltaic facilities for a term no less than 20 years. To qualify, the landowner must submit an application to the county or city in which the proposed solar use easement is to be located. The agency will forward the application materials to the DOC. The application must include:

- a) A written narrative factually demonstrating that even under the best currently available management practices, continued agricultural practices would be substantially limited on the solar-use easement land due to the soil’s reduced agricultural productivity from chemical or physical limitations;
- b) A soil test conducted no more than six (6) months immediately prior to submission of the application demonstrating that the characteristics of the soil on the solar-use easement land significantly reduce the soil’s agricultural productivity;

- c) An analysis of water availability for the solar-use easement land demonstrating the insufficiency of water supplies for continued agricultural production on the land;
- d) An analysis of water quality available to the solar-use easement land demonstrating that continued agricultural production on that land would, under the best currently available management practices, be significantly reduced;
- e) Crop and yield information regarding the solar-use easement land for the immediately preceding six (6) years;
- f) A soil management plan (including FMMP designations, a description of activities to mitigate the project's impacts, and a site restoration plan); and,
- g) A copy of the proposed Solar-Use Easement Agreement.

If the DOC, in consultation with the Department of Food and Agriculture, agree that lands are eligible to be included in a solar-use easement, the city or county will include, as conditions of approval or acceptance of the solar-use easement and requirements of the easement, all recommendations regarding the soil management plan that are made by DOC. The city or county will also require implementation of the soil management plan that includes a site restoration plan, describing how the solar-use easement land will be restored to the same general condition that existed at the time of approval of the solar-use easement once the easement has terminated.

*Public Resources Code Section 21060.1*

PRC Section 21060.1 defines agricultural land for the purposes of assessing environmental impacts using the FMMP. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides analysis of agricultural land use and land use changes throughout California.

**3.2.1.3 Local**

*Kern County General Plan*

The Kern County General Plan states that agriculture is vital to the future of Kern County and sets the goals of protecting important agricultural lands for future use and preventing the conversion of prime agricultural lands to other uses (e.g., industrial or residential). The Kern County General Plan includes three designations for agricultural land:

- 8.1 Intensive Agriculture (minimum parcel size 20 acres gross)—devoted to the production of irrigated crops or having potential for such use;

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

- 8.2 Resource Reserve (minimum parcel size 80 acres gross)—devoted to areas of mixed natural resource characteristics including rangeland; and,
- 8.3 Extensive Agriculture (minimum parcel size 20 acres gross except lands subject to a Williamson Act contract/Farmland Security Zone contract, in which case the minimum parcel size shall be 80 acres gross)—devoted to uses involving large amounts of land with relatively low value-per-acre yields such as livestock grazing, dry-land farming, and woodlands.

The policies, goals, and implementation measures in the Kern County General Plan for agricultural resources applicable to the project are provided below.

Chapter 1. Land Use, Open Space, and Conservation Element

1.9 Resource (pages 52 through 57)

Goal 1. To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.

Goal 2. Protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Goal 5. Conserve prime agriculture lands from premature conversion.

Policy 1. Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation.

Policy 12. Areas identified by the Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service) as having high range-site value should be conserved for Extensive Agriculture uses or as Resource Reserve, if located within a County water district.

Chapter 5. Energy (page 209)

5.4.5 Solar Energy Development

Goal. Encourage safe and orderly commercial solar development

Policy 1. The County shall encourage domestic and commercial solar energy uses to conserve fossil fuel and improve air quality.

Policy 3. The County should permit solar energy development in the desert and valley planning regions that does not pose significant environmental or public health and safety hazards.

Policy 4. The County should encourage solar development in the desert and valley regions previously disturbed, and discourage development of energy projects on undisturbed land supporting State or federally protected plant and wildlife species.

### *Kern County Zoning Ordinance*

The Kern County Zoning Ordinance establishes the basic regulations under which land is developed. This includes allowable uses, building setback requirements, and development standards. Pursuant to State law, the zoning ordinance must be consistent with the Kern County General Plan. The basic intent of the Kern County Zoning Ordinance is to promote and protect the public health, safety, and welfare via the orderly regulation of land uses throughout the unincorporated area of the County. This zoning code applies to all property in unincorporated Kern County, except land owned by the United States or any of its agencies.

### *Zoning Districts*

A description of the zoning district within the Covered Lands is provided below:

Exclusive Agriculture (A): The purpose of an A zone is to designate areas suitable for agricultural uses to prevent the encroachment of incompatible uses onto agricultural lands and premature conversion of such lands to nonagricultural uses. Allowable land uses within the A zone are set forth in Sections 19.12.020 and 19.12.030 of the Kern County Code and include those associated with growing and harvesting of crops, breeding and raising animals, agricultural industries, residential uses to house farm workers or the landowner, Christmas tree farms, utility corridors, resource extraction, waste facilities, institutional/educational uses, and various miscellaneous uses such as animal shelters and clubs. Solar facilities are permitted on properties zoned for exclusive agricultural use with approval of a conditional use permit (CUP).

### *Williamson Act Standard Uniform Rules*

The County of Kern has adopted a set of Agricultural Preserve Standard Uniform Rules that identify land uses that are considered compatible uses within agricultural preserves established under the Williamson Act. These rules are designed to restrict the uses of land enrolled in a Williamson Act contract to agriculture or other compatible uses. Agricultural uses include crop cultivation, grazing operations, commercial wind farms, livestock breeding, dairies, and uses that are incidental to agricultural uses. Other compatible uses include the erection of gas, electric, communications, water, and other similar public utilities.

### **3.2.2 Environmental Setting**

#### **3.2.2.1 State**

In 2010, the State of California contained 25.4 million acres of land that were dedicated to farm and ranch use, with 81,700 farms in operation at the time. This number represents less than 4 percent of the nation's total farming operations. However, these farms account for approximately 12.3 percent of the national gross cash receipts from crops and 6.5 percent of the receipts from livestock and livestock products, representing \$34.8 billion in revenue.

The California Department of Food and Agriculture (CDFA) reported in its 2010-2011 Resource Directory that the average farm size in California is 311 acres. Approximately 400 crops are grown in the State, including seeds, flowers, and ornamentals. California's top 20 crop and livestock commodities were valued at more than \$27.3 billion in 2009.

#### *State Farmland Conversions*

According to the DOC's most recent Farmland Conversion Report, irrigated farmland in California decreased by more than 317 square miles (203,011 acres) between 2006 and 2008. The 203,011-acre net loss in irrigated land in 2008 was 30 percent higher than the 2006 total. The highest-quality agricultural soils, known as Prime Farmland, comprised 49 percent of the decrease (98,471 acres). Urban land increased by 72,548 acres, a 29 percent decrease relative to the 2004-2006 reporting period. This was the lowest urbanization rate since the late 1990s, reflecting the onset of the recent economic recession. Long-term land idling was the largest factor contributing to irrigated land decreases, primarily in the San Joaquin Valley, where the net decrease tallied 129,788 acres or 64 percent of the net loss. The south Valley counties of Fresno, Kings, and Kern absorbed most of the loss. Agreements to idle land within Westlands Water District (in Fresno and Kings Counties) and water distribution issues affecting the Sacramento-San Joaquin Delta have the potential to accelerate this trend.

During the 12 biennial reporting cycles since FMMP was established, more than 1.3 million acres of agricultural land in California were converted to nonagricultural purposes. This represents a rate of about one square mile every four days.

Statewide, nearly 79 percent of this land was urbanized, while 19 percent became one of the miscellaneous land uses grouped into the Other Land category. Less than two percent of the conversion represents new water bodies—primarily Diamond Valley Lake, Lake Sonoma, and Los Vaqueros Reservoir (in Riverside, Sonoma, and Contra Costa counties, respectively) or flooding of San Joaquin Delta islands for habitat (Contra Costa and Solano counties). The largest losses from agricultural land categories have been from Prime Farmland and Grazing Land (559,743 and 386,525 acres, respectively). Urbanization at the periphery of California

cities, many of which are located in agricultural valleys and coastal zones, is the primary reason these categories are most affected. Unique Farmland showed a small net increase over the 24-year period (19,279 acres) due to expansion of high value crops—mostly orchards and vineyards—on hilly terrain.

### **3.2.2.2 Kern County**

Agriculture in Kern County makes a significant contribution to the economy of California. Kern County has consistently maintained its position as one of the top five agricultural economies in the state since 2005. In 2011, Kern County was the fourth-largest producer of agricultural products in California, with agricultural production valued at \$5.36 billion.

According to the 2011 Agricultural Crop Report prepared by the Kern County Agricultural Commissioner's Office, there are approximately 2.35 million acres of farmland in Kern County, of which approximately 874,559 acres were harvested in 2011. Kern County produces more than 250 different crops, including more than 30 types of fruits and nuts, 40 types of vegetables, and 20 field crops, as well as lumber, nursery stock, livestock, poultry, and dairy products.

#### *Local Farmland Conversions*

Kern County ranks high on the list of California counties with respect to urbanization and loss of farmland. From 2006 to 2008, 34,762 acres of important farmland and 51,410 acres of agricultural land were converted to another use, while from 2008 to 2010, 28,753 acres of Important Farmland and a total of 32,866 acres of agricultural lands were converted to another use. Overall, there was a 5.0 percent decrease in Important Farmland acreage between 2006 and 2010. The loss of acreage, coupled with unfavorable market prices, resulted in a decrease in value for crop categories such as fruits and nuts, nursery and seed crops, and livestock and poultry products in the County for 2008. The conversion of agricultural land to urban uses is affected by other factors. Actual production is dependent on commodity prices, water prices and supply, labor, proximity of processing and distribution facilities, and pest management. Factors outside the United States, such as weather, trade agreements, and labor disputes, can also affect decisions regarding what crops are grown and which lands go in and out of production. According to the DOC's California Land Conservation (Williamson) Act 2010 Status Report, a large number of property owners decided not to renew contracted acreage, which contributed to a loss of 14,009 acres of prime and non-prime property.

Also, in 2008 the factors that affected the decrease in value of crop production and the loss of acreage were somewhat mitigated by 2010. According to the 2011 Agricultural Crop Report, total permanent acres in agriculture increased from 2010 to 2011 by 21,722 acres (5.6 percent), while productive or bearing acres increased in 2011 from 2010 by 23,300 acres (6.26 percent).

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

**3.2.2.3 Covered Lands**

The Covered Lands include approximately 5,784 acres of nearly flat land, some of which were previously cultivated for agricultural production. The land in the immediate vicinity of the Covered Lands is cultivated and uncultivated farmland, industrial, residential, and a vacant mineral resource area. The Covered Lands have the following land use designations in the Kern County General Plan: 8.1 (Intensive Agriculture); 8.1/2.5 (Intensive Agriculture/Flood Hazard); 8.3/2.5 (Extensive Agriculture/Flood Hazard); 8.5/2.5 (Resource Management/Flood Hazard); and 8.1/2.3 (Intensive Agriculture/Shallow Groundwater). The Covered Lands are zoned A (Exclusive Agriculture) or A-1 (Limited Agriculture) by the Kern County Zoning Ordinance.

The Covered Lands are designated under the FMMP as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Grazing Land, and a small amount of Vacant or Disturbed Land and Nonagricultural and Natural Vegetation. Farmland designations are determined by a number of factors, including aerial photography and comment letters, GIS data, and field verification. In order for farmlands to be considered as “Prime” they must receive irrigation, meet soil classification requirements, and have been farmed within four years of the latest FMMP date (2010). Portions of three parcels of land adjacent to the Covered Lands are under cultivation of almond and cherry orchards, using allocated irrigation water. However, none of the Covered Lands receive irrigation water, as water in that vicinity is allocated to other parcels with planted acreage. The Covered Lands have not been farmed for at least 10 years and would not be farmed in the foreseeable future because of the lack of a developed, dependable irrigation water supply. Consequently, the lack of water for crop irrigation limits the potential agricultural productivity of the land, and the cultivation of crops is infeasible.

Additionally, soils and water play an important role in agricultural production in the vicinity of the Covered Lands. The Covered Lands are not irrigated, and the soils, according to the Class 7 description (see Table 3.2-1), “have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife habitat.” Therefore, the “farmlands” do not meet the NRCS criteria for Prime farmlands.

The Covered Lands are within the boundaries of Agricultural Preserve No. 12. The Project site was granted a certificate of cancellation of the Williamson Act land use contracts (Resolution No. 2011-078) by the Kern County Board of Supervisors on March 29, 2011 (County of Kern 2010). The landowner plans to pay associated taxes, fees, and penalties to complete the cancellation process.

*Land Capability Classification*

Irrigation and the availability of water play a major role in the success of agricultural production. However, in addition to water availability, another limitation on agriculture is the buildup of harmful salts in the soil.

The Land Capability Classification System is used by the NRCS to determine a soil’s agricultural productivity. The Land Capability Classification indicates the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops and the way they respond to management. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). The “prime” soil classification indicates the absence of soil limitations, which if present, would require the application of management techniques (e.g., drainage, leeching, special fertilizing practices) to enhance production. Specific subclasses are also utilized to further characterize soils. A general description of soil classifications, as defined by NRCS, is provided below in Table 3.2-1.

**Table 3.2-1**  
**Land Capability Classification**

<b>Soil Classification</b>	<b>Description</b>
1	Soils have few limitations that restrict their use.
2	Soils have moderate limitations that reduce the choice of plants, or that require special conservation practices.
3	Soils have severe limitations that reduce the choice of plants, require conservation practices, or both.
4	Soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
5	Soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use largely to pastures or range, woodland, or wildlife habitat.
6	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, or range, woodland, or wildlife habitat.
7	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife habitat.
8	Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, or water supply, or to aesthetic purposes.

Source: United States Department of Agriculture, NRCS, National Soil Survey Handbook Part 622, (2013).

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

The majority of the Covered Lands are made up of a soil mix of Cerini and Excelsior loam (approximately 75 percent), while the remaining 25 percent of the site area is a blend of sandy loams. Soils are described individually below:

**Calflax Loam, 0 to 1 percent slopes (Soil No. 132).** Calflax loam is the most commonly occurring soil, accounting for about 33 percent of the soils surveyed for all Covered Lands. Calflax loam is classified as a well-drained soil that generally occurs in fan skirt landforms formed from alluvium derived from mixed mineralogy rock and typically includes slopes ranging from 0 to 1 percent. Calflax loam includes loam within the first 6 inches of the surface, underlain by about 2.5 feet of stratified clay loam, followed by a mix of sandy loam and loam soils. The soil is well drained, available water capacity is moderate, percolation rates are slow, and the threat of flooding is low. Plasticity index for Calflax loam ranges from 6–29, which indicates low to moderate plasticity. These soils are in NRCS capability Class 2 irrigated (moderate limitations that restrict their use or require moderate conservation practices in order to be used for cultivation) and capability Class 7 non-irrigated.

**Cerini Loam, 0 to 2 percent slopes (Soil No. 132).** Cerini loam is classified as a well-drained soil and generally occurs in alluvial fans. The Cerini loam is formed from alluvium derived from granitoid rock and typically includes slopes ranging for 0 to 2 percent. Cerini loam is made of loams within the first two feet, followed by stratified fine sandy loam to silty clay loam for another two feet, underlain by another two feet of stratified sandy loam to sandy clay loam. The soil is well-drained, available water capacity is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Cerini loam ranges from 20–50, which indicates moderate to high plasticity. These soils are in NRCS capability Class 2 irrigated (moderate limitations that restrict their use or require moderate conservation practices in order to be used for cultivation) and capability Class 7 non-irrigated.

**Excelsior Sandy Loam, saline-sodic, 0 to 2 percent slopes (Soil No. 150).** The excelsior sandy loam consists of well-drained soil and generally occurs in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from sedimentary rock and generally includes fine sandy loam and sandy loam within the first 2 feet of soil, underlain by stratified fine sandy loam to silt loam mixed with fine sandy loam. Available water capacity for excelsior sandy loam is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Excelsior sandy loam ranges from 0–31, which is considered a moderate to high risk, and indicates low to high plasticity. These soils are in NRCS capability Class 2 irrigated and capability Class 7 non-irrigated.

**Excelsior Fine Sandy Loam, saline-sodic, 0 to 1 percent slopes (Soil No. 151).** The Excelsior fine sandy loam consists of well-drained soil and generally occurs in fan skirt landforms in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from

sedimentary rock and generally includes fine sandy loam and sandy loam within the first two feet of soil, underlain by stratified fine sandy loam to silt loam mixed with fine sandy loam. Available water capacity for excelsior fine sandy loam is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Excelsior fine sandy loam ranges from 0–33, which indicates low to high plasticity. These soils are in NRCS capability Class 2 irrigated and capability Class 7 non-irrigated

**Excelsior Loam, saline-sodic, 0 to 2 percent slopes (Soil No. 152).** The Excelsior loam consists of well-drained soil and generally occurs in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from sedimentary rock and generally includes loam and sandy loam within the first two feet of soil, underlain by stratified fine sandy loam to silt loam. Available water capacity for Excelsior sandy loam is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Excelsior loam ranges from 0–33, which indicates low to high plasticity. These soils are in NRCS capability Class 2 irrigated and capability Class 7 non-irrigated.

**Fages Clay, 0 to 1 percent slopes (Soil No. 160).** The Fages clay consists of moderately well-drained soils and generally is found near the south and west sides of Buena Vista Lake Bed in the south end of the San Joaquin Valley. The soil type is formed from lacustrine deposits over alluvium derived from rocks of mixed mineralogy and generally includes clays within the first four feet of soil, underlain by silty clay, loam, and clay loam. Available water capacity is very low, percolation rates are slow, and annual flooding is rare. Plasticity index for Fages clay ranges from 19–67, which indicates moderate to high plasticity. These soils are in NRCS capability Class 4 irrigated (very severe limitations that restrict their use or require very careful management in order to be used for cultivation) and capability Class 7 non-irrigated. These soils are in NRCS capability Class 4 irrigated (very severe limitations that restrict their use or require very careful management in order to be used for cultivation) and capability Class 7 non-irrigated.

**Posochanet Silt Loam, saline-sodic, 0 to 1 percent slopes (Soil No. 350).** Posochanet silt loam accounts for 33 percent of the soils in the Covered Lands. This soil type is a moderately well-drained soil and is found south of the Kern River near the edge of the Buena Vista Lake Bed in the south end of the San Joaquin Valley. The soil type is formed from alluvium derived from granitoid and/or sedimentary rock and generally includes a mixture of silt loam, silt clay loam, and clay loams. Available water capacity is moderate, annual flooding is considered rare, and percolation rates are slow. The plasticity index for Posochanet silt clay loam ranges from 20–61, which indicates moderate to high plasticity. These soils are in NRCS capability Class 2 irrigated and capability Class 7 non-irrigated.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.2 Agriculture**

---

**Posochanet Silty Clay Loam, saline-sodic, 0 to 1 percent slopes.** Posochanet silty clay loam occurs in very small amounts within the Covered Lands. See the discussion for Posochanet Silt Loam, above.

### **3.3 AIR QUALITY AND GREENHOUSE GAS**

This section addresses existing air quality and greenhouse gas conditions as well as regulation and primary sources of air pollution applicable to Covered Lands and the air basin.

#### **3.3.1 Regulatory Setting**

Air pollutants in California are regulated at the national, state, and air basin level. The U.S. Environmental Protection Agency (EPA) regulates at a national level, while California Air Resources Board (CARB) regulates at a state level, and the San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates at an air basin level. Applicable ambient air quality standards administered by these agencies are described in Section 3.3.2.

Each of these agencies develops rules and/or regulations to attain compliance with applicable federal and state air quality goals and other statutory requirements. Generally, EPA regulations establish minimum requirements, and state and local regulations may be more stringent. In California, mobile sources of air pollutants (e.g., cars and trucks) are largely controlled through U.S. EPA and CARB, while most stationary sources are regulated by local air districts (i.e., SJVAPCD). The Covered Lands are subject to air quality regulations developed and implemented at the federal, State, and local levels. Plans, policies, and regulations that are relevant to the alternatives evaluated in this EIS are discussed next.

##### **3.3.1.1 National Ambient Air Quality Standards**

The EPA is responsible for implementation of the federal Clean Air Act (CAA). Some portions of the CAA (e.g., certain mobile source requirements) are implemented directly by the EPA, while others (i.e., stationary source requirements) are applied through delegation of authority to state and local agencies. The CAA establishes federal air quality standards, known as National Ambient Air Quality Standards (NAAQS), for designated pollutants as described below, specifies dates for achieving compliance with these standards, and regulates various categories of hazardous air pollutants. The CAA also mandates that the state submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. In 1990, amendments to the CAA identified specific emission-reduction goals for basins not meeting the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment of emission-reduction goals and incorporation of additional sanctions for failure to attain or to meet interim milestones.

The federal action addressed in this EIS is issuance of a Federal Endangered Species Act 10(a)(1)(B) permit for take authorization of Covered Species as a result of the Proposed Action.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

This federal action would result in emissions of criteria pollutants. Thus, a conformity determination is required for this federal action.

**3.3.1.2 State Ambient Air Quality**

CARB is a California agency responsible for coordination and administration of both State and federal air pollution control programs within the state. A key function of CARB is to coordinate and guide regional and local air quality planning efforts required by the California Clean Air Act (CCAA) and to prepare and submit the SIP to the EPA. CARB also establishes emission standards for motor vehicles. The CAA allows California to adopt more stringent vehicle emission standards than the rest of the nation due to the state's severe ozone nonattainment status. Other portions (e.g., stationary source requirements) of the federal CAA are implemented through delegation of authority to local and regional agencies and through federally approved SIPs. The CCAA requires all areas of the state to achieve and maintain the CAAQS by the earliest practical date. The CAAQS incorporate additional standards for most of the criteria pollutants and include set standards for other pollutants recognized by the state.

**3.3.1.3 San Joaquin Valley Air Pollution Control District**

The SJVAPCD is responsible for controlling emissions primarily from stationary sources in the San Joaquin Valley Air Basin (SJVAB). In coordination with the eight countywide transportation agencies, the SJVAPCD is also responsible for developing, updating, and implementing air quality attainment plans for the SJVAB. The GAMAQI sets forth recommended thresholds of significance, analysis methodologies, and provides guidance on mitigating significant impacts. In order to comply with regulatory requirements, attainment plans to achieve state and federal air quality standards have been adopted. The SJVAPCD must monitor its progress in implementing attainment plans and must periodically report to CARB and the U.S. EPA. Implementing air quality plans and policies occurs through adoption and enforcement of rules and regulations. The SJVAB is in nonattainment for federal ozone and particulate matter (PM<sub>2.5</sub>), which means that concentrations of those pollutants currently exceed the NAAQS. The SJVAB is in nonattainment of state ambient air quality standards for ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>.

**3.3.1.4 Local**

*Kern County General Plan*

The Kern County General Plan includes goals and policies applicable to the project. Regulation presented in the General Plan, which is applicable to air quality is included in the Land Use, Open Space, and Conservation Element. The following relevant policies are contained in Section 1.10.2 Air Quality (page 65):

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

Policy 18. The air quality implications of new discretionary land use proposals shall be considered in approval of major developments. Special emphasis will be placed on minimizing air quality degradation in the desert to enable effective military operations and in the valley region to meet attainment goals.

Policy 19. In considering discretionary projects for which an Environmental Impact Report must be prepared pursuant to the California Environmental Quality Act, the appropriate decision making body, as part of its deliberations, will ensure that:

- (a) All feasible mitigation to reduce significant adverse air quality impacts have been adopted; and
- (b) The benefits of the proposed project outweigh any unavoidable significant adverse effects on air quality found to exist after inclusion of all feasible mitigation. This finding shall be made in a statement of overriding considerations and shall be supported by factual evidence to the extent that such a statement is required pursuant to the California Environmental Quality Act.

Policy 20. The County shall include fugitive dust control measures as a requirement for discretionary projects and as required by the adopted rules and regulations of the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District on ministerial permits.

Policy 21. The County shall support air districts' efforts to reduce PM10 and PM2.5 emissions.

Policy 22. Kern County shall continue to work with the San Joaquin Valley Unified Air Pollution Control District and the Kern County Air Pollution Control District toward air quality attainment with federal, State, and local standards.

Policy 23. The County shall continue to implement the local government control measures in coordination with the Kern Council of Governments and the San Joaquin Valley Unified Air Pollution Control District.

Policy 24. Kern County shall consult with transit providers to determine project effects and ensure that impacts are mitigated.

*Federal and State Air Quality Standards*

Both the federal government and State of California have established ambient air quality standards for several different pollutants (Table 3.3-1). For some pollutants, separate standards

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

have been set for different periods of time (i.e., 1 hour, 8 hours, and 24 hours). Most standards have been set to protect public health. For some pollutants, standards have been based on other values, such as protection of crops, protection of materials, or avoidance of nuisance conditions.

**Table 3.3-1**  
**Federal and State Ambient Air Quality Standards**

Air Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O <sub>3</sub> )	1 hour	—	0.09 ppm
	8 hour	0.075 ppm	0.070 ppm
Respirable particulate matter (PM <sub>10</sub> )	24 hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	Mean	—	20 µg/m <sup>3</sup>
Fine particulate matter (PM <sub>2.5</sub> )	24 hour	35 µg/m <sup>3</sup>	—
	Mean	15.0 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
Carbon monoxide (CO)	1 hour	35 ppm	20 ppm
	8 hour	9 ppm	9.0 ppm
Nitrogen dioxide (NO <sub>2</sub> )	1 hour	188 µg/m <sup>3****</sup>	0.18 ppm
	Mean	0.053 ppm	0.030 ppm
Sulfur dioxide (SO <sub>2</sub> )	1 hour	—	0.25 ppm
	24 hour	0.14 ppm	0.04 ppm
	Mean*	0.030 ppm	—
Lead	30-day	—	1.5 µg/m <sup>3</sup>
	Rolling 3-month	0.15 µg/m <sup>3**</sup>	—
	Quarter	1.5 µg/m <sup>3</sup>	—
Sulfates	24 hour	No Federal Standard	25 µg/m <sup>3</sup>
Hydrogen sulfide	1 hour		0.03 ppm
Vinyl chloride***	24 hour		0.01 ppm
Visibility-reducing particles	8 hour		Extinction coefficient of 0.23 per kilometer, visibility of 10 miles or more from particles when relative humidity is less than 70%.

Source: California Air Resources Board, 2010.

Notes: \* Mean = Annual Arithmetic Mean Abbreviations: ppm = parts per million, µg/m<sup>3</sup> = micrograms per cubic meter, 30-day = 30, day average, Quarter = Calendar quarter.

\*\* Federal lead standard, rolling 3-month average: final rule signed October 15, 2008.

\*\*\* CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

\*\*\*\* EPA set a new one-hour standard for nitrogen dioxide (NO<sub>2</sub>) at a level of 188 µg/m<sup>3</sup> or 100 parts per billion (ppb) on January 25, 2010, which will become effective April 12, 2010. EPA expects to identify or designate areas not meeting the new standard, based on the existing community-wide monitoring network, by January 2012.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Areas that do not meet the standards shown in Table 3.3-1 are classified as nonattainment areas in Table 3.3-2. Attainment areas are those with air quality that meets the relevant standards. The determination of whether an area meets a state and/or federal standard is based on air quality monitoring data collected and maintained by the air districts. Some areas are unclassified, which means no monitoring data are available. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standard and as nonattainment for the state standard for the same pollutant.

**Table 3.3-2**  
**San Joaquin Valley Air Basin Attainment Status**

Pollutant	Designation Status	
	Federal <sup>a</sup>	State <sup>b</sup>
Ozone – One Hour	No Federal Standard <sup>f</sup>	Nonattainment/Severe
Ozone – Eight Hour	Nonattainment/Extreme <sup>c</sup>	Nonattainment
PM <sub>10</sub>	Attainment <sup>c</sup>	Nonattainment
PM <sub>2.5</sub>	Nonattainment <sup>d</sup>	Nonattainment
Carbon monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen dioxide	Attainment/Unclassified <sup>e</sup>	Attainment
Sulfur dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Sulfates	No federal standards	Attainment
Hydrogen sulfide		Unclassified
Visibility-reducing particles		Unclassified
Vinyl Chloride		Attainment

Source: San Joaquin Valley Air Pollution Control District, 2011.

Notes: a See 40 CFR Part 81.

b See CCR Title 17 Sections 60200-60210.

c On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM<sub>10</sub> National Ambient Air Quality Standard (NAAQS) and approved the PM<sub>10</sub> Maintenance Plan.

d The Valley is designated nonattainment for the 1997 PM<sub>2.5</sub> NAAQS. EPA designated the Valley as nonattainment for the 2006 PM<sub>2.5</sub> NAAQS on November 13, 2009 (effective December 14, 2009).

e Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

f Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

g EPA set a new one-hour standard for nitrogen dioxide (NO<sub>2</sub>) at a level of 188 µg/m<sup>3</sup> or 100 parts per billion (ppb) on January 25, 2010, which will become effective April 12, 2010. EPA expects to identify or designate areas not meeting the new standard, based on the existing community-wide monitoring network, by January 2012.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

*Ambient Air Monitoring*

Ambient pollutant levels are monitored by both CARB and the SJVAPCD. Monitoring occurs at sampling stations which are set up in numerous locations around California. While some stations monitor for the same pollutant, others may keep track of one that is different. There are four monitoring stations in Kern County that measure the amounts of ozone, PM10, PM2.5, CO, and NOX. No data are available for SOX, lead (Pb), H2S, vinyl chloride, or other toxic air contaminants (TACs).

CARB and the SJVAPCD monitor air quality in Kern County through a network of eight monitoring stations. Monitoring stations on California Avenue in Bakersfield and in Edison and Oildale are all maintained by CARB. The SJVAPCD maintains the stations on Planz Road and US 99 in Bakersfield and Maricopa. The stations in Arvin and Shafter are operated jointly by CARB and the SJVAPCD.

Table 3.3-3 identifies the background concentrations for ozone, PM10, PM2.5, CO, and NOX. No data are available for SOX, lead (Pb), H2S, vinyl chloride, or other toxic air contaminants (TACs) in Kern County. Data for analysis of the proposed project relied on the CARB monitoring stations that are closest to the project site.

**Table 3.3-3**  
**Three Year Summary of Days Exceeding NAAQS and CAAQS Pollutant Standards**

Pollutant	Bakersfield — California Avenue			Bakersfield — US 99			Maricopa — Stanislaus Street			Oildale		
	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
Ozone 1-Hour (Number of Days Exceeding NAAQS (0.12 ppm))	0	0	1	0	1	0	0	0	0	0	0	0
Ozone 1-Hour (Number of Days Exceeding CAAQS (0.09 ppm) <sup>1</sup> )	52	4	15	15	1	9	4	3	2	38	11	23
Ozone 8-Hour (Number of Days Exceeding NAAQS (0.075))	79	25	40	38	14	18	45	23	20	70	41	49
Ozone 8-Hour (Number of Days Exceeding CAAQS (0.07 ppm))	104	49	60	62	26	30	64	47	40	87	74	81
PM <sub>10</sub> Days Exceeding NAAQS (50 µg/m <sup>3</sup> )	0	0	0	0	1	0	-	-	-	0	1	0
PM <sub>10</sub> Days Exceeding CAAQS (>50 µg/m <sup>3</sup> )	14	22	24	20	27	28	-	-	-	14	19	21
PM <sub>2.5</sub> Days Exceeding 24-hour NAAQS (65.5 µg/m <sup>3</sup> )	32	49	30	13	17	4	-	-	-	-	-	-
PM <sub>2.5</sub> Days Exceeding CAAQS (>50 µg/m <sup>3</sup> )	-	-	-	-	-	-	-	-	-	-	-	-

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Pollutant	Bakersfield — California Avenue			Bakersfield — US 99			Maricopa — Stanislaus Street			Oildale		
	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
CO Number of Days Exceeding 8-Hour NAAQS (>9.0 ppm)	0	0	0	-	-	-	-	-	-	-	-	-
CO Number of Days Exceeding 8-Hour CAAQS (>9.0 ppm)	0	0	0	-	-	-	-	-	-	-	-	-
Number of Days Exceeding CAAQS (0.25 ppm)	0	0	0	0	0	0		-	-	-	-	-

Source: California Air Resources Board, 2009.

Note: NAAQS = National Ambient Air Quality Standard; CAAQS = California Ambient Air Quality Standard.

Note: All numbers have been rounded. – is defined as not reported.

According to the results in Table 3.3-3, the NAAQS ozone 1-hour was exceeded for zero days between 2006 and 2008 at the Maricopa Stanislaus Street monitoring location which is closest to the proposed project site. However, at this same location, it exceeded CAAQS ozone 1-hour for 4 days during 2006, but has decrease over the next two years. Ozone 8-hour NAAQS and CAAQS were both exceeded at this location for all three years, but this pollutant has also decreased during 2007 and 2008. There was insufficient or no data available to determine results for SO<sub>x</sub> or lead.

### 3.3.1.5 Greenhouse Gas Regulatory Framework

#### *International and Federal*

On February 18, 2010, the CEQ released a draft guidance memorandum. Specifically, the document addresses two categories of climate change considerations that can arise from a proposed action before an agency: the effect of GHG emissions from the action on climate change, and the link between the action (or its alternatives) and the effects of climate change in relation to the Proposed Action’s design, environmental impacts, mitigation, and adaptation measures. Importantly, the draft guidance suggests that climate change analysis should only be conducted to the degree relevant to the decision at hand in terms of providing meaningful and useful information. This includes identifying a direct emissions threshold of 25,000 metric tons or more of CO<sub>2</sub>-equivalent GHG on an annual basis, as an “indicator” for projects where an assessment may be meaningful. International and federal agreements have been enacted to deal with climate change issues.

#### *California*

There have been significant legislative and regulatory activities that affect climate change and greenhouse gases in California. Relevant legislation is discussed next.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

Renewable Portfolio Standard: In 2002, SB 1078 required electric utilities to increase procurement of power generated by eligible renewable energy sources to 20 percent of total generation by 2017. In 2006, SB 107 accelerated the timetable to require 20 percent renewable energy by 2010. Then, in 2008, the Governor signed Executive Order S-14-08, which increased the required renewables content to 33 percent by 2020. In September 2009, the Governor signed Executive Order S-21-09, which directed the Air Resources Board to adopt regulations consistent with the 33 percent renewable energy target in Executive Order S-14-08 by July 31, 2010.

Title 24: Although it was not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The 2008 Standards went into effect January 1, 2010, and supersede the 2005 Standards. Projects that apply for a building permit on or after this date must comply with the 2008 Standards. Energy-efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

Executive Order S-3-05: California Governor Arnold Schwarzenegger signed Executive Order S 3 05 on June 1, 2005, which established the following reduction targets for greenhouse gas emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. To meet these targets, the Governor directed the Secretary of the California EPA to lead a Climate Action Team made up of representatives from the Business, Transportation, and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the CARB; the Energy Commission; and the Public Utilities Commission. The Climate Action Team's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

AB 32: In 2006, the California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. Assembly Bill 32 focuses on reducing greenhouse gas emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Assembly Bill 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. The CARB is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases.

SB 97: was passed in August 2007 and added Section 21083.05 to the Public Resources Code. The code states “(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a).” The SB 97 CEQA Guidelines Amendments were proposed in 2009 and took effect on March 18, 2010.

*Local*

The SJVAPCD has adopted the guidance document entitled: “Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA” and the policy document entitled: “District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency”. The guidance and policy documents rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA. Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency’s authority in establishing its own process and guidance for determining significance of project related impacts on global climate change. The guidance document, however, did not address determining significance for temporary greenhouse gas emissions, such as construction of the project.

**3.3.2 Environmental Setting**

The CARB has divided California into regional air basins according to topographic drainage features. The project site is located in the San Joaquin Valley Air Basin (SJVAB) and is under the jurisdiction of the SJVAPCD. The SJVAB, which is approximately 250 miles long and 35 miles wide (93,118 acres), is the second largest air basin in the State.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

**3.3.2.1 San Joaquin Valley Air Basin Characteristics**

*Regional Air Quality*

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal and, consequently, their effect on air quality. The combination of topography and inversion layers generally prevents dispersion of air pollutants in the SJVAB.

*Topography*

The SJVAB is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada mountains are along the eastern boundary (8,000 to 14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation). The mountains surrounding the SJVAB form natural horizontal barriers to the dispersion of air contaminants.

*Climate and Meteorology*

The SJVAB has an “inland Mediterranean” climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight is a catalyst in the formation of some air pollutants (such as ozone), and the Air Basin averages more than 260 sunny days per year. The SJVAB enjoys an inland Mediterranean climate, averaging more than 260 sunny days per year. The valley floor is characterized by warm, dry summers and cooler winters. Average daily temperatures in the basin range from a low of 41.7 Fahrenheit (°F) in December to a high of 98.7°F in July. Summer highs often exceed 100°F, averaging in the low 90s in the northern valley and high 90s to the south. Although the SJVAB enjoys a high percentage of sunshine, a reduction in sunshine occurs during December and January because of fog and intermittent stormy weather. Nearly 90 percent of the annual precipitation falls in the six months between October and May. Precipitation is low because the mountains to the west and south produce a rain shadow effect by intercepting prefrontal, moisture-laden western and southern winds. The southern valley receives precipitation primarily from cold, unstable, northwesterly flows that usually follow a frontal passage.

*Dominant Airflow*

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. Marine air moves into the SJVAB from the San Joaquin River Delta. The wind generally flows

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

south-southeast through the valley, through the Tehachapi Pass and into the Mojave Desert Air Basin portion of Kern County. As the wind moves through the SJVAB, it mixes with the air pollution generated locally, generally transporting air pollutants from the north to the south in the summer and in a reverse flow in the winter.

### *Inversions*

Inversions are also an important component of regional air quality. In general, air temperature decreases with distance from the earth's surface, creating a gradient from warmer air near the ground to cooler air at elevation. Under normal circumstances, the air close to the earth warms as it absorbs surface heat and begins to rise. Winds occur when cooler air rushes in to take the place of the rising warm air. The wind and upward movement of air causes "mixing" in the atmosphere and can carry away or dilute pollution. Inversions occur when a layer of warm air sits over cooler air, trapping the cooler air beneath. These inversions trap pollutants from dispersing vertically and the mountains surrounding the Air Basin trap the pollutants from dispersing horizontally. Strong temperature inversions occur throughout the Air Basin in the summer, fall, and winter. Daytime temperature inversions occur at elevations of 2,000 to 2,500 feet above the San Joaquin Valley floor during the summer and at 500 to 1,000 feet during the winter. The result is a relatively high concentration of air pollution in the valley during inversion episodes. These inversions cause haziness, which, in addition to moisture, may include suspended dust, a variety of emissions from vehicles, particulates from wood stoves, and other pollutants.

#### **3.3.2.2 Pollutants of Concern**

The criteria pollutants of greatest concern for the project area are ozone, PM10, and PM2.5. Although the SJVAB is in attainment of the federal and state carbon monoxide standards, carbon monoxide is a pollutant of concern, due to the potential for localized "hotspots" to occur. Other pollutants of concern are toxic air contaminants and greenhouse gases. The following provides a summary of the pollutants of concern in the area of the Covered Lands.

### *Ozone*

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NOx (ozone precursors are discussed below), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Often, the effects of emitted ROG and NOx are felt a distance downwind of the emission sources. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated \$500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

Ozone is a regional pollutant, as the reactions forming it take place over time, and it materializes downwind from the sources of the emissions. As a photochemical pollutant, ozone is formed only during daylight hours under appropriate conditions, but it is destroyed throughout the day and night. Thus, ozone concentrations vary, depending upon both the time of day and the location. Even in pristine areas, some ambient ozone forms from natural emissions that are not controllable. This is termed background ozone. The average background ozone concentrations near sea level are in the range of 0.015 to 0.035 parts per million (ppm), with a maximum of about 0.04 ppm.

#### *Reactive Organic Gases*

Reactive organic gases (ROG) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. ROG consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. It should be noted that there are no state or federal ambient air quality standards for ROG because they are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical

reactions that contribute to the formulation of ozone. ROG are also transformed into organic aerosols in the atmosphere, which contribute to higher PM10 levels and lower visibility.

Because ROG is an ozone precursor, the health effects associated with ROG emissions are due its role in ozone formation and, as discussed above, not due to direct effects.

### *Nitrogen Oxides*

During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO<sub>x</sub>. This occurs primarily in motor vehicle internal combustion engines, and fossil fuel-fired electric utility facilities and industrial boilers. The pollutant NO<sub>x</sub> is a concern because it is an ozone precursor, which means that it helps form ozone. When NO<sub>x</sub> and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight and heat to form ozone. NO<sub>x</sub> can also be a precursor to PM10 and PM2.5.

One of the most important health effects associated with NO<sub>x</sub> emissions is related to its role in ozone formation, as discussed above. Its role in the secondary formation of ammonium nitrate results in particulate health effects described in the next section. Nitrogen dioxide (NO<sub>2</sub>) is the largest and most important component of NO<sub>x</sub>. NO<sub>2</sub> acts mainly as an irritant affecting the mucosa of the eyes, nose, throat, and respiratory tract. Extremely high-dose exposure (as in a building fire) to NO<sub>2</sub> may result in pulmonary edema and diffuse lung injury. Continued exposure to high NO<sub>2</sub> levels can contribute to the development of acute or chronic bronchitis. Low level NO<sub>2</sub> exposure may cause increased bronchial reactivity in some asthmatics, decreased lung function in patients with chronic obstructive pulmonary disease and increased risk of respiratory infections, especially in young children.

### *Sulfur Dioxide*

Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides include SO<sub>2</sub> and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although SO<sub>2</sub> concentrations have been reduced to levels well below State and national standards, further reductions are desirable because SO<sub>2</sub> is a precursor to sulfate and PM<sub>10</sub>. Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO<sub>2</sub> levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

*Carbon Monoxide*

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. The health threat from relatively low levels of CO is most serious for those who suffer from such heart-related diseases as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

*Particulate Matter*

Particulate matter is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small that they can only be detected using an electron microscope.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers ( $\mu\text{m}$ ) in diameter pose the greatest problems, because they can get deep into lungs and the bloodstream. The United States Environmental Protection Agency (EPA) health standards have been established for two categories of particulate matter:

1. PM10 – “inhalable coarse particles” with diameters larger than 2.5 micrometers and smaller than 10 micrometers and
2. PM2.5 – “fine particles,” with diameters that are 2.5 micrometers and smaller. For reference, PM2.5 is approximately one-thirtieth the size of the average human hair.

Although the PM10 standard is intended to regulate “inhalable coarse particles” that ranged from 2.5 to 10 micrometers in diameter, PM10 measurements contain both fine and coarse particles. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the United States.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

### **3.3.2.3 Toxic Air Contaminants**

A toxic air contaminant is defined as an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. Toxic air contaminants are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those toxic air contaminants that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

---

health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

*Diesel Particulate Matter*

The CARB identified the PM emissions from diesel-fueled engines as a toxic air contaminant in August 1998 under California's toxic air contaminant program. In California, diesel engine exhaust has been identified as a carcinogen. Most researchers believe that diesel exhaust particles contribute the majority of the risk.

Both mobile and stationary sources emit DPM. In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report diesel PM emissions also include heavy construction (except highway) manufacturers of asphalt, paving materials and blocks, and electrical generation.

DPM is a subset of PM<sub>2.5</sub>—diesel particles are typically 2.5 microns and smaller. In a document published in 2002, the EPA noted that in 1998, diesel PM made up about 6 percent of the total PM<sub>2.5</sub> inventory nationwide. The chemical composition and particle sizes of DPM vary among different engine types (heavy-duty, light-duty), engine operating conditions (idling, accelerating, decelerating), expected load, engine emission controls, fuel formulations (high/low sulfur fuel), and engine year.

Some short-term (acute) health effects of diesel exhaust exposure include eye, nose, throat, and lung irritation, and exposure can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of ambient PM pollution in urban environments. In a 2002 report from the Office of Environmental Health Hazard Assessment (OEHHA) titled "Health Effects of Diesel Exhaust Report," it was noted that numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. The National Toxicology Program asserted that more serious, long-term health effects of diesel exhaust have demonstrated an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure in its 2005 Report on Carcinogens, Eleventh Edition.

*Valley Fever*

The following information was taken from the Centers for Disease Control (CDC) for Coccidioidomycosis (Valley Fever).

The CDC defines Valley Fever as:

*Coccidioides* is a fungus found in the soil of dry, low rainfall areas. It is endemic (native and common) in many areas of the southwestern United States, Mexico and, Central and South America. Coccidioidomycosis, also known as Valley Fever, is a common cause of pneumonia in endemic areas. At least 30% – 60% of people who live in an endemic region are exposed to the fungus at some point during their lives. In most people the infection will go away on its own, but for people who develop severe infections or chronic pneumonia, medical treatment is necessary. Certain groups of people are at higher risk of developing severe disease. It is difficult to avoid exposure to *Coccidioides*, but people who are at higher risk should try to avoid breathing in large amounts of dust if they are in endemic areas.

CDC defines Valley Fever symptoms as:

Most people who are exposed to the fungus do not develop symptoms, or have very mild flu-like symptoms that go away on their own. Some people may develop a more severe infection, especially those who have a weakened immune system, are of African-American or Filipino descent, or are pregnant in their third trimester.

Symptoms of coccidioidomycosis include:

- Fever
- Cough
- Headache
- Rash on upper trunk or extremities
- Muscle aches
- Joint pain in the knees or ankles

Symptoms of advanced coccidioidomycosis include:

- Skin lesions
- Chronic pneumonia
- Meningitis
- Bone or joint infection

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Symptoms of coccidioidomycosis may appear between 1 and 3 weeks after exposure to the fungus. Some patients have reported having symptoms for 6 months or longer, especially if the infection is not diagnosed right away. If the symptoms last for more than a week, a healthcare provider should be contacted (Centers for Disease Control and Prevention 2012).

Statistics on Valley Fever were recently released by the Kern County Public Health Department. Table 3.3-4 lists the top six cities with Valley Fever cases from 2007 to 2011.

**Table 3.3-4**  
**Kern County Coccidioidomycosis (Valley Fever) Cases by City**

<b>Table 6. Top Five Cities</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Taft Cases	32	17	19	114	154
1. Rate per 100,000	196.3	104.1	116.6	701.1	939.5
Wasco Cases	154	51	32	121	186
2. Rate per 100,000	624.3	203.3	125.6	477.5	728.2
Delano Cases	99	110	100	201	227
3. Rate per 100,000	246.9	269.6	242.8	483.9	542.2
Arvin Cases	34	16	2	54	65
4. Rate per 100,000	243.3	113.5	14.0	376.5	449.6
Lamont Cases	29	18	11	57	71
5. Rate per 100,000	150.5	93.1	56.8	294.3	363.6
Bakersfield Cases	757	557	299	1,292	1,727
6. Rate per 100,000	154.6	112.6	60.0	257.5	341.4

Source: Kern County Public Health Services Department, 2012.

According to the results in Table 3.3-4, in 2007 the greatest number of Valley Fever cases occurred in Bakersfield, followed by Wasco. A decline of the disease followed in 2008. In 2009, the decline continued. However, in 2010 there was a significant increase of cases occurring in Bakersfield, and in the cities of Taft, Wasco, and Delano. Increases continued through 2011 for all of these cities.

Currently there are no mandated federal, State, or Local regulations for addressing Valley Fever at the workplace. A brochure prepared by the Kern County Public Health Department states that studies are underway for methods on how to treat dust (Kern County Public Health Services Department, 2012). According to the “Epidemiologic summaries of Selected General Communicable Diseases in California, 2001-2008” the California Code of Regulations, Title 17, requires care providers to report all cases of Valley Fever to local health departments. Kern County has the highest incidence rates for the disease (California Department of Public Health 2011).

**3.3.2.4 Greenhouse Gases**

Gases that trap heat in the atmosphere are greenhouse gases. The effect is analogous to the way a greenhouse retains heat. Common greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit greenhouse gases. The presence of greenhouse gases in the atmosphere affects the earth’s temperature. Without the natural heat trapping effect of greenhouse gases, the earth’s surface would be about 34°C cooler. However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

The global warming potential is one type of simplified index based upon radiative properties that can be used to estimate the potential future impacts of emissions of different gases upon the climate system in a relative sense. Global warming potential is based on a number of factors, including the radiative efficiency (heat-absorbing ability) of each gas relative to that of carbon dioxide, as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of carbon dioxide.

The U.S. EPA defines global warming potential as the “cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas,” the reference gas in this case being CO<sub>2</sub>.

The global warming potential of a gas is essentially a measurement of the greenhouse gas compared with the reference gas, carbon dioxide; carbon dioxide has a global warming potential of one. The greenhouse gases of concern from the project are summarized in Table 3.3-5.

**Table 3.3-5**  
**Greenhouse Gases**

Greenhouse Gas	Description and Physical Properties	Sources
Water vapor	Water vapor is the most abundant, important, and variable greenhouse gas. In the atmosphere, it maintains the climate necessary for life.	Sources include evaporation from the ocean and other water bodies, sublimation of ice and snow, and transpiration from plants.
Ozone (O <sub>3</sub> )	Ozone is a short-lived local greenhouse gas and photochemical pollutant. Tropospheric ozone changes contribute to radiative forcing on a global scale. Global warming potential for short-lived greenhouse gases, such as ozone and aerosols, are not defined by the IPCC.	Ozone is formed from reactions of ozone precursors (nitrogen oxides [NO <sub>x</sub> ] and volatile organic compounds [VOC]) and sunlight in the atmosphere. VOC and NO <sub>x</sub> are emitted from automobiles, solvents, and fuel combustion.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Greenhouse Gas	Description and Physical Properties	Sources
Aerosols	<p>Aerosols are particulate matter suspended in the air. They are short-lived and remain in the atmosphere for about a week. Aerosols warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light, with radiative forcing cooling effects of <math>-1.2 \text{ Wm}^{-2}</math>. There is a low scientific understanding of the radiative forcing of individual aerosols, such as black carbon.</p> <p>Black carbon can cause warming from deposition on snow (<math>+0.1 \text{ Wm}^{-2}</math>) and from suspensions in air (<math>+0.2 \text{ Wm}^{-2}</math>). A global warming potential of 761 for black carbon has been identified in a journal article. Global cooling potentials for other aerosols in a metric similar to the global warming potential are not available.</p>	Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning and incomplete combustion of fossil fuels (such as diesel fuel).
Methane (CH <sub>4</sub> )	<p>Methane is a flammable gas and is the main component of natural gas. Global warming potential = 21.            Atmospheric lifetime = 12 (<math>\pm 3</math>) years</p>	A natural source of methane is from the anaerobic decay of organic matter. Methane is extracted from geological deposits (natural gas fields). Other sources are from landfills, fermentation of manure, and cattle.
Nitrous oxide (N <sub>2</sub> O)	<p>Nitrous oxide is a colorless greenhouse gas. Global warming potential = 310.            Atmospheric lifetime = 120 years</p>	Microbial processes in soil and water, fuel combustion, and industrial processes.
Carbon dioxide (CO <sub>2</sub> )	<p>Carbon dioxide is an odorless, colorless, natural greenhouse gas. Global warming potential = 1.            Atmospheric lifetime = 50 – 200 years.</p>	Carbon dioxide is emitted from natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. The concentration in 2005 was 379 ppm, which is an increase of about 1.4 ppm per year since 1960.
Chlorofluorocarbons (CFCs)	<p>CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.</p>	CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, the Montreal Protocol on Substances that Deplete the Ozone Layer stopped their production in 1987.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Greenhouse Gas	Description and Physical Properties	Sources
Hydrofluorocarbons (HFCs)	The HFCs with the largest measured atmospheric concentrations are HFC-23 and HFC-134a (10 ppt) and HFC-152a (1 ppt). Global warming potentials: HFC-23 = 11,700, HFC-134a = 1,300, HFC-152a = 140. HFC-23 has an atmospheric lifetime of 264 years. HFC-124a has an atmospheric lifetime of 14.6 years. HFC-152a has an atmospheric lifetime of 1.5 years.	HFCs are synthetic chemicals that are used as a substitute for CFCs in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons (PFCs)	PFCs have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of PFCs are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. Concentrations in the 1990s were about 4 ppt. It has the highest global warming potential of any gas evaluated, 23,900. The atmospheric lifetime of sulfur hexafluoride is 3,200 years.	It is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.

Source: United States Environmental Protection Agency, 2011.

Note: ppm = parts per million; ppt = parts per trillion (measure of concentration in the atmosphere).

***Kern County Emissions Inventories***

Following completion of its 1990 and 2020 GHG inventory, the CARB identified that the state will need to reduce GHG emissions by approximately 30 percent from business-as usual by 2020 to achieve AB 32 2020 target. At that time, the agency recommended that cities and counties adopt a similar GHG reduction goal. In response to reducing transportation emissions which account for 38% of GHG emissions in California, Senate Bill 375 was adopted. This bill requires Metropolitan Planning Organizations (MPOs) to reduce GHG emissions, from the 2005 base year, to targets of 7% to 8% in 2020, and between 13% to 16% in 2035. The MPOs will address how they will achieve these targets in a Sustainable Communities Strategy by identifying strategies to reduce vehicle miles traveled (VMT). If the agencies are not able to achieve the targets, then they will have to provide an Alternative Planning Strategy to identify other land use planning methods that would reduce VMT. Since local agencies have the final say on land use development, cooperation between regional and local agencies will be essential (Garner et al., 2012).

In May of 2012, the SJVAPCD completed GHG inventories for the County of Kern with a baseline year of 2005 and a forecast year of 2020. The County's inventory serves two purposes: (1) "To create an emissions baseline against which your jurisdiction can set emissions reduction targets and measure future progress" and (2) "To provide insight into the scale of emissions from

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

the various sources within the community, underpinning informed and strategic emissions reductions, commonly called “climate action planning”.

Table 3.3-6 lists the GHG emissions inventories for nine primary sectors which include the following: Electricity Production and Consumption, Residential/Commercial/Industrial Combustion, Transportation, Fossil Fuels Industry, Industrial Processes, Waste Management, Agriculture, Forestry and Land Use, and Other Sources. Under each primary sector is a breakdown of the subsectors that contribute to MT of CO<sub>2</sub><sup>e</sup> for base year 2005 and forecast year 2020. This is followed by the projected increase or decrease for each source after the base year is deducted from the forecast year. According to the report, heavy oil production is predicted to decrease which will offset the projected increase of GHG emissions that are related to population increase (San Joaquin Valley Air Pollution Control District 2012).

**Table 3.3-6**  
**Kern County 2005 Base Year and 2020 Forecasted Year by Sector and Subsector**

Sector Name and Subsector ID			MT of CO <sub>2</sub> <sup>e</sup>		Increase/Decrease 2005 to 2020	
			2005	2020	MT of CO <sub>2</sub> <sup>e</sup>	Percent
Total County*			27,045,617	27,272,709	227,092	0.8%
<b>Electricity**</b>			<b>6,039,114</b>	<b>8,572,261</b>	<b>2,533,147</b>	<b>41.9%</b>
1.	In-County Electricity Production***		13,002,127	18,455,958	5,453,831	41.9%
	a.	Coal/Coke	1,017,625	1,444,475	426,850	41.9%
	b.	Natural Gas	11,974,819	16,997,739	5,022,920	41.9%
	c.	Petroleum	0	0	0	0 0.0%
	d.	Waste/Biogas	9,683	13,744	4061	41.9%
	e.	Renewable	0	0	0	0 0.0%
2.	In-County Electricity Consumption		6,039,114	8,572,261	2,533,147	41.9%
<b>Residential/Commercial/Industrial Combustion</b>			<b>1,281,498</b>	<b>1,689,414</b>	<b>407,916</b>	<b>31.8%</b>
1.	Residential					
	a.	Coal/Coke	85	121	36	42.4%
	b.	Natural Gas	517,238	734,197	216,959	41.9%
	c.	Oil	421	598	177	42.0%
	d.	Wood	1,350	1,435	85	6.3%
	e.	LPG	51,863	73,617	21,754	41.9%
	f.	Kerosene	787	1,117	330	41.9%
2.	Commercial					
	a.	Coal/Coke	462	634	172	37.2%
	b.	Natural Gas	304,138	417,246	113,108	37.2%
	c.	Oil	10,249	14,061	3,812	37.2%
	d.	Wood	63	86	23	36.5%
	e.	LPG	7,300	10,015	2,715	37.2%
3.	Industrial					
	a.	Coal/Coke	66,723	75,115	8,392	12.6%
	b.	Natural Gas	212,590	239,329	26,739	12.6%

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Sector Name and Subsector ID			MT of CO <sub>2</sub> e		Increase/Decrease 2005 to 2020	
			2005	2020	MT of CO <sub>2</sub> <sup>e</sup>	Percent
	c.	Oil	92,836	104,513	11,677	12.6%
	d.	Wood	998	1,124	126	12.6%
	e.	LPG	14,395	16,206	1,811	12.6%
<b>Transportation</b>			<b>4,569,913</b>	<b>4,823,756</b>	<b>253,843</b>	<b>5.6%</b>
1.	On-road Gasoline		2,169,003	2,082,460	-86,543	-4.0%
2.	On-road Diesel		2,037,828	2,291,179	253,351	12.4%
3.	Off-road Gasoline		34,578	44,174	9,596	27.8%
4.	Off-road Diesel		See B.1.c, B.2.c, B.3.c (refer to entire report)			
5.	On-road CNG		30,130	40,412	10,282	34.1%
6.	On-road LPG		5,472	7,339	1,867	34.1%
7.	Marine Vessels/Water Craft		21,879	27,951	6,072	27.8%
8.	Rail		169,150	185,637	16,487	9.7%
9.	Airports		101,873	144,604	42,731	41.9%
<b>Fossil Fuels Industry</b>			<b>10,928,153</b>	<b>7,002,009</b>	<b>-3,926,144</b>	<b>-35.9%</b>
1.	Oil & Gas Industry - Refining					
	a.	Natural gas & waste gas	9,031,180	5,685,541	-3,345,639	-37.0%
	b.	Residual oil	361	227	-134	-37.1%
	c.	LPG	115	72	-43	-37.4%
2.	Fugitives - Oil & Gas Refining		1,263,434	829,832	-433,602	-34.3%
3.	Venting - Petroleum Production		429,036	288,986	-140,050	-32.6%
4.	Fugitives - Natural Gas Transmission/Distribution		87,234	123,825	36,591	41.9%
5.	Refining Processes		116,793	73,526	-43,267	-37.0%
<b>Industrial Processes</b>			<b>1,852,124</b>	<b>2,348,754</b>	<b>496,630</b>	<b>26.8%</b>
1.	Cement Manufacturing		1,503,630	1,854,082	350,452	23.3%
2.	Lime Manufacturing		0	0	0	0.0%
3.	Semiconductor Manufacturing		0	0	0	0.0%
4.	Substitutes for Ozone Depleting Substances		261,351	370,976	109,625	41.9%
5.	SF6 from Electrical Distribution and Transmission		59,128	83,930	24,802	41.9%
6.	CO <sub>2</sub> Consumption		3,337	4,737	1,400	42.0%
7.	Limestone & Dolomite Consumption		18,179	25,804	7,625	41.9%
8.	Soda Ash Consumption		6,499	9,225	2,726	41.9%
9.	Hydrogen Production		0	0	0	0.0%
10.	Coal Mining Operations		0	0	0	0.0%
<b>Waste Management</b>			<b>120,494</b>	<b>146,788</b>	<b>26,294</b>	<b>21.8%</b>
1.	Landfills		60,509	71,845	11,336	18.7%
2.	Wastewater Management		59,985	74,943	14,958	24.9%
<b>Agriculture***</b>			<b>2,024,470</b>	<b>2,652,616</b>	<b>628,146</b>	<b>31.0%</b>
1.	Fuel Combustion		74,511	69,751	-4,760	-6.4%
2.	Enteric Fermentation		633,214	866,165	232,951	36.8%
3.	Manure Management		741,173	1,107,528	366,355	49.4%
4.	Ag Burning		2,306	2,159	-147	-6.4%

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.3 Air Quality and Greenhouse Gas**

Sector Name and Subsector ID		MT of CO <sub>2</sub> e		Increase/Decrease 2005 to 2020	
		2005	2020	MT of CO <sub>2</sub> <sup>e</sup>	Percent
5.	Ag Soils - Livestock	186,310	244,778	58,468	31.4%
6.	Ag Soils - Liming	3,777	3,536	-241	-6.4%
7.	Ag Soils - Fertilizer	241,509	226,080	-15,429	-6.4%
8.	Ag Soils - Crops	141,670	132,619	-9,051	-6.4%
9.	Carbon Flux	-412,957	-386,575	26,382	-6.4%
<b>Forestry and Land Use****</b>		<b>11,028</b>	<b>14,669</b>	<b>3,641</b>	<b>33.0%</b>
1.	Forested Landscape	-2,073,706	-2,073,706	0	0.0%
2.	Non-Farm Fertilizer (Settlement Soils)	8,680	12,321	3,641	41.9%
3.	Wildfires	1,828	1,828	0	0.0%
4.	Range Improvement	0	0	0	0.0%
5.	Prescribed Burn	520	520	0	0.0%
6.	Hazard Reduction Burn	0	0	0	0.0%
<b>Other Sources****</b>		<b>218,823</b>	<b>225,455</b>	<b>6,632</b>	<b>3.0%</b>
1.	Composting	-494,994	-702,623	-207,629	41.9%
2.	Resource Recovery	-41,681	-59,164	-17,483	41.9%
3.	US Parks/Forests	-50,234	-71,305	-21,071	41.9%
4.	Military Bases (Aircraft)	203,013	203,013	0	0.0%
5.	Nitrogen Deposition	15,810	22,442	6,632	41.9%

Source: Garner et al., 2012.

Note: \* Does not include the subtraction of sequestering sectors.

\*\* Does not include the Electricity Production sector as noted previously.

\*\*\* Included for completeness only, not included in further descriptions of the County's emissions.

\*\*\*\*Does not include sequestering sectors noted by a negative sign.

As shown in Table 3.3-5, GHG emissions from electricity are projected to increase from the base year of 2005 to the forecast year of 2020 by 41.9%. Under the subsectors in this category, GHG emissions from both petroleum and renewable energy, within Kern County, are projected to have 0% growth. The second largest increase in GHG emissions at 33.0% is projected to come from Forestry and Land Use, as seen in the subsector, specifically Non-Farm Fertilizer (Settlement Soils). The third largest projected contributor of GHG emissions will come from Residential/Commercial/Industrial Combustion at 31.8% with coal/coke accounting for 42.4% of the amount. As mentioned before, GHG emissions resulting from the Fossil Fuels Industry are projected to decline by 35.9%. The total increase of GHG emissions in the county is projected to be 0.8% by 2020.

## **3.4 BIOLOGICAL RESOURCES**

This section describes the affected environment and regulatory setting for biological resources of the Covered Lands. The description of the Affected Environment in this section of the EIS is based on the Environmental Setting and Regulatory Setting sections of the Maricopa Sun Solar Complex Project EIR (Kern County 2010), updated where appropriate to reflect changed regulations, conditions, and circumstances.

### **3.4.1 Regulatory Setting**

#### **3.4.1.1 Federal**

##### *Federal Endangered Species Act of 1973, as Amended*

The Federal Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) was passed by Congress in 1973 and amended multiple times between 1976 and 2004. The stated purpose of the ESA is “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and to act on specified relevant treaties and conventions”(16 U.S.C. 1531 (b).

The United States Fish and Wildlife Service (USFWS), acting on behalf of the Secretary of Interior, oversees administration of the ESA. With several exceptions, Section 9 of the ESA (16 U.S.C. 1538(a)(1)(B)) prohibits the take of any endangered species and defines take as follows: “[t]he term ‘take’ means to harass, harm, pursue, hunt, shoot, kill, trap, capture, collect, or to attempt to engage in any such conduct” (16 U.S.C. 1532(19)). USFWS has further defined “harm” to mean “an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation, where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR 17.3). The term “harm” is defined to include “significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering” (64 FR 215).

##### *Section 10 and Habitat Conservation Plans*

Amendments to Section 10 of the ESA in 1982 allowed non-federal parties that engage in otherwise lawful activities that are likely to result in the “take” of federally-listed species to obtain incidental take permits under Section 10(a)(1)(B) of the ESA. This would be necessary if their actions are not otherwise covered by an incidental take statement under Section 7 of the ESA. Under Section 10(a)(2)(A) of the ESA, applicants for a Section 10 permit are required to develop and submit a habitat conservation plan (HCP). HCPs are developed by project applicants and/or state and local government entities with advice and guidance from USFWS.

The HCP defines the activities to be addressed, characterizes the extent to which activities may affect federally-listed species and their habitat, and then specifies measures to minimize and mitigate for impacts to the federally-listed species. An HCP is a plan authorized under Section 10 of the ESA (16 U.S.C. 1539) to conserve federally-listed species and the habitat they depend on, as well as unlisted species also covered by the plan. Section 10 authorizes a non-federal applicant to negotiate a conservation plan with USFWS to minimize and mitigate any impact to threatened and endangered species, while conducting otherwise lawful activities for the general welfare of the public. Section 10 authorizes incidental take of individuals of species' populations covered by a Section 10 permit, including those caused by disturbance of the habitat of such species, provided that a Section 10 permit has been issued. Through recent rulings and guidance, the Services have stated that an HCP is intended not only to provide regulatory certainty to applicants, but also to include provisions that will work in the manner intended and meet the conservation goals of the plan through incorporation of clear goals, monitoring, and adaptive management strategies.

#### *Section 7 Consultation*

The Section 7 consultation process determines whether the Proposed Action (issuance of the incidental take permit(s) and implementation of the HCP) is likely to jeopardize the continued existence of all affected listed species or is likely to destroy or adversely modify designated critical habitat. The Section 7 consultation on the issuance of a Section 10 permit considers both the direct and indirect effects of the Proposed Action on listed species and critical habitat.

Certain Covered Activities may require additional federal authorization if a federal nexus exists, such as issuance of a permit under Section 404 of the CWA by the U.S. Army Corps of Engineers for actions that may affect Waters of the United States (WOUS). Issuance of this permit, as well as any other federal action or authorization that may be required to make a Covered Activity an otherwise legal action, will be subject to the requirements of Section 7(a)(2) of the ESA.

#### *San Joaquin Valley Upland Species Recovery Plan*

The recovery plan covers 34 species of plants and animals that occur in the San Joaquin Valley. The 11 listed species include five federally endangered plants (California jewelflower, palmate-bracted bird's-beak, Kern mallow, San Joaquin woolly-threads, and Bakersfield cactus), 1 threatened plant (Hoover's woolly-star), and five endangered animals (giant kangaroo rat, Fresno kangaroo rat, Tipton kangaroo rat, blunt-nosed leopard lizard, and San Joaquin kit fox). In addition, 23 candidates or species of concern are addressed. The ultimate goal of this recovery plan is to delist the 11 endangered and threatened species and ensure the long-term conservation of the 23 candidates and species of concern. An interim goal is to reclassify the endangered

species to threatened status. USFWS is responsible for the implementation of the recovery plan (USFWS 1998).

### *Migratory Bird Treaty Act*

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 701-711) was enacted in 1918 between the United States and Great Britain (representing Canada as well), and Mexico in 1936, Japan in 1972 and the area previously known as the Union of Soviet Socialist Republics in 1976. The definition of migratory birds includes virtually all birds found in the United States with the exception of the domestic pigeon, the European starling, the house sparrow and various species of upland game birds. The MBTA established provisions regulating take, possession, transport and import of migratory birds, including nests and eggs. The MBTA prohibits the take of migratory birds and does not include provisions for incidental take. To relieve the permittees from liability under the MBTA for Covered Species, the permits may also serve as a “Special Purpose Permit” authorized under MBTA regulations for the take of migratory birds. Any species to be covered by this type of “Special Purpose Permit” must be listed under the ESA, and the incidental take of such species must be authorized, subject to applicable terms and conditions, under Section 10(a)(1)(B) of the ESA.

### *Wetlands and Other Waters of the U.S. and State*

Aquatic resources, including riparian areas, wetlands, and certain aquatic vegetation communities, are considered sensitive biological resources and can fall under the jurisdiction of several regulatory agencies.

U.S. Army Corps of Engineers (USACOE) exerts jurisdiction over “waters of the U.S.,” including all waters that are subject to the ebb and flow of tide; wetlands and other waters such as lakes, rivers, streams (including intermittent or ephemeral streams), mudflats, sandflats, sloughs, prairie potholes, vernal pools, wet meadows, playa lakes, or natural ponds; and tributaries of the above features. The extent of waters of the U.S. is generally defined as that portion that falls within the limits of the “ordinary high water” mark. Typically, the ordinary high water mark corresponds to the 2-year flood event.

Wetlands, including swamps, bogs, seasonal wetlands, seeps, marshes, and similar areas, are defined by USACOE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 Code of Federal Regulations [CFR] 328.3[b]; 40 CFR 230.3[t]). Indicators of three wetland parameters (hydric soils, hydrophytic vegetation, and wetlands hydrology) as determined by field investigation must be present for a site to be classified as a wetland by USACOE (1987).

*Federal Clean Water Act (33 U.S.C. 1251 through 1376)*

The federal CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 401 requires that a project proponent for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards administer the certification program in California.

Section 402 establishes a permitting system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. Section 404 establishes a permit program administered by USACOE regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by USACOE are found at 33 CFR Parts 320 330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the Environmental Protection Agency (EPA) in conjunction with USACOE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

**3.4.1.2 State**

*California Endangered Species Act (Fish and Game Code 2050 et seq.)*

The California Endangered Species Act (CESA) establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that State agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no State agency consultation procedures under CESA. For projects that affect both a State and federal-listed species, compliance with the federal Endangered Species Act (ESA) will satisfy CESA if the CDFW determines that the federal incidental take authorization is “consistent” with CESA under Fish and Game Code Section 2080.1. For projects that will result in a “take” of a State-only listed species, the project proponent must apply for a take permit under Section 2081(b).

**3.4.1.3 Kern County**

*Kern County General Plan*

The Kern County General Plan identifies the federal, State, and local statutes, ordinances, or policies that govern the conservation of biological resources that must be considered by the County of Kern (County) during the decision-making process for any project that could impact biological resources.

These details, as they pertain to this EIS, can be found in the Environmental Impact Report prepared for the County of Kern ( Kern County 2010, pages 4.4-15, 4.4-16).

*Draft Valley Floor Habitat Conservation Plan (VFHCP)*

The Permit Area is within the plan area of the draft Valley Floor HCP (Kern County Planning and Community Development Department 2006). It is a long-term program designed to conserve federal and State protected species, and/or other species of concern and to provide compliance with ESA and CESA. Although the VFHCP is not an approved plan, it presents a review of wildlife and habitat use in the plan area, which includes 3,110 square miles of the southern San Joaquin Valley.

The Draft VFHCP would acquire a permit under Section 10(a)(1)(B), of the FESA (hereafter referred to as a 10(a) permit), and a permit under Section 2081 of the CESA (CESA 9322). Although the Valley Floor HCP is not currently adopted, it has been determined that solar energy projects would not be covered under the terms of the agreement for the HCP.

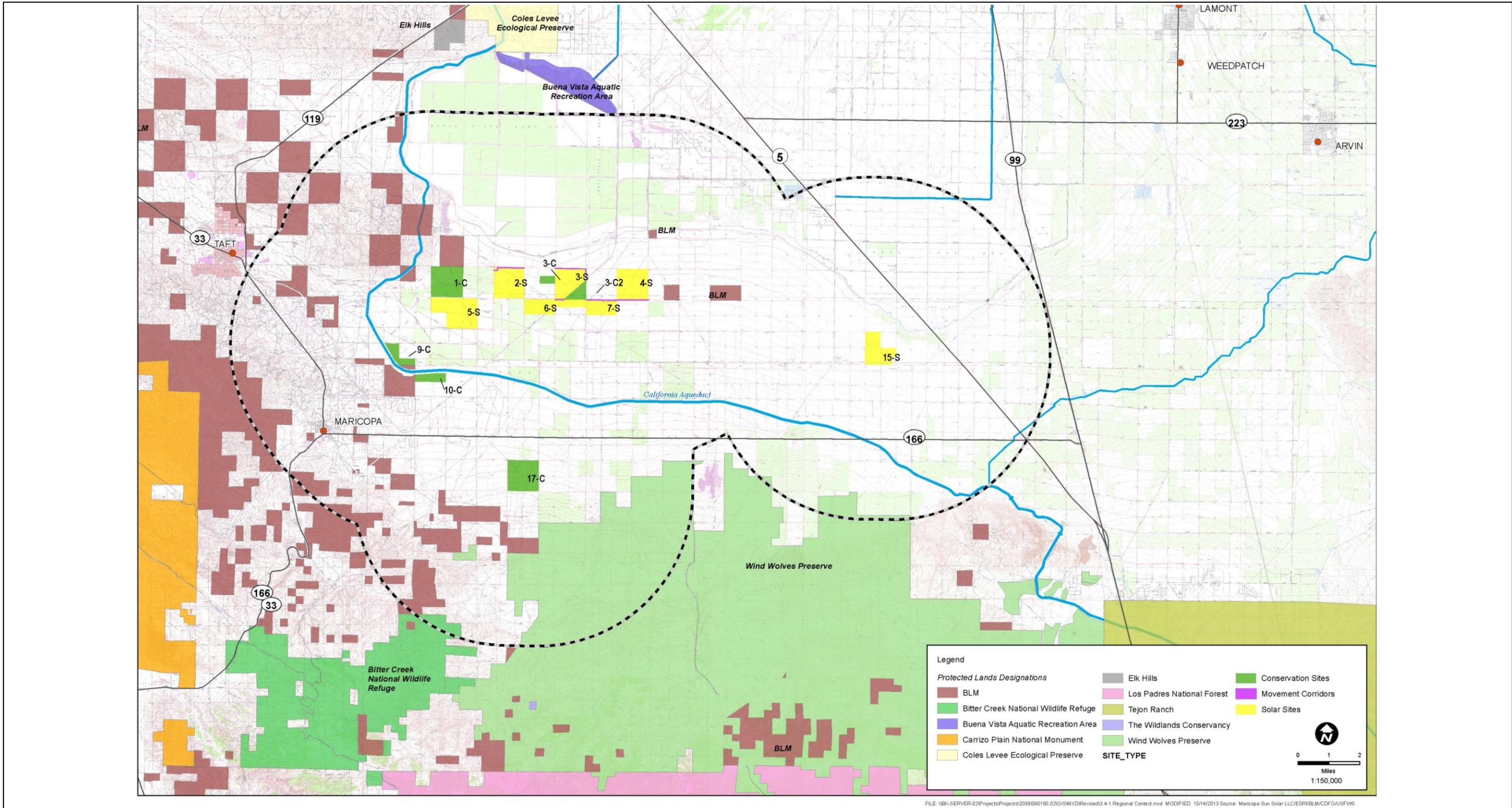
**3.4.2 Environmental Setting**

**3.4.2.1 Regional Setting**

*Geography*

The Covered Lands encompass a total of 5,784.3 acres, and include the following: 1) Solar Sites which consists of 3,798.3 acres (mandatory setbacks and Movement Corridors) and 2) Conservation Sites which encompass 1,894.4 acres. The Covered Lands are primarily located approximately five miles west of Taft along South Lake Road and along Old River Road in Kern County, California (see Figure 2-2). Three of the Conservation Sites are contiguous with the Solar Sites, but three others are located some distance away; one site is located one mile south of Hwy 166 and approximately 8 miles east of Maricopa (Site 17-C) and two are located approximately one-mile southwest of the Solar Sites bordering the north and south sides of the California Aqueduct (Sites 9-C and 10-C). All of the Conservation Sites are within 6 miles of the Solar Sites, except for Solar Site S-15 which is located approximately 7 miles to the east of the remaining Solar Sites and approximately 11 miles to the northeast of the southernmost Conservation Site, Site 17-C (Figure 3.4-1).

*This page intentionally left blank.*



FILE: \\BK-SERVER-02\Projects\Projects\2009\090180\2\GIS\MXD\Revised\3.4-1 Regional Context.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC\ESRI\BLM\CD\G\SFWS



LOCATION OF REGIONAL CONTEXT AND PROTECTED PUBLIC LANDS IN THE VICINITY MAP  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-1

*This page intentionally left blank.*

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

*Topography*

The topography of the area is mainly flat, cultivated or fallow lands with the only relief provided by ditches, levees, canal berms, and roadway berms. The Covered Lands occur to the north of the Transverse Range, near the southeastern base of the San Emigdio Mountains, generally to the south and southeast of the historic south shore of Buena Vista Lake. Elevations on the Covered Lands range from approximately 320 feet AMSL in the eastern portion to approximately 370 feet AMSL in the western portion. Although the properties that comprise the Covered Lands are repeatedly disked for weed control (except 152.9 acres of Site 3-C2, 83.25 acres of Site 9-C, and 647.7 acres of Site 17-C), some low relief occurs because the sites have not been laser-leveled. Conservation Sites 17-C and portions of Site 9-C contain natural topography. Conservation Site 3-C2 has not been disked for a number of years, and retains some low topographic relief.

*Climate*

The Covered Lands area has a moderate climate with generally mild temperatures throughout the year. It is hot and dry in the summer and cold and moist in the winter. The average temperature in the winter is 48.5 degrees Fahrenheit (F) and the average daily minimum winter temperature is 38.3 degrees F. Winter rains are interspersed with spells of cloudy, foggy, or sunny weather. The average summer temperature is 80.7 degrees and the average daily maximum summer temperature is 94.8 degrees. The annual average precipitation is 6.32 inches, with virtually all of the precipitation falling as rain. In the summer, the sun shines 93 percent of the time and 73 percent of the time in the winter. The prevailing wind is from the west-northwest. Average wind speed is highest in April and May, which averages 7.7 miles per hour. Snowfall has not been recorded at Maricopa and measurable snow is a rare occurrence in Bakersfield (USDA 2009). The growing season is over 350 days per year. Table 3.4-1 provides the monthly maximum, minimum and mean temperature and precipitation recorded for the Maricopa area.

**Table 3.4-1**  
**Monthly Maximum, Minimum, and Mean Temperature and Precipitation**  
**(Maricopa climate station: <http://www.idcide.com/weather/ca/taft.htm>)**

<b>Month</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Annual</b>
<b>Max °F</b>	56.9	63.8	68.6	75.9	83.9	92.2	96.9	95.8	90.0	80.5	66.1	57.2	77.3
<b>Min °F</b>	38.6	42.9	45.7	49.4	56.6	63.9	69.8	68.7	64.7	56.6	45.3	38.0	53.4
<b>Mean °F</b>	47.8	53.4	57.2	62.7	70.3	78.1	83.4	82.3	77.4	68.6	55.7	47.6	65.4
<b>Inches of precipitation</b>	1.16	1.13	1.40	0.51	0.21	0.04	0.00	0.07	0.26	0.20	0.63	0.71	6.32

*Land Use*

Much of the native habitat in the project region has been converted to agricultural production, oil field development, urban development, and associated infrastructure (e.g., highways, water

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

conveyance facilities, transmission lines), but remnant stands of native habitat exist at scattered localities. Some of these native lands have subsurface oil reserves, and oil extraction activities have caused varying levels of disturbance. Most of the sites containing native habitats have been disturbed at one time or another by dryland farming, extensive sheep and/or cattle grazing, oil extraction activities, or other causes. Many of these parcels are owned and managed by the BLM. There is extensive public and protected land to the south and west of the project, but land to the north and east is mostly privately owned and not protected.

Several Ecological Reserves and other protected lands are located in the region (see Figure 3.4-1, Location of Regional Context and Protected Public Lands in the Vicinity Map):

- The Lokern and Elk Hills Ecological Reserves, which are administered by the California Department of Fish and Wildlife (CDFW);
- The Tule Elk State Natural Reserve located near Tupman, which is administered by the California Department of Parks and Recreation;
- The Buena Vista Aquatic Recreation Area, which is administered by the County of Kern;
- The Wind Wolves Preserve, which is administered by The Wildlands Conservancy;
- The Bitter Creek National Wildlife refuge, which is administered by the USFWS; and
- The Carrizo Plains National Monument and the Carrizo Plains Ecological Reserve, which are administered by the Department of the Interior (DOI) and CDF.

The Covered Lands are zoned for agricultural uses and are currently under Williamson Act contracts. All sites are disked for weed control on a repeated basis, with the exception of 3-C2, 17-C, and the lower portion of site 9-C. Adequate water for financially viable farm production is not currently available and there are no irrigation systems present on the majority of the parcels. There are, however, scattered wells and ponding basins on some parcels. A petition to remove the parcels from the Williamson Act contracts was approved by the County of Kern on March 29, 2011.

***Soils***

Soils within the Covered Lands are highly variable. According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) map for Kern County, there are nine different soils within the Covered Lands (Figure 3.4-2, NRCS Soils Map and Table 3.4-2) including:

- Cerini loam;
- Calflax loam;
- Excelsior fine sandy loam;

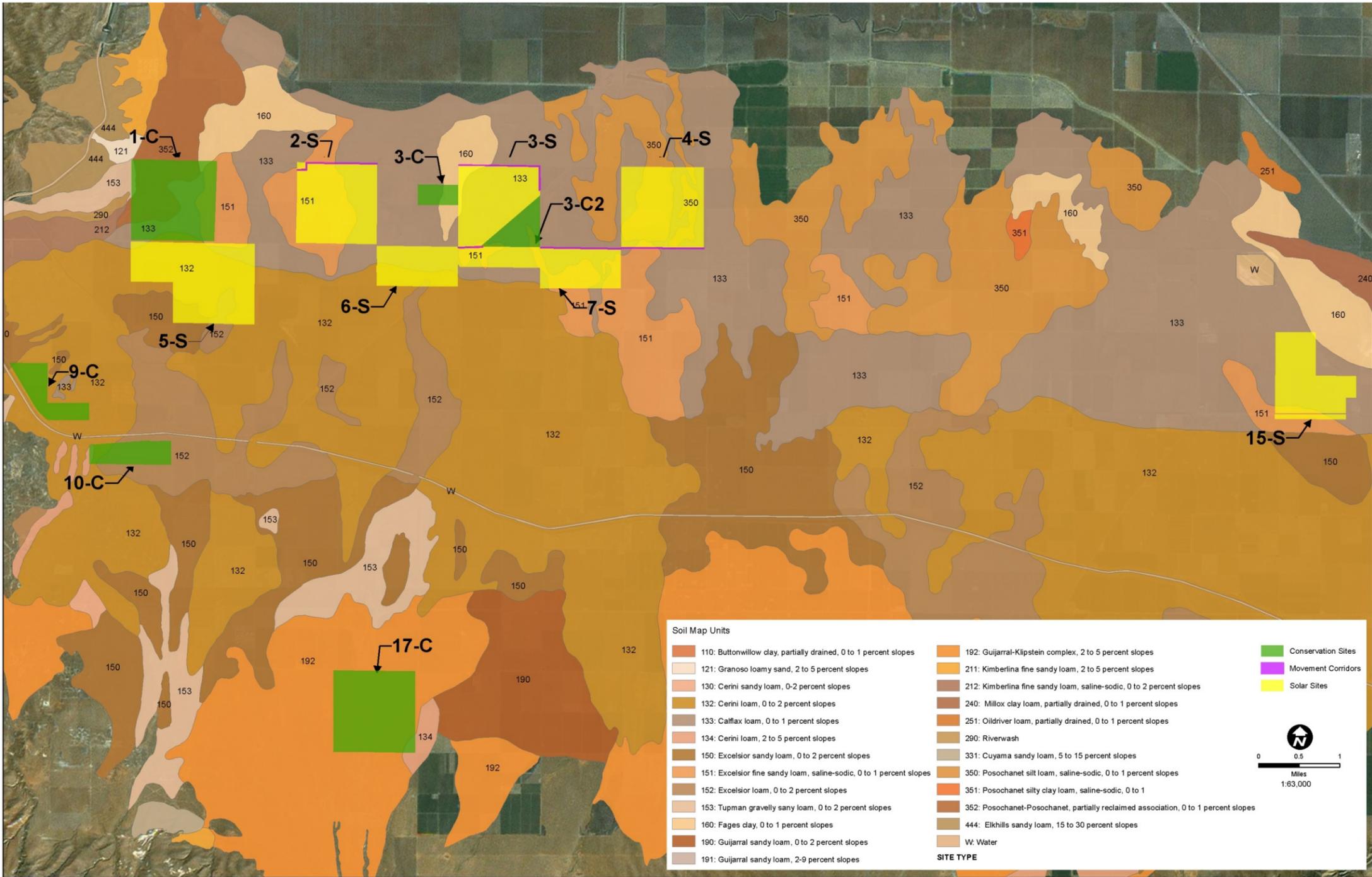
**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

- Excelsior sandy loam;
- Fages clay;
- Posochanet associations;
- Posochanet silt loam (saline-sodic soil);
- Posochanet silty clay loam (saline-sodic soil);
- Tupman gravelly sandy loam, and
- Gujarral-Klipstein complex.

**Table 3.4-2**  
**Soil Types Present on the Maricopa Sun Solar Project’s Covered Lands**

<b>Location</b>	<b>Soil Type Present</b>
<b>Site 1-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 153-Tupman gravelly sandy loam (0-2 percent slopes), 160-Fages clay (0-1 percent slopes), and 352-Posochanet-Posochanet (partially reclaimed association, 0-1 percent slopes)
<b>Site 2-S, 2-M</b>	133-Calflax loam (0-1 percent slopes) and 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 3-S, 3-M</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C2</b>	133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 4-S, 4-M</b>	133-Calflax loam (0-1 percent slopes) and 350-Posochanet silt loam (saline-sodic, 0-1 percent slopes)
<b>Site 5-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 150-Excelsior sandy loam (0-2 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 152-Excelsior loam (0-2 percent slopes)
<b>Site 6-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 7-S, 7-M</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 9-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 150-Excelsior sandy loam (0-2 percent slopes)
<b>Site 10-C</b>	132/134-Cerini loam (0-2 percent slopes/2-5 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 15-S</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic; 0-2 percent slopes), and 160-Fages clay (0-1 percent slopes)
<b>Site 17-C</b>	134-Cerini loam (0-2 percent slopes) and 192-Gujarral-Klipstein complex (2 -5 percent slopes)

*This page intentionally left blank.*



SOILS MAP  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-2

*This page intentionally left blank.*

### *Hydrology*

The Maricopa Sun Solar project is located within a semi-arid region, which relies on rainfall, groundwater, and the Kern River for its water supply. Most rainfall occurs in the winter and spring, as is typical for areas with this climate.

The only significant water course in the immediate area of the Covered Lands is the Kern River. The Kern River begins on the western slope of Mount Whitney in the southern Sierra Nevada Mountains and flows in a southwest direction. Several minor streams flow into the Kern River, which exists as a contained basin except during high runoff years. The Kern River is fully diverted and used (Kern County Planning and Community Development 2010); however, during very wet years, the Kern River reaches the flood channel located on the west of the valley floor and carries water into the Buena Vista Lake Basin that is subject to flooding and ponding (USDA, 2009). Other sources of water in the Buena Vista Lake Basin include intermittent streams from the south, such as Bitter Creek, Santiago Creek, Los Lobos Creek, the San Emigdio Creek complex, Pleito and Pleitito Creeks, the Salt Creek complex, and Tecuya Creek, which drain the San Emigdio Mountains portion of the Transverse Ranges. These waters are largely dispersed before reaching the historic Buena Vista Lake Bed. The drainage ways are dry much of the year but carry an extremely heavy flow during thunderstorms and spring runoff (USDA 2009).

A portion of the Covered Lands are currently mapped by the Federal Emergency Management Agency (FEMA) as Flood Zone A, and accordingly is within the 100-year flood zone (Figure 3.4-3, Flood Hazard Map). Kern River flows have been regulated since the completion of Isabella Dam in 1953 (Kern County Planning and Community Development Department, 2010). Based on flood maps flooding is likely related to heavy rain fall in the traverse range which flows down the alluvial slopes via streams to the south.

### *Jurisdictional Wetlands and Waters*

The USACOE has regulatory authority over the CWA, as provided for by the EPA. The USACOE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. The presence of wetlands on the Solar Sites was evaluated using these standard wetland delineation criteria. A wetland delineation report was prepared and submitted to the USACOE for verification (Quad Knopf 2010c). The presence of wetlands was also evaluated on most of the Conservation Sites. Wetland surveys were conducted on Conservation Sites 1-C, 3-C2, 9-C, and 10-C including areas within 100 feet of their perimeters (Appendix G). Conservation Sites 3-C and 17-C were not formally surveyed.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

Wetlands, streams, reservoirs, sloughs, and ponds typically meet the criteria for federal jurisdiction under Section 404 of the CWA and state jurisdiction under the Porter-Cologne Water Quality Control Act. Streams and ponds typically meet the criteria for state jurisdiction under Section 1602 of the California Fish and Game Code.

There are four types of wetlands and other waters that were identified to occur within, or immediately adjacent to the Solar Sites (Quad Knopf 2010c).

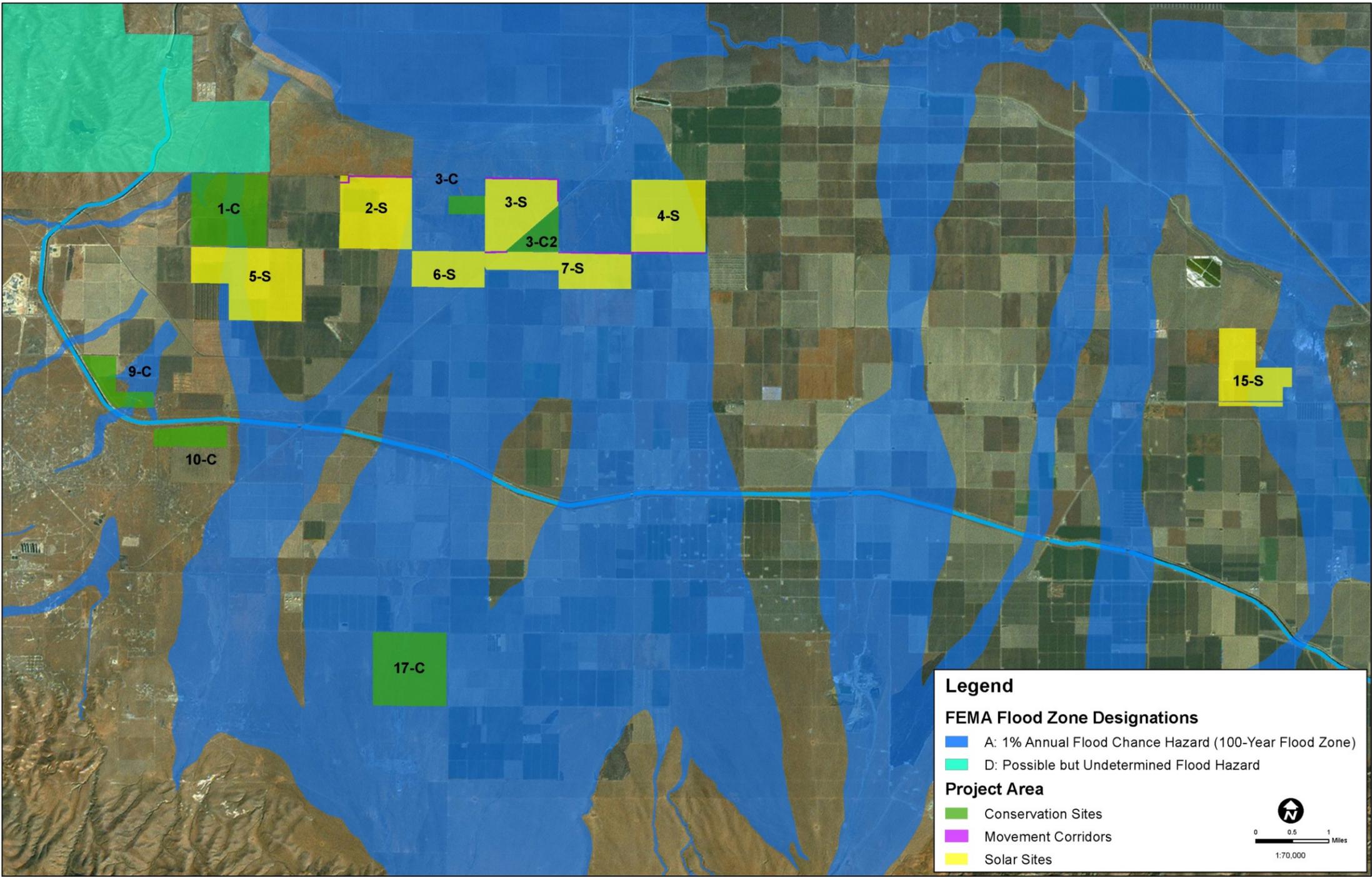
- Freshwater emergent wetland;
- Waters of the US;
- Artificial ponding basins; and
- Unlined canals.

Wetlands that are present on the Solar Sites include one Freshwater Emergent wetland that has been disked (located within Site 2-S). One ponding basin occurs adjacent to the south side of Site 7-S, but this basin is outside of the Covered Lands. Non-wetland features that are present include a tributary, two unlined canals, and one “other water”. Within the Conservation Sites there is one tributary and one large intermittent wash. No wetlands were identified within the Conservation Sites.

The wetland and non-wetland features are described in Table 3.4-3 and in the following paragraphs (Quad Knopf 2010c).

**Table 3.4-3**  
**Wetlands and Other Waters Identified Within and Adjacent to the**  
**Maricopa Sun Solar Project’s Covered Lands**

<b>Wetland</b>	<b>Location</b>	<b>Type</b>	<b>Acreage/Length</b>
MS 02	Site 2-S, 2-M	Freshwater Emergent (PEMFx)	2.55 acres
MS 05	South of Site 7-S, not in Covered Lands.	Ponding Basin (PUBFX)	3.88 acres
<b>Other Waters</b>			
Sandy Creek tributary	Site 1-C	Tributary	10.45 acres/3,887 feet
Blue-line drainages	Site 1-C	Intermittent streams	5,564.31 feet
	Site 2-S	Intermittent streams	5,882.66 feet
	Site 3-C	Intermittent streams	10,858.7 feet
	Site 3-S	Intermittent streams	14,849.64 feet
	Site 3-C2	Intermittent streams	2,827.74 feet
	Site 17-C	Intermittent streams	64,666.18 feet
Canal #1	Site 3-S	Unlined Canal	0.97 acres/5,288 feet
Canal # 2	Sites 6-S and 7-S	Unlined canal	2.06 acres/8,964 feet



FILE: L:\Projects\2009090180\_02\GISMXD\Revised\3-3\_FEMA\_FLOOD.mxd; MODIFIED: 9/5/2013  
 Source: Maricopa Sun Solar LLC\ESRI\FEMA



FLOOD ZONE MAP  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-3

*This page intentionally left blank.*

### *Freshwater Emergent Wetland*

Based upon a review of the Wetland Delineation report (Quad Knopf 2010c, d) and a site visit to verify those findings by USACOE, the only jurisdictional wetland within the Solar Sites is the freshwater emergent wetland in the northwest corner of Site 2-S. This wetland will be incorporated into the Movement Corridor that traverses the north portion of that site. The burned root crowns of common cattails (*Typha latifolia*), an obligate wetland indicator, are clearly visible in the disked soil, and the soil is hydric. This wetland lies within a shallow basin and is approximately 2.55 acres in extent (Table 3.4-3). Immediately adjacent, but outside the project boundary, is an artificially bermed ponding basin which also meets USACE wetland criteria. This ponding basin is all that remains of a once more extensive wetland mapped by the National Wetland Inventory (NWI) at this site. The land around these features is disked. The remnant wetland on Site 2-S and the wetland to the west that occurs off-site are connected by a culvert that crosses under a dirt road that separates these two wetland features. This wetland area will not be impacted by the project and exclusion barrier fencing will be established between the wetland and the work area to eliminate the potential for any adverse affects to the wetland. The wetland area on Site 2-S will be enhanced by cessation of disking.

### *Artificial Ponding Basin*

One artificial ponding basin that meets wetland criteria was found south of Site 7-S, off of but adjacent to the Covered Lands. This basin is classified by the Cowardin System as PUBFx (Palustrine, Unconsolidated Bottom, Semi-permanently flooded, excavated). This feature is a narrow pond running east-west and is 3.88 acres in extent (Table 3.4-3). Upland habitat adjacent to this wetland is ruderal. The outflow of this basin feeds into a channel off-site that runs to the north and has tamarisk (*Tamarix pentandra*) and Fremont cottonwood (*Populus fremontii*) along the banks. Quailbush (*Atriplex lentiformis*) and five-hook bassia (*Bassia hyssopifolia*) are profuse in the basin, and this feature exhibits hydric soils and wetland hydrology. Two similar features were mapped by the NWI immediately to the south, but these have been removed sometime in the past and are no longer present. The pond and its associated habitat will not be impacted by the project, and exclusion barrier fencing will be established between the pond and the work area to eliminate the potential for any impacts to this feature to occur.

### *Other Waters*

There is a Water of the U.S. located within the northwest portion of Site 1-C. This feature is a tributary of Sandy Creek. Site 1-C is a Conservation Site and the jurisdictional waters within Site 1-C will be avoided and not disturbed by construction or conservation activities, improvements or enhancements. There are several blue-line drainages that occur on Sites 3-S, 3-C, 3-C2, 7-S, and 17-C. With the exception of the drainages on Site 17-C, these are isolated waters that currently do not exhibit a bed and bank or other characteristics of Waters of the U.S. Based upon

site verification by the USACE, these were determined not to be under federal jurisdiction. The drainages on Site 17-C are collectively a substantial feature that are considered Waters of the U.S. because they establish connectivity with a navigable water to the south. However, this feature is located on a Conservation Site, and will not be impacted.

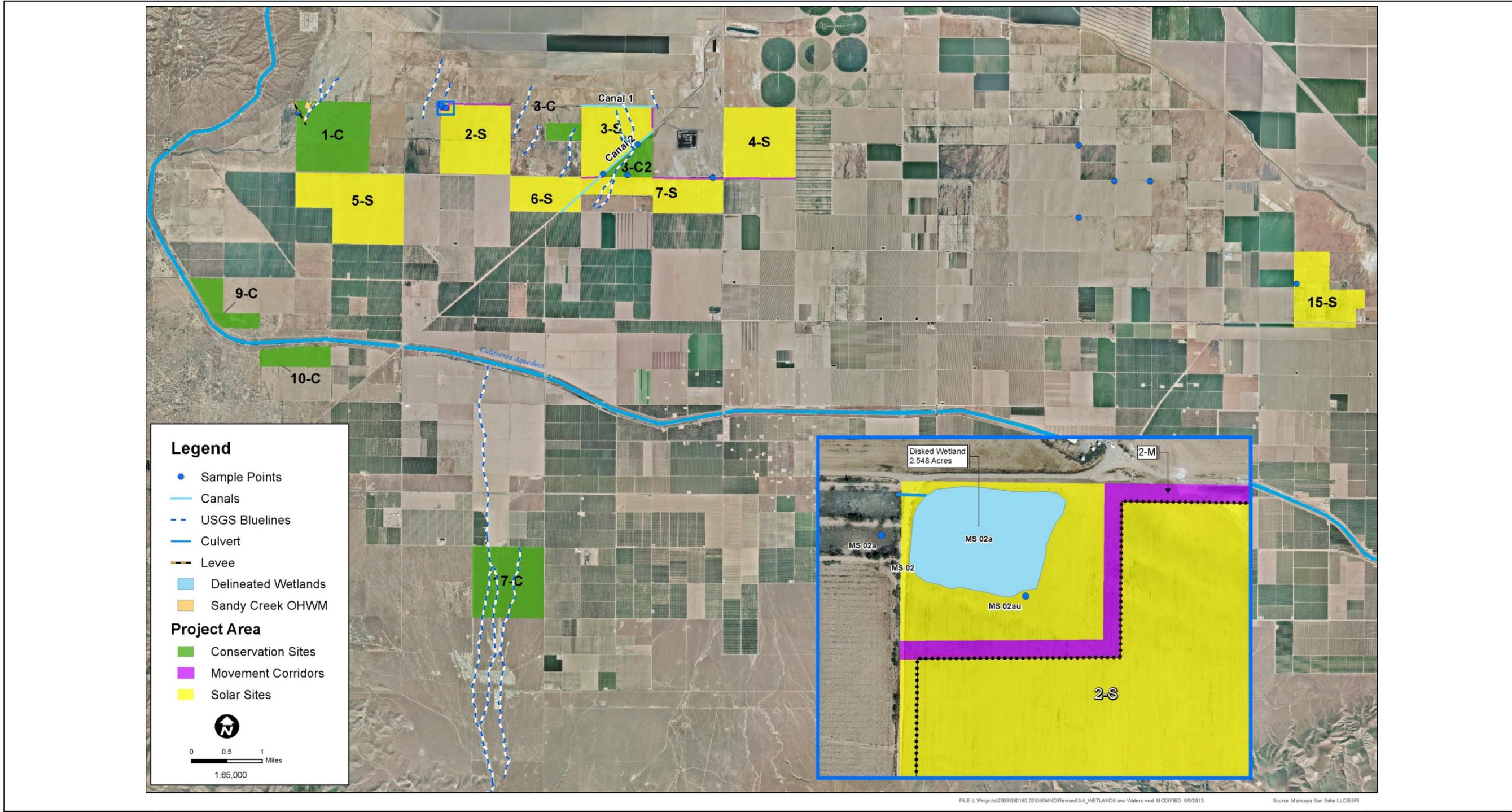
### *Unlined Canals*

Two unlined canals occur within, or immediately adjacent to, the Covered Lands.

- **Canal #1** collects flood waters and drains the cultivated lands in this portion of the project area. It begins to the west of Site 3-S and ends to the east of Site 3-S. The length of this feature along the northern border of the project site is 5,288 feet, and the average width of the Ordinary High Water (OHW) is eight feet. The OHW acreage of this feature on Site 3-S is 0.97 acres. The bottom of the canal is largely unvegetated, but the banks of the canal support annual sunflower (*Helianthus annuus*), quailbush, tamarisk, and five-hook bassia. This feature will not be impacted by the project. A Movement Corridor has been established along this canal and it will be kept intact.
- **Canal #2** has its source at Santiago Creek near State Route 166 and drains orchards to the south of the project area. This feature is an artificial, unlined canal from SR 166 to its terminus in the northeast (Figure 3.4-4). The OHW width is approximately 10 feet, and the length on-site is 8,964 feet. The OHW acreage of this feature on the project site is 2.06 acres. Quailbush, annual sunflower, and five-hook bassia are present on its banks throughout most of the onsite length, but it is mostly devoid of vegetation to the south of the project area. This feature lies within an existing public easement (railway easement). The Solar Development Footprint does not include this easement and this canal will be protected by a mandatory 30 foot setback from the easement.

#### **3.4.2.2 General Site Characteristics**

The project region once supported a wide variety of plant and wildlife species, but much of the diversity and abundance has been reduced and species composition has been altered by dramatic changes in land use. Land use in the region that has contributed to significant declines in plant and wildlife diversity include the conversion of native lands to agriculture, disturbance by oil extraction and associated conveyance structures, urbanization, and the construction of infrastructures and utilities including pipelines, roads, canals, and power transmission lines. The loss of habitat associated with these disturbances has resulted in many species being listed as threatened or endangered by the CDFW and the USFWS. These species are protected by the FESA and/or the CESA. Other species are listed as species of special concern by the agencies and are afforded a lesser level of protection.



FILE: L:\Projects\2009090180 02\GIS\MXD\Revised\3-4\_WETLANDS and Waters.mxd MODIFIED: 9/6/2013 Source: Maricopa Sun Solar LLC\ESRI



WETLANDS AND WATERS OF THE UNITED STATES  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-4

*This page intentionally left blank.*

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

*Vegetation*

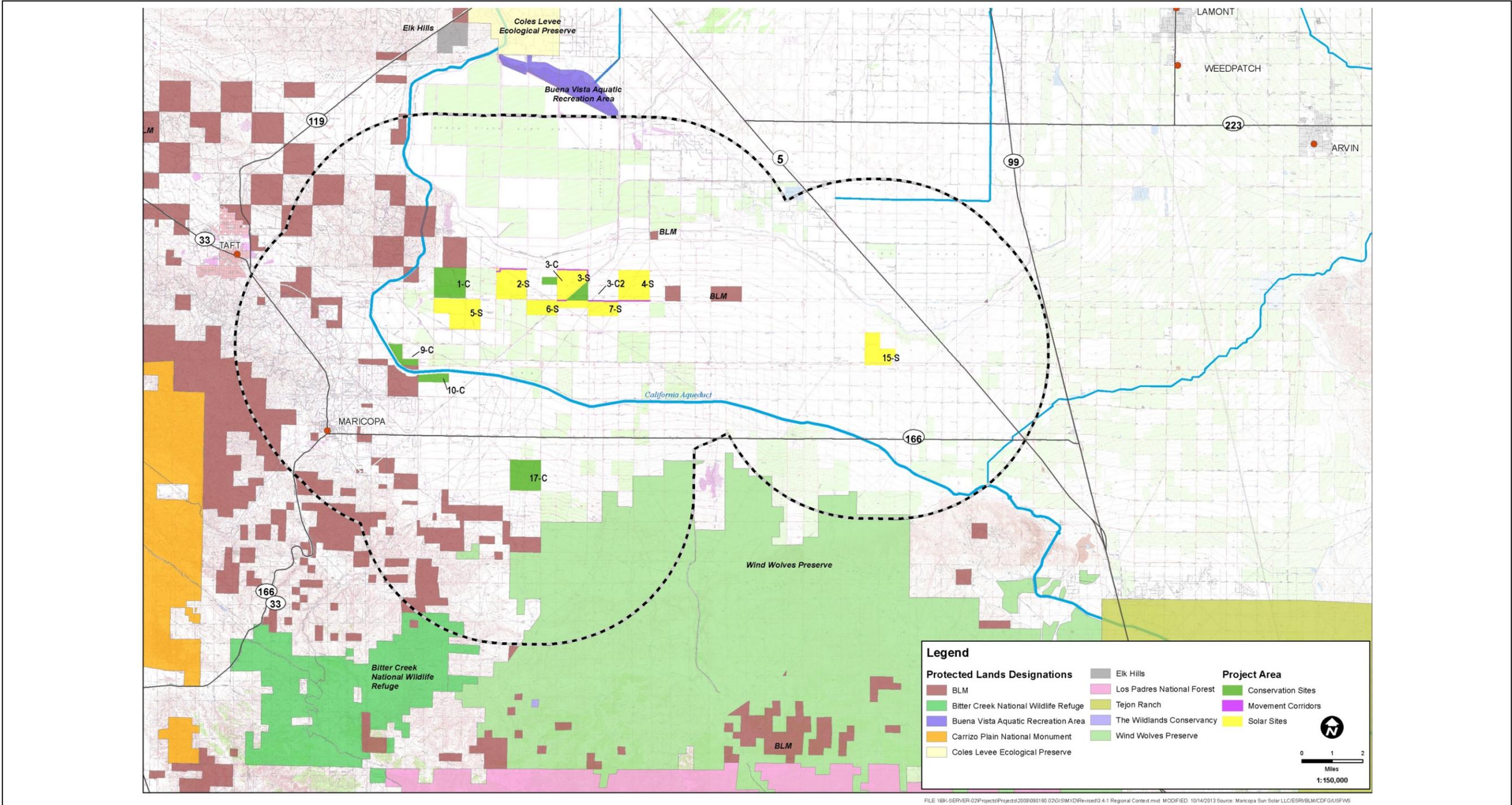
The seven Solar Sites (Sites 2-S, 3-S, 4-S, 5-S, 6-S, 7-S, and 15-S) including the Movement Corridors have been disked for weed control on a biannual basis. Due to the lack of available water, none of the land that is proposed for development (Solar Development Footprints) has been utilized in the past ten years for agricultural purposes. Virtually all of the land surrounding the Covered Lands is designated and zoned for agriculture and most of it is in active agricultural production. Some isolated parcels are in an unfarmed state, though, and contain some native species (Figure 3.4-5). All of the Solar Sites are maintained free of natural vegetative communities through biannual disking, and primarily weedy species sprout between disking activities. The only native plant that sprouts in significant numbers following disking is seepweed (*Suaeda nigra*), which occurs in scattered localities. Because disking occurs in the spring and fall of each year, the seepweed and other species never become established to any great degree and mostly remain as short seedlings, rarely maturing to established shrubs. Some surrounding parcels contain remnants of native Saltbush Scrub and Alkali Sink Scrub habitat in various sized blocks, which are highly fragmented and isolated from one another. Specific site occurrence information on vegetation is provided in Table 3.4-4.

**Table 3.4-4**  
**Plant Species Occurring on Solar Sites and**  
**Adjacent Lands of the Maricopa Sun Solar Project**

<b>Family Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Project Site</b>
Amaranthaceae	<i>Amaranthus</i> sp.	Amaranth	Adjacent to Site 4-S
Apocynaceae	<i>Asclepias fascicularis</i>	Narrow-leaf milkweed	Adjacent to Site 15-S
Asclepiadaceae	<i>Asclepias fascicularis</i>	Mexican milkweed	Adjacent to Site 15-S
	<i>Centaurea solstitialis</i>	Yellow starthistle	Occurring on Site 15-S
	<i>Helianthus annuus</i>	Annual sunflower	Occurring on Site 3-S
	<i>Helianthus</i> sp.	Sunflower	Adjacent to Site 3-S
	<i>Baccharis salicifolia</i>	Mulefat	Adjacent to Site 15-S
	<i>Achillea millefolium</i>	Yarrow	Adjacent to Site 15-S
	<i>Isocoma acradenia</i>	Alkali goldenbush	Occurring On Site 2-S, 15-S
	<i>Lactuca serriola</i>	Wire lettuce	Occurring On Site 3-S, 5-S
	<i>Xanthium strumarium</i>	Common cocklebur	Occurring On Site 3-S
Boraginaceae	<i>Amsinckia menziesii</i>	Fiddleneck	Occurring On Site 2-S, 3-S, 15-S
	<i>Heliotropium curassavicum</i>	Salt heliotrope	Occurring On Site 2-S, 3-S
Brassicaceae	<i>Sisymbrium irio</i>	London rocket	Occurring On Site 3-S, 5-S, 6-S, 15-S
	<i>Brassica nigra</i>	Black mustard	Occurring On Site 3-S

Source: Quad Knopf 2010c, 2010d

*This page intentionally left blank.*



FILE: YBK-SERVER-02\Projects\Projects\2009\09180\_02\GIS\XD\Revised\3.4-1 Regional Context.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC\ESR\BLM\CDG\USFWS



LAND USE MAP  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-5

*This page intentionally left blank.*

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

The six Conservation Sites (Site 1-C, Site 3-C, Site 3-C2, Site 9-C, Site 10-C, and Site 17-C) total 1,894.4 acres, but the Solar Sites will be converted to Conservation Sites once the solar facilities are decommissioned, resulting in a total of 5,692.7 acres of compensatory lands provided at the end of the project. The Movement Corridors will be managed as conservation land during the life of the project, but will be conserved in perpetuity along with the Solar Sites and Conservation Sites once the project is decommissioned. With the exception of Sites 3-C2, the southern 83.25 acres of Site 9-C, and all of 17-C, all of the lands within the Covered Lands are periodically disked for weed control. Site 3-C2 was previously disked, but has not been disked for some time and has recovered from previous disturbances. The only native plant that sprouts in significant numbers following disking is seepweed, which occurs in scattered localities, particularly on Sites 3-C. Site 1-C also contains some scattered saltbush shrubs and *Alkalo goldenbush*, primarily along the levee in the northwest corner of the site (which totals 2.44 acres), but some scattered quailbush shrubs survive disking. There is native saltbush scrub habitat occurring on 83.25 acres of Sites 9-C, and all of Site 17-C is vegetated with a matrix of annual grassland, saltbush scrub, and *Alkalo goldenbush*. There were 44 plant species occurring within the Conservation Sites, Movement Corridors, and surrounding adjacent lands (Table 3.4-5).

**Table 3.4-5**  
**Plant Species Occurring within Conservation Sites, Movement Corridors, and**  
**Adjacent Lands of the Maricopa Sun Solar Project**

<b>Family Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Project Site</b>
Asteraceae	<i>Ambrosia acanthicarpa</i>	Annual Bursage	Adjacent to Site 10-C
	<i>Centaurea solstitialis</i>	Yellow starthistle	Adjacent to Sites 9-C, 10-C
	<i>Conyza coulteri</i>	Coulter's conyza	Adjacent to Sites 9-C, 10-C
	<i>Hemizonia kelloggii</i>	Kellogg's tarweed	On and Adjacent to Site 9-C
	<i>Heterotheca grandiflora</i>	Telegraph weed	On and Adjacent to Site 9-C
	<i>Helianthus annuus</i>	Annual sunflower	Occurring on Site 3-C, 3-C2, 3-M; Adjacent to Site 10-C
	<i>Helianthus</i> sp.	Sunflower	Adjacent to Site 3-C2, 3-M
	<i>Isocoma acradenia</i>	Alkali goldenbush	Occurring On Site 2-M, 9-C; Adjacent to Sites 9-C, 10-C,
	<i>Lactuca serriola</i>	Wire lettuce	Occurring On Site 9-C, 3-C, 3-C2, 3-M; Adjacent to Site 9-C
Boraginaceae	<i>Xanthium strumarium</i>	Common cocklebur	Occurring On Site 3-C, 3-C2, 3-M
	<i>Amsinckia menziesii</i>	Fiddleneck	Occurring On Site 1-C, 2-M, 3-C, 3-C2, 3-M, 9-C, 10-C; Adjacent to Site 9-C, 10-C
	<i>Heliotropium curassavicum</i>	Salt heliotrope	Occurring On Site 3-S, 3-C, 3-C2, 3-M
Brassicaceae	<i>Sisymbrium irio</i>	London rocket	Occurring On Site 1-C, 3-S, 3-C, 3-C2, 3-M, 9-C
	<i>Brassica nigra</i>	Black mustard	Occurring On Site 3-S, 3-C, 3-C2, 3-M
	<i>Lepidium</i> sp.	Peppergrass	Adjacent to Site 10-C

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

<b>Family Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Project Site</b>
	<i>Raphanus sativus</i>	Radish	Adjacent to Site 9-C
	<i>Sisymbrium orientale</i>	Eastern rocket	Adjacent to Site 9-C
Chenopodiaceae	<i>Salsola tragus</i>	Russian thistle	Adjacent to Site 9-C, 10-C; Occurring on Site 3-C, 3-C2, 3-M, 9-C, 10-C
	<i>Bassia hyssopifolia</i>	Five-hook bassia	Occurring on Site 3-C, 3-C2, 3-M, 10-C ; Adjacent to Site 10-C
	<i>Atriplex lentiformis</i>	Quailbush	Occurring On Sites 1-C, 3-C, 3-C2, 3-M, 9-C, Adjacent to Site 10-C
	<i>Chenopodium album</i>	Lamb's quarters "weedy chenopods"	Occurring On Site 3-S, 3-C, 3-C2, 3-M
	<i>Suaeda nigra</i>	Seepweed	Occurring On 3-S, 3-C, 3-C2, 3-M, 17-C
	<i>Atriplex polycarpa</i>	Allscale saltbush	Occurring on Site 9-C; Adjacent to Site 9-C, 10-C
Convolvulaceae	<i>Convolvulus arvensis</i>	Orchard bindweed	Occurring On Site 1-C
	<i>Convolvulus</i> sp.	Morning glory	Occurring On Site 1-C
Euphorbiaceae	<i>Eromocarpus setigerus</i>	Dove weed	Adjacent to Site 10-C
Lamiaceae	<i>Trichostema ovatum</i>	Vinegar Weed	Occurring On Site 17-C
	<i>Marrubium vulgare</i>	White horehound	Adjacent to Site 10-C
	<i>Malacothamnus</i> sp.	Bushmallow	Adjacent to Site 9-C
Plantaginaceae	<i>Bromus diandrus</i>	Ripgut brome	Occurring on Site 9-C; Adjacent to Site 9-C
Poaceae	<i>Bromus hordeaceus</i>	Soft brome	Occurring On 17-C; Adjacent to Site 9-C and 10-C
	<i>Bromus madritensis</i> ssp. <i>Rubens</i>	Red brome	Occurring On Site 2-M, 9-C; Adjacent to Site 10-C
Geraniaceae	<i>Erodium</i> sp.	Filaree	Occurring on Site 9-C; Adjacent to Site 9-C
	<i>Cynodon dactylon</i>	Bermuda grass	Occurring On Site 1-C
	<i>Distichlis spicata</i>	Saltgrass	Occurring On Site 3-C, 3-C2, 3-M
	<i>Schismus</i> sp.	Mediterranean barley	Occurring On Site 2-M, 3-S, 3-C, 3-C2, 3-M, 9-C; Adjacent to Site 9-C
Rosaceae	<i>Prunus dulcis</i>	Almond	Adjacent to Site 5-S
Salicaceae	<i>Salix laevigata</i>	Red willow	Adjacent to Site 15-S
	<i>Salix goodingii</i>	Black willow	Adjacent to Site 15-S
	<i>Salix</i> sp.	Willow	Occurring On Site 2-S, 2-M
Solanaceae	<i>Datura wrightii</i>	Jimsonweed	Occurring On Site 5-S; Adjacent to Site 9-C
	<i>Nicotiana glauca</i>	Tree tobacco	Adjacent to Site 10-C
Tamaricaceae	<i>Tamarix pentandra</i>	Tamarisk	Occurring On Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 15-S, 17-C; Adjacent to Site 9-C, 10-C, 15-S
Typhaceae	<i>Typha latifolia</i>	Narrowleaf cattail	Adjacent to Site 15-S

Source: Quad Knopf 2010c, 2010d

**Wildlife**

General wildlife species observed in 2009, 2010, and 2012 (Quad Knopf, 2009, 2010a, 2010e, 2012, HCP Appendix G) during visual surveys, small mammal trappings studies, focused surveys for the San Joaquin kit fox, and focused surveys for blunt-nosed leopard lizard in and

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

surrounding the Covered Lands include, but are not limited to, coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), black-tailed jack rabbit (*Lepus californicus*), deer mouse (*Peromyscus maniculatus*), Heermann’s kangaroo rat (*Dipodomys heermanni*), barn owl (*Tyto alba*), red-tailed hawk (*Buteo jamaicensis*), lesser nighthawk (*Chordeiles acutipennis*), American kestrel (*Falco sparverius*), greater roadrunner (*Geococcyx californianus*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), California horned lark (*Eremophila alpestris actia*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), California whiptail (*Aspidoscelis tigris munda*), common side-blotched lizard (*Uta stansburiana*), and western toad (*Anaxyrus boreas*). Specific site occurrence information for all of the species identified during the surveys is provided in Table 3.4-6.

**Table 3.4-6**  
**Wildlife Species Occurring on Covered Lands and**  
**Lands Adjacent to the Maricopa Sun Solar Project**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Project Site</b>
<b>Amphibians</b>		
<i>Anaxyrus sp. Or Spea sp.</i>	Toad	Site 3-S, 3-C, 3-C2, 3-M
<b>Reptiles</b>		
<i>Aspidoscelis tigris munda</i>	California whiptail	Site 3-S, 3-C, 3-C2, 3-M
<i>Crotalus oreganus</i>	western rattlesnake	Site 15-S
<i>Gambelia sila*</i>	blunt-nosed leopard lizard	Adjacent to Site 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 17-C
<i>Phrynosoma blainvillii*</i>	California horned lizard	Adjacent to Site 3-S, 3-C, 3-C2, 3-M
<i>Uta stansburiana</i>	common side-blotched lizard	Site 3-S, 3-C, 3-C2, 3-M, 15-S
<b>Birds</b>		
<i>Athene cunicularia*</i>	western burrowing owl	Site 1-C, 3-S, 3-C, 3-C2, 3-M, 5-S, 6-S, 7-S, 9-C, 10-C, 15-S; Adjacent to Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 5-S, 6-S, 7-S, 7-M, 15-S
<i>Buteo swainsoni*</i>	Swainson’s hawk	Adjacent to Site 4-S, 4-M
<i>Chordeiles acutipennis</i>	Lesser nighthawk	Site 15-S
<i>Circus cyaneus*</i>	Northern harrier	Site 15-S, Adjacent to Site 1-C, 3-S, 3-C, 3-C2, 3-M, 4-S, 4-M, 6-S
<i>Corvus corax</i>	raven	Site 1-C, 2-S, 2-M, 15-S
<i>Corvus brachyrhynchos</i>	crow	Site 15-S
<i>Elanus leucurus*</i>	white-tailed kite	Site 5-S
<i>Eremophila alpestris actia</i>	California horned lark	Site 15-S
<i>Falco sparverius</i>	American kestrel	Site 15-S
<i>Lanius ludovicianus*</i>	Loggerhead shrike	Site 17-C
<i>Tyto alba</i>	barn owl	Site 3-S, 3-C-3, 3-C2, 3-M, 5-S, 15-S
<i>Zenaida macroura</i>	mourning dove	Site 15-S
<b>Mammals</b>		
<i>Ammospermophilus nelsoni*</i>	Nelson’s antelope squirrel	Adjacent to Site 1-C, 9-C, 10-C, 17-C

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Project Site</b>
<i>Spermophilus beecheyi</i>	California ground squirrel	Site 15-S
<i>Peromyscus maniculatus</i>	deer mouse	Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, C-M, 9,10, 15-S
<i>Dipodomys nitratooides nitratooides*</i>	Tipton's kangaroo rat	Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 9-C, 10-C
<i>Dipodomys heermanni</i>	Heermann's kangaroo rat	Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3M, 9-C, 10-C
<i>Onychomys torridus tularensis*</i>	Tulare grasshopper mouse	Site 1-C, 6-S, 9-C, 15-S
<i>Lepus californicus</i>	black-tailed jackrabbit	Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 4-S, 4-M, 7-S, 7-M, 15-S
<i>Sylvilagus audubonii</i>	cottontail	Site 1-C, 2-S, 2-M, 3-S, 3-C, 3-C2, 3-M, 4-S, 4-M, 7-S, 7-M, 15-S
<i>Felis catus</i>	house cat	Site 6-S
<i>Taxidea taxus*</i>	American badger	Site 17-C
<b>CANIDAE</b>	unknown canid	Site 15-S
<i>Canis familiaris</i>	domestic dog	Site 7-S, 7-M, 15-S
<i>Vulpes macrotis mutica*</i>	San Joaquin kit fox	Adjacent to Sites 1-C, 15-S, 17-C
<i>Canis latrans</i>	coyote	Site 1-C, 3-S, 3-C, 3-C2, 3-M, 5-S, 15-S

Source: Quad Knopf 2009, 2010a, 2010e, 2012)

\*Indicates special-status species

***Special Status Species***

A search of existing databases and literature was conducted to determine sensitive biological resources occurring in the project region. Information was obtained from the California Natural Diversity Database (CNDDDB) (CDFW 2013), California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2013), Recovery Plan for the Upland Species of San Joaquin Valley, California (USFWS 1998), and the federal Endangered and Threatened Species List (USFWS 2013). There are five sensitive natural communities, 20 special-status plant species (Table 3.4-7), and 39 special-status wildlife species (Table 3.4-8) known to occur within the nine USGS 7.5-minute topographic quadrangles surrounding the Covered Lands. The distributions of these CNDDDB records are provided in Figures 3.4-6 A through D. There are CNDDDB records within a five-mile radius of the project area for the following special-status wildlife species:

- Blunt-nosed leopard lizards (*Gambelia sila*);
- San Joaquin kit foxes (*Vulpes macrotis mutica*);
- Tipton kangaroo rats (*Dipodomys nitratooides nitratooides*);
- Buena Vista Lake shrews (*Sorex ornatus relictus*);
- Nelson's antelope squirrels (*Ammospermophilus nelson*);
- American badgers (*Taxidea taxus*); and
- Western burrowing owls (*Athene cunicularia*).

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

**Table 3.4-7**  
**Sensitive Vegetation Communities and Special Status Plant Species**  
**Occurring in the Region of the Maricopa Sun Solar Habitat Conservation Plan Area**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Status</b>
<b>Sensitive vegetative communities</b>		
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Protected under CEQA
Great Valley Mesquite Scrub	Great Valley Mesquite Scrub	Protected under CEQA
Valley Sacaton Grassland	Valley Sacaton Grassland	Protected under CEQA
Valley Saltbush Scrub	Valley Saltbush Scrub	Protected under CEQA
Valley Sink Scrub	Valley Sink Scrub	Protected under CEQA
<b>Plants</b>		
<i>Allium howellii</i> var. <i>clokeyi</i>	Mt. Pinos onion	1B.3
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	1B.1
<i>Atriplex cordulata</i>	Heartscale	1B.2
<i>Atriplex tularensis</i>	Bakersfield smallscale	CE, 1B.1
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2
California ( <i>Erodium</i> ) <i>macrophyllum</i>	round-leaved filaree	1B.1
<i>Caulanthus californicus</i> ( <i>Stanfordia californica</i> )	California jewel-flower	FE, CE, 1B.1
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower	1B.2
<i>Cirsium crassicaule</i>	slough thistle	1B.1
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	1B.1
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2
<i>Eremalche kernensis</i>	Kern mallow	FE, 1B.1
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>	Tejon poppy	1B.1
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1
<i>Layia heterotricha</i>	Pale-yellow layia	1B.1
<i>Layia leucopappa</i>	Comanche Point layia	1B.1
<i>Monardella linoides</i> ssp. <i>oblonga</i>	tehachapi monardella	1B.3
<i>Monolopia congdonii</i>	San Joaquin woollythreads	FE, 1B.2
<i>Stylocline citroleum</i>	oil neststraw	1B.1

**Status Definitions**

- FE Federally Endangered
- CE California Endangered
- 1B.1 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
- 1B.2 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
- 1B.3 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
- 4.2. Plants of limited distribution - Watch list, Fairly endangered in California (20-80% occurrences threatened)

Source: CNDDDB 2013, CNPS 2013, USFWS 2013, and CDFW 2013)

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

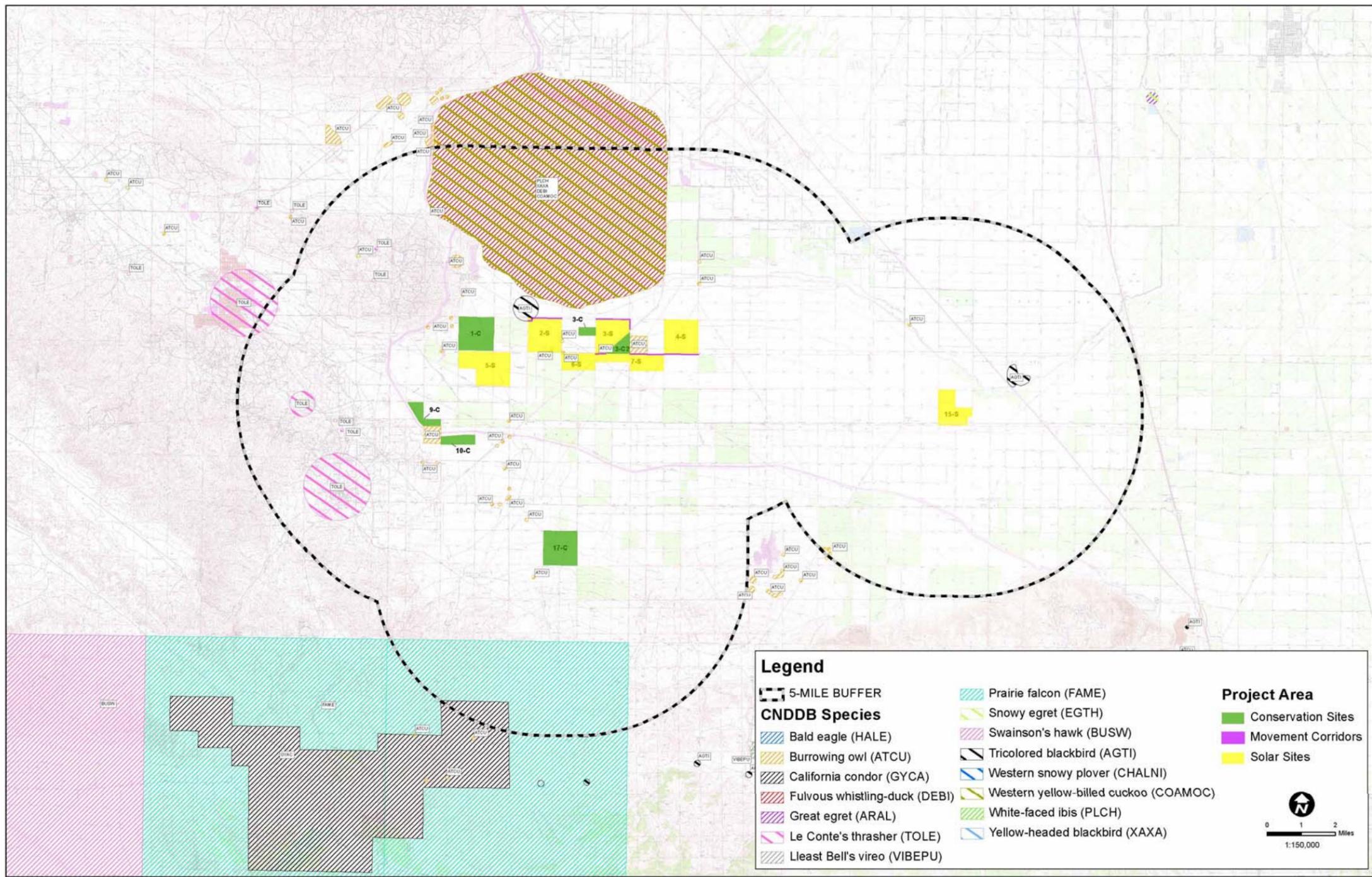
**Table 3.4-8**  
**Special Status Wildlife Species**  
**Occurring in the Region of the Maricopa Sun Solar Habitat Conservation Plan Area**

Scientific Name	Common Name	Status
<b>Invertebrates</b>		
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT
<i>Euproserpinus euterpe</i>	Kern primrose sphinx moth	FT
<b>Fishes</b>		
<i>Hypomesus transpacificus</i>	Delta smelt	FT, CT
<b>Amphibians</b>		
<i>Rana aurora draytonii</i>	California red-legged frog	FT
<i>Spea hammondi</i>	western spadefoot	CSC
<b>Reptiles</b>		
<i>Actinemys marmorata pallida</i>	western pond turtle	CSC
<i>Anniella pulchra pulchra</i>	silvery legless lizard	CSC
<i>Gambelia sila</i> *	blunt-nosed leopard lizard	CE, FE, CDFW fully protected
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	CSC
<i>Phrynosoma blainvillii</i> *	California horned lizard	CSC
<i>Thamnophis gigas</i>	giant garter snake	FT, CT
<b>Birds</b>		
<i>Agelaius tricolor</i>	tricolored blackbird	CSC
<i>Athene cunicularia</i>	western burrowing owl	CSC
<i>Buteo swainsoni</i> *	Swainson's hawk	CSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT
<i>Charadrius montanus</i>	mountain plover	CSC
<i>Circus cayaneus</i> *	Northern harrier	CSC
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	CE
<i>Dendrocygna bicolor</i>	fulvous whistling-duck	CSC
<i>Elanus leucurus</i> *	white-tailed kite	CDFW fully protected
<i>Eremophila alpestris actia</i>	California horned lark	CDFW watch list
<i>Falco mexicanus</i>	prairie falcon	CDFW watch list
<i>Gymnogyps californianus</i>	California condor	FE, CE
<i>Lanius ludovicianus</i> *	Loggerhead shrike	CSC
<i>Plegadis chihi</i>	white-faced ibis	CDFW watch list
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CSC
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	CSC
<b>Mammals</b>		
<i>Ammospermophilus nelson</i> *	Nelson's antelope squirrel	CT
<i>Dipodomys ingens</i>	giant kangaroo rat	FE, CE
<i>Dipodomys nitratoides brevinasus</i>	short-nosed kangaroo rat	CSC
<i>Dipodomys nitratoides nitratoides</i> *	Tipton kangaroo rat	FE, CE
<i>Eumops perotis californicus</i>	western mastiff bat	CSC
<i>Onychomys torridus tularensis</i> *	Tulare grasshopper mouse	CSC
<i>Perognathus inornatus inornatus</i>	San Joaquin pocket mouse	CSC, BLMS
<i>Sorex ornatus relictus</i>	Buena Vista Lake shrew	FE
<i>Taxidea taxus</i> *	American badger	CSC
<i>Vulpes macrotis mutica</i> *	San Joaquin kit fox	FE, CT

\*Identified on or adjacent to Covered Lands

\* Status designations are: CSC = California Special of Special Concern, FE = federally endangered, FPS = fully protected species, FT = federally threatened, SE = State endangered, ST = State threatened, MBTA = protected by the Migratory Bird Treaty Act.

Source: CNDDB 2013, CNPS 2013, USFWS 2013, and CDFW 2013



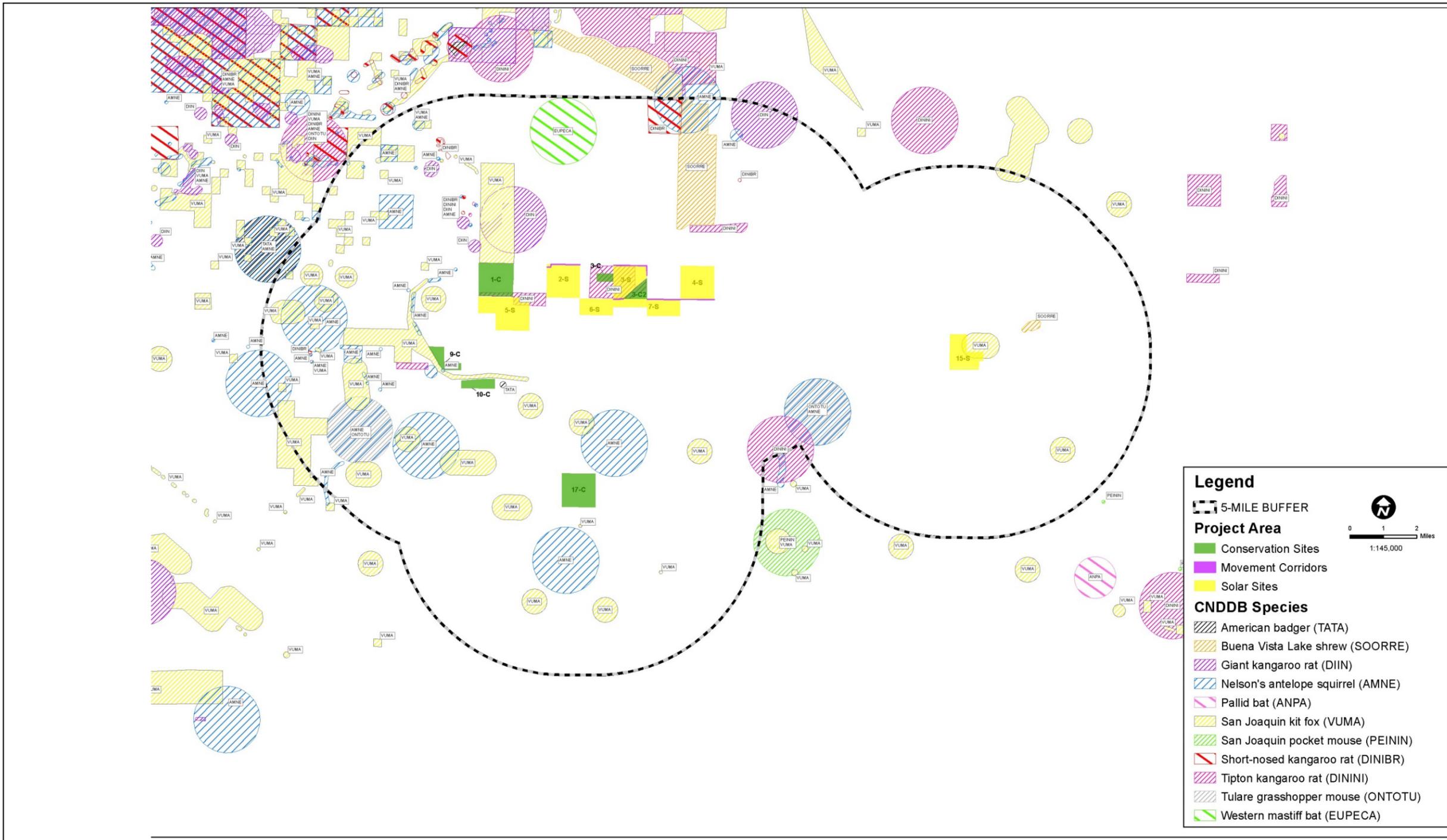
FILE: VBK-SERVER-02\Projects\Projects\2009\090180\2\GIS\MXD\Revised\3.4-6A\_CNDDDB\_AVIAN.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC/SOS/CDFG - CNDDDB (September 2012)



CNDDDB SENSITIVE AVIAN SPECIES OBSERVATIONS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-6A

*This page intentionally left blank.*



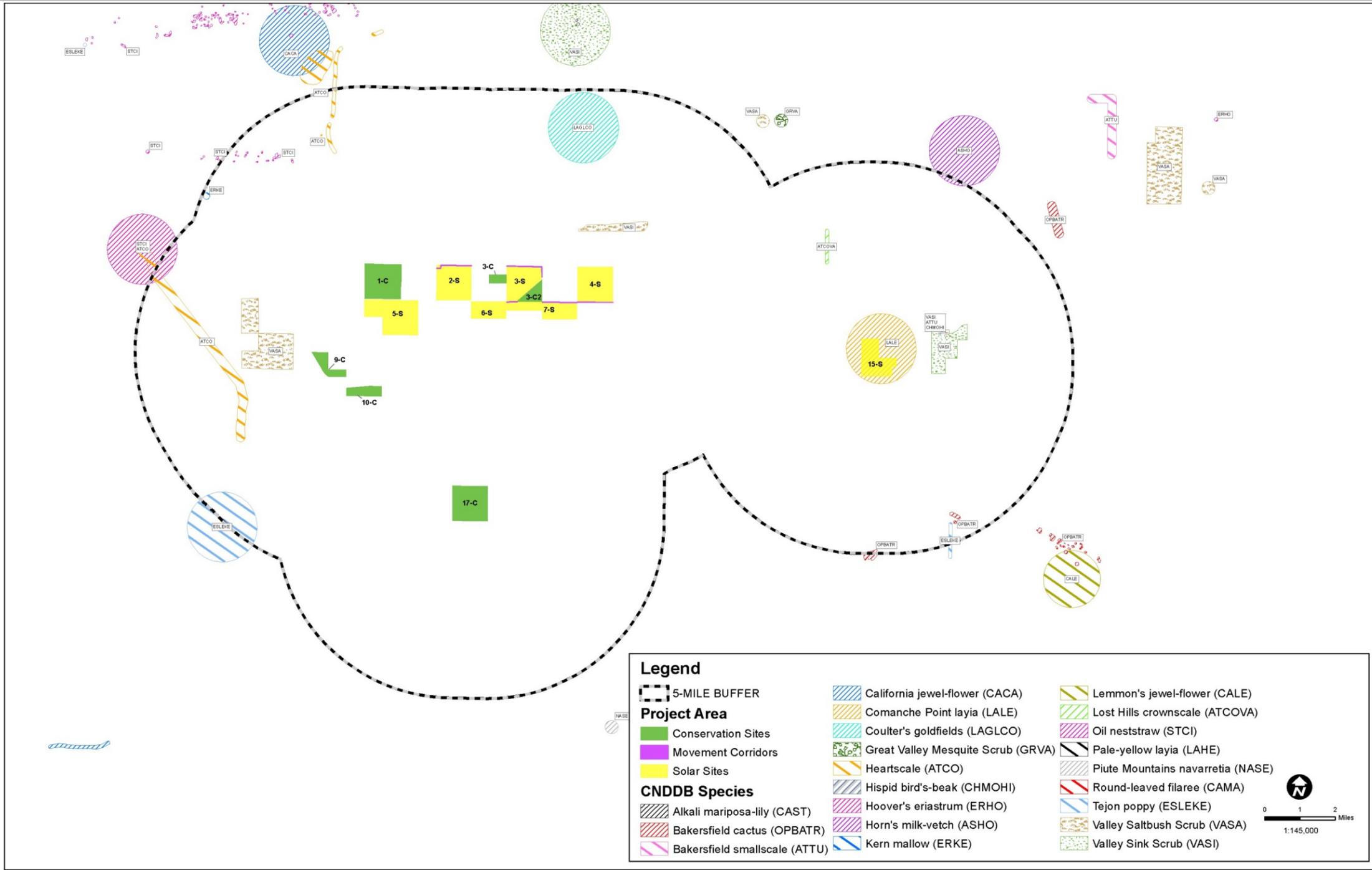
FILE: \\BK-SERVER-02\Projects\Projects\2008\08180 02\01\SM\DR\Revised\3 4-6B\_CNDDB\_MAMMAL.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC\USGS\CDFG - CNDDDB (September 2012)



CNDDDB SENSITIVE MAMMAL SPECIES OBSERVATIONS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-6B

*This page intentionally left blank.*



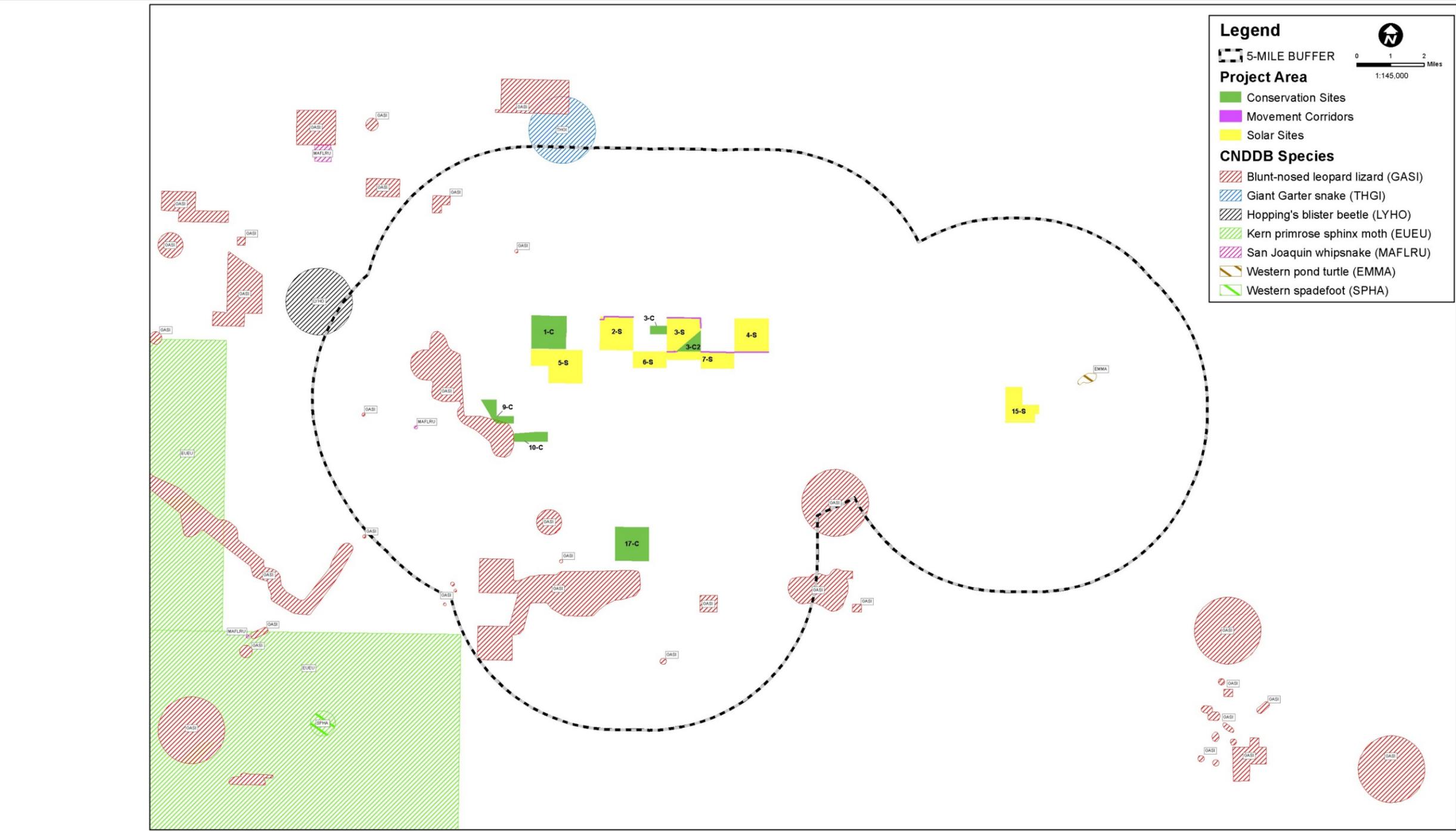
FILE: VBK-SERVER-02\Projects\Projects\2009\09160\_02\GIS\MXD\Revised\3-4-C\_CNDDDB\_PLANTS.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC\US\SCDFG - CNDDDB (September 2012)



CNDDDB SENSITIVE PLANT SPECIES OBSERVATIONS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-6C

*This page intentionally left blank.*



FILE: VBI-SERVER-02\Projects\Projects\2009\00180\_02\GIS\MXD\Revised\3.4-6D\_CNDDB\_REPTILE.mxd MODIFIED: 10/14/2013 Source: Maricopa Sun Solar LLC\GIS\SCDFG - CNDDB (September 2012)



CNDDB SENSITIVE REPTILE, AMPHIBIAN, INSECT, AND INVERTEBRATE SPECIES OBSERVATIONS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-6D

*This page intentionally left blank.*

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

Numerous evaluations of the potential for special-status species to occur on the Covered Lands were conducted between 2009 and 2012. These evaluations consisted of both reconnaissance and focused biological surveys. The focused surveys included protocol-surveys for small mammals, the San Joaquin kit fox, the blunt-nosed leopard lizard, and nesting raptors. The special-status species observed either on the Covered Lands or on adjacent lands include the blunt-nosed leopard lizard, San Joaquin kit fox, Tipton kangaroo rat, Nelson’s antelope ground squirrel, western burrowing owl, American badger, Swainson’s hawk, white-tailed kite, California horned lark, and Northern harrier (see Table 3.4-6).

The HCP covers five species that may be subject to take by Covered Activities (Table 3-4-9). A summary of the natural history of these species and the occurrence of covered species within the Permit Area are described below.

**Table 3.4-9**  
**List of Species Proposed for Coverage, Maricopa Sun HCP**

Common Name	Scientific Name	Status*		
		Federal	State	Other
<b>Mammals</b>				
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	ST	-
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	FE	SE	-
Nelson’s antelope squirrel	<i>Ammospermophilus nelsoni</i>	-	ST	-
<b>Birds</b>				
Western burrowing owl	<i>Athene cunicularia</i>	-	CSSC	MBTA
<b>Reptiles</b>				
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE	SE	FPS

\* Status designations are: CSC = California Species of Special Concern, FE = federally endangered, FPS = fully protected species, FT = federally threatened, SE = State endangered, ST = State threatened, MBTA = protected by the Migratory Bird Treaty Act.

**LIFE HISTORY**

The San Joaquin kit fox is found only in the Central Valley area of California. San Joaquin kit foxes currently inhabit suitable habitat in the San Joaquin Valley and in surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains, and on the Carrizo and Elkhorn Plains. Much of the historic natural vegetative communities within the range of the San Joaquin kit fox has been eliminated and is now represented only by small, isolated and degraded remnants. San Joaquin kit foxes are now primarily found on the western side of the San Joaquin Valley natural lands in Kern, Tulare, Kings, Fresno, Madera, San Benito, Merced, Stanislaus, San Joaquin, Alameda, and Contra Costa counties.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

San Joaquin kit foxes occur in a variety of habitats, including grassland, scrublands, oak woodland, alkali sink scrubland, vernal pool areas, and alkali meadow communities. San Joaquin kit foxes are also known to occur in extensively modified habitats such as oil fields and wind turbine facilities (USFWS 1998). They are present, but generally less abundant, in other highly modified landscapes such as agricultural row crops, irrigated pastures, orchards, vineyards, and grazed annual grassland. They prefer habitats with loose-textured soils that are suitable for digging, but they occur on virtually every soil type.

The diet of San Joaquin kit foxes varies, with season and geographic locality based on local availability of potential prey but usually consists of kangaroo rats, pocket mice, white-footed mice, and other nocturnal rodents. San Joaquin kit foxes also prey on black-tailed hares, Nelson's antelope squirrels, desert cottontails, ground-nesting birds, and insects (USFWS 1998).

San Joaquin kit foxes can, but do not necessarily, breed their first year. Adult pairs of foxes stay together throughout the year and can begin breeding at one year of age. During September and October, females begin to clean and enlarge their pupping dens and mating usually occurs between December and March. Litters of two to six pups are born between February and late March, with pups emerging from the den after about a month. Population growth rates generally vary positively with reproductive success and kit fox density is often positively related to both current and the previous year's prey availability (Cypher et al. 2000).

Dens are generally located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. Preferred sites are relatively flat, well-drained terrain (USFWS 1998). The kit fox requires underground dens for temperature regulation, shelter, reproduction, and predator avoidance. Dens are usually located on loose-textured soils on slopes less than 40 degrees, but the characteristics (number of openings, shape, slope, aspect) of dens vary across the fox's geographic range. Kit foxes dig their own dens, but also use those constructed by other animals. They also frequently use human-made structures (culverts, abandoned pipelines, or banks in sumps or roadbeds) as den sites.

Kit foxes may range up to 20 miles at night (Girard 2001) during the breeding season and somewhat less (6 miles) during the pup-rearing season. Home ranges vary from less than 1 square mile up to approximately 12 square miles (Knapp 1978, Spiegel and Bradbury 1992, White and Ralls 1993).

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

**LIFE HISTORY**

The historical geographic range of Tipton kangaroo rats was over 1.7 million acres of arid-land communities occupying the valley floor of the Tulare Basin. By 1985, the inhabited area had been reduced to about 60,000 acres or about 4% of the historically occupied acreage. Currently,

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

Tipton kangaroo rats inhabit small, scattered, isolated fragments of remnant habitat. In the southern San Joaquin Valley, this includes the Kern and Pixley National Wildlife Refuges, and other scattered areas within Kern, Tulare, and Kings Counties.

The Tipton kangaroo rat is limited to arid-land communities occupying the valley floor of the Tulare Basin in level or nearly level terrain. They occupy alluvial fan and floodplain soils ranging from fine sands to clay-sized particles (because of the high alkalinity of these soils, some of the finer-textured soils tend to be powdery when dry rather than hard-packed). Generally, woody shrubs of one or more species are sparsely scattered over occupied terrain with scant-to-moderate ground cover of grasses and forbs. Tipton kangaroo rats are commonly associated with spinescale saltbush (*Atriplex spinifera*), Allscale saltbush, leafcover saltweed (*Atriplex covillei*), quailbush, iodine bush, alkali goldenbush, mesquite (*Prosopis glandulosa*), and seepweed (Williams, 1985).

The Tipton kangaroo rat eats mostly seeds, with small amounts of green, herbaceous vegetation and insects supplementing their diet when available (USFWS 1998). Little is known about Tipton kangaroo rat reproduction in the wild. Mating appears to begin in the winter and most females seem to have one litter per year, although litters of two or more may be born during exceptional years (USFWS 1998). Young are born in burrows.

Burrow systems are usually in open areas but may occur in thick scrub. They are typically simple, but may include interconnecting tunnels. Most are less than 10 inches deep. Burrows are most prominent on slightly elevated mounds, the berms of roads, canal embankments, railroad beds, and bases of shrubs and fences where wind-blown soils accumulate above the level of surrounding terrain.

Loss, fragmentation, and degradation of habitat associated with agricultural conversion in the San Joaquin Valley continue to decrease the remaining habitat of the Tipton kangaroo rat. As a result of industrial and agricultural related developments, cultivation, formation of patches of exotic grasses, urbanization, and flooding, there is an increase of habitat destruction or modification (USFWS 1998). The more common Heermann's kangaroo rat may competitively exclude or reduce the density of Tipton kangaroo rats where they co-occur.

*Nelson's Antelope Squirrel (Ammospermophilus nelsoni)*

**LIFE HISTORY**

Nelson's antelope squirrels are restricted to desert and scrubland habitats. The historical geographic range was within the southern and western areas of the Tulare Basin, the San Joaquin Valley, and up to the Cuyama Valley and the Carrizo and Elkhorn Plains. Its current range is now estimated to be uncultivated habitat within the San Joaquin Valley. They are thought to be extirpated from the Tulare Basin floor and only occur in the marginal habitat in the foothills of

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

the mountains bordering the west of the basin. Populations of Nelson's antelope squirrel occur in Lokern and Elk Hills and on the Carrizo and Elkhorn Plains. In all, approximately 41,300 hectares have been deemed fair to adequate habitat for Nelson's antelope squirrels within its historic range (USFWS 1998).

Habitat of Nelson's antelope squirrels consist of grasslands with moderate shrub cover which includes such species as salt bush, ephedra (*Ephedra* sp.), bladder pod (*Peritoma arborea*), goldenbush (*Isocoma* sp.), snakeweed (*Gutierrezia* sp.), and others. The squirrels live in small underground familial colonies on sandy, easily excavated grasslands

Nelson's antelope squirrels are opportunistic omnivores. Common food is green vegetation and insects, but is largely dependent on what is seasonally available (Hawbecker 1975; Harris 1993). Nelson's antelope squirrels are largely diurnal and are active for much of the day. However, during extreme high or low temperatures they will often stay in their ground burrows. Nelson's antelope squirrels often excavate their own ground burrows, but if the opportunity presents itself they will use a burrow that was constructed by another small mammal, such as kangaroo rats.

Nelson's antelope squirrels breed between late winter and early spring. Young are usually born between March and April. Only one litter is produced each year. Mortality rates of young are about 70% their first year, and the annual adult survival rate is between 50% and 60% (Williams and Tordoff 1988).

Nelson's antelope squirrels are social animals (Grinnell and Dixon 1916). They do not expend much energy throughout the day because of the extreme temperatures in their environment (Hawbecker 1953) and there is little activity during the heat of the day. Although there is no evidence of hibernation, the squirrels are not bothered by the cold and can survive temperatures below freezing in their burrow (Hawbecker 1958).

Nelson's antelope squirrels are cautious when emerging from their burrows (Grinnell and Dixon 1916), and have a specific route that they follow when foraging for food. If danger seems near, they will run into a burrow along their foraging route to get to safety (Hawbecker 1953). They move quickly and do not spend much time in one place (Hawbecker 1975).

***Western burrowing owl (Athene cunicularia)***

**LIFE HISTORY**

The western burrowing owl is a summer resident in the western half of the United States and a year-round resident in the southwestern portion of the U.S. and northern and central Mexico. In California, they inhabit the lowlands of the Central Valley and the desert environments of the southeastern part of the state. Although western burrowing owls still exist in most portions of

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

their historic range, their population densities have declined due to habitat loss, degradation, and fragmentation.

Western burrowing owls occupy grasslands, deserts, sagebrush scrub, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands, and urban vacant lots, as well as the margins of airports, golf courses, and roads. Western burrowing owls select sites that support short vegetation, even bare soil, presumably because they can easily see over it. However, they will tolerate tall vegetation if it is sparse. Owls will perch on raised burrow mounds or other topographic relief, such as rocks, tall plants, fence posts, and debris piles, to attain good visibility (Haug et al. 1993). Western burrowing owls are primarily crepuscular in their foraging habits, but will hunt for insects and small vertebrates during both day and night.

Their breeding season begins in March or April and extends through August. Average clutch size is five or six eggs and they rarely produce a second brood. Where site conditions are optimal, western burrowing owls sometimes form loose colonies, which is unusual for avian predators (Haug et al. 1993). The female will lay an egg every 1 or 2 days until she has completed a clutch, which can consist of 4 to 12 eggs (usually 9). She will then incubate the eggs for three to four weeks while the male brings her food. After the eggs hatch, both parents will feed the chicks. Four weeks after hatching, the chicks are able to make short flights and begin leaving the nest burrow. The parents will still help feed the chicks for 1 to 3 months. While most of the eggs will hatch, only 4 to 5 chicks usually survive to leave the nest.

During the breeding season, western burrowing owls spend most of their time within 50 to 100 m (162 to 325 feet) of their nest or satellite burrows (Haug and Oliphant 1990). During the day, they forage in the vicinity of the natal burrow where they find it easy to prey on insects in low, open vegetation. Western burrowing owls will nest in loose colonies, although owls display intraspecific territoriality immediately around nest burrow (Haug et al. 1993). Western burrowing owls in California typically begin pair formation and courtship in February or early March, when adult males attempt to attract a mate.

When hunting, they wait on a perch until they spot prey. They then swoop down on prey or fly up to catch insects in flight. Sometimes, they chase prey on foot across the ground.

An immediate threat to the western burrowing owl is the conversion of grassland habitat to urban and agricultural uses, and the loss of suitable agricultural lands to development. Equally important is the loss of fossorial rodents, such as small ground squirrel species, across much of the owl's historical range. Another cause of population declines is thought to be pesticide use but evidence does not clearly indicate that other contaminants are reducing populations (Gervais et al. 1997). Habitat fragmentation (Remsen 1978) probably increases foraging distances, making hunting less efficient and potentially reducing reproductive success. In urban settings,

owls occurring in isolated habitats may experience frequent disturbances from adjacent land uses and barriers to foraging areas.

*Blunt-nosed Leopard Lizard (Gambelia sila)*

**LIFE HISTORY**

Historically, the blunt-nosed leopard lizard occurred in the southern San Joaquin Valley and adjacent western and southern foothills. The current distribution is restricted to scattered sites in the southern San Joaquin Valley, Carrizo Plain, Elkhorn Plain, and southeastern Cuyama Valley. This distribution roughly corresponds with the western half of Kern County, the eastern boundary of San Luis Obispo and Kings Counties, the western boundary of Fresno County, and extreme southwestern Tulare County. These lizards are rare and localized in suitable habitat throughout their current range (Quad Knopf 2010c).

Blunt-nosed leopard lizards are typically associated with sparsely vegetated, arid habitats of saltbush scrub, alkali sinks, non-native grasslands, Ephedra scrub, and washes. Most of these habitat types have been lost to agricultural conversion, oil production, and urbanization, and the blunt-nosed leopard lizard currently occurs in less than 15 percent of their historic distribution (USFWS 1998).

The blunt-nosed leopard lizard is a carnivorous predator that feeds primarily on insect (mostly grasshoppers, crickets, and moths) and other lizards. Lizard species taken as prey include side-bloched lizards, coast horned lizards, California whiptails, and spiny lizards. Young of its own species are also eaten (USFWS 1998).

Blunt-nosed leopard lizards are in reproductive status from April to July. Females typically lay eggs between May and June. Clutch size averages three eggs with a range of one to six eggs. One clutch per season is the normal pattern, but females may produce a second, third, or even fourth clutch if environmental conditions are favorable (Jennings 1995; Germano and Williams 1992 and 2005; USFWS 1998). There are no current data available for population densities of blunt-nosed leopard lizards, but Uptain *et al.* (1992) reported densities ranging from 0.1 to 4.2 individuals per acre at the Pixley National Wildlife Refuge in Tulare County.

The optimum activity period occurs when air temperatures are between 25-35°C (77-95°F) and soil temperatures are between 30-50°C (86-122°F). On hotter days, they are active in the early morning and late afternoon and use small rodent burrows during the day. Blunt-nosed leopard lizards are highly territorial.

### **3.4.2.3 Site-Specific Characteristics**

Descriptions of the Covered Lands, including information on land use, plant and wildlife communities, and special-status species are provided below for each of the Solar Sites, Movement Corridors, and Conservation Sites.

#### *Solar Sites (3,798.3 acres)*

The Solar Sites, including the Movement Corridors, encompass 3,798.3 acres and formerly supported agricultural uses. Due to the lack of available water, these lands have not been in agricultural production for at least ten years. However, the lands have been maintained in a farm-ready condition by repeated disking, which has prevented Covered Species from occurring on the sites or has removed Covered Species from the sites. The Solar Sites are currently not fenced or actively improved.

#### *Site 2-S (628.8 acres)*

Site 2-S has been disked for weed control on a biannual basis, with the exception of an earthen berm located along the northern edge of the site. The site is mostly bare ground, but it does support sparse patches of weedy annual plants that include salt heliotrope, tamarisk, red brome, fiddleneck, Mediterranean barley (*Hordeum murinum*), quailbush, and seepweed. A lone willow tree, which appeared to be a black willow/weeping willow hybrid (*Salix babylonica*), exists near the electrical transmission lines in the southeast quarter of the site. Most of the annual plants occur along the earthen berm located at the north end of the site. There are scattered seepweed shrubs on the sides of the, but these scattered shrubs do not comprise a functional Valley Sink Scrub community. The surrounding lands consist of vineyards, an alfalfa (*Medicago sativa*) field, and disked fields. To the east of this site is native Saltbush Scrub habitat, which has been disturbed by past disking. This area is vegetated with disturbed chenopod scrubland, seepweed, Allscale saltbush, Mediterranean grass (*Schismus arabicus*), red brome, fiddleneck, alkali goldenbush and a few large tamarisks.

This site was likely historically vegetated with a matrix of Valley Saltbush Scrub and Alkali Sink Scrub vegetation communities. However, there are no historical records of special-status plant species occurring on the site (see Figures 3.4-6 A-D) (Quad Knopf 2010a, d). Although possible, it is also unlikely that special-status plant species occur within the saltbush scrub habitat that exists east of this site.

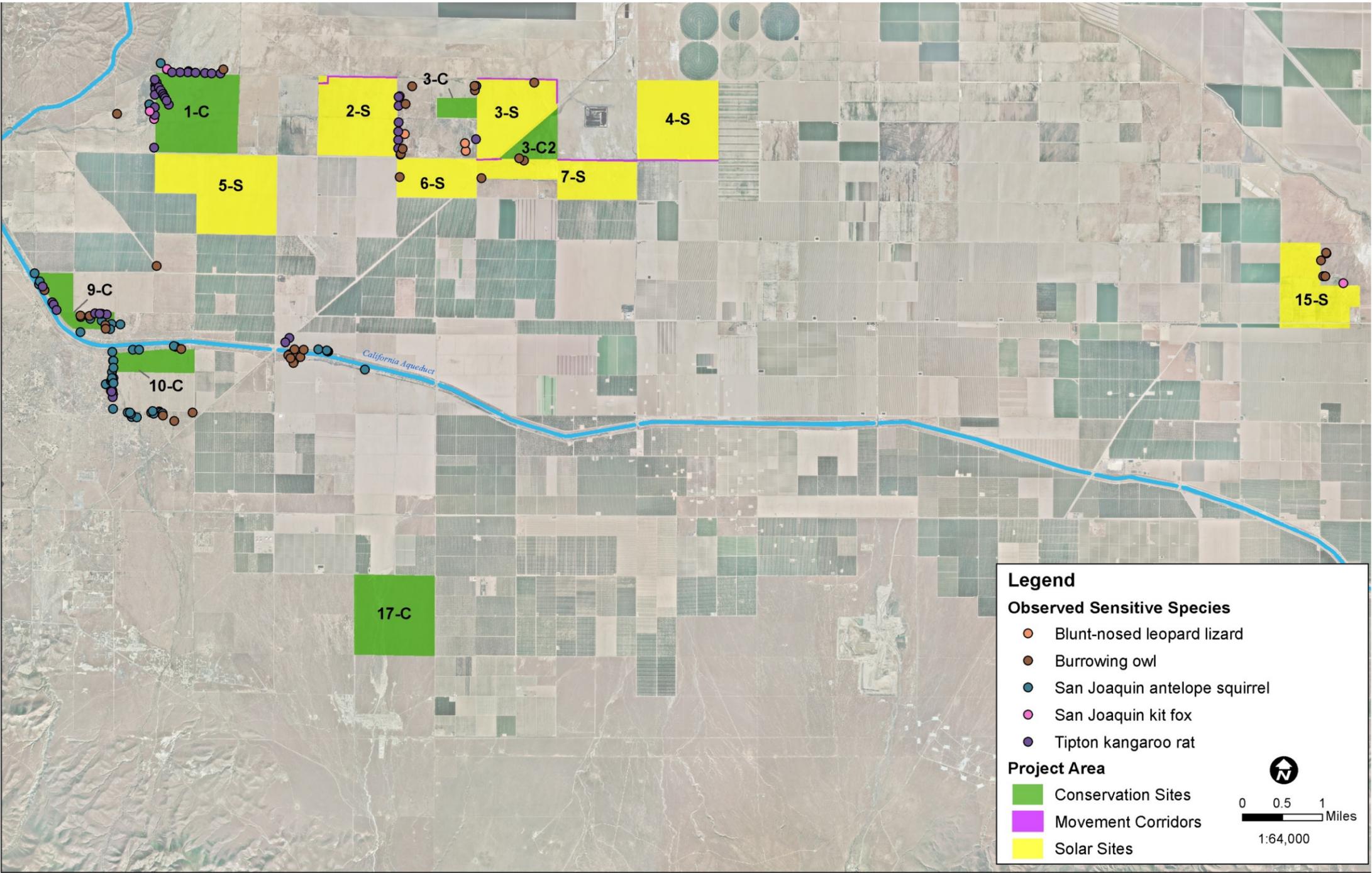
There are no historical records of special-status wildlife species occurring on the site (see Figures 3.4-6 A through D), and no evidence could be found that Covered Species occur on this site (Quad Knopf 2010a). However, Covered Species that may occasionally make forays onto or across the site for foraging or movement purposes include the San Joaquin kit fox, blunt-nosed

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

leopard lizard, Tipton kangaroo rat, and western burrowing owl (Table 3.4-9). Blunt-nosed leopard lizards, western burrowing owls, and Tipton kangaroo rats were located on the adjacent land east of the site (Figure 3.4-7). Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

**Table 3.4-10**  
**Existing Maricopa Sun Solar Site Conditions and Presence of Covered Species**

<b>Site No.</b>	<b>Area (Acres)</b>	<b>Site Condition/Vegetation</b>	<b>Presence of Covered Species*</b>
2-S	628.8	Fallow farmland, actively disked for weed control, minimal vegetation present	None present, but SJKF and WEBO may move through area BNLL, TKR, and WEBO known to occur nearby
3-S	460.4	Fallow farmland, actively disked for weed control, minimal vegetation present; NWI mapped freshwater emergent wetlands; field surveys determined that the area lacks hydric soils or wetland vegetation	WEBO was sighted on this site, SJKF may occasionally move through the area; BNLL, TKR, and WEBO known to occur nearby
4-S	652.5	Fallow farmland, actively disked for weed control, no vegetation present; a ponding basin is located on lands off site, adjacent to the southwest corner of this site	None present; SJKF and WEBO may move through area
5-S	797.2	Fallow farmland, actively disked for weed control, minimal vegetation present	None present; SJKF and WEBO may move through area
6-S	304.2	Fallow farmland, actively disked for weed control, minimal vegetation present	WEBO observed on site; SJKF may occur as; TKR and BNLL not present on site, but may be present on adjacent lands to the north;
7-S	471.6	Fallow farmland, actively disked for weed control, minimal vegetation present; NWI mapped emergent wetlands in the north central portion no longer present; a small (3.88-acre) ponding basin is present, off site, at the south corner	WEBO observed on site; SJKF may occur as; TKR and BNLL not present on site, but present on adjacent lands to the north; Covered Species may be present within existing easements, but no evidence of presence was obtained and those areas are not within the Solar Development Footprint
15-S	483.6	Fallow farmland, actively disked for weed control, minimal vegetation present; several NWI mapped wetlands are no longer present due to frequent disking	None present; WEBO, SJKF observed on adjacent lands and are expected to be on the site; TKR may also occur on adjacent lands.



Document Path: \\BK-SERVER-02\Projects\Projects\2009\090160.02\GIS\MXD\Revised\Fig 3.4-7 SS Species survey results.mxd



SPECIAL STATUS SPECIES SURVEY RESULTS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.4-7

*This page intentionally left blank.*

*Site 3-S (460.4 acres)*

Site 3-S has been disked for weed control on a biannual basis, with the exception of an irrigation ditch that is located to the north of the site. The ditch is bounded on both sides by dirt roads. The ditch and roads are maintained to control weeds, but weedy species are present at a greater frequency here than on the disked portion of this site. The site is sparsely vegetated with weedy annual plant species, including London rocket, five-hook bassia, black mustard, seepweed, Russian thistle, Mediterranean grass, saltgrass, tamarisk, quailbush, annual weedy chenopods and annual sunflower. The adjacent lands consist of disked fields, a fallow field with a small patch of Valley Sink Scrub habitat, an expanse of Chenopod Scrub habitat, and ponding basins that are vegetated with tamarisk, seepweed, saltbush, and scattered iodine bush (*Allenrolfea occidentalis*).

There are no historical records of sensitive natural communities or special-status plant species occurring on the site (see Figures 3.4-6 A through D), but it is likely that this site was once vegetated with Valley Saltbush Scrub. No sensitive communities or special-status plant species were observed on the site during surveys, and special-status species cannot be supported on the disked portions of the site (Quad Knopf 2010 a, d). There is potential for special-status plant species to occur in adjacent native habitat to the west of the site. Special status species potentially occurring in this adjacent habitat include heartscale, Lost Hills crownscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw. The disturbed habitat to the north of the site, which will be managed as a Movement Corridor, could also potentially support special-status plant species.

Based on a search of the CNDDDB database, much of this site was once occupied by Tipton kangaroo rats (see Figures 3.4-6 A through D). However, the only Covered Species observed on the site was the western burrowing owl (Table 3.4-9)(Quad Knopf 2010a). Other Covered Species that may occasionally cross utilize the site for foraging or movement purposes include the San Joaquin kit fox, blunt-nosed leopard lizard, and Tipton kangaroo rat (Table 3.4-9). Other special-status species (e.g., western mastiff bat, white-tailed kite, and northern harrier) may occasionally fly over the site.

*Site 4-S (652.5 acres)*

Site 4-S has been disked on a biannual basis for weed control, and it has virtually no topographic relief. Along its margins are a few weedy species such as amaranth, but the site is otherwise devoid of vegetation. The adjacent land consists of row crop fields (onions and carrots), disked fields, fallow fields and alfalfa fields. There is a ponding basin adjacent to the southwest corner of the site. It is vegetated with thick quailbush and some tamarisk.

There are no historical records of sensitive natural communities or special-status plant species occurring on the site (see Figures 3.4-6 A through D), but it is likely that this site was once vegetated with Valley Saltbush Scrub, a sensitive natural community. Repeated disking has eliminated all native vegetation from the site removing habitat that would support special-status plant species. Similarly, intensive agricultural activities occurring on adjacent lands has eliminated habitat that would support special-status plant species from those areas.

There are no historical records of special-status wildlife species occurring on the site (see Figures 3.4-6 A through D), and no special-status species were observed on the site (Quad Knopf 2010a). Covered Species that may occasionally utilize the site for foraging or movement purposes include the San Joaquin kit fox and western burrowing owl (Table 3.4-9). Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Site 5-S (797.2 acres)*

Site 5-S has been disked on a biannual basis for weed control, and includes only sparse patches of weedy annual plants. Plants observed on this site include Bermuda grass, orchard bindweed, Johnsongrass (*Sorghum halepense*), five-hook bassia, London rocket, Russian thistle, and lamb's quarters. The adjacent lands include disked fields, an almond orchard, and an alfalfa field.

There are no historical records of sensitive natural communities or special-status plant species occurring on the site (see Figures 3.4-6 A through D), but it is likely that this site was once vegetated with Valley Saltbush Scrub. No sensitive vegetation communities or special-status plant species were observed on the site during surveys (Quad Knopf 2010a, d). Lands to the south, west, and east are cultivated and do not support special-status species. However, land to the north beyond South Lake Road, is known to support a variety of special-status species (see descriptions of lands adjacent to Sites 2-S and 3-S).

There are historical records of the Tipton kangaroo rat on the northeast portion of the site and on adjoining lands to the north (see Figures 3.4-6 A through D). No Covered Species were observed on the site, but a white-tailed kite was observed flying over the site (Table 3.4-9)(Quad Knopf 2010a). Tipton kangaroo rats are currently absent from the site, having been extirpated by the conversion of habitat through regular disking. Covered Species that may occasionally utilize the site for foraging or movement purposes include the San Joaquin kit fox and western burrowing owl (Table 3.4-9). Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Site 6-S (304.2 acres)*

Site 6-S has been repeatedly disked for weed control, with the exception of a small strip of land occurring within an existing railroad easement. The disked portion of the site includes only sparse patches of weedy annual plants, but the railroad easement is densely vegetated with London rocket, Russian thistle, five-hook bassia, and annual atriplex (*Atriplex argentea*). A canal occurring off the site along the southeastern border contains some quailbush, annual sunflower, and some scattered tamarisk. Adjoining lands include disked fields, orchards, and the native chenopod scrub habitat that occurs between sites 2-S and 3-S.

There are no historical records of sensitive natural communities or special-status plant species occurring on the site (see Figures 3.4-6 A through D), but it is likely that this site was once vegetated with Valley Saltbush Scrub. No sensitive vegetation communities or special-status plant species were observed on the site during surveys (Quad Knopf 2010a, d). However, there is some habitat within the existing railroad easement, which is outside the Solar Development Footprint, that could potentially support special-status plant species. Special status plant species could also potentially occur on adjacent lands to the north that are vegetated with disturbed saltbush scrub. Special status plant species potentially occurring on those adjacent lands include heartscale, Lost Hills crownscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

There are no historical records of special-status wildlife species occurring on the site (see Figures 3.4-6 A through D). The only Covered Species observed during surveys was the western burrowing owl (see Table 3.4-9)(Quad Knopf 2010a). Other Covered Species that could occasionally make forays onto or across the site for foraging or movement purposes include the San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard. These species would likely come from the saltbush scrub habitat to the north. Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Site 7-S (471.6 acres)*

Site 7-S has been disked on a biannual basis for weed control, with the exception of a small strip of land occurring within existing railroad and South Lake Road easements. These easements are not within the Solar Development Footprint. The site is generally devoid of vegetation, but it does have sparse patches of weedy species including five-hook bassia, yarrow, annual sunflower, and tamarisk. These plants are common throughout the existing easements though. The site is surrounded by disked lands, orchards, and a fallow field that is vegetated with weedy species and tamarisk.

There are no historical records of sensitive natural communities or special-status plant species occurring on the site (see Figures 3.4-6 A through D), but it is likely that this site was once

vegetated with Valley Saltbush Scrub. No sensitive vegetation communities or special-status plant species were observed on the site during surveys, (Quad Knopf 2010a, d). There is potential for special-status plant species to occur within the railroad and road easements, though. Lands surrounding this site are in active agriculture or are managed by repeated disking. It is unlikely that special-status plant species occur on these adjacent lands.

There are no historical records of sensitive wildlife species occurring on the site (see Figures 3.4-6 A through D). The only Covered Species observed during surveys was the western burrowing owl (see Table 3.4-9)(Quad Knopf 2010a). The San Joaquin kit fox may occasionally make forays onto and across the project site. Other Covered Species that could potentially occur on the site include the Tipton kangaroo rat and blunt-nosed leopard lizard. These species are known to occur in native habitat to the northwest of the site. Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Site 15-S (483.6 acres)*

Site 15-S is entirely disked for weed control and is devoid of vegetation. Valley Sink Scrub, a sensitive vegetative community, occurs to the northeast of the site. The remaining surrounding lands include disked fields, alfalfa fields, asparagus fields, a vineyard, and a fallow field that is mostly vegetated with London rocket. There is also a ponding basin to the north of the site that contains tamarisk, red willow, black willow, mulefat, yarrow, quailbush, seepweed, common cattails, and Mexican milkweed.

One historical record of Comanche Point layia, a sensitive plant species, occurs in the vicinity of the site (see Figures 3.4-6 A through D). The polygon record has a non-specific one-mile radius accuracy, so the specimen may not have been located directly on the site. There are currently no sensitive vegetation communities or special-status plant species present on the site, and there is no habitat to support them (Quad Knopf 2010a, d). There is potential for special-status plant species such as Comanche Point layia to occur on adjacent lands to the north and east of the site.

Historical records indicate that this site was once occupied by the San Joaquin kit fox (see Figures 3.4-6 A through D). No Covered Species were observed on the site during the surveys, but the San Joaquin kit fox and western burrowing owl were observed on adjoining lands east of the site (Quad Knopf 2010a). These Covered Species, as well as the blunt-nosed leopard lizard, Nelson's antelope squirrel, and Tipton kangaroo rat, could occasionally utilize the site for foraging or movement purposes. Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Movement Corridors (33.8 acres)*

Although the Movement Corridors are technically included along with the acreage described within the Solar Sites, the Movement Corridors will be part of the areas managed as conservation areas. These include movement corridors that are present along the north border of site 2-S (2-M), the north and east borders of site 3-S (3-M), the south border of site 4-S (4-M), and the north border of site 7-S (7-MW and 7-ME).

The four Movement Corridors encompass 33.8 acres as described below. These areas are not within the Solar Development Footprint and will be avoided by construction activities and managed to facilitate wildlife movements in and around the solar sites. They will be protected by a conservation easement, incorporated into the conservation strategy, and protected and managed for Covered Species in perpetuity once the solar project is decommissioned.

*Corridor 2-M (12.5 acres)*

Movement Corridor 2-M is located along the northern border of Site 2-S. It includes an earthen berm and an existing wetland. Much of this corridor has been disked and is generally devoid of vegetation, but some scattered vegetation exists along the earthen berm. There are no sensitive vegetation communities occurring within this corridor, and it is unlikely that this area contains special-status plant species due to the routine disking and other maintenance activities that occur here. Covered Species were not observed within this corridor. Some burrows do exist along the earthen berm and the Tipton kangaroo rat might exist in very low numbers within this corridor.

*Corridor 3-M (7.8 acres)*

Movement Corridor 3-M is located along the north and east borders of Site 3-S. The portion of the corridor along the north border contains an irrigation canal. Portions of the corridor along the north border and the entire portion along the east border are managed by routing disking. Consequently, much of the corridor is devoid of vegetation, but the irrigation canal is more heavily vegetated. There are no sensitive vegetation communities occurring within this corridor and it is unlikely that this area contains special-status plant species. Covered Species were not observed within this corridor. Some burrows do exist along the earthen berm and the Tipton kangaroo rat might exist in very low numbers within this corridor.

*Corridor 4-M (6.1 acres)*

Movement Corridor 4-M is located along the south border of Site 4-S. It consists entirely of bare ground that has been subject to repeated disking. It does not contain habitat capable of supporting Covered Species, and no special-status plant species were present in the corridor.

*Corridor 7-M (7.4 acres)*

Movement Corridor 7-M is divided into two separate sections. One section aligns with the South Lake road easement, connecting with a railroad easement to the east (7-MW). The second section aligns with the north border of Site 7-S, connecting Site 3-C2 to Movement Corridor 4-M (7-ME). Both of these sections consist of disked lands that contain no vegetation other than sparse weedy annuals. Covered Species were not observed within this corridor. Lands adjacent to this corridor, though, are known to contain habitat that may support Covered Species.

*Conservation Sites (1894.4 acres)*

Existing conditions on the Conservation Sites (1-C, 3-C, 3-C2, 9-C, 10-C, and 17-C) are variable, ranging from lands that are currently disked to lands that contain native habitat and are known to currently support Covered Species. The six Conservation Sites encompass 1,894.4 acres. The sites will be placed into a permanent Conservation Easement and managed in perpetuity for the benefit of Covered Species and other special-status species. Enhancements, management actions and goals, and long-term monitoring of these lands will be conducted.

*Site 1-C (656.6 acres)*

Site 1-C is regularly disked for weed control, and the majority of the site contains virtually no vegetation. It is sparsely vegetated with weedy plant species, including fiddleneck, orchard bindweed, Bermuda grass, London rocket, tamarisk and quailbush. A small patch of degraded saltbush scrub habitat is located within the northeast corner of the site. There is also an old levee structure in the northwest corner of the site that is not disked, and it is vegetated with valley saltbush, quailbush, and akali goldenbush. The site historically contained freshwater shrub wetlands (NWI 2012). The area lacks hydric soils or wetland vegetation, but there are some areas with remnant characteristics of historical water flow across the site from southwest to northeast. These areas have been determined by the ACOE to be federally regulated waters that are hydrologically connected to a traditionally navigable water (per communication, Ramon Aberasturi, ACOE). Higher quality Valley Sink Scrub and saltbush scrub habitats are present on the lands adjoining the north and south perimeters. These habitats are known to contain sensitive species. The other surrounding land uses include alfalfa production, orchards, and disked fields.

There are no historical records of special-status plant species occurring on the site (see Figures 3.4-6 A through D). Past disking has eliminated all but a small portion of the saltbush scrub habitat type now restricted to the northeast corner of the site. There are no special-status plant species on the site (Quad Knopf 2010a, d). Special status plant species that might occur in the Valley Sink Scrub and saltbush scrub habitats to the north and east include heartscale, Lost Hills crownscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

There are historical records of the Tipton kangaroo rat along the south portion of the site (see Figures 3.4-6 A through D). The only Covered Species observed on the site during the surveys was the Tipton kangaroo rat (Quad Knopf 2010a, b, Table 3.4-10), which was identified in the northeast corner of the site. The western burrowing owl, Nelson’s antelope squirrel, and a San Joaquin kit fox skull were found in adjacent habitats. These species, as well as the blunt-nosed leopard lizard, could potentially forage on or otherwise occur as transient visitors to the site. Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site. The San Joaquin kit fox “Core” habitat encompasses the majority of the site, and the site is near Windwolves Preserve, which provides an east-west linkage corridor for the species (USFWS 1998).

**Table 3.4-11**  
**Existing Conditions of Maricopa Sun Solar Project’s Conservation Sites**  
**and Presence of Covered Species**

<b>Site No.</b>	<b>Area (Acres)</b>	<b>Site Condition/Vegetation</b>	<b>Presence of Covered Species*</b>
1-C	656.6	Fallow farmland, actively disked for weed control, little vegetation except in the northwest corner along an existing levee; mapped as NWI freshwater shrub wetlands; however, field surveys determined that the area lacks hydric soils or wetland vegetation, but ACOE determines that federal Waters are present	TKR observed on site. SJKF, NAS, and WEBO observed on adjacent lands and may be transients on site. BNLL may also be present on adjacent lands, but protocol surveys failed to locate them
3-C	80.4	Fallow farmland, actively disked for weed control, no vegetation	No Covered Species observed. Adjacent lands contain WEBO, TKR, BNLL, and possibly NAS and SJKF
3-C2	152.9	Fallow farmland which was managed for weed control in past years, but disking has not occurred in recent years; the site has partially recovered, supporting annual grasses, seepweed, and some scattered saltbush and tamarisk	WEBO observed. No TKR captured despite extensive trapping. SJKF may be a transient
9-C	180.6	83.25 acres vegetated with Atriplex scrub, the remainder is disked with no vegetation	WEBO, NAS, and TKR are known to occur on the 83.25 acre portion. BNLL and SJKF might also be present. WEBO and SJKF may be a transient on the remaining portion of this site
10-C	176.2	Fallow farmland, actively disked for weed control, no vegetation	No Covered Species were observed. The SJKF, WEBO, NAS, TKR, and BNLL are all known to occur nearby
17-C	647.7	Relatively natural state, consisting of saltbush and goldenbush dominated scrublands	No Covered Species observed. Two special-status species observed on site. WEBO, SJKF, BNLL, and NAS are known from nearby. The site is located within the “Core” area of SJKF

*Site 3-C (80.4 acres)*

Site 3-C has been disked on a biannual basis and is devoid of vegetation. The site was formerly in agricultural production and has been kept in a farm-ready condition by repeated disking. It is surrounded on three sides by native saltbush scrub habitat. No special-status plant species were observed on this site during surveys (Quad Knopf 2010a, d). No Covered Species were observed on this site (Quad Knopf 2010a). Lands adjacent to this site are known to contain the western burrowing owl, blunt-nosed leopard lizard, and Tipton kangaroo rat. These species along with the San Joaquin kit fox could be present as transients and could become established on the site once disking ceases. Other special-status species (e.g., western mastiff bat, white-tailed kite, and Northern harrier) may occasionally fly over the site.

*Site 3-C2 (152.9 acres)*

Site 3-C2 has historically been disked for weed control on a biannual basis, but it has not been disked in a number of years. This site is now vegetated with a matrix of introduced grasses, seepweed, and some scattered saltbush scrub and tamarisk. Some of the more common species include London rocket, five-hook bassia, black mustard, seepweed, Russian thistle, Mediterranean grass, saltgrass, tamarisk, quailbush, annual weedy chenopods and annual sunflower. The adjacent land consists of disked fields to the east, saltbush scrub to the south, and west, and a matrix of disturbed saltbush scrub and alkali sink habitat to the north.

There are no historical records of special-status plant species occurring on the site (see Figures 3.4-6 A through D). No sensitive vegetation communities or special-status plant species were observed on the site during the surveys (Quad Knopf 2010a, d), but they could potentially become established as site recovery proceeds. Special status plant species may already be present in adjacent native habitats to the north, south and west of the site. Special status species potentially occurring in these habitats include heartscale, Lost Hills crownscale, recurved larkspur, Kern mallow, Hoover's eriastrum, Tejon poppy, San Joaquin woollythreads, and oil neststraw.

Much of this site was historically occupied by the Tipton kangaroo rat (see Figures 3.4-6 A through D). However, no Tipton kangaroo rats were identified on the site during the surveys (Quad Knopf 2010a, e). The western burrowing owl was observed on the site. The blunt-nosed leopard lizard was observed on adjacent lands. In addition to the western burrowing owl, Covered Species that could occasionally utilize the site for foraging or movement purposes include the San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard.

*Site 9-C (180.6 acres)*

Site 9-C borders native habitat located along the California Aqueduct right-of-way, which provides a viable movement corridor for the Covered Species. The north portion of the site has been disked on a biannual basis for weed control, and is nearly devoid of vegetation. The south portion of the site supports Saltbush Scrub habitat, a sensitive vegetative community, which is dominated by saltbush with a sparse groundcover of fiddleneck and Mediterranean grass. Remnant scarring and mounding within the center of the Saltbush Scrub habitat indicates that disking and grading activities have occurred here in the past.

The land to the south of the site consists of non-native annual grassland habitat that exhibits signs of previous sheep grazing (e.g. sheep pellets, tracks, and sheep carcass). A stubble field along the east perimeter of the site contains a substantial amount of Russian thistle and some tamarisk. Almond orchards are located to the north beyond Cadet Road.

The south portion of the site is known to be occupied by the Tipton kangaroo rat, Nelson's antelope squirrel, and western burrowing owl. It is also likely to be used by the San Joaquin kit fox and the blunt-nosed leopard lizard. Any of the Covered Species could occur here. In addition, the San Joaquin kit fox "Core" habitat encompasses the majority of the site, and the site is near Windwolves Preserve, which provides an east-west linkage corridor for the species (USFWS 1998).

*Site 10-C (176.2 acres)*

Site 10-C is repeatedly disked for weed control and currently lacks vegetation. Irrigation standpipes and pumps are located within this site, indicating that it was used for agriculture in the past. The habitat to the south and west of the site is vegetated with Allscale saltbush, and is currently grazed by sheep. The areas to the west and southwest are used for oil production, with numerous active and inactive oil wells present. The habitat to the north of the site along the California Aqueduct right-of-way is vegetated with saltbush scrub, tamarisk, and other shrub species. The California Aqueduct right-of-way is a known corridor for a variety of special-status wildlife species. The east perimeter of the site adjoins disked fields, beyond which almond and apricot orchards are located.

This site is not known to support Covered Species, but the San Joaquin kit fox and western burrowing owl may forage on the site. The north perimeter of this site is contiguous with native habitat along the California Aqueduct right-of-way. Native habitat occurs to the west and south of the site as well. Given the relative abundance of adjoining native habitat, the site will likely recover and provide conservation benefits to Covered Species rather quickly. The San Joaquin kit fox, western burrowing owl, Nelson's antelope squirrel, blunt-nosed leopard lizard, and Tipton kangaroo rat are all expected to eventually occur here. In addition, the San Joaquin kit

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.4 Biological Resources**

---

fox “Core” habitat encompasses the majority of the site, and the site is near Windwolves Preserve, which provides an east-west linkage corridor for the species (USFWS 1998).

The Tipton kangaroo rat range is defined as occurring to the north and east of the California Aqueduct (Williams 1986). This has been generally accepted by the biological community and holds true except in limited instances, such as this location. The habitat on the site is suitable for the Tipton kangaroo rat because it is on the valley floor rather than on the alluvial plain of the coast or transverse range. Furthermore, *Dipodomys nitratoides* from the area are specifically identified in the CNDDDB as Tipton kangaroo rats (*D. n. nitratoides*) because morphological characteristics of the population are indicative of Tipton kangaroo rats. In reality, the morphological characteristics of individuals captured from this area exhibit both Tipton kangaroo rats and short-nosed kangaroo rat (*D. n. brevinasus*) characteristics, thus providing evidence that the two species intergrade within this limited geographic area.

*Site 17-C (647.7 acres)*

Site 17-C is in a relatively natural state, having never been actively farmed or tilled. Vegetation on the site includes a mosaic of Chenopod Scrub and non-native grassland habitats, but the Chenopod Scrub habitat is dominant. Valley Saltbush Scrub habitat, a sensitive natural community, also occurs over a large portion of the site (see Figures 3.4-6 A through D). No Covered Species were observed on the site, but the blunt-nosed leopard lizard, San Joaquin kit fox, and Nelson’s antelope squirrel have been historically recorded in the vicinity of the site and the habitat on the site could potentially support these species (Quad Knopf 2010a, e). The site does not occur within the range of the Tipton kangaroo rat. The San Joaquin kit fox “Core” habitat encompasses the western portion of the site, and the site is nearly contiguous with Windwolves Preserve, which provides an east-west linkage corridor for the species (USFWS 1998). The site does not occur within the range of the Tipton kangaroo rat.

### **3.5 CULTURAL RESOURCES**

The following discussion provides an overview of the existing cultural resources conditions within and adjacent to the Covered Lands.

Cultural resources include archaeological, historical, architectural, and paleontological resources. Paleontological resources include vertebrate, invertebrate and plant fossils. All prehistoric human related artifacts are considered “archeological” resources and all human-related artifacts from the era of the written record are considered “historical” resources. Although there can be some cross-over between archeological and historical resources, “historical” is generally applied to artifacts dating from the start of European colonization of the region.

#### **3.5.1 Regulatory Setting**

##### **3.5.1.1 Federal**

###### *Section 106 of the National Historic Preservation Act*

Archaeological resources are protected through the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470f), and its implementing regulation, Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Prior to implementing an “undertaking” (e.g., issuing a Federal permit), Section 106 of the NHPA requires Federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation and the State Historic Preservation Officer a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register of Historic Places (NRHP). As indicated in Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to a tribe are eligible for inclusion in the NRHP. Under the NHPA, a resource is considered significant if it meets the NRHP listing criteria at 36 CFR 60.4.

###### *National Register of Historic Places*

The NRHP was established by the NHPA of 1966, as “an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation’s historic resources and to indicate what properties should be considered for protection from destruction or impairment” (36 CFR 60.2). The NRHP recognizes both historical-period and prehistoric archaeological properties that are significant at the national, State, and local levels. In the context of the project, which does not involve any historical-period structures, the following NRHP criteria are given as the basis for evaluating archaeological resources.

To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

---

objects of potential significance must meet one or more of the following four established criteria (U.S. Department of the Interior 1995):

- Are associated with events that have made a significant contribution to the broad patterns of our history;
- Are associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;  
or
- Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for NRHP listing (U.S. Department of the Interior 1995).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as “the ability of a property to convey its significance” (U.S. Department of the Interior 1995). The NRHP recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

**3.5.1.2 State**

*California Register of Historic Resources*

Created in 1992 and implemented in 1998, the California Register of Historic Resources (CRHR) is “an authoritative guide in California to be used by State and local agencies, private groups, and citizens to identify the State’s historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change.” Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historic resources surveys or designated by local landmarks programs, may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

---

- Criterion 1. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Criterion 2. It is associated with the lives of persons important in our past;
- Criterion 3. It embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual, or possesses high artistic values; and
- Criterion 4. It has yielded, or may be likely to yield, information important in history or prehistory.

Furthermore, under Public Resource Code (PRC) Section 4852(c), a cultural resource must retain integrity to be considered eligible for the CRHR. Specifically, it must retain sufficient character or appearance to be recognizable as a historical resource and convey reasons of significance. Integrity is evaluated with regard to retention of such factors as location, design, setting, materials, workmanship, feeling, and association. Cultural sites that have been affected by ground-disturbing activities, such as grazing and off-road vehicle use (both of which occur within the project site), often lack integrity because they have been directly damaged or removed from their original location, among other changes.

Typically, a prehistoric archaeological site in California is recommended eligible for listing in the CRHR based on its potential to yield information important in prehistory or history (criterion 4). Important information includes chronological markers such as projectile point styles or obsidian artifacts that can be subjected to dating methods or undisturbed deposits that retain their stratigraphic integrity. Sites such as these have the ability to address research questions.

#### **CALIFORNIA STATE HISTORICAL LANDMARKS IN KERN COUNTY**

Of the 78 Historic Resources located in Kern County, six are within 10 miles of the proposed Project site. These include:

**FAGES-ZALVIDA CROSSING:** In 1772, Don Pedro Fages, first recorded non-Indian to visit the southern San Joaquin Valley, crossed this spot on his way from San Diego to San Luis Obispo. Near this point crossed Farther Jose Maria de Zalvidea in 1806, while accompanying the Ruiz expedition in search of mission sites. This site is located on SR 166, 5.5 miles west of Mettler, near the intersections of SR 166 and State Highway 99.

**JAMESON 17-24 C OIL WELL (P495):** This is currently the site of the West Kern Museum in the City of Taft, located on SR 33.

**FORT TAFT:** The Fort is located on the northwest side of the city of Taft on SR 33.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

---

**TULAMNIU INDIAN SITE:** The old Yokuts village of Tulamniu was named Buena Vista by Spanish Commander Fages in 1772. Fr. Zalvidea again recorded the site in 1806. This village was occupied for several centuries, and in 1933-34, its site was excavated by the Smithsonian Institute. This site is located 300 feet southeast of Block House #BV4, 1.1 miles north of Buena Vista Pumping Station, and 8 miles east of Taft. It is approximately two and a half miles north of a conservation site, just east of the California Aqueduct.

**WELL 2-6:** Near an area of small 40-and 50-barrel wells, it blew in over the derrick top on November 27, 1909, with a production of 2,000 barrels a day, and started one of the greatest oil booms California ever experienced. The well was located as a wildcat, on June 1, 1909 by Fred C. Ripley. The site is 100 feet west of the Fellows Fire Station on Broadway, in the community of Fellows.

**LAKEVIEW GUSHER:** America's most spectacular gusher blew on this site on March 14, 1910. Initially 18,000 barrels per day, the flow later reached an uncontrolled peak of 100,000 barrels per day, completely destroying the derrick. This Union Oil Company well produced nine million barrels of oil in 18 months. The site is approximately two miles west of two of the conservation sites, and approximately one and one half miles north of Maricopa on Petroleum Club Road.

**3.5.1.3 Local**

*Kern County General Plan*

The Kern County General Plan includes the following goals and policies applicable to the project:

Chapter 1. Land Use, Open Space, and Conservation Element

1.10.3 Archaeological, Paleontological, Cultural, and Historical Preservation (pages 66 and 67)

Policy 25. The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors.

Implementation Measure K. Coordinate with the California State University, Bakersfield's Archaeology Inventory Center

Implementation Measure L. The County shall address archaeological and historical resources for discretionary projects in accordance with the California Environmental Quality Act (CEQA).

Implementation Measure M. In areas of known paleontological resources, the County should address the preservation of these resources where feasible.

## **3.5.2 Cultural Resources Setting**

### **3.5.2.1 Prehistoric Setting**

Prehistoric hunter-gatherers inhabited the San Joaquin Valley beginning at least 12,000 years before present (BP). To better understand long-term culture change, archaeologists have divided prehistory into three broad chronological periods. The Early Holocene spans the period from 12,000 BP to 7,000 BP and is represented by very scant archaeological evidence. The period from 7,000 BP to 4,000 BP, the Middle Holocene, is similarly poorly represented in the archaeological record of the southern San Joaquin Valley. Evidence for prehistoric land use in the region is most abundant from 4,000 BP to 150 BP (Late Holocene). Because of its richer archaeological record, the Late Holocene can be further subdivided into three distinct temporal sub-periods: Late Holocene I (4,000–2,000 BP); Late Holocene II (2,000 BP–1,100 BP); and Late Holocene III (1,100 BP–300 BP). The period from 350 BP to 150 BP is referred to as the Protohistoric and is sometimes considered within Late Holocene III (see discussion in Culleton et al. 2005:277–287).

#### *Early Holocene (12,000 to 7,000 BP)*

The available data for Early Holocene occupation of the southern San Joaquin Valley comes almost exclusively from the shores of Tulare and Buena Vista lakes. Extant evidence suggests Early Holocene hunter-gatherers were organized as small groups whose ephemeral camps left few enduring marks on the landscape. Material remains, including faunal bone, stone tools, and associated debris, indicate that resources were procured locally and lifeways were focused almost exclusively on lakes and their immediate vicinity. While the remains of extinct terrestrial big game have been recovered in the Tulare Lake and Buena Vista Lake areas, their association with prehistoric hunter-gatherers has not been clearly established. Fluted points, tools widely associated with the hunting of late Pleistocene and early Holocene terrestrial big game, are also absent in the study area.

#### *Middle Holocene (7,000 to 4,000 BP)*

The Middle Holocene is very poorly represented across the region. Sites with well-defined stratigraphy or radiocarbon dates that indicate Middle Holocene occupation of the study area are rare. Several researchers have suggested that the lack of sites is likely attributable not to an absence of prehistoric occupation but to fluctuating lake levels and geomorphological processes that have obscured Middle Holocene deposits. Material remains thought to be associated with the Middle Holocene include handstones and milling slabs, which indicate an increased reliance on the gathering of plant foods and the use of landscapes outlying the lakes and sloughs. Lakeshores appear to be used on a year-round basis to hunt game. Task-specific campsites also begin to appear near lakeshores. Topographic rises near lakes show evidence of temporary camps established by hunters to process fresh kills and to refresh tools during hunting

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

---

expeditions. From the limited evidence available, the Middle Holocene appears to be a time in which hunter-gatherers organized themselves in small task-specific groups to exploit an increasing variety of resources.

*Late Holocene Period (1,400 BP to the Historic Period)*

The Late Holocene period is characterized by an increase in archaeological visibility and evidence of shifting land use strategies. Following the warm, dry Middle Holocene, a period of geomorphic instability accompanied the onset of cooler, wetter conditions at the beginning of the Late Holocene. Middle Holocene subsistence and settlement systems were likely disrupted as landscape, vegetation, and fauna were fundamentally altered between 5,000 and 4,000 BP. Some researchers have argued that the Late Holocene was a period of increasing residential mobility in which entire groups moved as resources became available. Others have argued for a more detailed chronology that tracks several different economic strategies utilized throughout the Late Holocene as hunter-gatherers adapted to changing environmental conditions. A chronological framework for understanding prehistoric land use during the Late Holocene was created through the synthesis of research undertaken by several investigators in the Buena Vista Basin and the incorporation of extensive research in the Elk Hills. This is the chronology used in the following discussion.

*Late Holocene I (4,000 BP to 2,000 BP)*

During the Late Holocene I phase (4,000–2,000 BP) researchers argue that the Elk Hills were seasonally occupied by people who relied on a terrestrially oriented strategy that included gathering and processing seeds and obtaining game. Habitations were dispersed and were probably camps established for specific purposes on a seasonal basis. The presence of handstones and other milling implements in Buena Vista Lake indicates a focus on terrestrial resources was widespread, even in lakeshore environments. From this data, researchers argue that the proximity of Late Holocene I sites within foraging distance from lakes and sloughs was probably related to access to water rather than a reliance on lacustrine resources. In sum, Late Holocene I people appear to have been organized as regularly mobile, foraging groups with few year-round settlements.

*Late Holocene II (2,000 BP to 1,100 BP)*

Evidence for Late Holocene II occupation suggests possible abandonment of lakeshore environments during this time span. It is likely that prehistoric people continued a pattern of highly mobile foraging focused on the exploitation of terrestrial resources.

*Late Holocene III (1,100 BP to 300 BP)*

The Late Holocene III components are the most archaeologically visible in the Buena Vista Basin and elsewhere, recognizable by widespread deposits characterized by freshwater mussel shell, Olivella beads, and midden deposits. In the early part of the Medieval Climatic Anomaly, occupation of the Elk Hills was still relatively sparse. From approximately 900 BP, Culleton et al. (2005) identify a radically different use of the Elk Hills as compared to the Late Holocene I component. Exploitation of slough resources, particularly freshwater mussel, fish, and turtle, rather than terrestrial resources was the dominant activity at sites widely distributed across the north flank of the Elk Hills. Use of these sites appears to be focused on intense short-term exploitation of Buena Vista Slough. Sites along the shoreline of Buena Vista Lake take on the character of more permanent settlements as indicated by distinct cemeteries, house pits, and structural remains, as well as the development of dense shell middens. This land use pattern has been interpreted as a complementary strategy in which permanent sedentary village populations on Buena Vista Lake supported their lifeways through periodic short-term use of resources available in outlying Buena Vista Slough. This adaptation appears to have been basically consistent until the Protohistoric period, and it corresponds to ethnographic descriptions of Yokuts culture. Evidence suggests that Yokuts populations increased and by approximately 300 BP occupied the majority of the San Joaquin Valley.

**3.5.2.2 Ethnographic Setting**

There is no available literature to confirm that any historically known Native American settlement existed within the program area. The area is located near the homeland of the Tulumne Yokuts, an ethno-linguistic group of more than 40 autonomous, linguistically and culturally related tribelets. Ethnographic sources identify the Tulumne Yokuts as residing in the area south and west of Lake Buena Vista. There were two Tulumne settlements along the Buena Vista lakeshore, both north of the project area.

Yokuts' villages were typically located on elevated ground overlooking a slough or a lake. Dwellings were of two general types: a small, oval structure housing a single family, a series of which were arranged in a linear pattern and covered with a long continuous awning of brush wood; and a larger linear structure, housing up to ten families. Both were constructed of tule mats lain over support poles. Other structures at Yokuts villages included sunshades, windbreaks, and granaries. The Southern Valley Yokuts practiced a mixed subsistence economy based primarily on fish, waterfowl, freshwater mussels, seeds, and roots, with a much smaller emphasis on terrestrial game such as tule elk, deer, and antelope. Fish were harvested in nets dropped from tule rafts, in baskets, by spearing, by trapping in weirs, or by poisoning. Smaller game, particularly rabbits and hares, were taken in communal drives; larger game such as elk and pronghorn were sometimes shot from blinds. Smaller game and fowl were taken in snares. Waterfowl were also taken from blinds and rafts, often using decoys.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

---

**3.5.2.3 History**

*Early Exploration and Development*

At least eight Spanish colonial expeditions traveled to the southern San Joaquin Valley. These expeditions included: 1804 Martin, 1806 Moraga–Muñoz, 1806 Zalvidea–Ruiz, 1814 Cabot, 1815 Ortega, 1816 Father Luis Antonio Martinez, 1819 Estudillo, and 1828. The area in which Bakersfield now sits was settled by homesteaders in the 1860s, but flooding destroyed these early agricultural settlements. Colonel Thomas Baker re-settled the area in 1863 and found that the land was productive once it had been drained and reclaimed. His homestead, referred to as Baker’s field, became the center of the community that grew up in the area. By 1870, it had become the principal town in Kern County and was officially incorporated as a city in 1873, and became the County seat in 1874.

The San Joaquin Valley branch of the Central (now Southern) Pacific Railroad reached Kern County in 1873 and had moved through the southernmost part of the County by 1875. Interest in petroleum exploration was sparked by discoveries of oil in the Buena Vista Lake area and asphalt near McKittrick in the late 1890s. Discoveries of oil in the Elk Hills District in the early 1900s, however, created an all-out rush to develop the oilfields on the west side of the San Joaquin Valley. Major companies quickly acquired control over the westside fields and associated refining facilities. Three of the biggest oil companies in the area were Standard Oil, Southern Pacific, and Associated Oil (a cooperative of independent Kern River oil field producers).

At the same time, the U.S. Navy, concerned about the security of future oil supplies, asked the U.S. Congress to create a system of petroleum reserves in the western United States. In September 1912, President Taft issued an executive order that created Naval Petroleum Reserve No. 1 (NPR-1) from approximately 38,000 acres in the Elk Hills. NPR-2 (south of NPR-1) and NPR-3 (at Teapot Dome, Wyoming) were created in the following three years.

The development of the oil industry led to the growth of towns and cities out of oil camps. This included now largely-vanished towns such as Tupman, as well as the thriving Taft area inclusive of the communities of Taft, Maricopa, Ford City, McKittrick, Dustin Acres, Fellows, and Derby Acres. Each of these towns was principally dependent on revenues from the massive Midway-Sunset oil field, the Elk Hills oil field, and the Buena Vista oil field. The towns in this region grew during the early 20<sup>th</sup> century from oil camps composed of cheap housing and temporary structures to full-fledged towns with permanent community centers, thriving businesses, and facilities such as schools and town administrative offices. The expansion of the railroad system during the late 19<sup>th</sup> and early 20<sup>th</sup> century, required by the increasing importance of these oil fields to the nation as a whole, fed the population and economic growth. Although the train’s importance has faded, sections of the once-vital track are still visible throughout the region.

### **3.5.3 Paleontological Setting**

Paleontological resources are the mineralized (fossilized) remains of prehistoric plants and animals and the mineralized impressions (trace fossils) left as indirect evidence of the form and activity of such organisms. These resources are located within sedimentary rocks or alluvium and are considered to be nonrenewable.

The formations of the project site can be divided into five groups: (1) late Paleozoic metamorphic rocks (Bean formation); (2) Mesozoic granitic rocks; (3) the sedimentary Winet formation; (4) Tertiary volcanic rocks; and (5) Quaternary age (past 2 million years) sedimentary deposits (old alluvial fan and recent alluvium). The metamorphic and igneous rocks have no potential for paleontological resources. However, the Quaternary alluvium and Winet formation do have potential for both vertebrate and invertebrate fossils as well as woodrat middens. Woodrat middens can contain remains of "mummified" plant materials and small vertebrate remains that can contain scientifically significant information about vegetation and climates of the past. In addition, isolated pendants of marble within the Mesozoic metamorphic rock have potential for containing solution caves that contain significant fossils.

Formations that contain vertebrate fossils are considered more sensitive because vertebrate fossils tend to be rare and fragmentary. Formations containing microfossils, plant casts, and invertebrate fossils are more common. A significant fossil deposit is a rock unit or formation that contains significant nonrenewable paleontological resources. This is defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals such as trackways or nests and middens), which provide datable material and climatic information. This definition excludes invertebrate or botanical fossils except when present within a given vertebrate assemblage. However, invertebrate and botanical fossils may be significant as environmental indicators associated with vertebrate fossils or may have scientific importance if they are rare or provide stratigraphic or tectonically important data.

### **3.5.4 Results of the Records Search**

#### **3.5.4.1 Records Search**

Pacific Legacy Incorporated prepared a Cultural Resources Inventory for the Maricopa Sun Solar Complex EIR (Kern County, page 4.5-1) prepared for the project in 2010. The records search identified 17 previously recorded cultural resources (10 oil extraction facility remains, one oil camp, two sites composed of the remains of historic-era structures, one historic debris scatter, and three isolated historic artifacts) within 0.5 mile of the original project site of 6,046 acres, none of which were within the boundaries of the project. A request was submitted to the California Native American Heritage Commission (NAHC) at that time to consult their Sacred

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.5 Cultural Resources**

Lands files to identify other culturally significant properties within the original project area. The NAHC reported that there were no known sensitive resources within a 0.5-mile radius of the original project-level parcels, but resources were known to have been found within the general vicinity of the project site.

**3.5.4.2 Field Surveys**

Pacific Legacy Incorporated conducted pedestrian archaeological surveys from March 2 through March 21, 2010, and June 29 through July 8, 2010 on the original project site. Survey results for the project included the identification of 14 cultural resources, four historic era archaeological sites, two historic structures, seven prehistoric sites, and one prehistoric isolated artifact. All the identified cultural resources within the survey area had been disturbed due to agricultural activities that have historically occurred on the project site.

The results of the field surveys are also shown in Table 3.5-1, below.

**Table 3.5-1**  
**Existing Resources Identified During Survey**

<b>Target Site Number</b>	<b>Archeological Site Number</b>	<b>Description of Finding</b>	<b>Resource Type</b>
1	PL-Maricopa-01	Historic era debris scatter	Historic Era Deposit
1	PL-Maricopa-02	Large earthwork, possible oil sump	Structure
1	PL-Maricopa-04	Prehistoric freshwater mussel scatter	Shell Scatter
1	PL-Maricopa-05	Prehistoric freshwater mussel scatter	Shell Scatter
1	PL-Maricopa-06	Prehistoric freshwater mussel scatter	Shell Scatter
5	PL-Maricopa-07	Historic era debris scatter	Historic Era Deposit
3,6	PL-Maricopa-08	Remains of historic railroad	Structure
2	PL-Maricopa-12	Prehistoric freshwater mussel scatter	Shell Scatter
7	PL-Maricopa-13	Historic era debris scatter	Historic Era Deposit
16	PL-Maricopa-14	Historic era debris scatter	Historic Era Deposit
7	PL-Maricopa-15	Prehistoric freshwater mussel scatter	Shell Scatter
16	PL-MS-A-ISO-001	Prehistoric chert biface fragment	Isolated Prehistoric Artifact
5	PL-MS-B-001	Prehistoric freshwater mussel scatter	Shell Scatter
2	PL-MS-B-002	Prehistoric freshwater mussel scatter	Shell Scatter

Source: Pacific Legacy Incorporated, "Cultural Resources Inventory, Maricopa Solar Project", July 2010

## **3.6 GEOLOGY AND SOILS**

This section describes the geology and soils characteristics of the Covered Lands, including an overview of all applicable regulations and a description of the physical environment.

### **3.6.1 Regulatory Setting**

#### **3.6.1.1 Federal**

##### *Federal Soil Conservation Law (16 USGS 590a)*

By Congressional policy, this law provides permanently for the control and prevention of soil erosion by preventative measures, including but not limited to engineering operations, methods of cultivation, growing of vegetation, and changes in land use.

##### *Uniform Building Code*

The Uniform Building Code includes development standards for projects to comply with appropriate seismic design criteria in the Uniform Building Code, adequate drainage facility design, and preconstruction soils and grading studies. Seismic design standards have been established to reduce many of the structural problems occurring because of major earthquakes. In 1998, the code was revised as follows:

- Upgrade the level of ground motion used in the seismic design of buildings;
- Add site amplification factors based on local soils conditions; and
- Improve the way ground motion is applied in detailed design.

There are four types of regions defined by Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest. That portion of Kern County where the project site is located is within Seismic Zone 3 (Uniform Building Code 1997).

##### *Clean Water Act (Erosion Control)*

Formerly the Federal Water Pollution Control Act of 1972, the Clean Water Act (CWA) (33 USC 1251 et seq.) was passed with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain nonpoint source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). Projects that disturb one or more acres of land are required to obtain NPDES coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.6 Geology and Soils**

---

(General Permit), Order No. 99-08-DWQ. The General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which includes Best Management Practices (BMPs) to protect stormwater runoff, including measures to prevent soil erosion.

**3.6.1.2 State**

*Alquist-Priolo Earthquake Fault Zoning Act*

In response to the severe fault rupture damage of structures by the 1971 San Fernando earthquake, the State of California enacted the Alquist-Priolo Earthquake Fault Zoning Act in 1972. This act required the State Geologist to delineate Earthquake Fault Zones along known active faults that have a relatively high potential for ground rupture. Faults that are zoned under the Alquist-Priolo Act must meet the strict definition of being “sufficiently active” and “well-defined” for inclusion as an Earthquake Fault Zones. The Earthquake Fault Zones are revised periodically, and they extend 200 to 500 feet on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 feet on either side of an active fault trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction in an Earthquake Fault Zone is permitted only following the completion of a fault location report prepared by a California Registered Geologist.

*The Seismic Hazards Mapping Act of 1990*

In accordance with PRC, Chapter 7.8, Division 2, the California Department of Conservation, Division of Mines and Geology [now the California Geological Survey (CGS)] is directed to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards, such as those associated with strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. In accordance with the Seismic Hazards Mapping Act, site-specific geotechnical investigations must be performed prior to permitting most urban development projects within seismic hazard zones.

*The California Building Code*

The California Building Standards Code establishes building requirements for construction and renovation. The most recent version of the California Building Standards Code was adopted in 2007 by the California Building Standards Commission and took effect January 1, 2008, and it is based on the National Fire Protection Association, International Association of Plumbing and Mechanical Officials, and the International Code Council’s Building and Fire Codes. Included

in the California Building Standards Code are the Electrical Code, Mechanical Code, Plumbing Code, Energy Code, and Fire Code.

### **3.6.1.3 Local**

#### *Kern County General Plan*

The Kern County General Plan establishes the following goals and policies related to geology and soils that are applicable to the project:

Chapter 1: Land Use, Conservation, and Open Space Element, 1.3 Physical and Environmental Constraints (page 12)

Policy 1: Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained (Map Code 2.1 [Seismic Hazard], Map Code 2.2 [Landslide], Map Code 2.3 [Shallow Groundwater], Map Code 2.5 [Flood Hazard], Map Codes from 2.6 – 2.9, Map Code 2.10 [Nearby Waste Facility], and Map Code 2.11 [Burn Dump Hazard]) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Chapter 4: Safety Element, 4.3 Seismically Induced Surface Rupture, Ground Shaking, and Ground Failure (Safety Element) (page 157)

Policy 1: The County shall require development for human occupancy to be placed in a location away from an active earthquake fault in order to minimize safety concerns.

4.5 Landslides, Subsidence, Seiche, and Liquefaction (Safety Element) (page 166)

Policy 1: Determine the liquefaction potential at sites in areas of shallow groundwater (Map Code 2.3) prior to discretionary development and determine specific mitigation to be incorporated into the foundation design, as necessary, to prevent or reduce damage from liquefaction in an earthquake; and

Policy 3: Reduce potential for exposure of residential, commercial, and industrial development to hazards of landslide, land subsidence, liquefaction, and erosion.

#### *Kern County Code of Building Regulations (Title 17 of the Ordinance Code of Kern County)*

All construction in Kern County is required to conform to the Kern County Building Code (Chapter 17.08, Building Code, of the Kern County Code of Regulations). Kern County has adopted the UBC, 2007 Edition, with some modifications and amendments. The entire county is in Seismic Zone 4, a designation previously used in the UBC to denote the areas at highest risk for earthquake ground motion. California has an unreinforced masonry program that details

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.6 Geology and Soils**

---

seismic safety requirements for Zone 4. Seismic provisions associated with Seismic Zone 4 have been adopted.

### **3.6.2 Environmental Setting**

#### **3.6.2.1 Geologic Setting**

The Covered Lands are located in the southwestern portion of the Great Valley geomorphic province of California. The Great Valley, also known as the Central Valley, is an elongated, northwest-trending, nearly flat lowland located between the Sierra Nevada Mountains on the east and the Coast Ranges on the west. The Sacramento River drains the northern portion of the Great Valley, and the San Joaquin River drains the southern portion. The southern part of the Great Valley, where the project site is located, is also known as the San Joaquin Valley.

The Great Valley consists of the alluvial flood and delta plains of the Sacramento River, the San Joaquin River, and their tributaries. The region has persisted as a shallow marine embayment, and later as lowland, for the entire Cenozoic and the latest Mesozoic eras (from about 100 million years ago to present). The valley originated below sea level as an offshore area that was later enclosed by uplift of the Coast Ranges. Over the millennia the valley was filled by the sediments eroded from the Coast Ranges and the Sierra Nevada Mountains. In the late Cenozoic much of the Great Valley was occupied by shallow brackish and freshwater lakes.

#### **3.6.2.2 Faults and Seismic History**

A fault is a fracture in the crust of the earth along which the land on one side has moved relative to the land on the other side. Most faults are the result of repeated displacements over a long period of time. A fault trace is the line on the earth's surface defining the fault.

An active fault is defined by the State Mining and Geology Board as a fault that has had surface displacement within Holocene times (about the last 11,000 years). This definition does not mean that faults lacking evidence of surface displacement within Holocene times are necessarily inactive. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity is sometimes difficult to obtain and locally may not exist. A potentially active fault is a fault that shows evidence of surface displacement during Quaternary time (the last 1.6 million years).

The Covered Lands are in a seismically active region that could be subjected to future seismic shaking during earthquakes generated by any one of the several surrounding active faults. There are numerous geologic fractures in the earth's crust within the San Joaquin Valley, with the San Andreas Fault being the most prominent. Other major fault lines of the San Joaquin Valley include the Garlock Fault, the Breckenridge–Kern Canyon Fault, the Pond Poso Fault, and the White Wolf Fault.

### **3.6.2.3 Soils**

The Covered Lands include eight soil types: Calfax Loam, Cerini Loam, Excelsior Sandy Loam, Excelsior Fine Sandy Loam, Excelsior Loam, Fages Clay, Posochanet Silt Loam, Posochanet Silty Clay Loam. Each of the eight soil types are described below. A Soil Map is provided is provided in the Biological Resources section of this EIS in Figure 3.4-2.

**Calflax Loam, 0 to 1 percent slopes:** Calflax loam is the most commonly occurring soil, accounting for about 33 percent of the soils surveyed for all Covered Lands. Calflax loam is classified as a well-drained soil that generally occurs in fan skirt landforms formed from alluvium derived from mixed mineralogy rock and typically includes slopes ranging from 0 to 1 percent. Calflax loam includes loam within the first 6 inches of the surface, underlain by about 2.5 feet of stratified clay loam, followed by a mix of sandy loam and loam soils. The soil is well drained, available water capacity is moderate, percolation rates are slow, and the threat of flooding is low. Plasticity index for Calflax loam ranges from 6–29, which indicates low to moderate plasticity.

**Cerini Loam, 0 to 2 percent slopes.** Cerini loam is classified as a well-drained soil and generally occurs in alluvial fans. The Cerini loam is formed from alluvium derived from granitoid rock and typically includes slopes ranging for 0 to 2 percent. Cerini loam is made of loams within the first two feet, followed by stratified fine sandy loam to silty clay loam for another two feet, underlain by another two feet of stratified sandy loam to sandy clay loam. The soil is well-drained, available water capacity is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Cerini loam ranges from 20–50, which indicates moderate to high plasticity.

**Excelsior Sandy Loam, saline-sodic, 0 to 2 percent slopes:** The excelsior sandy loam consists of well-drained soil and generally occurs in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from sedimentary rock and generally includes fine sandy loam and sandy loam within the first 2 feet of soil, underlain by stratified fine sandy loam to silt loam mixed with fine sandy loam. Available water capacity for excelsior sandy loam is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Excelsior sandy loam ranges from 0–31, which is considered a moderate to high risk, and indicates low to high plasticity.

**Excelsior Fine Sandy Loam, saline-sodic, 0 to 1 percent slopes:** The Excelsior fine sandy loam consists of well-drained soil and generally occurs in fan skirt landforms in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from sedimentary rock and generally includes fine sandy loam and sandy loam within the first two feet of soil, underlain by stratified fine sandy loam to silt loam mixed with fine sandy loam. Available water capacity for excelsior fine sandy loam is high, percolation rates are slow, and the threat of flooding is low.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.6 Geology and Soils**

---

Plasticity index for Excelsior fine sandy loam ranges from 0–33, which indicates low to high plasticity.

**Excelsior Loam, saline-sodic, 0 to 2 percent slopes:** The Excelsior loam consists of well-drained soil and generally occurs in the southern end of the San Joaquin Valley. The soil type is formed from alluvium derived from sedimentary rock and generally includes loam and sandy loam within the first two feet of soil, underlain by stratified fine sandy loam to silt loam. Available water capacity for Excelsior sandy loam is high, percolation rates are slow, and the threat of flooding is low. Plasticity index for Excelsior loam ranges from 0–33, which indicates low to high plasticity.

**Fages Clay, 0 to 1 percent slope:** The Fages clay consists of moderately well-drained soils and generally is found near the south and west sides of Buena Vista Lake Bed in the south end of the San Joaquin Valley. The soil type is formed from lacustrine deposits over alluvium derived from rocks of mixed mineralogy and generally includes clays within the first four feet of soil, underlain by silty clay, loam, and clay loam. Available water capacity is very low, percolation rates are slow, and annual flooding is rare. Plasticity index for Fages clay ranges from 19–67, which indicates moderate to high plasticity.

**Posochanet Silt Loam, saline-sodic, 0 to 1 percent slopes:** Posochanet silt loam accounts for 33 percent of the soils in the Covered Lands. This soil type is a moderately well-drained soil and is found south of the Kern River near the edge of the Buena Vista Lake Bed in the south end of the San Joaquin Valley. The soil type is formed from alluvium derived from granitoid and/or sedimentary rock and generally includes a mixture of silt loam, silt clay loam, and clay loams. Available water capacity is moderate, annual flooding is considered rare, and percolation rates are slow. The plasticity index for Posochanet silt clay loam ranges from 20–61, which indicates moderate to high plasticity.

**Posochanet Silty Clay Loam, saline-sodic, 0 to 1 percent slopes:** Posochanet silty clay loam occurs in very small amounts within the Covered Lands. See the discussion for Posochanet Silt Loam, above.

#### **3.6.2.4 Seismic Hazards**

Seismic hazards pose a substantial danger to property and human safety and are present because of the risk of naturally occurring geologic events and processes affecting human development. Therefore, the hazard risk is equally influenced by the condition and location of human development as by the frequency and distribution of major geologic events. Seismic hazards present in California include ground rupture along faults, strong seismic shaking, liquefaction, ground failure, and slope failure.

#### **3.6.2.5 Fault Rupture**

Fault rupture is a seismic hazard that affects structures sited above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault during an earthquake. Typically, this movement takes place during the short time of an earthquake, but it also can occur slowly over many years in a process known as creep. Most structures and underground utilities cannot accommodate the surface displacements of several inches to several feet commonly associated with fault rupture or creep.

#### **3.6.2.6 Ground Shaking**

The severity of ground shaking depends on several variables such as earthquake magnitude, epicenter distance, local geology, thickness, and seismic wave-propagation properties of unconsolidated materials, groundwater conditions, and topographic setting. Ground shaking hazards are most pronounced in areas near faults or with unconsolidated alluvium.

The most common type of damage from ground shaking is structural damage to buildings, which can range from cosmetic cracks to total collapse. The overall level of structural damage from a nearby large earthquake would likely be moderate to heavy, depending on the characteristics of the earthquake, the type of ground, and the condition of the building. Besides damage to buildings, strong ground shaking can cause severe damage from falling objects or broken utility lines. Fire and explosions are also hazards associated with strong ground shaking.

While Richter magnitude provides a useful measure of comparison between earthquakes, the moment magnitude is more widely used for scientific comparison, since it accounts for the actual energy released by the earthquake. Actual damage is due to the propagation of seismic or ground waves as a result of the earthquake, and the intensity of shaking is related to earthquake magnitude and distance as well as to the condition of underlying materials. Loose and soft materials tend to amplify long period vibrations, while hard rock can quickly attenuate them, causing little damage to overlying structures. For this reason, the Modified Mercalli Intensity (MMI) Scale provides a useful qualitative assessment of ground shaking. The MMI Scale is a 12-point scale of earthquake intensity that is based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation.

#### **3.6.2.7 Ground Failure**

Ground failure includes liquefaction and the liquefaction-induced phenomena of lateral spreading and lurching.

Liquefaction is a process by which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited sand and

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.6 Geology and Soils**

---

silt in areas with high groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure and causing the particles to collapse. This causes the granular layer to behave temporarily as a viscous liquid rather than a solid, resulting in liquefaction.

Liquefaction can cause the soil beneath a structure to lose strength, which may result in the loss of foundation-bearing capacity, which could cause a structure to settle or tip. Liquefaction can also result in the settlement of large areas due to the densification of the liquefied deposit. Where structures are located within liquefied deposits, the liquefaction can result in the structure to rise as a result of buoyancy.

Lateral spreading is lateral ground movement, with some vertical component, as a result of liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes less than 2 percent, under certain circumstances, and can cause ground cracking and settlement.

Lurching is the movement of the ground surface toward an open face when the soil liquefies. An open face could be a graded slope, stream bank, canal face, gully, or other similar feature.

**3.6.2.8 Landslides and Slope Failure**

Landslides and other slope failures form in response to the long-term geologic cycle of uplift, mass wasting, and slope disturbance. Mass wasting refers to a variety of erosional processes from gradual downhill soil creep to mudslides, debris flows, landslides, and rock fall. These processes are commonly triggered by intense precipitation. Seismic activity can also trigger landslides and rockfalls.

Often, various forms of mass wasting are grouped together as landslides, which are generally used to describe the downhill movement of rock and soil. Geologists classify landslides into several different types that reflect differences in the type of material and type of movement. The four most common types of landslides are translational, rotational, earth flow, and rock fall. Debris flows and earth flows are another type of landslide that are characterized by soil and rock particles in suspension with water and which often move with considerable speed. Debris flows often refer to flows that contain coarser soil and rock materials while earth flows frequently refer to slides that are predominantly finer materials. Mudslide is a term that appears in non-technical literature to describe a variety of shallow, rapidly moving earth flows.

## **3.7 HAZARDS AND HAZARDOUS MATERIALS**

This section describes hazards and hazardous materials that may occur on Covered Lands, including an overview of all applicable regulations and a description of the physical environment.

### **3.7.1 Regulatory Setting**

#### **3.7.1.1 Federal**

##### *Federal Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act*

In 1976, the Federal Toxic Substances Control Act (TSCA) and Resource Conservation and Recovery Act (RCRA) created a program administered by the EPA for regulation of the following: generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the “cradle to grave” system of regulating hazardous waste.

##### *Clean Water Act/Spill Prevention, Control, and Countermeasure Rule*

As part of the CWA, the EPA oversees and enforces the Oil Pollution Prevention regulation contained in 40 CFR 112, which is often referred to as the “SPCC rule” because the regulations describe the requirements for facilities to prepare, amend and implement Spill Prevention, Control, and Countermeasure (SPCC) Plans. A facility is subject to SPCC regulations if a single oil storage tank has a capacity greater than 660 gallons, or the total aboveground oil storage capacity exceeds 1,320 gallons, or the underground oil storage capacity exceeds 42,000 gallons, and if, due to its location, the facility could reasonably be expected to discharge oil into or upon the “Navigable Waters” of the United States.

##### *Toxic Substances Control Act*

The Toxic Substances Control Act requires the control of new and existing chemical substances that may pose an unreasonable risk to public health or the environment. The legislation establishes provisions for testing of chemical substances, regulation of hazardous chemical substances, manufacture and processing notices, management of imminent hazards, and reporting and recordkeeping requirements.

##### *Federal Aviation Administration*

Aviation is regulated by the Federal Aviation Administration (FAA) at regional, public, private, and military airports such as Edwards Air Force Base. The FAA regulates objects affecting navigable airspace and structures taller than 200 feet according to Federal Aviation Regulation

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

49 CFR 77.13. The U.S. and California Departments of Transportation also require the project operator to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration. According to 49 CFR 77.17, notification allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing any adverse impacts on the safe and efficient use of navigable airspace. Any structure that would constitute a hazard to air navigation, as defined in this FAA regulation, requires issuance of a permit from the California Department of Transportation's Aeronautics Program. The permit is not required if the FAA aeronautical study determines that the structure has no impact on air navigation.

**3.7.1.2 State**

*Division of Oil, Gas, and Geothermal Resources (DOGGR)*

The DOGGR is a California agency responsible for supervising the drilling, operation, maintenance, plugging, and abandonment of oil, gas, and geothermal wells. The DOGGR's regulatory program promotes the sensitive development of oil, natural gas, and geothermal resources in California through sound engineering practices, prevention of pollution, and implementation of public safety programs. To implement this regulatory program, DOGGR requires avoidance of building over or near plugged or abandoned oil and gas wells, or requires the remediation of wells to current DOGGR standards.

*Powerline Hazard Reduction (PRC 4292)*

PRC 4292 requires a 10-foot clearance of any tree branches or ground vegetation around the base of power poles carrying more than 110 kilovolts (kV). The firebreak clearances required by PRC 4292 are applicable within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer, or lightning arrester is attached and surrounding each dead-end or corner pole, unless such pole or tower is exempt from minimum clearance requirements by provisions of PRC 4296.

*Powerline Clearance Required (PRC 4293)*

PRC 4293 provides guidelines for line clearance including a minimum of 10 feet of vegetation clearance from any conductor operating at 110,000 volts or higher.

*Minimum Clearance Provisions (14 CCR 1254)*

California Code of Regulations (CCR) Title 14, Section 1254 presents guidelines for minimum clearance requirements on non-exempt utility poles. The proposed project structures would be primarily exempted from the clearance requirements with the exception of cable poles and dead-end structures.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

The firebreak clearances required by 14 CCR 1254 are applicable within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer, or lightning arrester is attached and surrounding each dead-end or corner pole, unless such pole or tower is exempt from minimum clearance requirements by provisions of 14 CCR 1255 or PRC 4296. The radius of the cylindroid is 3.1 meters (10 feet) measured horizontally from the outer circumference of the specified pole or tower with the height equal to the distance from the intersection of the imaginary vertical exterior surface of the cylindroid with the ground to an intersection with a horizontal plane passing through the highest point at which a conductor is attached to such pole or tower. Flammable vegetation and materials located wholly or partially within the firebreak space would be treated as follows:

- At ground level—remove flammable materials, including but not limited to, ground litter, duff, and dead or desiccated vegetation that will propagate fire;
- From 0 to 2.4 meters (0 to 8 feet) above ground level—remove flammable trash, debris, or other materials, grass, and herbaceous and brush vegetation. All limbs and foliage of living trees would be removed up to a height of 2.4 meters (8 feet); and
- From 2.4 meters (8 feet) to the horizontal plane of highest point of the conductor attachment -remove dead, diseased, or dying limbs and foliage from living sound trees and any dead, diseased, or dying trees in their entirety.

*Hazardous Materials Release Response Plans and Inventory Act of 1985*

Businesses that use hazardous materials are required by the Hazardous Materials Release Response Plans and Inventory Act (also known as the Business Plan Act) to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Hazardous materials are defined as unsafe raw or unused materials that are part of a process or manufacturing step. They are not considered hazardous waste. Health concerns pertaining to the release of hazardous materials, however, are similar to those relating to hazardous waste.

*Hazardous Materials Transportation*

The transportation of hazardous materials within California is subject to various federal, State, and local regulations. It is illegal to transport explosives or inhalation hazards on any public highway not designated for that purpose, unless the use of the highway is required to permit delivery or the loading of such materials (California Vehicle Code, Sections 31602(b) and 32104(a)). The California Highway Patrol (CHP) designates through routes to be used for the transportation of hazardous materials. Transportation of hazardous materials is restricted to these routes except in cases where travel branching from these routes is required to deliver or receive hazardous materials

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

*Hazardous Materials and Waste*

A hazardous material is any substance that, because of its quantity, concentration, or physical or chemical properties, may pose a hazard to human health and the environment. Under Title 22 of the CCR, the term “hazardous substance” refers to both hazardous materials and hazardous wastes. Both of these are classified according to four properties: (1) toxicity, (2) ignitability, (3) corrosiveness, and (4) reactivity (22 CCR 11, Article 3). A hazardous material is defined as:

A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed (22 CCR 66260.10).

Various forms of hazardous materials can cause death; serious injury; long-lasting health effects; and damage to buildings, homes, and other property. Hazards to human health and the environment can occur during production, storage, transportation, use, or disposal of hazardous materials.

*Hazardous Waste Control Act*

The Hazardous Waste Control Act created the State hazardous waste management program, which is similar to but more stringent than the Federal RCRA program. The act is implemented by regulations contained in CCR, Title 26, which describes the following required aspects for the proper management of hazardous waste:

- Identification and classification;
- Generation and transportation;
- Design and permitting of recycling, treatment, storage, and disposal facilities;
- Treatment standards;
- Operation of facilities and staff training; and
- Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the California Department of Toxic Substances and Control (DTSC).

*California Environmental Protection Agency*

The California Environmental Protection Agency (Cal/EPA) was created in 1991, which unified California's environmental authority in a single cabinet-level agency and brought the California Air Resources Board (CARB), State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), California Department of Resources Recycling and Recovery (CalRecycle, formerly Integrated Waste Management Board), Department of Toxic Substance Control (DTSC), Office of Environmental Health Hazard Assessment (OEHHA), and Department of Pesticide Regulation (DPR) under one agency. These agencies were placed within the Cal/EPA "umbrella" for the protection of human health and the environment and to ensure the coordinated deployment of State resources. Their mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality.

*Department of Toxic Substance Control*

As a department within the CalEPA, the DTSC regulates hazardous waste, cleaning up existing contamination, and finding ways to reduce the hazardous waste produced in California. The DTSC regulates hazardous waste primarily under the authority of the Federal RCRA and the California Health and Safety Code (primarily Division 20, Chapters 6.5 through 10.6, and Title 22, Division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

*California Office of Emergency Services*

In order to protect the public health and safety and the environment, the California Office of Emergency Services (OES) is responsible for establishing and managing Statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials. The OES requires that basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and health risks) be available to firefighters, public safety officers, and regulatory agencies. Typically this information should be included in business plans in order to prevent or mitigate damage to the health and safety of persons and the environment from the release or threatened release of these materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California Health and Safety Code Article 1–Hazardous Materials Release Response and Inventory Program (Sections 25500 to 25520) and Article 2–Hazardous Materials Management (Sections 25531 to 25543.3).

The CCR Title 19, Public Safety, Division 2, Office of Emergency Services, Chapter 4–Hazardous Material Release Reporting, Inventory, And Response Plans, Article 4 (Minimum

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

Standards for Business Plans) establishes minimum Statewide standards for Hazardous Materials Business Plans (HMBPs). These plans include the following: (1) a hazardous material inventory in accordance with Sections 2729.2 to 2729.7; (2) emergency response plans and procedures in accordance with Section 2731; and (3) training program information in accordance with Section 2732. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the State. Each business must prepare a HMBP if that business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following:

- 500 pounds of a solid substance;
- 55 gallons of a liquid;
- 200 cubic feet of compressed gas;
- A hazardous compressed gas in any amount; or
- Hazardous waste in any quantity.

*California Occupational Safety and Health Administration*

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

*California Highway Patrol*

A valid Hazardous Materials Transportation License, issued by the CHP, is required by the laws and regulations of State of California Vehicle Code Section 3200.5 for transportation of either:

- Hazardous materials shipments for which the display of placards is required by State regulations; or
- Hazardous materials shipments of more than 500 pounds, which would require placards if shipping greater amounts in the same manner.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the CHP under the authority of the State Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing,

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

safe stopping distances, and inspection stops (14 CCR 6 [1][1150–1152.10]). Inhalation hazards face similar, more restrictive rules and regulations (13 CCR 6 [2.5] [1157–1157.8]). Transportation of radioactive materials is restricted to specific safe routes.

**3.7.1.3 Local**

*Kern County General Plan*

The Kern County General Plan establishes the following goals and policies that are applicable to the project:

Chapter 1: Land Use, Open Space, and Conservation Element, 1.3 Physical and Environmental Constraints (pages 11 and 12)

Goal 1: To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous:

Policy 1: Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained ((Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard)) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Chapter 2: Circulation Element, 2.5.4 Transportation of Hazardous Materials (page 142)

Transportation-related accidents and spills of hazardous materials pose a serious threat to the traveling public and nearby sensitive land uses. Transportation of hazardous materials poses a short-term threat to public health.

Goal 1: Reduce risk to public health from transportation of hazardous materials:

Policy 1: The commercial transportation of hazardous material, identification and designation of appropriate shipping routes will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan; and

Policy 2: Kern County and affected cities should reduce use of County-maintained roads and city maintained streets for transportation of hazardous materials.

Chapter 4: Safety Element, 4.6 Wildland and Urban Fire (pages 172 and 173)

Policy 1: Require discretionary projects to assess impacts on emergency services and facilities;

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

Policy 4: Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents; and

Policy 6: All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

4.9 Hazardous Materials (page 180)

Policy 1: The proposed siting or expansion of hazardous waste facilities will be in conformance with the adopted Kern County and Incorporated Cities Hazardous Waste Management Plan; and

Policy 2: Innovative technologies to manage hazardous waste streams generated in Kern County will be encouraged.

Chapter 5: Energy Element (page 195)

Goal To ensure the proper abandonment of petroleum production operations, in accordance with DOGGR requirements, when petroleum resource areas are depleted or are no longer productive, to provide for conversion of these areas to other land uses:

Policy 3: The County shall promote and encourage the safe reuse of former petroleum production lands by developments compatible with surrounding land use designations. The guidelines for site reestablishment include the following:

- Removal of oil-laden soil;
- Shaping of disturbed lands back to natural grade and the elimination of pad areas, settling ponds, and similar disturbances;
- Stabilization of sites by seedlings and plantings as appropriate;
- Other measures as may be stipulated by the State Division of Oil, Gas and Geothermal Resources; and
- Proper identification and abandonment of all oil and natural gas wells.

**3.7.2 Environmental Setting**

**3.7.2.1 Existing Environment**

The Covered Lands are located on the north and south sides of South Lake Road, approximately 5 miles east of Taft, and approximately 1.5 miles west of Interstate 5 (I-5); along Copus Road, north of Maricopa Highway (State Route [SR] 166); as well as bisected and bordered by the California Aqueduct to the west. A small number of scattered farm residences and buildings are located adjacent to and within the vicinity of the Covered Lands. There are three plugged oil

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.7 Hazards and Hazardous Materials**

---

wells within the Covered Lands. The Covered Lands are in an area that is subject to periodic levels of high winds. The Covered Lands have previously been used for agricultural purposes and as such, pesticides and herbicides have been applied to the crops and soils. A privately owned and operated airport is located adjacent to the Covered Lands along Corpus Road that provides glider and skydiving opportunities for the community and surrounding region. The Covered Lands are not located in an area of severe fire risk.

*This page intentionally left blank.*

### **3.8 HYDROLOGY AND WATER QUALITY**

This section describes aspects of the Covered Lands that have the potential to impact hydrology and water quality during construction and after implementation of the project. Issues such as drainage, groundwater supply and recharge, water quality, water supply, and flooding are discussed.

#### **3.8.1 Regulatory Setting**

##### **3.8.1.1 Federal**

###### *Clean Water Act*

The Federal Water Pollution Control Act, also known as the Clean Water Act,(CWA) is the principal statute governing water quality. Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of National Pollutant Discharge Elimination System (NPDES) stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than 1 acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB) and implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs). The project site is within the boundaries of the Central Valley RWQCB. See NPDES, below, for additional discussion.

###### *Federal Emergency Management Agency (FEMA)*

Floodplain zones are determined by the Federal Emergency Management Agency (FEMA) and used to create Flood Insurance Rate Maps designating flood areas. These tools assist cities in mitigating flooding hazards through land use planning and building permit requirements. To address the need for insurance to cover flooding issues, FEMA administers the National Flood Insurance Administration (NFIA) program. The NFIA program provides federal flood insurance and federally financed loans for property owners in flood prone areas. The 100-year floodplain is the area that has a statistical probability of being flooded every 100 years. To qualify for federal flood insurance, a City must identify flood hazard areas and implement a system of protective controls.

##### **3.8.1.2 State**

###### *Department of Water Resources*

The California Department of Water Resources' (DWR) major responsibilities include preparing and updating the California Water Plan to guide development and management of the State's water resources; planning, designing, constructing, operating, and maintaining the State Water

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.8 Hydrology and Water Quality**

---

Resources Development System; regulating dams; providing flood protection; assisting in emergency management to safeguard life and property; educating the public; and serving local water needs by providing technical assistance. In addition, DWR cooperates with local agencies on water resources investigations; supports watershed and river restoration programs; encourages water conservation; explores conjunctive use of ground and surface water; facilitates voluntary water transfers; and, when needed, operates a State drought water bank.

*Porter-Cologne Water Quality Control Act*

The State's Porter-Cologne Water Quality Control Act outlines the responsibilities of the RWQCB, and the procedures for coordinating with the State Water Quality Control Board (SWQCB) to meet federal CWA standards. The Porter-Cologne Act established the responsibilities and authorities of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements. Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the EPA to issue NPDES permits.

**STATE WATER RESOURCES CONTROL BOARD AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)**

The CWA requires local jurisdictions to address the problems of pollutants in stormwater runoff from development. The CWA provides for the control of the discharge of any pollutant into navigable waters from any point sources. To regulate point source pollution, the CWA provides a provision to allow the EPA to issue NPDES permits. The SWRCB is responsible for implementing the CWA and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Section 402(p) of the CWA establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES program, and requires controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods.

Federal regulations allow two permitting options for storm water discharges, individual permits and general permits. The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0004-DWQ) for Municipal Separate Storm Sewer System (MS4s) covered under the CWA to efficiently regulate numerous storm water discharges under a single permit. Permit applicants must meet the requirements in Provision D of the General Permit, which requires development and implementation of a Storm Water Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.8 Hydrology and Water Quality**

---

Pursuant to the CWA, in 2001, the SWRCB issued a statewide general NPDES Permit for stormwater discharges from construction sites (NPDES No. CAS000002); it was updated in 2010. Under this Statewide General Construction Activity permit, discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or to be covered by the General Permit. Each permit must list Best Management Practices (BMPs) to be implemented on the construction site to protect stormwater runoff and must contain a visual monitoring program, a chemical monitoring program for nonvisible pollutants to be implemented if there is a failure of BMPs; and a monitoring plan if the site discharges directly to a water body listed on the state's 303(d) list of impaired waters.

In September 2009, the SWRCB adopted a new NPDES General Permit for the stormwater discharges associated with construction and land disturbance activities (No. 2009-0009-DWQ) that, among other things, requires compliance with certain numeric effluent limitations. This General Permit became effective on July 1, 2010. It requires development of a site-specific SWPPP that specifies Best Management Practices (BMPs) that will prevent construction pollutants from contacting stormwater with the interest of keeping all products of erosion from moving offsite to receiving waters. This General Permit is implemented and enforced by the RWQCBs.

*California Water Code §13260*

California Water Code Section 13260 requires that any person discharging waste or proposing to discharge waste that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable RWQCB. Any actions related to the proposed project that would be applicable to California Water Code Section 13260 will be reported to the Central Valley RWQCB.

*Water Quality*

Surface water quality is subject to Federal, State, and local water quality requirements that are administered and enforced by the EPA, the SWRCB, and the California RWQCB, with cooperation from each county. The principal law governing pollution of the nation's surface waters is the CWA. Originally enacted in 1948, it was amended in 1972 and has remained substantially the same since. The CWA consists of two major parts: provisions that authorize Federal financial assistance for municipal sewage treatment plant construction and regulatory requirements that apply to industrial and municipal dischargers. The CWA authorizes the establishment of effluent standards on an industry basis. The CWA also requires states to adopt water quality standards that "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses."

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.8 Hydrology and Water Quality**

---

**3.8.1.3 Local**

*Kern County General Plan*

The Kern County General Plan includes the following goals and policies that are applicable to the project:

Chapter 1. Land Use, Open Space, and Conservation Element

1.3 Physical and Environmental Constraints (pages 12 and 13)

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained (Map Code 2.1 [Seismic Hazard], Map Code 2.2 [Landslide], Map Code 2.3 [Shallow Groundwater], Map Code 2.5 [Flood Hazard], Map Codes from 2.6 – 2.9, Map Code 2.10 [Nearby Waste Facility], and Map Code 2.11 [Burn Dump Hazard]) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Policy 2. In order to minimize risk to Kern County residents and their property, new development will not be permitted in hazard areas in the absence of implementing ordinances and programs. The ordinances will establish conditions, criteria and standards for the approval of development in hazard areas.

Policy 3. Zoning and other land use controls will be used to regulate and, in some instances, prohibit development in hazardous areas.

Policy 8. Encourage the preservation of the floodplain's flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.

Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

Policy 10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.

Policy 11. Protect and maintain watershed integrity within Kern County.

1.9 Resources (page 57)

Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

1.10.6 Surface Water and Groundwater (pages 68 and 69)

Policy 34. Ensure that water quality standards are met for existing users and future development.

Policy 41. Review development proposals to ensure adequate water is available to accommodate projected growth.

Policy 43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.

Policy 44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the CEQA, to prevent the degradation of the watershed to the extent practical.

**3.8.1.4 Wheeler Ridge - Maricopa Water Storage District**

The Wheeler Ridge – Maricopa Water Storage District is a public agency whose jurisdiction encompasses about 147,000 acres (230 square miles) of land in Kern County, at the extreme southern end of the San Joaquin Valley south of Bakersfield. This Water district provides water supplies to about 90,000 acres of farmland within its boundaries. It was founded in 1959 for the purpose of securing a surface water supply for agricultural purposes from the Feather River Project (now the State Water Project). The supply of surface water has allowed some lands in the district not previously irrigated to be productively farmed, and eliminated the need for ground water pumping, except in drought years. As a result, the decline of ground water levels within the District has been halted, and some recovery has occurred, with ground water levels raising an average of 50 feet to 100 feet between the early 1970s and 1996.

According to the District, “Most of the District’s water supply is obtained via the California Aqueduct from the State Water Project under contract with the Kern County Water Agency. This 197,088 acre-feet supply is allocated and distributed to 72,074 acres of farm lands within the District’s Surface Water Service Area under the terms of recorded long-term agricultural water service contracts. Current District facilities can also provide temporary water service to about 18,000 acres of additional farm lands. An additional 20,000 acres of farm lands and 10,000 acres of other developed lands rely primarily on ground water supplies. Another 27,000 acres are undeveloped and...” (Wheeler Ridge – Maricopa Water Storage District, August 2013).

### **3.8.2 Environmental Setting**

This section discusses the existing conditions relating to hydrology and water quality in the Covered Lands. The environmental setting discussion is divided into discussions of hydrology, water quality, and water supply. The Western Regional Climate Center provides quality climate data derived from stationary weather stations throughout the western United States. WRCC has developed a data set for monthly climate for the Bakersfield area (1937 to 2010); this data set is based on weather readings taken from a stationary weather station found at the Meadows Field Airport north of Bakersfield. The monthly average maximum was 98.6°F in July and the monthly average minimum was 38.5°F in January.

Typical of southern California, most of the rainfall in the Bakersfield area occurs during the period between November and April because the Gulf Stream shifts southward from northern latitudes in the wintertime. This shift creates a quasi-permanent, low-pressure zone over southern California and feeds moisture originating over the Pacific Ocean into the region. This southern shift creates the winter-wet or Mediterranean climate characteristic of southern California. However, because of its inland location and the rain shadow effect caused by the coastal mountain ranges, the Bakersfield area typically gets less rainfall during the winter than coastal areas to the west. The rain shadow effect refers to a reduction of precipitation commonly found on the leeward side of a mountain. Infrequent summer thunderstorms and showers from tropical depressions account for the remaining rainfall in the summer months. Average annual precipitation in the Bakersfield area is 6.21 inches.

#### **3.8.2.1 Regional Surface Water Resources**

##### *Tulare Lake Basin*

The Covered Lands are located in the Central Valley's Tulare Lake Basin. This essentially closed basin is situated in the topographic horseshoe formed by the Diablo and Temblor Ranges on the west, by the San Emigdio and Tehachapi Mountains on the south, and by the Sierra Nevada Mountains on the east and southeast. The Tulare Lake Basin encompasses approximately 10.5 million acres, of which approximately 3.25 million acres are in federal ownership. Valley floor lands (i.e., those having a land slope of less than 200 feet per mile) make up slightly less than half of the total basin land area. The maximum length and width of Tulare Lake Basin are about 170 miles and 140 miles, respectively. The valley floor is approximately 40 miles wide near its southern end and widens to a maximum of 90 miles. The basin is generally a closed system; it drains only to the north into the San Joaquin River Basin in years of extreme rainfall.

The Tulare Lake Basin is within the jurisdiction of the Central Valley RWQCB, which is responsible for preparing the Tulare Basin Plan.

### *South Valley Floor Watershed*

At a local level, the Covered Lands are located in the South Valley Floor Watershed, which is the largest watershed in the Tulare Lake Basin. The watershed is hydrologically closed, except in extremely wet periods, as annual average precipitation is about 8 inches. The South Valley Floor Watershed is bounded on the north by the San Joaquin River, on the south by the Tehachapi Mountains, on the west by the Coast Ranges, and on the east by the Sierra Nevada Mountains. The South Valley Floor Watershed is relatively flat compared to surrounding watershed areas and surface water is minimal. There are no water bodies within the vicinity of the Covered Lands that are listed as impaired per the Final 2008 CWA 303(d) List of Water Quality Limited Segments.

Most water in the area is imported from other locations. The Friant-Kern Canal, the San Luis Canal/California Aqueduct System, and the Cross-Valley Canal primarily control surface hydrology. Agriculture is the primary land use type in the watershed, encompassing approximately 66 percent (3.5 million acres) of the total land area.

### *Topography*

The topography of the Covered Lands is generally flat with little to no change in elevation, though runoff water flows north to south. The topography of the Covered Lands, coupled with very low average precipitation, results in very little natural offsite drainage. Precipitation that would cause standing water or water that flows anywhere on level ground is rare in the Bakersfield area. Because of the Covered Lands relatively flat topography and the typically low rainfall in the Bakersfield area, most of the onsite stormwater surface flows percolate into the soil on the site.

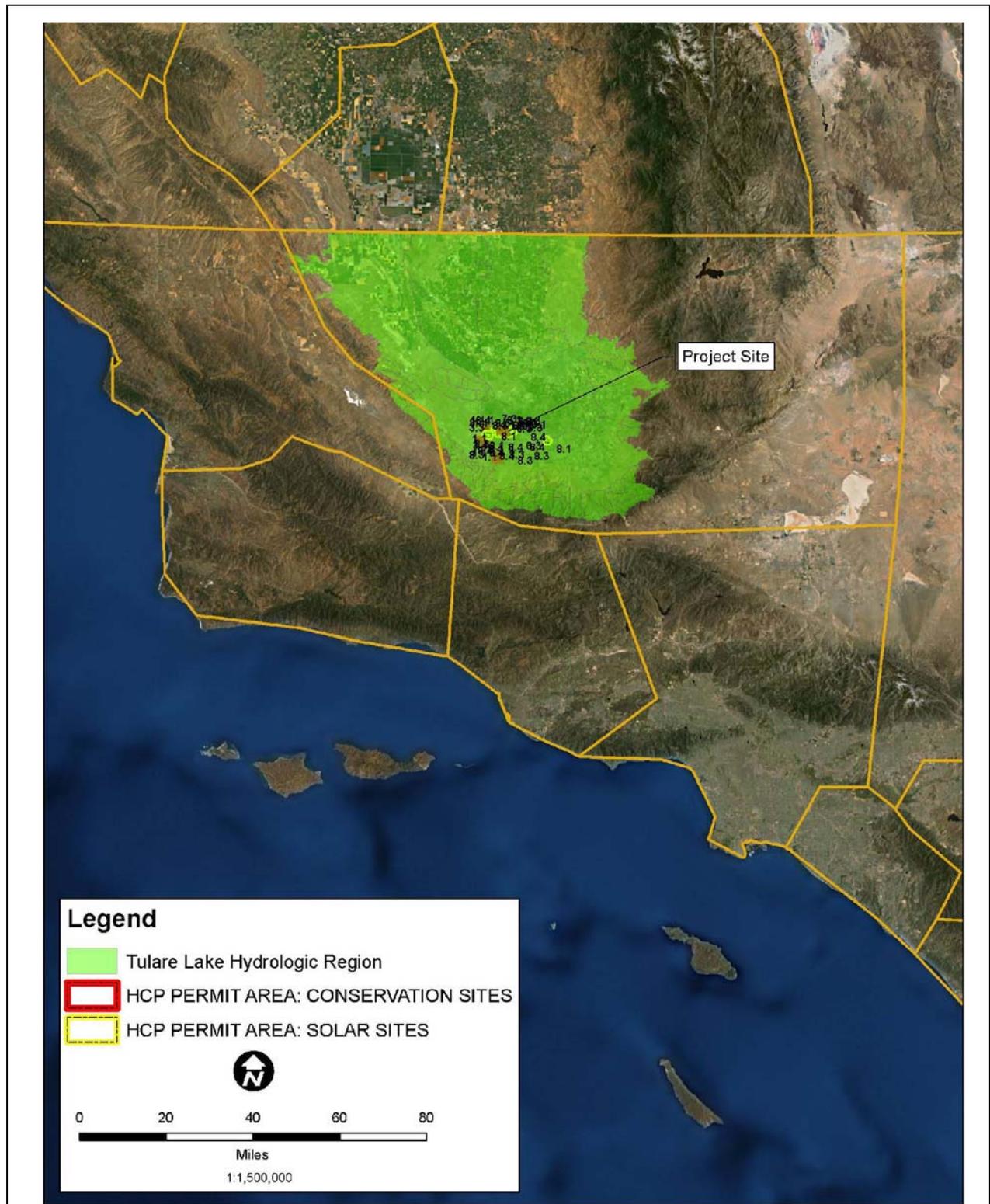
The Covered Lands are located between four watersheds, referred to as Watersheds A, B, C, and D (see Figure 3.8-1). Watershed A drains into the western portion of the Covered Lands and is formed by the Santiago Creek, Bitter Creek, Bitterwater Creek, and Cienaga Creek. Watersheds B and C drain into the central portion of the Covered Lands from the San Emigdio Mountains, located north of the site. Watershed B is formed by Santiago Creek while Watershed C is formed by the Muddy Creek and Los Lobos Creek. Watershed D drains from Tecuya Ridge and the San Emigdio Mountains in the eastern portion of the Covered Lands and is formed by the San Emigdio Creek and the Pleitito Creek.

### *Local Surface Water Availability*

Figure 3.8-2, on the following page, depicts surface water availability in the Wheeler Ridge – Maricopa Water Storage District. Essentially all the Solar Sites have no availability.

*This page intentionally left blank.*

MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN  
Draft Environmental Impact Statement  
Section 3.8 Hydrology and Water Quality



F:\E:\Projects\2010\3016\01\MAPS\9\3\CB5-Visuals\Figures\3.8\Watersheds.mxd; MODIFIED: 7/28/2013

Source: Maricopa Sun Solar LLC/ESR

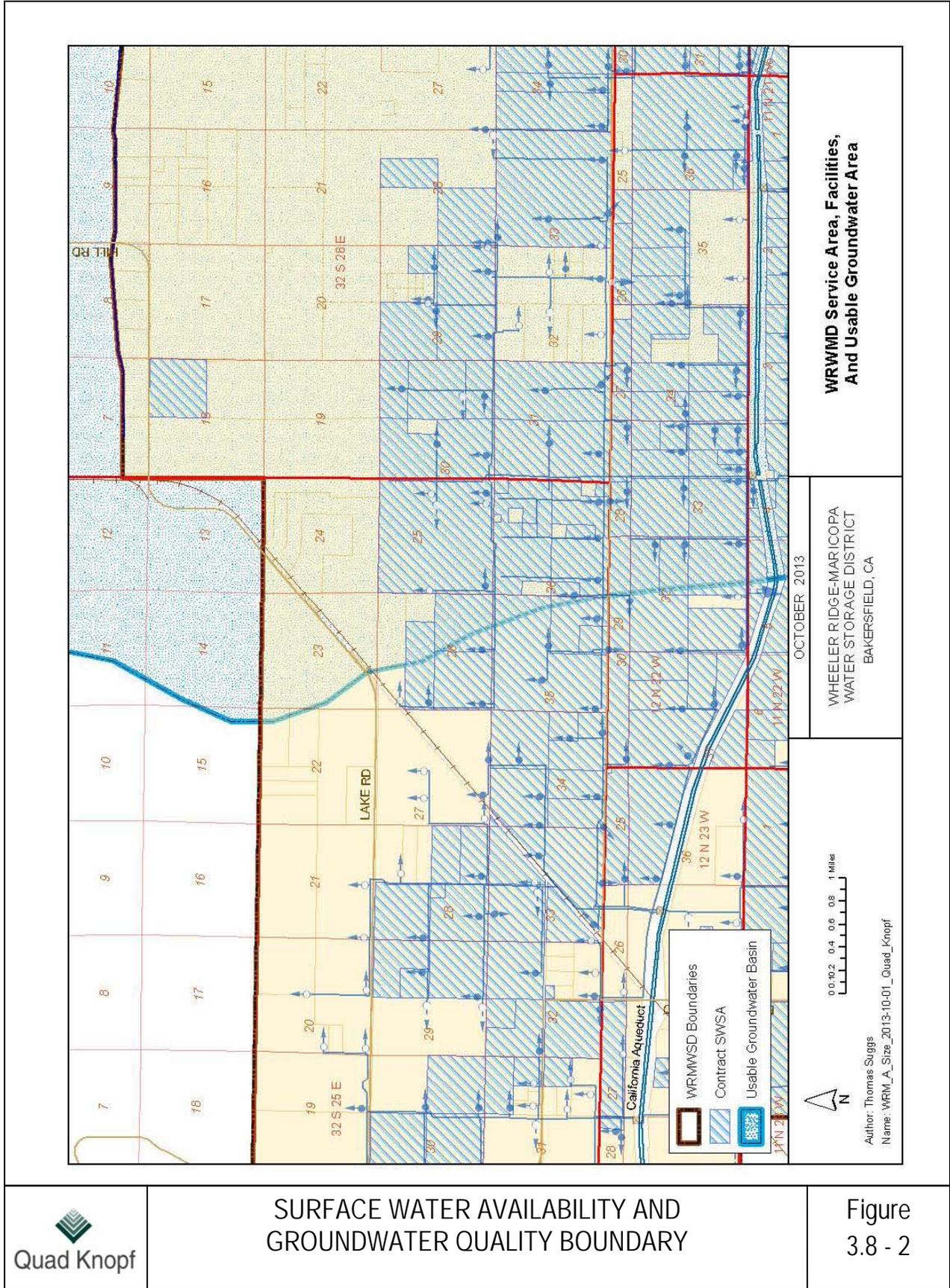


WATERSHEDS  
MARICOPA SUN SOLAR LLC

Figure  
3.8 - 1

*This page intentionally left blank.*

MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN  
 Draft Environmental Impact Statement  
 Section 3.8 Hydrology and Water Quality



*This page intentionally left blank.*

### **3.8.2.2 Groundwater Resources**

The following description of groundwater resources is based on the Department of Water Resources California's Groundwater Bulletin 118. This bulletin provides a description of the groundwater basin and its supply, water quality, and use.

#### *Regional Groundwater Basin*

The Covered Lands are in the Tulare Lake Hydrologic Region, San Joaquin Valley Groundwater Basin, and the Kern County Subbasin (Groundwater Basin No. 5 22.14). This groundwater basin is located entirely within Kern County and has a surface area of 1,950,000 acres (3,040 square miles). The aquifers are generally quite thick in the San Joaquin Valley subbasins with groundwater wells commonly exceeding 1,000 feet in depth. The maximum thickness of freshwater-bearing deposits (4,400 feet) occurs at the southern end of the San Joaquin Valley. The Tulare Hydrological Region supplies about 40 percent of the 10,556,000 acre-feet water demand from groundwater.

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada Mountains, and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the delta via the San Joaquin River and its tributaries: the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin, including the beds of the former Tulare, Buena Vista, and Kern Lakes. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains.

Located within the San Joaquin Valley Groundwater Basin, the Kern County Subbasin is bounded on the north by the Kern County line and the Tule Groundwater Subbasin, on the east and southeast by granitic bedrock of the Sierra Nevada foothills and Tehachapi Mountains, and on the southwest and west by the marine sediments of the San Emigdio Mountains and Coast Ranges.

Water quality degradation has been observed in many wells in Kern County. Groundwater contamination in the area includes nitrates, ethylene dibromide (EDB), and dibromochloropropane (DBCP). As a result of the historical use of the area for cultivated agriculture, a number of groundwater contaminants have been introduced over a period of years. In many cases, recent efforts to limit such discharge have led to a reduction or complete cessation of new sources of contamination. Many uses, however, continue to contribute significant quantities of contaminants to the groundwater.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.8 Hydrology and Water Quality**

---

Three principal sources for ongoing groundwater contamination exist within the subbasin: septic systems, cultivated agriculture, and contaminants resulting from petroleum industry activities. By design, septic systems discharge nitrified effluent into soils surrounding the systems. Cultivated agriculture contributes pollutants through nitrogen fertilizer application resulting in a measurable increase in groundwater nitrates throughout the area. A past source of groundwater contamination was the application of EDB and DBCP to control crop damage.

Petroleum production and refining contributes contamination through direct application of spilled or leaked crude oil and petroleum products to the ground surface and through the use of corrosion inhibitors in the well development process. Pollutants resulting from this activity typically include hydrocarbons and phenols that have entered the subsurface soils through injection or by percolation.

*Regional Groundwater Overdraft Conditions and Recharge Activities*

Groundwater overdraft occurs when groundwater-pumping rates exceed recharge rates. If groundwater pumping is not controlled, the groundwater table could be lowered to a depth where its use is not economical. Extended overdraft situations also raise the possibility of physical damage to aquifers through subsidence, where the aquifer collapses on itself as a result of insufficient pressure in its pore space.

Kern County is a semi-arid region that relies on its water supply for its farming and other activities. The goal for water resource management in the area is to reach a condition of “safe yield” where the amount of water pumped from the basin is less than or equal to recharge in the basin.

Overdraft conditions have existed in the County and in the worst-case scenario would lower groundwater to a depth where pumping for agricultural uses would no longer be economical. This would reduce withdrawals to balance recharge—thus achieving storage balance—but would make water available only for municipal and industrial uses that could afford the increased cost.

Water that is pumped from the local aquifer is recharged by precipitation runoff, whether in the form of direct precipitation or melted snow from the nearby Sierra Nevada Mountains. However, direct recharge (i.e., in-situ percolation) from precipitation is only a minor source of supply for the aquifers in the South Valley Floor watershed because average rainfall is only 8 inches per year. Rather, snow melt and precipitation runoff from the Sierra Nevada feeds into the Kern River, which recharges local aquifers through seepage and percolation; this is the most important method of recharge in the South Valley Floor watershed. Other sources of groundwater recharge come in the form of agricultural canal seepage and percolation, irrigation of inedible crops with reclaimed water (which percolates to the aquifer), and water spreading (a method of storing water underground for later retrieval).

### *Local Groundwater Quality*

Areas of high Total Dissolved Solids (TDS) content are primarily located along the west side of the San Joaquin Valley and in the trough of the valley. High TDS content of west-side water is due to recharge of stream flow originating from marine sediments in the Coast Range. High TDS content in the trough of the valley is the result of concentration of salts remaining from evaporation and poor drainage. In the central and west-side portions of the valley, where the Corcoran Clay confining layer exists, water quality is generally better beneath the clay than above it. Nitrates may occur naturally or as a result of disposal of human and animal waste products and fertilizer. Areas of high nitrate concentrations are known to exist near the town of Shafter and other isolated areas in the San Joaquin Valley.

High levels of arsenic occur locally and appear to be associated with lakebed areas. Elevated arsenic levels have been reported in the Tulare Lake, Kern Lake and Buena Vista Lake bed areas. Organic contaminants can be broken into two categories, agricultural and industrial. Agricultural pesticides and herbicides have been detected throughout the valley, but primarily occur along the east side, where soil permeability is higher and depth to groundwater is shallower. The most notable agricultural contaminant is DBCP, a now-banned soil fumigant and known carcinogen once used extensively on grapes. Industrial organic contaminants include TCE, DCE, and other solvents. They are found in groundwater near airports, industrial areas, and landfills. Typical well yields in the San Joaquin Valley range from 300 gallons per minute (gpm) to 2,000 gpm with yields of 4,000 gpm possible. The average total dissolved solids content for wells in this area is 400-450 milligrams per liter (mg/L), with a range of 150-5,000 mg/L. Water with TDS levels less than 500 mg/L have generally no restrictions on agricultural uses, while water with 500-2,000 mg/L have slight to moderate restrictions. However, water that exceeds 2,500 mg/L TDS content has severe use restrictions.

### *Local Groundwater*

Eight local-area agricultural water wells have been identified, all located about 3 miles southeast of the easternmost Covered Lands. These wells can pump between 1,000 and 2,800 gpm. Groundwater in the Covered Lands area has high total dissolved solids. Figure 3.8-2 depicts the westerly boundary of “usable groundwater” (2,000 milligrams per liter mg/l) of total dissolved solids, or less. Fifty percent of the Solar Sites lie west of that boundary. “Usable groundwater” approaching a 2,000 mg/l quality is of limited value per crop irrigation. Most crops (all fruit crops) cannot produce viable yields at such levels. As noted above, the Covered Lands are in Tulare Hydrologic region and the Kern County Subbasin. The Tulare Hydrological Region supplies about 40 percent of the 10,556,000 acre-feet water demand from groundwater and the Kern County Subbasin has a surface area of 1,950,000 acres (3,040 square miles).

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.8 Hydrology and Water Quality**

---

*Flooding/Floodplains*

Due to the historic use of the area for agriculture, the Covered Lands area is relatively flat. As shown in Figure 3.4-3, portions of the Covered Lands are currently mapped by the Federal Emergency Management Agency (FEMA) in Flood Zone A, and accordingly are within 100-year flood zone (annual flood risk of 1 percent).

The Covered Lands are composed of two hydrological soils groups as categorized by the Kern County Hydrology Manual. Approximately 61.4 percent of the Covered Lands contains Soils Group B, which is characterized by having slow infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well drained soils with moderately coarse textures. These soils have a moderate rate of water transmission and are generally suitable for stormwater retention basins on a case-by-case basis. The remaining 38.6 percent of the Covered Lands area is composed of Soils Group D, which is characterized by having very slow infiltration rates when thoroughly wetted, consisting chiefly of, (1) clay soils with high swelling potential, (2) soils with a high permanent water table, (3) soils with clay pan or clay layer at or near the surface, and (4) shallow soils over nearly impervious materials. These soils have very slow water transmission and high storm runoff potential. Stormwater retention basins are not recommended for group D soils.

Storm water drainage resulting from the area's limited rainfall is principally retained on site. Minimal drainage runoff from one Solar Site is temporarily retained in a small pond (drainage basin) just outside the edge of the Site. Minimal runoff, prior to agricultural land leveling and disking, from another Site formerly drained to a plant-identified "wetlands" in a Site-adjacent, proposed, Movement Corridor.

*Dam Inundation*

Isabella Dam is located approximately 40 miles northeast of the city of Bakersfield and approximately 90 miles from the Covered Lands. The dam is built near a major earthquake fault. Isabella Dam is earth-filled and approximately 185 feet high and 1,725 feet long with a capacity of 570,000 acre-feet of water.

Because Isabella Dam is near an active fault, the potential for seismic activity to cause dam failure exists. If the dam fails, its entire reservoir would be released, and approximately 60 square miles of metropolitan Bakersfield would be flooded. The Kern County General Plan indicates that the chance of the dam failing entirely, with the reservoir at capacity, is equal to 1 day in 10,000 years. The Covered Lands are located outside the area of potential flooding due to inundation from dam collapse.

### **3.9 LAND USE AND PLANNING**

This section discusses the current land uses and land use designations affecting the Covered Lands.

#### **3.9.1 Regulatory Setting**

##### **3.9.1.1 Federal**

###### *Section 10 and Habitat Conservation Plans*

The federal Endangered Species Act of 1973 (ESA) was enacted to protect sensitive animal and plant species (e.g., those listed under the ESA as threatened or endangered by extinction), in part by providing programs for their conservation. Amendments to Section 10 of the ESA in 1982 allowed non-Federal parties (i.e., private landowners and local agencies) that engage in otherwise lawful activities that are likely to result in the unintentional harm, death, or destruction of habitat (“take”) of federally-listed species to obtain incidental take permits under Section 10(a)(1)(B) of the ESA. Under Section 10(a)(2)(A) of the ESA, applicants for a Section 10 permit are required to develop and submit a habitat conservation plan (HCP). HCPs are developed by project applicants and/or state and local government entities with advice and guidance from USFWS. The HCP defines the activities to be addressed, characterizes the extent to which activities may affect federally-listed species and their habitat, and then specifies measures to minimize and mitigate for impacts to the federally-listed species. In approving the 1982 amendments to the ESA, Congress also expressed that HCPs be long-term, multi-species plans that cover not only federally-listed species, but also unlisted species, as long as those species are treated as if they were federally-listed (H.R. Rep. No. 835, 97th Cong., 2d Sess. 29 (1982)). Section 10 authorizes incidental take of individuals of species’ populations covered by a Section 10 permit, including those caused by disturbance of the habitat of such species, provided that a Section 10 permit has been issued.

##### **3.9.1.2 State**

###### *Farmland Mapping and Monitoring Program*

The California Department of Conservation created the Farmland Mapping and Monitoring Program (FMMP) in the 1980s as a continuation of Federal Natural Resources Conservation Service mapping efforts. Under the FMMP, State farmlands are inventoried based on soil quality, land use, availability of water, soil temperature range, flooding potential, and other factors. The Important Farmlands maps identify four agriculture listings and three additional land use designations: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban Land, and Other Land. Other land includes wetlands, timber/brush, borrow pits, and other uses that fit no other category.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.9 Land Use and Planning**

---

**3.9.1.3 Local**

Land use and planning decisions within and adjacent to the Covered Lands are regulated by a variety of jurisdictional planning agencies and programs, including the Kern County General Plan and the Kern County Zoning Ordinance.

*Kern County General Plan*

Kern County adopted a General Plan in 2004 that was last amended (with an update to the text and zoning consistency matrix) in 2009. The General Plan Land Use Element identifies certain classes of land uses that are consistent with the County's planning goals and objectives throughout the area of its jurisdiction. The portions of the County that are subject to each General Plan land use designation are identified by a corresponding map code on maps that are maintained by the County. Relevant goals and policies contained within the General Plan are provided below. Figure 3.9-1 identifies the locations of the existing General Plan land use designations applicable to the Covered Lands, including the following.

Chapter 1. Land Use, Open Space, and Conservation Element

1.3 Physical and Environmental Constraints (pages 11 through 15)

Goal 1. To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous.

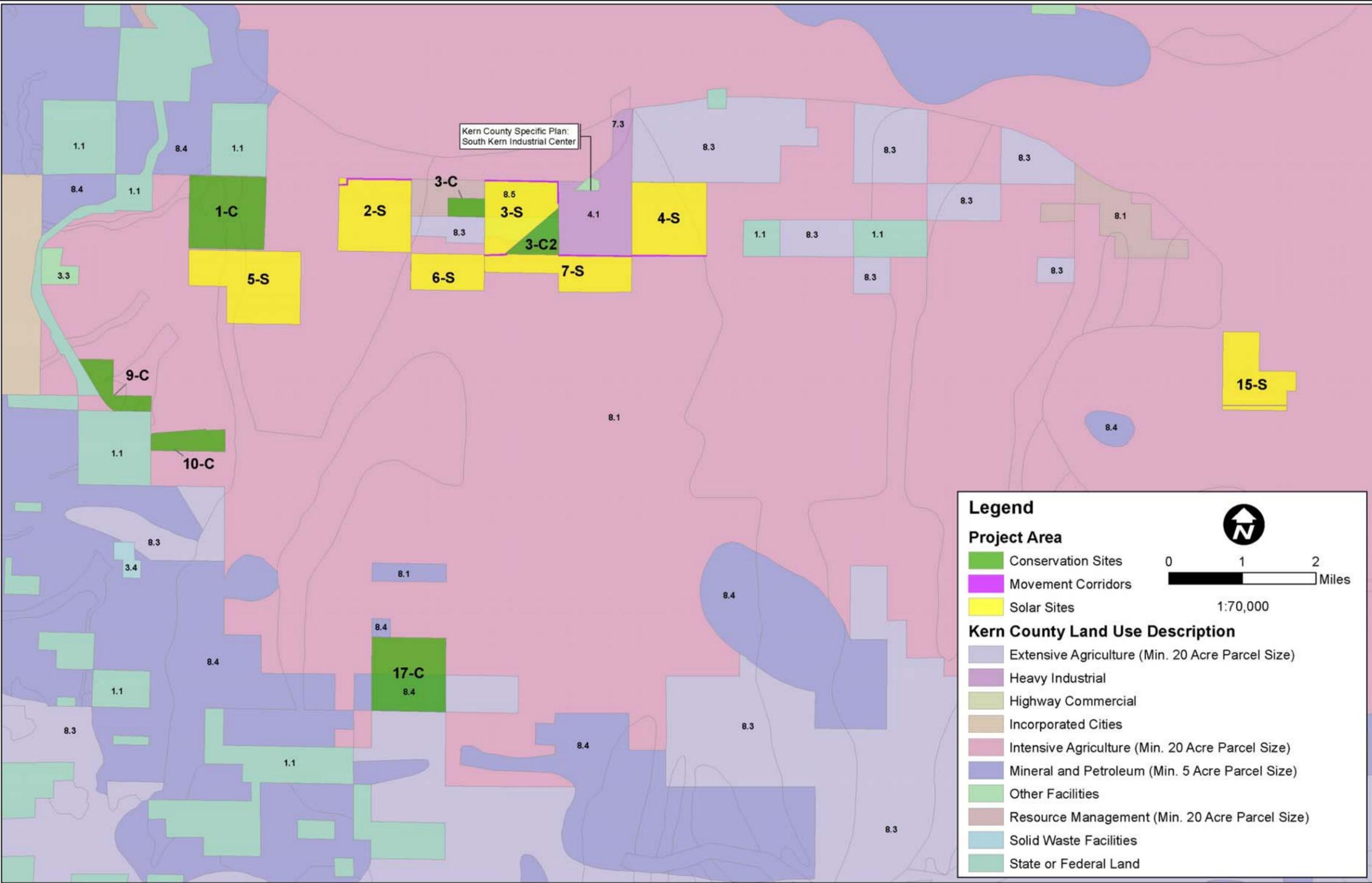
Map Code Provisions: Physical and Environmental Constraints

Shallow Groundwater (Map Code 2.3). Groundwater within 15 feet of the land surface is delineated on the Kern County Seismic Hazard Atlas.

Flood Hazard (Map Code 2.5). Special Flood Hazard Areas (Zone A), as identified on the Flood Insurance Rate Maps (FIRM) of the Federal Emergency Management Agency (FEMA) and supplemented by floodplain delineating maps that have been approved by the Kern County Engineering and Survey Services Department.

Policy 1. Kern County will ensure that new developments will not be sited on land that is physically or environmentally constrained. The County will not support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

Policy 2. In order to minimize risk to Kern County residents and their property, new development will not be permitted in hazard areas in the absence of implementing ordinances and programs. These ordinances will establish conditions, criteria, and standards for the approval of development in hazard areas.



Document Path: \\BK-SERVER-02\Projects\Projects\2009\090160.02\GIS\MXD\Revised\Fig3.9-1 KCLandUse.mxd



GENERAL PLAN LAND USE DESIGNATIONS  
 MARICOPA SUN SOLAR LLC

Figure  
 3.9 - 1

*This page intentionally left blank.*

Policy 3. Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas.

Policy 8. Encourage the preservation of the floodplain's flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.

Policy 9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

Policy 10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element of this General Plan.

Implementation Measure J. Compliance with the Floodplain Management Ordinance prior to grading or improvement of land for development or the construction, expansion, conversion or substantial improvements of a structure is required.

#### 1.9 Resource (pages 53 through 58)

Intensive Agriculture (Map Code 8.1). Areas devoted to the production of irrigated crops or having a potential for such use. Other agricultural uses, while not directly dependent on irrigation for production, may also be consistent with the intensive agriculture designation. Minimum parcel size is 20 acres gross.

Uses shall include, but are not limited to, the following:

Irrigated cropland; orchards; vineyards; horse ranches; raising of nursery stock ornamental flowers and Christmas trees; fish farms' bee keeping' ranch and farm facilities and related uses; one single-family dwelling unit; cattle feed yards; dairies; dry land farming; livestock grazing; water storage; groundwater recharge acres; mineral; aggregate; and petroleum exploration and extraction; hunting clubs; wildlife preserves; farm labor housing; public utility uses; and Agricultural industries pursuant to provisions of the Kern County Zoning Ordinance, and land within development areas subject to significant physical constraints.

Extensive Agriculture (Map Code 8.3). Agricultural uses involving large amounts of land with relatively low value-per-acre yields, such as livestock grazing, dry land farming, and woodlands. Minimum parcel size is 20 acres gross, except lands subject to a Williamson Act Contract/Farmland Security Zone Contract, in which case the minimum parcel size shall be 80 acres gross.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.9 Land Use and Planning**

---

Uses shall include, but are not limited to, the following:

Livestock grazing; dry land farming; ranching facilities; wildlife and botanical preserves; and timber harvesting; one single-family dwelling unit; irrigated croplands; water storage or groundwater recharge areas; mineral; aggregate; and petroleum exploration and extraction; and recreational activities, such as gun clubs and guest ranches; and land within development areas subject to significant physical constraints.

Resource Management (Map Code 8.5). Primarily open space lands containing important resource values, such as wildlife habitat, scenic values, or watershed recharge areas. These areas may be characterized by physical constraints, or may constitute an important watershed recharge area or wildlife habitat or may have value as a buffer between resource areas and urban areas. Other lands with this resource attribute are undeveloped, non-urban areas that do not warrant additional planning within the foreseeable future because of current population (or anticipated increase), marginal physical development, or no subdivision activity.

Minimum parcel size is 20 acres gross, except lands subject to a Williamson Act Contract/Farmland Security Zone Contract, in which case the minimum parcel size shall be 80 acres gross.

Uses shall include, but are not limited to, the following:

Recreational activities; livestock grazing; dry land farming; ranching facilities; wildlife and botanical preserves; and timber harvesting; one single-family dwelling unit; irrigated croplands; water storage or groundwater recharge areas; mineral; aggregate; petroleum exploration and extraction; open space and recreational uses; one single-family dwelling on legal residentially zoned lots on effective date of this General Plan; land within development areas subject to significant physical constraints; State and federal lands which have been converted to private ownership.

Goal 3. Ensure the development of resource areas minimize effects on neighboring resources lands.

Goal 4. Encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decision and actions of other agencies as they affect energy development in Kern County.

Goal 6. Encourage alternative sources of energy, such as solar and wind energy, while protecting the environment.

Policy 1. Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation.

Policy 7. Areas designated agricultural use, which includes Class I and II, and other enhanced agricultural soils with surface delivery water systems, should be protected from incompatible residential commercial, and industrial subdivision and development activities.

Policy 9. When evaluating General Plan Amendment proposals to change a Map Code 8.1 (Intensive Agriculture) designation to accommodate residential, commercial, or industrial development, the County shall consider the following factors:

- a. Approval of the proposal will not unreasonably interfere with agricultural operations on surrounding lands.
- b. Necessary public services and infrastructure are available to adequately serve the project.
- c. There is a demonstrated need for the proposed project location based upon population projections, market studies and other indications.
- d. The requested change in land use designation is accompanied by a zone change and other implementing land use applications for a specific development proposal.
- e. The site is contiguous to properties that are developed or characterized by nonagricultural land uses.
- f. Past agricultural use of the site has led to soil infertility or other soil conditions which render the property unsuitable for long term agricultural use.
- g. Approval of the proposed project outweighs the need to retain the landform long term agricultural use.
- h. Where adjacent or within proximity (1/2 mile) to existing urban areas, the County shall discourage agricultural conversion that is discontinuous with urban development.

Policy 11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

Policy 14. Emphasize conservation and development of identified mineral deposits.

Policy 16. The County will encourage development of alternative energy sources by tailoring its Zoning and Subdivision Ordinances and building standards to reflect Alternative Energy Guidelines published by the California State Energy Commission.

Policy 19. Work with other agencies to define regulatory responsibility concerning energy-related issues.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.9 Land Use and Planning**

---

Policy 25. Discourage incompatible land use adjacent to Map code 8.4 (Mineral and Petroleum) areas.

1.10 General Provisions

1.10.1 Public Services and Facilities (pages 61 through 64)

Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

Policy 9. New development should pay its pro rate share of the local cost of expansions in services, facilities, and infrastructure which it generates and upon which it is dependent.

Policy 16. The developer shall assume full responsibility for costs incurred in service extension or improvements that are required to ensure the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

Chapter 5. Energy Element (pages 183 through 185)

The Energy Element has three primary objectives:

- Ensuring resource management and protection;
- Establishing development standards to protect the environment, public health and safety;
- Promoting and facilitating energy development.

Goal: To assert Kern County's position as California's leading energy producer, to encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decisions and actions of other agencies as they affect energy development in Kern County.

Policy 7. The processing of all discretionary energy project proposals shall comply with California Environmental Quality Act (CEQA) Guidelines directing that the environmental effects of a project must be taken into account as part of a project consideration.

Policy 8. The County should work closely with local, State, and federal agencies to assure that energy projects (both discretionary and ministerial) avoid or minimize direct impacts to fish, wildlife, and botanical resources, wherever practical.

Policy 9. The County should develop and implement measures which result in long term compensation for wildlife habitat, which is unavoidably damaged by energy exploration and development activities.

#### 5.4 Electricity Resources and Generation (pages 202 and 203)

##### 5.4.5 Solar Energy Development (page 209)

Goal: [To] encourage safe and orderly commercial solar development

Policy 3. The County should encourage solar development in the desert and valley planning regions that does not pose significant environmental or public health and safety hazards.

Policy 4. The County should encourage solar development in the desert and valley regions previously disturbed, and discourage development of energy projects on undisturbed land supporting State or federally protected plant and wildlife species.

##### 5.4.7 Transmission Lines (page 212)

Goal: To encourage the safe and orderly development of transmission lines to access Kern County's electrical resources along routes, which minimize potential adverse environmental effects.

Policy 1. The County should encourage the development and upgrading of transmission lines and associated facilities (e.g., substations) as needed to serve Kern County residents and access the County's generating resources, insofar as transmission lines do not create significant environmental or public health and safety hazards.

### Circulation Element

#### 2.3 Highways

##### 2.3.3 Highway Plan (pages 91 through 93)

Goal 1. To set up a simple way to protect rights-of-way. Protecting corridors for future transportation facilities is the most important transportation planning activity in any high-growth area.

Goal 2. To reserve rights-of-way to meet future needs resulting from development allowed by land use plans.

Goal 3. To maintain a minimum level of service (LOS) of D.

Policy 1. Development of roads within the County shall be in accordance with the Circulation Diagram Map. The chartered roads are usually on section and mid-section lines.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.9 Land Use and Planning**

---

*Kern County Zoning Ordinance*

The Zoning Ordinance contains regulations through which the General Plan's provisions are implemented. The Covered Lands are zoned A (Exclusive Agriculture) by the Kern County Zoning Ordinance. The purpose of the Exclusive Agriculture (A) District is to designate areas suitable for agricultural uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to nonagricultural uses. Permitted land uses in this district include agriculture, commercial uses, utility lines and substations, resource extraction, energy development, and miscellaneous accessory structures related to permitted uses.

*Kern County Draft Valley Floor Habitat Conservation Plan*

The Draft Valley Floor HCP was designed in 2006 to conserve federally-protected species, State-protected species, and/or other species of concern. This HCP encompasses 3,100 square miles and generally includes most of the San Joaquin Valley floor portion of Kern County up to an elevation of 2,000 feet AMSL. On the west side, the HCP extends to the San Luis Obispo County line. It does not include incorporated cities, and does not provide incidental take coverage for the Kern Water Bank, Coles Levee Ecosystem Preserve, Occidental Elk Hill, Inc., or Buena Vista Naval Petroleum Reserve No. 2. The Covered Lands, as described in this EIS, are located within this HCP. The issuance of an incidental take permit by the U.S. Fish and Wildlife Service is contingent upon Kern County's approval of the HCP. Because this HCP has not been approved, an incidental take permit has not yet been issued.

### **3.9.2 Environmental Setting**

#### **3.9.2.1 Existing Land Uses**

The Covered Lands have historically been used for agricultural production. The Covered Lands are designated under the FMMP as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Grazing Land, and a small amount of Vacant or Disturbed Land and Nonagricultural and Natural Vegetation.

Lands that are not actively farmed have been left fallow due to a lack of available water. The land in the immediate vicinity of the Covered Lands is cultivated and uncultivated farmland, industrial, residential, and a vacant mineral resource area. The Covered Lands are within agricultural preserves. The Project Area is also included within the Draft Valley Floor HCP area. However, because a separate HCP is planned for the Project Area, the landowner has opted out of the Draft Valley Floor HCP. The Covered Lands are not within the administrative boundaries of an oil field; however there are three plugged oil wells within the Covered Lands.

### **3.10 MINERAL RESOURCES**

This section describes the existing mineral resources within the Covered Lands.

#### **3.10.1 Regulatory Setting**

Mineral resources situated on (surface) or beneath (subsurface) a tract of land can be owned. The owner of the land may have surface rights, while a different owner may have subsurface rights. When this is the case, it is referred to as “split estate” or “severed estate land.” This may occur when a landowner sells his/her right to the surface land, and retains the rights to the subsurface minerals.

##### **3.10.1.1 Federal**

###### *Bureau of Land Management*

The Bureau of Land Management is responsible for managing mineral production and commercial energy on federal lands. There are no federal lands within the Project Area.

##### **3.10.1.2 State**

###### *California Geological Survey*

In 1860 the California Legislature established the Geological Survey of California, which is today the California Geological Survey. Its mission is to provide scientific products and services concerning the State’s geology, seismology and mineral resources that affect the health, safety, and business interests of the State’s residents. The Office of Mine Reclamation, which oversees the Surface Mining and Reclamation Act of 1975, is within this agency.

###### *Division of Oil, Gas, and Geothermal Resources*

The Division of Oil, Gas, and Geothermal Resources (DOGGR) is a State agency under the Department of Natural Resources. DOGGR is responsible for supervising the drilling, operation, maintenance, plugging and abandonment of oil, gas, and geothermal resources in California, including fracking operations. DOGGR’s regulatory program promotes the sensitive development of these resources through sound engineering practices, prevention of pollution, and implementation of public safety programs. Regulations require remediation of wells to current DOGGR standards, and include the avoidance of building over or near plugged or abandoned oil and gas wells.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.10 Mineral Resources**

---

*Special Publication 51*

The State Policy for Surface Mining and Reclamation Practice (1977), also known as Special Publication 51, was prepared by the State Mining and Geology Board. The publication contains the California Surface Mining and Reclamation Policies and Procedures.

*Surface Mining and Reclamation Act of 1975*

The Surface Mining and Reclamation Act of 1975 (SMARA), Public Resources Code, Section 2710-2796, provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable conditions. SMARA also encourages the production, conservation, and protection of the state's mineral resources. Public Resources Code Section 2207 provides annual reporting requirements for all mines in the state, under which the State Mining and Geology Board is also granted authority and obligations. SMARA , Chapter 9, Division 2 of the Public Resources Code, requires the State Mining and Geology Board to adopt State policy for the reclamation of mined lands and the conservation of mineral resources. These policies are prepared in accordance with the Administrative Procedures Act, and are found in California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

Mineral resources addressed in this EIS are classified under SMARA. This classification, initiated by the State Geologist of mineral land classification, was intended to identify and protect mineral resources in areas of the State subject to urban development and other irreversible land uses that would preclude mineral extraction. In 1980 SMARA was updated to include classification in other, non-urban, areas that were also subject to land uses incompatible with mining activities. Mineral lands are mapped using the California Mineral Land Classification System, using a priority list to determine the classification of a mine or specific area. Priority is given to areas where future mineral resource extraction could be precluded by incompatible land use or mineral resources likely to be mined during the 50 year period following their classification. This list is maintained and updated by the State Mining and Geology Board, and is on file with Kern County.

*Designation of Regionally Significant Aggregate Resources in the Bakersfield Production-Consumption Region*

This publication, published by the Department of Conservation, Natural Resources Agency in November 2011 includes the designation of lands containing mineral resources of regional or statewide economic significance that are needed to meet the demands of the future. Designation is the formal recognition of significant mineral resources by the State Mining and Geology Board. The designation of regionally significant aggregate resources in the Bakersfield Production-Consumption Region of Kern County was enacted on August 30, 2011. The

Production-Consumption Region is identified as Sectors A through K. Alluvial deposits of San Emidio Creek, located south of State Highway 166 and south and east of the Covered Lands, is the nearest designated area to the Project Area.

### **3.10.1.3 Local**

#### *Kern County General Plan*

The Kern County General Plan includes goals, policies and implementation measures regarding mineral resources. Those applicable to the proposed project are as follows:

Chapter 1. Land Use, Open Space, and Conservation Element

1.9 Resource (pages 52 through 59)

Goal 1. To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations that will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources or diminish the other amenities that exist in the County.

Goal 2. To protect areas of important mineral, petroleum, and agricultural resource potential for future use.

Goal 3. To ensure that the development of resource areas minimizes effects on neighboring resource lands.

Policy 14. Emphasize conservation and development of identified mineral deposits.

Policy 17. Lands classified as MRZ-2, as designated by the State of California, should be protected from encroachment of incompatible land uses.

Policy 25. Discourage incompatible land use adjacent to Map 8.4 (Mineral and Petroleum) areas.

Implementation Measure H. Use the California Geological Survey's latest maps to locate mineral deposits until the regional and Statewide importance mineral deposits maps has been completed, as required by the Surface Mining and Reclamation Act.

Implementation Measure I. Periodically review the Zoning Ordinance to reflect new technology and energy sources, and encourage these types of uses for new development.

Implementation Measure J. The County shall continue to monitor new legislation as it relates to energy production and periodically review the General Plan and Zoning Ordinance for any required updates.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.10 Mineral Resources**

---

Implementation Measure K. Protect oilfields and mineral extraction areas through the use of appropriate implementing zone districts: A (Exclusive Agriculture), DI (Drilling Island), NR (Natural Resource), or PE (Petroleum Extraction).

Chapter 5. Energy Element

Reuse of Nonproductive Petroleum Resource Areas (pages 195 through 196)

The oil and natural gas reservoirs in Kern County are finite resources, which will eventually be depleted. It should be noted that recoveries from these reservoirs are only partial, and that upon abandonment a reservoir may retain a major portion of the original oil in place. Based upon oil price and available technology, both individual wells and entire oilfields have been abandoned and subsequently reactivated. It is important to provide for the productive reuse of these areas. The State Division of Oil, Gas, and Geothermal Resources (DOGGR) regulate abandonment of wells, including the removal of surface equipment.

Wells that were abandoned prior to the 1950s were abandoned in accordance to law and regulation in place at that time, however, additional requirements have subsequently been added in order to better protect fresh groundwater and protect the public from hazards at the surface. Previously abandoned wells may not be precisely at the location on record, and may be hazardous or leaking.

Goal To ensure the proper abandonment of petroleum production operations in accordance with DOGGR requirements, when petroleum resource areas are depleted or are no longer productive, to provide for conversion of these areas to other land uses.

Policy 3. The County shall promote and encourage the safe reuse of former petroleum production lands by developments compatible with surrounding land use designations. The guidelines for site reestablishment include the following:

- a. Removal of oil-laden soil;
- b. Shaping of disturbed lands back to natural grade and the elimination of pad areas, settling ponds, and similar disturbances;
- c. Stabilization of sites by seedlings and plantings as appropriate;
- d. Other measures as may be stipulated by the State Division of Oil, Gas, and Geothermal Resources; and
- e. Proper identification and abandonment of all oil and natural gas wells.

The General Plan also includes Policies and Implementation measures regarding the proper disposal of petroleum wastes, and the identification and mitigation for any adverse impacts on

the environment (including air quality, water quality, and sensitive plant and animal species) from new or continued petroleum development.

### **3.10.2 Environmental Setting**

#### **3.10.2.1 Existing Mineral Resources**

Mineral and petroleum resources are basic to Kern County's economy. Kern County has the distinction of producing more oil than any other county in California. In addition, borax, cement production, and construction aggregates constitute major economic mineral resources, and trends for increasing demand of these resources are expected to continue. Adjacent to the Covered Lands, the J.W. Brown Rock Plant, an aggregate, sand and gravel operation, is located on Gardener Field Road, approximately one mile east of the California Aqueduct.

The Kern County General Plan (2009) includes one land use designation for mineral and petroleum production, with a minimum parcel size of five acres gross. Although the Covered Lands are not within the administrative boundaries of an oil field, there are three plugged oil wells within the Covered Lands. Some lands surrounding the Covered Lands are classified as "8.4 Mineral and Petroleum." DOGGR-recognized oil fields, including Midway Sunset, Buena Vista, San Emidio Nose, Rio Viejo, and Yowlumne are in the close proximity to the Covered Lands.

Sand and gravel operations are found primarily along stream beds in alluvial fans. In Kern County, these occur along the eastern side of the San Joaquin Valley and in the foothills of the Sierra Nevada Mountains east of the Covered Lands. Alluvial fans also occur along the north flank of the San Emidio and Tehachapi Mountains to the south and east of the Covered Lands. The publication, *Designation of Regionally Significant Aggregate Resources in the Bakersfield Production-Consumption Region*, produced by the State Mining and Geology Board in 2011, includes sand and gravel operations throughout the County. The Sector Group F includes deposits of the alluvial fan of San Emidio Creek, 25 miles southwest of Bakersfield, north and south of State Highway 166. Sector F is divided into eleven subsectors identified as F-1 through F-11. The combined area of the subsectors is 11,271 acres.

*This page intentionally left blank.*

### **3.11 PUBLIC SERVICES**

This section describes public facilities including police, fire, and other public facilities, including an overview of all applicable regulations and a description of the physical environment.

#### **3.11.1 Regulatory Setting**

##### **3.11.1.1 State**

###### *California Building Standards Code*

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes;
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and,
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

The California Fire Code is a component of the California Building Standards Code and contains fire safety-related building standards.

###### *Senate Bill 267*

SB 267 modifies the existing requirements to prepare a water supply assessment for projects that meet certain size thresholds. Under the new law, a photovoltaic or wind energy generation facility that demands no more than 75 acre-feet of water per year is exempt from the water supply assessment requirements. By eliminating this aspect of project analysis, this law is expected to help reduce the time and cost associated with permitting new photovoltaic and wind projects, which typically do not have high water demand.

###### *Climate Change Response for Clean and Safe Drinking Water Act of 2014*

**Water Quality; Safe and Clean Drinking Water** - Eligible projects include but are not limited to improving drinking water quality; wastewater treatment facilities; stormwater quality; etc.

- Up to \$100 million to the SWRCB for the State Water Pollution Control Revolving Fund Small Community Grant Fund for wastewater treatment projects.
- Up to \$250 million for stormwater management projects.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.11 Public Services**

---

**Ecosystem and Watershed Protection Projects** - Eligible projects include projects that protect economic benefits of healthy watersheds; help watersheds adapt to climate change; restore river parkways; remove barriers to fish passage, etc.

- \$500 million to fulfill state obligations for Klamath River, Salton Sea, and San Joaquin River restoration.
- \$250 million to the Natural Resources Agency for allocation to State Conservancies.

**Climate Change Preparedness for Regional Water Security** - Eligible projects must be included in an adopted Integrated Regional Water Management plan.

- \$1 billion allocated to DWR hydrologic regions for general IRWM program implementation.
- Up to \$250 million for direct expenditures, grants, and loans for urban and agricultural water conservation projects.
- Up to \$500 million for grants and loans for water recycling and advanced treatment technology.

**Delta Sustainability** - Eligible projects include Delta levee improvements, ecosystem restoration, and Delta sustainability.

**Water Storage for Climate Change** - Fund continuously appropriated to the CA Water Commission for public benefits associated with water storage projects. Eligible projects include:

- Calfed Reservoirs (except Shasta).
- Groundwater storage and groundwater clean-up projects.
- Local and regional surface water projects.
- Conjunctive use and reoperation projects.
- Projects that restore the capacity of existing reservoirs.

*California Integrated Waste Management Act*

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the State Legislature passed Assembly Bill 939, the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. The legislation requires each local jurisdiction in the State to set diversion requirements of 25 percent in 1995 and 50 percent in 2000; establishes a comprehensive statewide system of permitting, inspections, enforcement, and

maintenance for solid waste facilities; and authorizes local jurisdictions to impose fees based on the types or amounts of solid waste generated. In 2007, Senate Bill (SB) 1016, (Wiggins, Chapter 343, Statutes of 2008) introduced a new per capita disposal and goal measurement system which moves the emphasis from an estimated diversion measurement number to using an actual disposal measurement number as a per capita disposal rate factor. As such, the new disposal-based indicator (pounds per person per year) uses only two factors: a jurisdiction's population (or in some cases employment) and its disposal as reported by disposal facilities. Unincorporated Kern County's disposal rate goal is 7.6 pounds per person per year. In 2009, unincorporated Kern County's disposal rate was 5.6 pounds per person per year.

*California Public Utilities Commission*

The California Public Utilities Commission (CPUC) regulates privately owned telecommunication, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. It is the responsibility of the CPUC to (1) assure California utility customers' safe, reliable utility service at reasonable rates; (2) protect utility customers from fraud; and (3) promote a healthy California economy. The Public Utilities Code, adopted by the legislature, defines the jurisdiction of the CPUC.

**3.11.1.2 Local**

*Kern County General Plan*

The Kern County General Plan establishes the following applicable goals and policies related to public services that are relevant to the project:

Chapter 1. Land Use, Open Space, and Conservation Element

1.4 Public Facilities and Services (page 21 and 22))

Policy 1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development;

Policy 6. The County will ensure adequate fire protection to all Kern County residents; and

Policy 7. The County will ensure adequate police protection to all Kern County residents.

1.10 General Provisions (pages 61 through 64)

Goal 1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving viable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.11 Public Services**

---

Policy 9. New development should pay its pro rata share of the local cost of expansions in services, facilities, and infrastructure that it generates and upon which it is dependent;

Policy 15. Prior to approval of any discretionary permit, the County shall make the finding, based on information provided by the California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development; and

Policy 16. The developer shall assume full responsibility for costs incurred in service extension or improvements that are required to ensure the project. Cost sharing or other forms of recovery shall be available when the service extensions or improvements have a specific quantifiable regional significance.

#### Chapter 4. Safety Element

##### 4.6 Wildland and Urban Fire (pages 172 through 173)

Policy 1. Require discretionary projects to assess impacts on emergency services and facilities.

Policy 3. The County will encourage the promotion of fire prevention methods to reduce service protection costs and costs to taxpayers.

Policy 4. Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

Policy 6. All discretionary projects shall comply with the adopted Fire Code and the requirements of the Fire Department.

#### Capital Improvement Plan

A proposed Countywide Capital Improvement Plan (CIP), was presented to the Board of Supervisors on October 9, 2007 and adopted in 2008. This report represents the best current understanding of the new public facilities that will be needed to serve the County's projected development through 2030. The scope of services includes: parks, libraries, sheriff (public protection and investigation), fire, animal control, public health, landfill/transfer stations, and general government. Roads and sewer costs and impacts are not part of this program. The program, authorized by the Board in 2005, includes three phased components:

- Phase One: Develop a conceptual CIP for the included facility categories, assessing what additional capacity and conceptual projects are required to provide needed infrastructure for new development through 2030;

- Phase Two: Evaluate existing and potential funding sources, and outline options available as financing mechanisms, including a development fee proposal; and,
- Phase Three: Perform a fiscal (operational) analysis for use in evaluating the ongoing operating and maintenance impact of a new development on the County’s general fund.

The adopted CIP includes a summary of proposed service levels for the included facilities and a conceptual list of planned projects, upon which the CIP was based.

#### Public Facilities Mitigation Program

The changing fiscal landscape in California during the past 30 years has steadily undercut the financial capacity of local governments to fund infrastructure. Three dominant trends stand out:

- The passage of a string of tax limitation measures, starting with Proposition 13 in 1978 and continuing through the passage of Proposition 218 in 1996;
- Declining popular support for bond measures to finance infrastructure for the next generation of residents and businesses; and,
- Steep reductions in Federal and State assistance.

Faced with these trends, the County has adopted a policy of “growth pays its own way” through use of a public facilities mitigation program. The primary policy objective of this program is to ensure that new development pays the capital costs associated with growth. In 2008, the County adopted a CIP that identifies the best current understanding of the public facilities that would be needed to accommodate new development anticipated through 2030. The CIP further identified appropriate existing facility demand standards to be used as a basis for estimating future facility needs and levels of service. The basic purpose of the CIP is to identify the facilities and infrastructure needed to serve the population in 2030.

Continued growth within the County and the associated impacts resulting from that growth have increased the demands on Countywide public services and have made it difficult to implement and fund many of the facilities identified in the CIP, and also to maintain existing public service demand standards.

The purpose of the Public Facilities Mitigation Program is to identify impacts on public services and the CEQA–required mitigation (in dollars) that would be needed to adequately address the growth impacts. The following categories would help determine the specific public needs that would be impacted by the Proposed Action:

- Sheriff patrol and investigation facilities; and,
- Fire facilities.

### **3.11.2 Environmental Setting**

#### **3.11.2.1 Fire Protection**

The Kern County Fire Department (KCFD) provides primary fire protection to unincorporated areas of the County and on regional transportation corridors, such as Interstate 5. The KCFD protects an area that covers over 8,000 square miles and provides fire protection services for over 500,000 citizens living in the unincorporated areas of Kern County and the cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco.

The KCFD has 46 fire stations throughout Kern County and is divided into seven battalions for operational management. Each battalion covers a large geographical area and includes between seven and nine fire stations.

Battalion 2 of the Kern County Fire Department (KCFD) provides fire suppression and emergency medical services to the program and project parcels, with Kern County Fire Station 21, located at 303 North 10th Street in the City of Taft, providing primary service. The majority of responses in the area are for medical aid, including accidents on Interstate 5.

#### **3.11.2.2 Public Protection and Law Enforcement Services**

##### *Kern County Sheriff's Department*

The Kern County Sheriff's Department provides primary police protection for the Covered Lands and surrounding areas within unincorporated Kern County.

The Sheriff's Department provides law enforcement services through the enforcement of local, State, and Federal laws. The sheriff's office is responsible for crime prevention, field patrol (ground and air), crime investigation, apprehension of offenders, regulation of noncriminal activity, and a number of related and support services. Traffic and parking control functions are also provided, with some investigation of property damage, traffic accidents, and complete investigations of all injury, fatal, intoxication, and hit-and-run accidents.

The Kern County Sheriff's Office administers police services throughout the County, including jail system management, bailiff and prisoner transportation services to the courts, search and rescue operations, coroner services, and civil processing (serving lawsuit papers). The Kern County Sheriff's Department has 1,239 sworn and civilian employees. There are 572 authorized deputy sheriff positions deployed in patrol, substations, detectives, courts services, and special investigations units. There are 336 detention deputy positions deployed in the detention facilities and 331 Sheriff's professional support staff assigned throughout the County.

The Kern County Sheriff's Office also operates the Inmate Reception Center, the Lerdo Maximum Security Facility, Lerdo Minimum/Medium Security Facility, and the Lerdo Pre-Trial Facility.

The main headquarters facility is located on 1350 Norris Road in the city of Bakersfield; 17 substations have access to all department support services. The substation closest to the Covered Lands is the Taft Substation.

### *California Highway Patrol*

As a major Statewide law enforcement agency, the California Highway Patrol (CHP) is responsible for the management and regulation of traffic to achieve safe, lawful and efficient use of the California highways as well as provide disaster and lifesaving assistance.

The purpose of the CHP is to ensure safety and provide service to the public on the highway transportation system and to assist local government during emergencies when requested. The primary responsibility of the CHP is to patrol State highways and all County roadways, enforce traffic regulations, respond to traffic accidents, and provide service and assistance to disabled vehicles. The CHP maintains a mutual aid agreement with the Kern County Sheriff's Department.

The CHP is divided into eight different divisions. The Covered Lands are located in the CHP Central Division, which includes 15 area offices, six resident posts, and 667 uniformed officers.

The closest CHP facility is located in the Buttonwillow area at 29449 Stockdale Highway near Interstate 5.

#### **3.11.2.3 Other Public Facilities**

Public protection facilities in the County include criminal detention facilities, courthouse, coroner, 911 communications, and Kern County Sheriff's Office administrative buildings and equipment. In contrast with sheriff patrol and investigation facilities, which are used primarily to provide services in unincorporated areas of the County, public protection facilities serve residential and nonresidential development Countywide.

Emergency medical services are managed and coordinated by the Kern County Emergency Medical Services Department and include a system of services organized to provide rapid response to serious medical emergencies, including immediate medical care and patient transport to definitive care in an appropriate hospital setting. San Joaquin Hospital and Bakersfield Memorial Hospital are the two major hospitals nearest the Covered Lands and are located in the city of Bakersfield.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.11 Public Services**

---

The nearest library is the Kern County Library Taft Branch in the city of Taft. The city of Taft and community of Maricopa each have federal post offices as well.

## **3.12 TRAFFIC AND TRANSPORTATION**

This section describes the affected environment and regulatory setting for transportation and traffic of the Covered Lands.

### **3.12.1 Regulatory Setting**

#### **3.12.1.1 State**

##### *California Department of Transportation*

Caltrans has jurisdiction over State highways and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. The following Caltrans regulations apply to potential transportation and traffic impacts of the project:

California Vehicle Code (CVC), division 15, chapters 1 through 5 (Size, Weight, and Load): Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways.

California Street and Highway Code §§660–711, 670–695: Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery, includes regulations for the care and protection of State and County highways and provisions for the issuance of written permits, and requires permits for any load that exceeds Caltrans' weight, length, or width standards for public roadways.

#### **3.12.1.2 Regional**

##### *Kern Council of Governments Congestion Management Plan*

All urbanized areas with populations of more than 200,000 are required to have a congestion management system, program, or process. The Kern Council of Governments (Kern COG) refers to its congestion management activities as the Congestion Management Program (CMP). Kern COG has been designated as a congestion management agency.

The CMP provides a systematic process for managing congestion and information regarding (1) transportation system performance and (2) alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs. The purpose of the CMP is to ensure that a balanced transportation system is developed that relates population growth, traffic growth, and land use decisions to transportation system LOS performance standards and air quality improvement. The program attempts to link land use, air quality, transportation, and advanced transportation technologies as integral and complementary parts of the region's plans and programs.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.12 Traffic and Transportation**

---

The purpose of defining the CMP network is to establish a system of roadways that will be monitored in relation to established level of service (LOS) standards. At a minimum, all State highways and principal arterials must be designated as part of the Congestion Management System of Highways and Roadways. Kern County has 18 designated State highways.

*Kern County Regional Transportation Plan*

The Regional Transportation Plan (RTP) establishes regional transportation policy for the Kern County region. The RTP focuses on achieving a coordinated and balanced multimodal transportation system, while maintaining the integrity of the existing system. The RTP includes projects located throughout the Kern County region for all forms or modes of transportation, including automobiles, transit, nonmotorized (including bicycle), passenger rail, freight and aviation facilities.

**3.12.1.3 Local**

*Kern County General Plan*

The policies, goals, and implementation measures in the Kern County General Plan for transportation applicable to the project are provided below:

Chapter 2 Circulation Element:

2.1 Introduction (page 80)

Goal 4: Kern County will plan for a reduction of environmental effects without accepting a lower quality of life in the process.

Goal 5: Maintain a minimum Level of Service (LOS) D for all roads throughout the County.

2.3.3 Highway Plan (pages 91 through 92)

Goal 1: To carry out this plan in a manner consistent with needs and standards of the County.

Goal 2: This plan proposes to improve access to Kern County using all available methods of transportation.

Goal 3: This plan sets up a simple way for protecting road right-of-way. Protecting corridors for future transportation facilities is the most important transportation planning activity in any high growth area.

Goal 4: To reserve right-of-way to meet future road needs that result from development allowed by land use plans.

Goal 5: Maintain a minimum Level of Service (LOS) D.

Policy 1: Development of roads within the County shall be in accordance with the Circulation Diagram Map. The charted roads are usually on section and midsection lines. This is because the road centerline can be determined by an existing survey.

Policy 2: This plan requires, as a minimum, construction of local road widths in areas where the traffic model estimates little growth through and beyond year 2010. Where Planning Department's growth estimates indicate more than a local road is required, expanded facilities shall be provided. The timing and scope of required facilities should be set up and implemented through the Kern County Land Division Ordinance. However, the County shall routinely protect all surveyed section lines in the Valley and Desert Regions for arterial right-of-way. The County shall routinely protect all mid-section lines for collector highways in the same regions. The only possible exceptions shall be where the County adopts special studies and where Map Code 4.1 (Accepted County Plan) areas occur. In the Mountain Region where terrain does not allow construction on surveyed section and mid-section lines, right-of-way width shall be the size shown on the diagram map. No surveyed section and mid-section "grid" will comprehensively apply to the Mountain Region.

Policy 3: This plan's road width standards are listed below. These standards do not include State highway widths that would require additional right-of-way for rail transit, bike lanes and other modes of transportation. Kern County shall consider these modifications on a case-by-case basis:

- Expressway [Four Travel Lanes] Minimum 110 foot right-of-way;
- Arterial [Major Highway] Minimum 110-foot right-of-way (County Standard 110-feet);
- Collector [Secondary Highway] Minimum 90-foot right-of-way (County Standard 90-feet);
- Commercial-Industrial Street Minimum 60-foot right-of-way (County Standard 60-feet); and,
- Local Street [Select Local Road] Minimum 60-foot right-of-way; and County Standard 60-feet.

#### 2.3.4 Future Growth (pages 94 through 95)

Goal 1: To provide ample flexibility in this plan to allow for growth beyond the 20 year planning horizon.

Policy 2: The County should monitor development applications as they relate to traffic estimates developed for this plan. Mitigation is required if development causes affected roadways to fall below Level-of-Service (LOS) D. Utilization of the California Environmental Quality Act

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.12 Traffic and Transportation**

---

(CEQA) process would help identify alternatives to or mitigation for such developments. Mitigation could involve amending the Land Use, Open Space, and Conservation Element to establish jobs/housing balance if projected trips in any traffic zone exceed trips identified for this Circulation Element. Mitigation could involve exactions to build off-site transportation facilities. These enhancements would reduce traffic congestion to an acceptable level.

Policy 4: As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads to County standards unless improvements along State routes are necessary then roads shall be built to California Department of Transportation (Caltrans) standards. Developers shall locate these roads (width to be determined by the Circulation Plan) along centerlines shown on the circulation diagram map unless otherwise authorized by an approved Specific Plan Line. Developers may build local roads along lines other than those on the circulation diagram map. Developers would negotiate necessary easements to allow this.

Policy 5: When there is a legal lot of record, improvement of access to County, city or State roads will require funding by sources other than the County. Funding could be by starting a local benefit assessment district or, depending on the size of a project, direct development impact fees.

Policy 6: The County may accept a developer's road into the county's maintained road system. This is at Kern County's discretion. Acceptance would occur after the developer follows the above requirements. Roads are accepted into the County road system.

Chapter 4: Safety Element (page 173)

#### 4.6 Wildland and Urban Fire

Policy 4: Ensure that new development of properties have sufficient access for emergency vehicles and for the evacuation of residents.

#### *Kern County Airport Land Use Compatibility Plan*

The Kern County Airport Land Use Compatibility Plan (ALUCP) establishes procedures and criteria to assist the County of Kern and affected incorporated cities in addressing compatibility issues for the Covered Lands regarding airports and the land uses around them.

### **3.12.2 Environmental Setting**

The Covered Lands are located in an unincorporated, southwestern portion of Kern County, in an east-west alignment approximately 1.5 miles west of Interstate 5 (I-5) and 5 miles east of the city of Taft.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.12 Traffic and Transportation**

---

Transportation in the surrounding area is dominated by automobile traffic and conditions are characterized by a sparse roadway system stemming from SR-166 and I-5. This section discusses the existing conditions related to transportation and traffic in the area, including a general explanation of the roadways that traverse the site and the surrounding area, and a description of the existing site access.

The circulation system in the vicinity of the project is made up of a combination of State and County jurisdiction facilities. Major components of the system are discussed below in the next section.

**3.12.2.1 Regional**

*Highways and Roadways*

The Covered Lands and its vicinity are served primarily by I-5, which is a 4-lane north–south highway designated as an arterial/major highway by the Kern County General Plan Circulation Element, with an operating speed limit of 65 miles per hour (mph). I-5 is a major, multi-lane freeway that provides access for goods movement, shipping, and travel. Within the regional area, I-5 is a four-lane facility, with two lanes in each direction. This highway is under the jurisdiction of the California Department of Transportation (Caltrans) and crosses the western portion of the County, just east of the Covered Lands.

The latest 2010 traffic volume counts from the Caltrans Traffic Count Database for I-5, SR-166, SR- 119, and SR-33 are shown below in Table 3.12-1.

**Table 3.12-1**  
**Peak Hour Trips for Nearby Highways**

<b>Roadway</b>	<b>Peak Hour Trips</b>
I-5	4,750
SR-119	410
SR-166	322
SR-33	630

Source: California Department of Transportation, 2010.

SR-166, also known as Maricopa Highway, provides east–west service between I-5 and the Pacific coast. The Covered Lands are located north of SR-166. SR-166 is the main transportation connection to Kern County for the cities of Maricopa and Taft. The highway is a two-lane facility, with one lane in each direction. The primary industry in the Taft/Maricopa area is petroleum exploration and production as well as agricultural production; as a result there are increased levels of truck traffic to and from the area to serve the oil fields and neighboring farms.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.12 Traffic and Transportation**

---

*Non-Motorized Transportation*

There are no dedicated pedestrian or bicycle facilities in the immediate project vicinity or along the surrounding roadways.

*Public Transit*

Public transportation in the area is provided by Taft Area Transit, which provides service between the cities of Taft and Maricopa; however, direct service to the Covered Lands is not available. Taft Area Transit provides a total of three daily trips Monday through Friday and is closed on weekends. In addition, Kern Regional Transit provides a non-emergency medical dial-a-ride service for passengers traveling to or from metropolitan Bakersfield for medical appointments. Amtrak provides rail service to and from Bakersfield. The Amtrak station is located in Bakersfield.

*Airport Facilities*

The nearest public airport to the Covered Lands is the Taft-Kern Airport, which is one of the six County owned airports. The Taft-Kern Airport is located northwest of the program sites and covers approximately 71 acres. The airport is surrounded by single-family residential homes to the north and west, undeveloped and industrial uses to the south, and undeveloped and agricultural land to the east. No commercial airline services are available, but the facility is open to the public; there are tie-downs and hangars available for airplane parking. The airport's 3,550-foot runway serves agricultural, business, and personal aviation needs, including skydiving activities.

A privately owned airstrip is located adjacent to one parcel along Copus Road (APN 295-130-25). The airstrip is not available for public use or public access. It consists of a single 3,000-foot paved runway, hangar and accessory building. The airstrip is used by the property owner for personal use, as well as by the Skydive San Joaquin Valley Skydiving School. Because of its small size and as a result of access restrictions, the facility sees relatively few flights.

**3.12.2.2 Local**

Within the vicinity of the Covered Lands there are a number of local roadways that provide access to the area, including:

- Copus Road
- South Lake Road
- Gardner Field Road

- Cadet Road
- Basic School Road
- Old River Road

Copus Road is a paved County facility running east to west, and provides local access to parcels in the southern portion of the area. It originates from SR-99 in the east, crosses I-5, and terminates at the intersection of Basic School Road approximately 15.5 miles west of the I-5. Copus Road runs parallel to and north of SR-166. The I-5/Copus Road intersection is located approximately 2 miles east of the nearest site within the Covered Lands, and the Covered Lands are located to the north of Copus Road. The remaining Covered Lands parcels are located north, north-west of where Copus Road ends at Basic School Road.

South Lake Road, located parallel to and north of Copus Road, provides access to parcels located in the northern portion of the Covered Lands, and also crosses diagonally through one of the parcels (APN 220-110-08).

Gardner Field Road and Cadet Road begin in the western portion of the Covered Lands area. Gardner Field Road originates at Basic School Road and heads west, where it forks at its intersection with Cadet Road and trends in a northerly direction; it continues in a westerly direction until it reaches and terminates at the City of Taft.

Cadet Road also heads in a westerly direction from its origin at Gardner Field Road, running for approximately 4 miles before terminating at SR-33 (West Side Highway), which provides access to both the cities of Taft and Maricopa.

Basic School Road is a paved road, with one-lane in each direction, and provides access to four of the southern parcels located along the California Aqueduct. Basic School Road originates at SR-166, heading in a northerly direction, crossing the California Aqueduct, and terminating at Gardner Field Road.

Old River Road is located in the eastern portion of the project and provides access to parcel number 295-130-25. Old River Road is a paved, single-lane road running north to south. It is one of the longest local roads in the project area, approximately 18 miles in length, and provides local access between the project area and the City of Bakersfield. It originates at SR-166 and heads diagonally north until it intersects with Copus Road approximately 1 mile west of the nearest parcel. It then continues northward through the project area toward the I-5 and the City of Bakersfield.

The Covered Lands are located in an area dominated by agricultural use and are at least 3 miles from any population area. Due to the general vacancy of most of these agricultural parcels, there

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.12 Traffic and Transportation**

---

is very little existing traffic within the area. Most of the parcels are accessible through unnamed dirt roads and paths.

The Kern County Roads Department provided 2007 Average Daily Traffic (ADT) for these roads:

- Copus Road
  - East of Basic School Road: 940
  - West of Old River Road: 1240
  - East of Old River Road: 2600
- South Lake Road
  - East of Gardner Field Road: 450
- Gardner Field Road
  - East of Cadet Road: 730
- Cadet Road (no data available)
- Basic School Road
  - North of SR-166 (Maricopa Hwy): 520
- Old River Road
  - North of Copus Road: 3200
  - South of SR-119(Taft Highway): 3050
  - South of SR-223 (Bear Mountain Boulevard) 5000

Although there is no level of service determined for these roads, most are not heavily travelled. Based on the average daily traffic counts, the potentially affected roads are currently at LOS C or better.

### **3.13 ENVIRONMENTAL JUSTICE**

This section describes community resources in the Covered Lands study area. For this section, the study area is considered concurrent as the Covered Lands, with the exception of demographic data pertaining to socioeconomics and environmental justice, which is also presented in the context of Kern County. Topics include current land uses and land designations of the project area; socioeconomic conditions, including overall demographics and population growth, race and ethnicity, educational attainment, income and poverty levels; as well as labor and unemployment rates. There are four communities in the vicinity of the Covered Area, including unincorporated Maricopa, Taft Heights CDP, South Taft CPD, and the incorporated city of Taft.

#### **3.13.1 Regulatory Setting**

##### **3.13.1.1 Federal**

###### *Executive Order 12898*

Title VI of the Civil Rights Act of 1964 (Public Law 88-352, 78 Stat.241) prohibits discrimination on the basis of race, color, or national origin in all programs or activities receiving federal financial assistance. Executive Order 12898, “Federal Actions to address environmental justice in Minority Populations and Low-Income Populations,” focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission (59 Fed. Reg. 7629 (Feb. 16, 1994)). The order requires the U.S. Environmental Protection Agency (USEPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

###### Council on Environmental Quality

The U.S. Council on Environmental Quality’s *Environmental Justice Guidance Under the National Environmental Policy Act* (CEQ 1997) provides an overview of Executive Order 12898; summarizes its relationship to NEPA; recommends methods for the integration of environmental justice into NEPA compliance; and incorporates definitions, established by the Interagency Federal Working Group on Environmental Justice, of key terms and concepts containing in Executive Order 12898.

The fundamental question to be addressed in a NEPA document is:

Would the proposed federal action result in human health or environmental impacts to minority or low-income populations that are disproportionately high and adverse when compared to the impacts on the general population?

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.13 Environmental Justice**

---

CEQ guidance identifies minority populations where the percent minority is greater than 50 percent, or “meaningfully greater” than that of the general population (usually the next larger geographic unit relevant for a specific impact with a specific geographic scope; for this analysis, the general population is Kern County). “Meaningfully greater” is not defined in CEQ (1997) guidance; for this analysis, “meaningfully greater” is interpreted to mean simply “greater,” which provides for a conservative analysis. CEQ guidance identifies low-income populations where the percent low-income is meaningfully greater than the general population.

According to environmental justice guidance, “low income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census’ Current Population Reports, Series P-60 on Income and Poverty. The Census Bureau’s 2011 poverty thresholds set the poverty level for an individual at \$11,484 and for a family of four at \$23,021 (University of Wisconsin, Institute for Research on Poverty, 2012).

As noted in the demographic data presented in Section 3.13.3.2, Table 3.13-4, Kern County as a whole has 21.4% of individuals and 17.6% of families living below the poverty line. The only community within the vicinity of the Covered Area to exceed County levels is Maricopa, where 34.1% of individuals and 25.3% of families are below federal poverty levels. However, the population in Census Designated Places (Taft Heights and South Taft) as well as Taft city, and within Kern County as a whole, does not meet the environmental justice criteria for identifying a low-income population that may be affected by the proposed action.

According to a breakdown of self-identified race and ethnicity for Kern County as a whole, and for the cities, and Census Designated Places that are in the vicinity of the Covered Area as illustrated in Table 3.13.-2 in Section 3.13.3.2, none of the communities meet the criteria as having minority greater than 50 percent or significantly greater than the overall population of the County.

**3.13.1.2 State**

*California Government Code Section 65040.12*

For the purposes of GC §65040.12, environmental justice is defined as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies.”

**3.13.1.3 Local**

*Kern County General Plan*

The Covered Lands are located solely within Kern County and contain no incorporated cities. As a result, the County of Kern exercises the primary land use regulatory authority over the area. The County adopted its General Plan in 2004, with the most recent amendment adopted by the

Board of Supervisors in 2009. The General Plan land use element identifies certain classes of land that are consistent with Kern County's planning goals and objectives throughout the area of its jurisdiction. Applicable policies are listed below.

The policies, goals, and implementation measures in the General Plan for population and housing applicable to the Covered Lands are provided below. The General Plan contains additional policies, goals, and implementation measures that are more general in nature and not specific to development such as the Covered Lands. Therefore, they are not listed below.

#### Chapter 1. Land Use, Open Space, and Conservation Element

##### 1.0 General Provisions (page 62)

Policy 6. The County shall ensure the fair treatment of people of all races, cultures, incomes and age groups with respect to the development, adoption, implementation and enforcement of land use and environmental programs.

Policy 7. In administering land use and environmental programs, the County shall not deny any individual or group the enjoyment of the use of land due to race, sex, color, religion, ethnicity, national origin, ancestry, lawful occupation or age.

Under the General Plan, the Covered Lands have the following land use designations: 8.1 (Intensive Agriculture (20 ac min)), 8.1/2.3 (Intensive Agriculture (20 ac min)/Shallow Groundwater) and 8.1/2.5 (Intensive Agriculture (20 ac min)/Flood Hazard), 8.3/2.5 (Extensive Agriculture (20 ac min)/Flood Hazard), 8.5/2.5 (Resource Management (20 ac min)/Flood Hazard). A brief description of applicable land use designations follows.

- Intensive Agriculture (Map Code 8.1). Areas devoted to the production of irrigated crops or having a potential for such use. Other agricultural uses, while not directly dependent on irrigation for production, may also be consistent with the intensive agriculture designation. Minimum parcel size is 20 acres gross.
- Extensive Agriculture (Map Code 8.3). Agricultural uses involving large amounts of land with relatively low value-per-acre yields, such as livestock grazing, dry land farming, and woodlands. Minimum parcel size is 20 acres gross, except lands subject to a Williamson Act Contract/Farmland Security Zone Contract, in which case the minimum parcel size shall be 80 acres gross.
- Mineral and Petroleum (Map Code 8.4). Areas which contain producing or potentially productive petroleum fields, natural gas, and geothermal resources, and mineral deposits of regional and statewide significance. Uses are limited to activities directly associated with the resource extraction. Minimum parcel size is five acres gross.

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.13 Environmental Justice**

---

- Resource Management (Map Code 8.5). Primarily open space lands containing important resource values, such as wildlife habitat, scenic values, or watershed recharge areas. These areas may be characterized by physical constraints, or may constitute an important watershed recharge area or wildlife habitat or may have value as a buffer between resource areas and urban areas. Other lands with this resource attribute are undeveloped, non-urban areas that do not warrant additional planning within the foreseeable future because of current population (or anticipated increase), marginal physical development, or no subdivision activity.
- Shallow Groundwater (Map Code 2.3). Groundwater within 15 feet of the land surface is delineated on the Kern County Seismic Hazard Atlas.
- Flood Hazard (Map Code 2.5). Special Flood Hazard Areas (Zone A), as identified on the Flood Insurance Rate Maps (FIRM) of the Federal Emergency Management Agency (FEMA) and supplemented by floodplain delineating maps that have been approved by the Kern County Engineering and Survey Services Department.

*Kern County Zoning Ordinance*

The Covered Lands are within the A (Exclusive Agriculture) zone district described in the Kern County Zoning Ordinance, and have historically been used for agricultural production. However agricultural productivity of the land has been severely limited due to the lack of suitable, reliable water. The purpose of the Exclusive Agriculture (A) District is to designate areas suitable for agricultural uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to nonagricultural uses. Permitted land uses in this district include agriculture, commercial uses, utility lines and substations, resource extraction, energy development, and miscellaneous accessory structures related to permitted uses. Pursuant to Section 19.12.030 of the Kern County Zoning Ordinance, solar facilities are permitted with the approval of a Conditional Use Permit.

Lands that are not actively farmed have been left fallow due to a lack of available water. The land in the immediate vicinity of the Covered Lands consists of cultivated and uncultivated farmland, industrial, residential, and a vacant mineral resource area. The Covered Lands are not within the administrative boundaries of an oil field; however there are three plugged oil wells within the Covered Lands.

The Covered Lands are designated under the Department of Conservation Farmland Mapping and Monitoring Program (FMMP) as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Grazing Land, and a small amount of Vacant or Disturbed Land and Nonagricultural and Natural Vegetation. The Covered Lands are within Agricultural Preserve 12.

**3.13.2 Socioeconomic Conditions**

This section describes the current population, demographics, economic conditions and environmental justice conditions in the Covered Area. Information in this section is based on the 2010 U.S. Census data, as well as Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2012, 2012 Population Estimates, the 2007-2011 American Community Survey 5-Year Estimates and Labor Force and Unemployment Rate for Cities and Census Designated Places.

**3.13.2.1 Population**

The Permit Area of this HCP encompasses a total of 5,784.3 acres, located in the southwestern portion of unincorporated Kern County (see Figure 2-1). The surrounding area is predominantly rural, with few scattered residences and some heavy industrial uses. The nearest unincorporated community is Maricopa, 3 miles to the west; Taft is the closest incorporated city, located about 5 miles to the west. Taft Heights is about 1 mile southwest and South Taft 0.5 miles south, of the city of Taft. Both are designated as Census Designated Places (CDP), and are also included in this analysis. A Census Designated Place (CDP) is an unincorporated area designated by the U.S. Census Bureau for the decennial census.

Kern County encompasses 8,202 square miles and is the third largest County in California, located at the southern end of the Central San Joaquin Valley. As shown in Table 3.13-1, from 2000 to 2010, the population of Kern County grew by 26.9% to 839,631. In that decade, Taft increased population from 6,400 to 9,327, a 45% increase; Taft Heights grew by 4.5% to 1,949; South Taft increased by 14.2% and Maricopa grew by 3.8% to 1,154 (U.S. Census Bureau 2012).

However, between 2010 and 2012, Kern County grew only 1.9%. In the same period, the communities near the study area, Maricopa had a growth rate of 0.78 %, while the Taft population decreased by -3.8% from 9,312 to 8,954. According to the California Department of Finance projections the County’s population is anticipated to grow to 1.0 million people by 2020 and 1.3 million people by 2030 (CA Department of Finance 2011).

**Table 3.13-1**  
**2000-2012 U.S. Census Population Estimates**

	Census 2000	Population Estimates 2012**				
		Census 2010	Estimates Base	2010	2011	2012
Kern County	661,645	839,631	839,631	839,631	849,457	856,158
Maricopa	1111	1,154	1,154	1,154	1,156	1,163
Taft city	6400	9,327	9,327	9,327	9,310	8,954
Taft Heights CDP	1865	1949	*	*	*	*
South Taft CDP	1989	2169	*	*	*	*

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.13 Environmental Justice**

	Census 2000	Population Estimates 2012**				
		Census 2010	Estimates Base	2010	2011	2012

\* Data not available \*\* Estimates as of July 1, 2012

Source: [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP\\_2012\\_PEPANNRES](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2012_PEPANNRES)

**3.13.2.2 Demographics**

*Race and Ethnicity*

Table 3.13-2 lists the self-identified race and ethnicity for Kern County as a whole, and for the cities, and Census Designated Places that are in the vicinity of the Covered Area (US Census Bureau, 2012).

**Table 3.13-2**  
**Race and Ethnicity (2010 Census)**

Geography	Total Population	White	Hispanic or Latino (of any race)	Black or African American	American Indian and Alaska Native	Total Asian	Other Race	One Race	Two + Races Total Population Two+ Races
Kern County	839,631	499,766	413,033	48,921	12,676	34,846	239,160	801,775	37,856
Maricopa	1,154	958	232	1	27	16	114	1,116	38
Taft city	9,327	7,388	3,353	396	118	93	1,088	9,083	244
Taft Hgts CDP	1,949	1,602	441	15	35	11	220	1,883	66
South Taft CDP	2,169	1,404	931	21	55	5	601	2,092	77

Source: CA Department of Finance, 2011

The racial makeup of Kern County was 61.6% White, 6.0% African American, 3.4% Asian, 1.5% Native American/Alaskan, 23.2% from other races, and 4.1% from two or more races. 38.4% of the population were Hispanic or Latino of any race. The racial makeup of Maricopa was 958 (83.0%) White, 1 (0.1%) African American, 27 (2.3%) Native American/Alaskan, 27 (2.3%) Asian, 2 (0.2%) Some Other Race, 114 (9.8%), and 38 (3.3%) from two or more races. Hispanic or Latino of any race were 232 persons (20.1%). The racial makeup of Taft was 7,388 (79.2%) White, 396 (4.2%) African American, 118 (1.3%) Native American/Alaskan, 93 (1.0%) Asian, 1,088 (11.6%) from other races, and 244 (2.6%) from two or more races. Hispanic or Latino of any race were 3,353 persons (35.9%). The racial makeup of South Taft was 1,404 (64.7%) White, 21 (1.0%) African American, 55 (2.5%) Native American/Alaskan, 5 (0.2%) Asian, 11 (0.5%) 601 (27.7%) from other races, and 77 (3.6%) from two or more races. Hispanic or Latino of any race were 931 persons (42.9%). The racial makeup of Taft Heights was 1,602 (82.2%) White, 15 (0.8%) African American, 35 (1.8%) Native American/Alaskan, 11 (0.6%) Asian, 220 (11.3%) from other races, and 66 (3.4%) from two or more races. Hispanic or Latino of any race were 441 persons (22.6%).

*Educational Attainment*

Table 3.13-3 lists the graduation success rate for County residents, as well as for the cities, and Census Designated Places that are in the vicinity of the Covered Area (CA Department of Finance, 2011).

**Table 3.13-3**  
**Educational Achievement**

	<b>Percentage (%) of High School Graduate or Higher</b>
Kern County	71.2%
Maricopa	70.1%
Taft city	67.9%
Taft Heights CDP	86.6%
South Taft CDP	57.0%

Source: CA Department of Finance, 2011

*Income and Poverty Levels*

Income levels for individuals and families in 2010 are illustrated in Table 3.13-4 (2007-2011 American Community Survey). The city of Taft had the highest household median income (\$46,136), while Maricopa experienced the lowest median household (\$34,167) and per capita income (\$15,062) levels in the vicinity of the Covered Area.

**Table 3.13-4**  
**Income (In 2011 Inflation-adjusted dollars)**

	<b>Median Household Income</b>	<b>Per Capita Income</b>	<b>Individuals Below Poverty Level</b>	<b>Families Below Poverty Line</b>
<b>Kern County</b>	<b>\$48,021</b>	<b>\$20,167</b>	<b>21.40%</b>	<b>17.6%</b>
<b>Maricopa</b>	<b>\$34,167</b>	<b>\$15,062</b>	<b>34.1%</b>	<b>25.3%</b>
<b>Taft city</b>	<b>\$46,136</b>	<b>\$16,198</b>	<b>14.1%</b>	<b>12.8%</b>
<b>Taft Heights CDP</b>	<b>\$37,465</b>	<b>\$16,440</b>	<b>19.8%</b>	<b>15.9%</b>
<b>South Taft CDP</b>	<b>\$39,375</b>	<b>\$11,524</b>	<b>15.4%</b>	<b>19.5%</b>

Source: CA Department of Finance, 2011

The US Census Bureau has identified income thresholds that vary by family size and composition to define the applicable poverty level within a population (U.S. Census Bureau, 2010). Under these thresholds, in 2010, Maricopa had the highest percentage of individuals (34.1%) and families (25.3%) living below the poverty line. Taft had the lowest poverty rates (14.1% for individuals, 12.8% for families).

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.13 Environmental Justice**

*Labor Force and Unemployment Rates*

Table 3.13-5 shows the number of people considered to be in the labor force (i.e., actively working or seeking work), and the employment rate for Kern County and the city and unincorporated Census Designated Places near the Covered Area for the year 2008 to 2012. Only not seasonally-adjusted labor force (unemployment rates) data are developed for cities and CDPs.

Monthly sub-county data are derived by multiplying current estimates of county-wide employment and unemployment by the respective employment and unemployment shares (percentages) in each sub-county area at the time of the 2000 Census. Sub-county labor force is then obtained by totaling employment and unemployment, and the result is divided into unemployment to calculate the unemployment rate. Based on Each Area's 2000 Census Share of County Employment and Unemployment\*

Maricopa consistently has the highest unemployment rate among the communities in the vicinity of the project, which ranges from 16.7% in 2010 to 10.3% in 2008. Taft Heights CDP shows the lowest rate of unemployment, ranging from 10.6% in 2010 to 6.3% in 2008.

**Table 3.13-5**  
**Annual average Unemployment (not seasonally adjusted)**

	<b>Kern County</b>	<b>Maricopa</b>	<b>South Taft CDP</b>	<b>Taft</b>	<b>Taft Heights CDP</b>
<b>2012</b>					
Labor Force	396,700	600	1,000	3,800	1,200
Employment	344,000	500	900	3,300	1,100
# Unemployed	52,700	100	100	500	100
% Unemployment	13.3%	14.10%	11.6%	13.0%	8.70%
<b>2011</b>					
Labor Force	384,900	600	1,000	3,700	1,100
Employment	327,600	500	900	3,100	1,000
# Unemployed	57,300	100	100	500	100
% Unemployment	14.9%	15.7%	13.0%	14.6%	9.8%
<b>2010</b>					
Labor Force	373,700	600	1,000	3,500	1,100
Employment	314,300	500	800	3,000	1,000
# Unemployed	59,400	100	100	600	100
% Unemployment	15.9%	16.7%	14.0%	15.6%	10.6%
<b>2009</b>					
Labor Force	363,200	600	900	3,400	1,100
Employment	311,100	500	800	3,000	1,000
# Unemployed	52,200	100	100	500	100
% Unemployment	14.4%	15.2%	12.5%	14.1%	9.5%

**MARICOPA SUN SOLAR COMPLEX HABITAT CONSERVATION PLAN**  
**Draft Environmental Impact Statement**  
**Section 3.13 Environmental Justice**

	<b>Kern County</b>	<b>Maricopa</b>	<b>South Taft CDP</b>	<b>Taft</b>	<b>Taft Heights CDP</b>
<b>2008</b>					
Labor Force	359,700	500	900	3,400	1,100
Employment	324,500	500	900	3,100	1,000
# Unemployed	35,100	100	100	300	100
% Unemployment	9.8%	10.3%	8.5%	9.6%	6.3%

Source: California Employment Development Department (2012)

*This page intentionally left blank.*