CHAPTER 3
Affected Environment

3.1 Introduction

The Applicant proposes to construct, operate, maintain, and decommission the MSEP, an up-to-750 MW solar PV energy generating facility and related infrastructure in unincorporated Riverside County, California.

If approved, the MSEP would be located primarily on public land managed by the BLM with a small portion located on non-federal lands under Riverside County's jurisdiction at a site approximately 6 miles north of the I-10 freeway, and 13 miles northwest of the City of Blythe, California. See Figure 1. The Proposed Action includes an approximately 13-mile-long (measured from the solar plant site boundary), double-circuit, overhead 230 kV gen-tie line that would interconnect at the CRS about 7 miles southwest of the solar plant site. The Applicant has applied for a ROW grant from BLM for approximately 7,700 acres. The Applicant also has applied for a CUP and PUP from the County for the portion of the MSEP site on 480 acres of non-federal lands. The CUP would be required to construct the gen-tie line poles on private land, which would exceed the allowable heights set forth in the zoning code (Article XV §15.2(a)), while a PUP would be required for public utility uses (the gen-tie line) on private and County-owned land (Article XVIII §18.29).[1] Construction and operation of the MSEP would disturb approximately 5,000 acres.

The Proposed Action would utilize solar PV technology to generate electricity. With this technology, arrays of solar PV modules (or panels) collect radiant energy from the sun and convert it directly into DC electrical energy. The arrays would be organized into 2 MW blocks consisting of up to 15 acres of panels and a PCS that would convert the DC electricity to AC electricity for transmission.

Chapter 3 describes the environmental components in the action area that could be affected by implementation of the Proposed Action. Chapter 3 describes resources, resource uses, special designations, and other important topics (including public health and safety, social and economic considerations, and environmental justice conditions) that may be impacted by the Proposed

[1] The County returned the application for the CUP in March 2012, which resulted in the bifurcation of the environmental review process under federal and state law. The County actively participated in the development of this PA/EIS toward complying with its obligations under CEQA and may rely on it in accordance with CEQA to document the analysis of potential environmental impacts that could result from the County's approval of permits for the Project.

Action. “Resources” include air, soil, water, vegetative communities, wildlife, wildland fire ecology and management, as well as cultural, paleontological, and visual resources. “Resource uses” include livestock grazing management, land use planning and realty, minerals, recreation management, public services, transportation and public access, and utilities and service systems. “Special designations” include areas of critical environmental concern (ACECs), wilderness areas, wilderness study areas, and lands with wilderness characteristics.

Information and data used to prepare this chapter were obtained from the CDCA Plan of 1980, as amended, various BLM planning and NEPA documents, and applicable regulations and plans. Information and data also were collected from many other related planning documents and research publications prepared by various federal, state, and local agencies as well as from private sources pertaining to key resource conditions and resource uses found within the Project area. The purpose of this chapter is to provide a description of affected resources and BLM program areas within the existing environment of the Project area, which will be used as a baseline to evaluate and assess the direct, indirect, and cumulative impacts of the Proposed Action and alternatives described in Chapter 2. Descriptions and analyses of the impacts themselves are presented in Chapter 4, *Environmental Consequences*.

3.2 Air Resources

This section describes the existing meteorological conditions, air quality, sensitive receptors, and overall baseline conditions associated with the Project area. Regulations, plans, and policies including federal, state, and local laws related to air quality that may be relevant to the Proposed Action also are discussed.

3.2.1 Environmental Setting

3.2.1.1 Meteorological Conditions

The Project site is within the Mojave Desert Air Basin (MDAB) at elevations that range between approximately 500 feet and 1,000 feet amsl. Relatively high daytime temperatures, large variations in relative humidity, large and rapid diurnal temperature changes, occasional high winds, and sand, dust, and thunderstorms characterize the climate. The aridity of the region is influenced by a sub-tropical high-pressure system typically off the coast of California and topographical barriers that effectively block the flow of moisture to the region. The Colorado Desert experiences two rainy seasons per year. The first occurs during the winter and the second is the summer monsoon.

The monthly average high temperature in Blythe is 108 degrees Fahrenheit (°F) in July and the lowest average monthly temperature is 37°F in January. Total rainfall in Blythe averages just less than 4 inches per year with about 50 percent of the total rainfall occurring from December through March, and about 25 percent occurring during the August/September summer monsoon season (Western Regional Climate Center [WRCC], 2011).

Prevailing winds in the MDAB are out of the west and southwest (MDAQMD, 2011a). This is due to the proximity of the MDAB to coastal and central regions of the state and the blocking nature of the Sierra Nevada Mountains to the north. The mountain passes are the main channels for the air masses (MDAQMD, 2011a). Mixing heights in the area, which represent the altitudes where different air masses mix together, are estimated to be on average 230 feet (70 meters) in the morning to as high as 5,250 feet (1,600 meters) above ground level in the afternoon.

3.2.1.2 Existing Air Quality

The Federal Clean Air Act and the California Clean Air Act both require the establishment of standards for ambient concentrations of air pollutants, called Ambient Air Quality Standards (AAQS). The federal AAQS, established by USEPA, are typically higher (less protective) than the state AAQS, which are established by the California ARB. The federal and state air quality standards are listed in Table 3.2-1. The times over which the various air quality standards are measured range from 1 hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 or $\mu g/m^3$, respectively).

TABLE 3.2-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm (147 µg/m^3)	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.030 ppm (57 µg/m^3)
	1 Hour	0.100 ppm[a] (188 µg/m^3)	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	Annual	—	—
	24 Hour	—	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1,300 µg/m^3)	—
	1 Hour	0.075 ppm[b] (196 µg/m^3)	0.25 ppm (655 µg/m^3)
Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	15.0 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
	Rolling 3-Month Average	0.15 µg/m^3 [c]	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

NOTES:

[a] The USEPA is in the process of implementing this new standard, which became effective April 12, 2010. This standard is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.

[b] On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The USEPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010.

[c] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

SOURCE: ARB, 2010.

Currently the ambient air quality within the MDAB is classified in the non-attainment category for state ozone and fugitive dust particulate matter (PM10) criteria, but classified in the attainment category for federal air quality. According to the NECO Plan, the ozone standard is exceeded due to long-distance transport of pollutants from the Los Angeles Basin, while the PM10 standard is due to natural sources found in a desert environment and various land uses. These uses include off-highway vehicle use, mining, and livestock grazing.

In general, an area is designated as attainment if the concentration of a particular air contaminant does not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that contaminant standard is violated. In circumstances where there is not enough ambient data available to support designation as either attainment or non-attainment, the area can be designated as unclassified. An unclassified area is normally treated by the USEPA the same as an attainment area for regulatory purposes. An area could be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same air contaminant.

The MDAB is under the jurisdiction of the MDAQMD. The Riverside County portion of the MDAB is designated as non-attainment for the state ozone and PM10 standards. This area is designated as attainment or unclassified for all federal criteria pollutant AAQS and the state carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and fine particulate matter (PM2.5) standards. Table 3.2-2 summarizes the site area's attainment status for various applicable state and federal standards.

TABLE 3.2-2
FEDERAL AND STATE ATTAINMENT STATUS
MDAB WITHIN RIVERSIDE COUNTY

Pollutant	Attainment Status[a]	
	Federal	State
Ozone	Attainment[b]	Moderate Non-attainment
CO	Attainment	Attainment
NO_2	Unclassified/Attainment[c]	Attainment
SO_2	Attainment	Attainment
PM10	Attainment[b]	Non-attainment
PM2.5	Attainment	Attainment

NOTES:
[a] Attainment = Attainment or Unclassified, where Unclassified is treated the same as Attainment for regulatory purposes.
[b] Attainment status for the MDAB within Riverside County only, not the entire MDAB.
[c] Nitrogen dioxide attainment status for the new federal 1-hour NO_2 standard was determined on January 20, 2012.

SOURCE: ARB, 2011a; MDAQMD, 2011a; and USEPA, 2012.

Ambient air quality monitoring data from the most representative MDAB monitoring stations for ozone, PM10, PM2.5, CO, NO_2, and SO_2, for the years 2005 through 2010, are shown in Table 3.2-3 and compared to most restrictive applicable standards. Ozone data are from the Blythe – 445 West Murphy Street monitoring station, PM10 data are from the Lucerne Valley – Middle School monitoring station, and PM2.5, CO, NO_2, and SO_2 data are from the Victorville – 14306 Park Avenue monitoring station.

TABLE 3.2-3
CRITERIA POLLUTANT SUMMARY MAXIMUM AMBIENT CONCENTRATIONS (PPM OR µG/M^3)

Pollutant	Averaging Period	Units	2005	2006	2007	2008	2009	2010	Limiting AAQS[a]
Ozone[b]	1 hour	ppm	0.074	0.078	0.092	0.074	0.072	0.072	0.09
Ozone[b]	8 hours	ppm	0.072	0.059	0.076	0.071	0.066	0.067	0.07
PM10[c]	24 hours	µg/m^3	57	50	212	62	81	38	50
PM10[c]	Annual	µg/m^3	16.9	23.0	27.8	20.7	15.4	13.4	20
PM2.5[c]	24 hours	µg/m^3	27.0	22.0	28.0	17.0	20.0	18.0	35
PM2.5[c]	Annual	µg/m^3	9.6	10.3	9.7	---	9.3	7.6	12
CO[d]	8 hours	ppm	1.6	1.6	1.6	1.0	1.1	5.2	9.0
NO_2[d]	1 hour	ppm	0.08	0.08	0.07	0.07	0.06	0.13	0.18
NO_2[d]	Annual	ppm	0.02	0.02	0.02	0.01	0.02	0.02	0.030
SO_2[d]	24 hours	ppm	0.00	0.01	0.01	0.00	0.01	0.01	0.04
SO_2	Annual	ppm	0.00	0.00	0.00	0.00	0.00	0.00	0.03

NOTES:

[a] The limiting AAQS is the most stringent of the California or National AAQS for that pollutant and averaging period.
[b] Ozone data are from the Blythe - 445 West Murphy Street monitoring station.
[c] PM10 and PM2.5 data are from the Lucerne Valley and Victorville monitoring stations, respectively. Exceptional PM concentration events, such as those caused by wind storms or fires are not shown where excluded by USEPA; however, some exceptional events may still be included in the data presented.
[d] CO, NO_2, and SO_2 are from the Victorville monitoring station.

SOURCE: ARB, 2011b

3.2.1.3 Criteria Air Pollutants

Ozone (O_3)

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted nitrogen oxides (NO_x) and hydrocarbons (volatile organic compounds or VOCs) in the presence of sunlight. Pollutant transport from the South Coast Air Basin (Los Angeles Area) is one source of the pollution experienced in the eastern Riverside County portion of the MDAB.

The 1- and 8-hour ozone concentrations measured at the eastern border of Riverside County have been very slowly decreasing over time. The raw collected air quality data indicate that the ozone violations occurred primarily during the sunny and hot periods typical during May through September.

Nitrogen Dioxide (NO_2)

The entire MDAB is classified as attainment for the state 1-hour and annual and federal annual NO_2 standards. The NO_2 attainment standard could change due to the new federal 1-hour standard, although a review of the air basin-wide monitoring data suggest this would not occur for the MDAB.

Approximately 90 percent of the NO_x emitted from combustion sources is nitric oxide (NO), while the balance is NO_2. NO is oxidized in the atmosphere to NO_2, but some level of photochemical

activity is needed for this conversion. The highest concentrations of NO_2 typically occur during the fall. The winter atmospheric conditions can trap emissions near the ground level, but lacking substantial photochemical activity (sun light), NO_2 levels are relatively low. In the summer the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions disperse pollutants, preventing the accumulation of NO_2. The NO_2 concentrations in the Project area are well below the state and federal AAQS.

Carbon Monoxide (CO)

MDAB is classified as attainment for the state and federal 1- and 8-hour CO standards. The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend 1 or 2 hours after sunrise. The Project area has a lack of significant mobile source emissions and has CO concentrations that are well below the state and federal AAQS.

Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere.

MDAB is classified as non-attainment for state PM10 standards and unclassified for the federal PM10 standard. Table 3.2-3 shows recent PM10 and PM2.5 concentrations, and shows clear exceedances of the state 24-hour PM10 standard. It should be noted that exceedance does not necessarily mean violation or non-attainment, as exceptional events do occur and some of those events, which do not count as violations, may be included in the data, such as the 2007 data for PM10. The MDAB is designated as non-attainment for the state PM10 standard.

Fine particulate matter, or PM2.5, is derived mainly either from the combustion of materials, or from precursor gases (SO_x, NO_x, and VOC) through complex reactions in the atmosphere. PM2.5 consists mostly of sulfates, nitrates, ammonium, elemental carbon, and a small portion of organic and inorganic compounds.

The entire MDAB is classified as attainment for the federal standard and, in the Project area, is designated unclassified for the state PM2.5 standards. As indicated in Table 3.2-3, PM2.5 concentrations did not exceed applicable standards during the 6-year study period. This divergence in the PM10 and PM2.5 concentration levels and attainment status indicates that a substantial fraction of the ambient particulate matter levels are most likely due to localized fugitive dust sources, such as vehicle travel on unpaved roads, agricultural operations, or wind-blown dust.[1]

[1] Fugitive dust, unlike combustion source particulate and secondary particulate, is composed of a much higher fraction of larger particles than smaller particles, so the PM2.5 fraction of fugitive dust is much smaller than the PM10 fraction. Therefore, when PM10 ambient concentrations are significantly higher than PM2.5 ambient concentrations this tends to indicate that a large proportion of the PM10 are from fugitive dust emission sources, rather than from combustion particulate or secondary particulate emission sources.

Sulfur Dioxide (SO_2)

The entire MDAB is classified as attainment for the state and federal SO_2 standards.

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Sources of SO_2 emissions within the MDAB come from a wide variety of fuels: gaseous, liquid and solid; however, the total SO_2 emissions within the eastern MDAB are limited due to the limited number of major stationary sources and California's and USEPA's substantial reduction in motor vehicle fuel sulfur content. The Project area's SO_2 concentrations are well below the state and federal AAQS.

3.2.1.4 Toxic Air Contaminants

Toxic Air Contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines (ARB, 2012).

3.2.1.5 Sensitive Receptors

For the purposes of this air quality analysis, sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and daycare centers. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, and/or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality.

There are no sensitive receptors in the immediate vicinity of the Project site. The nearest sensitive receptor is a residence off Black Creek Road approximately 2.7 miles south of the Project site boundary and a residence near 7th Avenue that is approximately 2.6 miles to the southeast of the Project site boundary. In addition, there are several residences that would be within 1 mile of the proposed gen-tie line, the closest of which is south of I-10 at a distance of approximately 0.6 mile.

3.2.2 Applicable Regulations, Plans, and Standards

3.2.2.1 Federal

The USEPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal AAQS and judging the adequacy of State Implementation Plans (SIPs). The USEPA has delegated its authority to implement many of the federal programs to California while retaining an oversight role to ensure that the programs continue to be implemented.

MDAQMD is responsible for issuing federal New Source Review (NSR) permits and has been delegated enforcement of the New Source Performance Standards (NSPS). The federal NSR program requires air quality construction and operating permits (i.e., NSR air quality permits) for stationary sources when they exceed specific emissions thresholds for non-attainment pollutants, and require Prevention of Significant Deterioration (PSD) air quality permits when specific emissions thresholds are exceeded for attainment pollutants. The NSPS are emission control/performance standards for specific types of stationary sources, such as boilers, cement kilns, gas turbines, etc. However, the Project does not include stationary sources of air pollution that would have emissions high enough to trigger federal air quality (NSR) permitting, or that would be subject to any of the NSPS (40 CFR Part 52; 40 CFR Part 60).

The Project site is located in a federal attainment/unclassified area; therefore, the Project would not be subject to the general conformity regulations (40 CFR Part 93). The USEPA has set emission standards for non-road diesel engines, including those used on construction cranes. These standards are published in 40 CFR Part 89.

3.2.2.2 State

As discussed above in Section 3.2.1.2, ARB has established state AAQS for many of the same pollutants covered by the federal AAQS that are as stringent, or more stringent, than the federal AAQS. Pollutants regulated under these standards include ozone, NO_2, CO, PM10, PM2.5, SO_2, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Additional information regarding the state AAQS that are relevant to the Project is provided Section 3.2.1.2.

ARB also has on-road and off-road engine emission reduction programs that would indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, ARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts.

In 1990, the State of California administratively listed under Proposition 65 the particulates formed in the exhaust of diesel-powered equipment and vehicles as a chemical known to the state to cause cancer. California has also enacted a regulation for the reduction of TACs in the form of

diesel particulate matter (DPM) and criteria pollutant emissions from in-use off-road diesel-fueled vehicles (13 CCR §2449). This regulation provides target emission rates for PM and NO_x emissions from owners of fleets of diesel-fueled off-road vehicles and applies to equipment fleets of three specific sizes and the target emission rates are reduced over time (ARB, 2011c).

3.2.2.3 Local

Mojave Desert Air Quality Management District

The Project site is within the jurisdiction of the MDAQMD. The MDAQMD regulates air pollutant emissions for all sources in the MDAB other than motor vehicles. The MDAQMD enforces regulations and administers permits governing stationary sources. The only stationary sources that would be associated with the MSEP would be two 35-horsepower (hp) standby emergency generators; however, those sources would be exempt from MDAQMD permit requirements because they would be less than 50 hp (MDAQMD, 2012). The following rules would apply to the Project:

Rule 402 – Nuisance

This rule prohibits discharge from any source whatsoever in such quantities of air contaminants or other material that cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property (MDAQMD, 2011b).

Rule 403 – Fugitive Dust

This rule limits the emissions of fugitive dust or particulate matter from a variety of activities and sources such as construction and storage sites. It includes a visible emissions property line standard, a sampling standard of 100 $\mu g/m^3$, and precautionary requirements to prevent track-out on to paved public roads (MDAQMD, 2011b).

Triennial Revision to the 1991 Air Quality Attainment Plan

As required by the federal and California CAAs, air basins or portions thereof have been classified as in either "attainment" or "non-attainment" of each criteria air pollutant, based on whether or not the standards have been achieved. Jurisdictions of non-attainment areas are also required to prepare an air quality attainment plan that includes strategies for achieving attainment. The MDAQMD's attainment plan applicable to the Project area was adopted on January 22, 1996. The purpose of the Triennial Revision to the 1991 Air Quality Attainment Plan was to set forth a program to lead the entire MDAB into compliance with state 1-hour ozone air quality standard (MDAQMD, 2011a).

3.3 Biological Resources – Vegetation

This section describes the environmental setting; vegetation communities; invasive, weeds; special-status plant species; and state and federal jurisdictional areas that are present within the proposed Project site. It also lists the special-status plant species that have potential to occur but that were not observed during focused botanical surveys.

This discussion is based, in part, upon information from these sources:

1. Focused botanical surveys performed in spring and fall 2011 (Tetra Tech EC and Karl, 2011a; 2011b);

2. The *Biological Resources Technical Report* for the Project prepared by the Applicant (Tetra Tech EC and Karl, 2011a) (see Appendix C);

3. The *Fall 2011 Plants and Supplemental Wildlife Survey Report* prepared by the Applicant (Tetra Tech EC and Karl, 2011b) (see Appendix C);

4. A supplemental biological report entitled *Response to Data Request* (Tetra Tech EC, 2012);

5. The CNDDB (2011);

6. The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS, 2011); and

7. Calflora (2011); and

8. Findings and supporting technical studies for the California Energy Commission (CEC) Staff Assessment and Draft Environmental Impact Statement for the Blythe Solar Power Project (BSPP), March 2010.

The study area for vegetation resources includes public lands administered by the BLM and private land under the land use jurisdiction of Riverside County. The 4,948-acre study area where vegetation communities were characterized and special-status plant surveys were performed included the immediate footprint for the solar plant site and a minimum 240-foot-wide survey corridor for linear facilities (Tetra Tech EC, 2012).

3.3.1 Environmental Setting

The Sonoran Desert region of southeastern California, a region bounded by the Mojave Desert to the north and by the higher elevations of the Peninsular Ranges to the west, has a unique desert climate influenced by the addition of monsoonal summer rains; a contrast to the dry summer Mediterranean climate that characterizes much of California. The southeastern corner of California has a bimodal rainfall pattern, with a rainy season in both summer and winter (December through March and July through September).

The unique position of the region at the junction with the Neotropic ecozone to the south contributes to the presence of a number of rare and endemic plants and vegetation communities

specially adapted to this bimodal rainfall pattern, and not found further north in the Mojave Desert. These include ironwood (*Olneya tesota*) and blue palo verde (*Cercidium floridum*), and a number of summer annuals that only germinate after a significant warm summer rain.

This distinctive bimodal climate of the Sonoran Desert distinguishes it, floristically, from other deserts, including the Mojave Desert, and from the rest of California, which is characterized by warm dry summers and a single rainy season in winter. In addition to being hotter and drier, the Sonoran Desert region also rarely experiences frost. Although the region supports numerous perennial species, including a wide variety of cacti, more than half of the region's plant species are herbaceous annuals, which reveal themselves only during years of suitable precipitation and temperature conditions.

This region also occupies an important biogeographic location and zone of ecological transition on the Pacific coast of North America, and so its floristic diversity includes many widespread taxa on the edge of their range. Many such species are more common outside of California but here they represent geographically marginal, peripheral populations on the frontiers of their range. The evolutionary significance, and therefore the conservation value, of peripheral populations are well documented, as is their greater risk of extirpation (Leppig & White, 2006).

3.3.1.1 Vegetation Communities

Four natural vegetation communities were identified within the study area (Figure 3.3-1). On the proposed solar plant site, located 5.5 miles north of I-10 on the Palo Verde Mesa, vegetation communities include Sonoran creosote bush scrub, desert dry wash woodland, and vegetated ephemeral swales (supporting a desert wash scrub of creosote bush and big galleta grass). Within the Sonoran creosote bush scrub community lie broad expanses of desert pavement, a distinctive but largely unvegetated habitat. The gen-tie line crosses I-10 and terminates at the southeast end of Chuckwalla Valley at the Colorado River Substation. This area includes stabilized and partially stabilized desert dunes associated with the Chuckwalla-Palen dune system. No dunes or sand fields occur on the proposed solar plant site. The two other non-natural cover types in the study area in the eastern portion are agriculture and developed.

Several desert washes of varying hydrologic capacity and size drain out of the McCoy Mountains from the west to east in the Project site. The majority of these washes support woody, riparian vegetation while drier, flashy washes located in the center of the site support a desert wash scrub of creosote bush and big galleta grass, with only widely scattered riparian trees such as blue palo verde and ironwood. Active and fallow agriculture and developed areas also occur within the gen-tie line corridor in addition to the communities already mentioned. Two of the four communities, desert dry wash woodland and creosote bush-big galleta, are considered sensitive as indicated by the CNDDB. These communities are discussed in more detail below. Vegetation communities were characterized by the classification system used by Holland (1986) and the NECO Plan (Evens and Hartman, 2007), and cross-referenced with *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995), where appropriate. Table 3.3-1 summarizes the acreage of natural communities that occurs within the Project Area.

TABLE 3.3-1
NATURAL COMMUNITIES AND COVER TYPES IN THE PROJECT AREA

Vegetation Communities/Cover Type	Area within Project Area[a]				
	Unit 1	Unit 2	Gen-tie Line and Access Road	Distribution Line	Total
Ephemeral "Riparian" Drainages					
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)	0	1.5	1.8	0.9	4.2
Mesquite Bosque	0	0	0.5	0	0.5
Vegetated Ephemeral Channels (Wash-dependent Vegetation with Sparsely Scattered Trees)	2.8	42.2	0	0	45.0
Vegetated Ephemeral Channels (Vegetated with No Trees)	44.8	61.1	0.8	0	106.7
Unvegetated (approximately less than or equal to 5% cover)	8.8	20.3	0.5	0	29.6
Subtotal Ephemeral "Riparian" Drainages	***56.4***	***125.1***	***3.6***	***0.9***	***186.0***
Upland					
Sonoran Creosote Bush Scrub (Creosote Bush-White Burr Sage Scrub Alliance)	2,138.0	2,473.0	96.4	4.1	4711.5
Stabilized and Partially Stabilized Desert Dunes (Sand Sheets and Dunes: Creosote Bush-White Burr Sage-Galleta Grass)	0	0	38	0	38
Subtotal Upland	***2,138.0***	***2,473.0***	***134.4***	***4.1***	***4,749.5***
Other Cover Types					
Agricultural Land (Crops, Ruderal Vegetation, or Bare Ground)	0	0	0	2.3	2.3
Developed (No Vegetation)	0	0	22.7	0	22.7
Subtotal Other Cover Types	***0***	***0***	***22.7***	***2.3***	***25.0***
Total Acres	**2,194.4**	**2,598.1**	**160.7[2]**	**7.3**	**4,960.5[b]**

NOTES:

[a] The Project Area is the footprint of all Project components, which includes the Solar Plant Site and linear features
[b] Includes 22.7 acres of developed lands

SOURCE: Tetra Tech EC, 2012

Upland

Sonoran Creosote Bush Scrub

Sonoran creosote bush scrub occurs on well-drained, secondary soils of slopes, fans, and valleys and is the basic creosote scrub species of the Colorado Desert (Figure 3.3-1) (Holland, 1986). This community dominates the study area and is typically characterized by large expanses of desert pavement. Typical upland vegetation in this community is largely confined to drainages, likely because most of the available water is in the drainages due to the low regional rainfall and qualities of both substrate and soil. The indicator plant species within this community are creosote bush

(*Larrea tridentata*), white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), ocotillo (*Fouquieria splendens*), and cheesebush (*Ambrosia* [=*Hymenoclea*] *salsola*) (Tetra Tech EC and Karl, 2011a; Tetra Tech EC, 2012; Solar Millennium, 2009a as cited in CEC, 2010b).

Stabilized and Partially Stabilized Desert Dunes

These dune systems are described as accumulations in the desert which are stabilized or partially stabilized by evergreen and/or deciduous shrubs and scattered, low grasses. Sand Dune communities were recognized as sensitive in the NECO Plan (Figure 3.3-2). These dunes typically occur lower than active dune systems and retain water just below the sand surface which allows deep-rooted, perennial vegetation to survive during longer drought periods. The dominant plant species associated with this community include creosote bush, white bursage, galleta grass (*Pleuraphis rigida*), four-wing saltbush (*Atriplex canescens*), desert croton (*Croton californicus*), and Colorado Desert buckwheat (*Eriogonum deserticola*) (Tetra Tech EC, 2012; Holland, 1986). Several sand-associates and other annuals are also abundant such as sand verbena (*Abronia villosa*), birdcage primrose (*Oenothera deltoides*), desert marigold (*Baileya pauciradiata*), and narrow-leaved forget-me-not (*Cryptantha angustifolia*). Sahara mustard (*Brassica tournefortii*) and, often, Russian thistle (*Salsola tragus*) are also dense throughout the dunes (Tetra Tech EC, 2012).

The 230 kV switchyard and the western section of the gen-tie line route are exclusively within this habitat type. The dunes within the study area are an important habitat for the Mojave fringe-toed lizard, Harwood's phlox, western burrowing owl, American badger, and desert kit fox, as well as a variety of common plant and wildlife species.

Ephemeral "Riparian" Drainages

Virtually all surface hydrology within the study area is from stormwater runoff originating in unnamed ephemeral washes west of the Project site from the McCoy Mountains and flowing eastward to the Palo Verde Mesa. These washes are a component of a large alluvial fan that generally comprises the Palo Verde Mesa (Galati & Blek, 2009a as cited in CEC, 2010b). The closest major watercourse to the study area is the McCoy Wash, a large ephemeral wash that drains to the Colorado River. The McCoy Wash is located west of the Project site and the ephemeral washes that flow eastward from the McCoy Mountains abate into the landscape prior to any surface hydrological connection with the McCoy Wash.

The ephemeral drainages within the study area are generally microfloodplains with compound channels, is a common arid stream system (USACE, 2008). With any connecting ephemeral stream system in arid regions, the riparian corridor can be populated and lined with xeric riparian vegetation and unvegetated areas such as recently created swales and terraces (interfluves), or a mosaic of these types (Bendix and Hupp, 2000 as cited in CEC, 2010b). While the bed and bank topography in arid region stream systems are subtle, evidence of channelized flow fundamentally defines the presence of a stream. Swales are depressions or hollows, oftentimes vegetated but not necessarily so, where runoff from the surrounding uplands accumulates. Three communities that occupy ephemeral drainages have been identified in the study area. These are Desert Dry Wash Woodland, Vegetated Swales supporting Creosote Bush-Big Galleta Grass Association, and Unvegetated Ephemeral Dry Washes.

Desert Dry Wash Woodland

Desert dry wash woodland is recognized as a sensitive vegetation community by the BLM (NECO Plan), CNDDB, and is also designated as state waters by the CDFG (Figure 3.3-3). This vegetation community corresponds to CDFG's Blue Palo Verde-Ironwood-Smoke Tree Woodland habitat type (Holland, 1986). This community is described by Holland as an open to densely covered, drought-deciduous, microphyll riparian scrub woodland. These habitat types often support braided wash channels that change patterns and flow directions following every surface flow event (Holland, 1986). Typical indicator plant species of this community include but are not limited to blue palo verde (*Parkinsonia* [=*Cercidium*] *florida*), cheesebush, smoke tree (*Psorothamnus spinosus*), sweetbush (*Bebbia juncea* var. *aspera*), tamarisk (*Tamarisk* spp.), and catclaw acacia (*Senegalia* [=*Acacia*] *greggii*).

This community is dominated by an open tree layer of blue palo verde, honey mesquite, ironwood, and smoke tree with an understory of big galleta grass, desert starvine (*Brandegea bigelovii*), and intermixed creosote scrub and Russian thistle (*Salsola* sp.) (Solar Millennium, 2009a and AECOM, 2010a as cited in CEC, 2010b). Desert dry wash woodland habitat locally shows various signs of coyote (*Canis latrans*), fox (either kit fox [*Vulpes macrotus*] or gray fox [*Urocyon cinereoargenteus*]), and bobcat (*Lynx rufus*) use, and provides value to various species of wildlife in the form as food, cover, dispersal, and refuge habitat (AECOM, 2010a as cited in CEC, 2010b).

Vegetated Swales Supporting Creosote Bush-Big Galleta Grass Association

The Creosote Bush-Big Galleta Grass Association is relatively uncommon in California deserts. It is not defined by Holland but is a subcomponent of Sonoran creosote bush scrub, part of the big galleta alliance as defined by CDFG, and is recognized as a sensitive community by the CNDDB. It was mapped and documented under the recent detailed mapping of the Mojave Desert region (Thomas et al., 2004; Sawyer, Keeler-Wolf & Evans, 2009) and is defined by CDFG as a rare natural community, with a CNDDB State (NatureServe) Rank of G3 S2.2 (CDFG considers natural communities with a State Rank 3 or less to be rare). Communities with a State Rank of 3 have fewer than 100 documented occurrences or are represented by fewer than 50,000 acres statewide. Within the study area, the creosote bush-big galleta grass community occurs as an understory component in the washes within the desert dry wash woodland and continues along the drier reaches of ephemeral desert washes where sandy fluvium collects. Dominant and indicator plants of this community include creosote bush, big galleta grass, and cheesebush, another characteristic perennial of ephemeral desert washes. Occasional associates found within this community include brownplume wirelettuce (*Stephanomeria pauciflora* var. *pauciflora*), Utah cynanchum (*Cynanchum utahense*), Hartweg's twinevine (*Sarcostemma cynanchoides* ssp. *hartwegii*), and trailing townula (*Sarcostemma hirtellum*) (AECOM, 2010a as cited in CEC, 2010b). This desert wash community often occurs as the only vegetated habitat in broad expanses of desert pavement, which increases its value to wildlife.

Unvegetated Ephemeral Dry Washes

This habitat community occurs within the transition zone between desert dry wash woodland in higher elevation areas and creosote bush-big galleta grass communities in flatter areas

(Figure 3.3-4). Unvegetated dry washes provide movement corridors for small and large mammals and provide a seasonal water source not available in the surrounding dry uplands. Even the smaller washes have been shown to support a higher density of spring and summer annuals than the surrounding uplands and thus provide important habitat value.

Unvegetated ephemeral dry washes are defined by shelving and/or scour resulting in an established bed, bank, and channel. In areas where evidence of distinct shelving and/or scour were absent, but some indication of past surface water flow could be observed, it was ascertained that these features were either swales (that support low volume and duration surface flow and/or were low lying undefined relatively linear features in the landscape that are unvegetated or primarily populated exclusively by Sonoran creosote bush scrub) or eroded relictual washes that support sheet flow during rain events.

The ephemeral washes in the Project Disturbance Area are generally linear features collectively composed of multiple, sinuous subchannels of varying sizes, resulting in anastomosed morphology. By virtue of the anastomosed morphology occurring within the washes, there are interfluves that have been formed by these multiple subchannels. Within the unvegetated ephemeral dry wash, there are interfluves of Sonoran creosote bush scrub habitat between the channels of the dry washes. These interfluves are upland features, encompassed by unvegetated ephemeral dry wash, and are not considered jurisdictional waters of the United States.

Functions and Values of Ephemeral Drainages

The ephemeral washes within the study area provide significant hydrologic, biogeochemical, plant, and wildlife functions.

Hydrologic Function. The established washes and ancillary drainage features are the primary fluvial systems within the study area, and these provide a significant potential for aquifer recharge during storm events. The vegetated swales are the secondary fluvial system and do not present a significant potential for aquifer recharge. However, the vegetated swales present high functions and values for surface water quality (USACE, 1979). The ephemeral washes are not sufficiently developed to abate flooding in severe storms. However, the unvegetated portions of the ephemeral washes and swale features and networks can intercept runoff and slow down the velocity of surface water and potentially remove or transform pollutants through physical, chemical, and biological processes improving water quality.

Biogeochemical Function. The xeric riparian areas potentially provide a sink for nutrients, organic compounds, metals, and components of organic matter. The desert dry wash woodland may also act as filters of sediments and organic matter. The xeric riparian areas may be a permanent sink for these substances. The inputs of detritus within the wash present basic energy inputs at an ecosystem level for biochemical processes, nutrient cycling, and elemental import/export processes, which for desert dry wash woodland are also functioning at a relatively high value level in comparison with the surrounding upland areas. Lacking established wash obligate vegetation for additional organic and inorganic inputs and uptake, the unvegetated ephemeral dry washes are likely functioning at a relatively moderate to low level. The vegetated swale features and networks supporting low-volume

and short-duration flow presents a moderate to low function and value for biogeochemical function and a high function and value for the retention of particulates during storm events (USACE, 1979).

Plant Habitat Function. The ephemeral washes and vegetated swale networks provide habitat for establishment of more developed plant diversity and developed spatial structure because of access to water relative to upland areas. The diversity of plants also provides habitat to special-status species, discussed below. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote bush scrub where a diversity of perennial plants is relatively high and production of ephemeral forage plants is also high (USFWS, 2011). Desert dry wash woodland and vegetated swales offer high functions and values such as forage production and shelter, while unvegetated ephemeral dry washes comparatively offer moderate to low functions and values relative to forage production and shelter.

Animal Habitat Function. The xeric riparian areas and unvegetated ephemeral dry washes are integral to the ecological function of the watershed. The ephemeral washes, both vegetated and unvegetated, and vegetated swale networks provide unique wildlife habitat with a diversity of vegetation and topography. Ephemeral washes provide cover, foraging habitat, opportunities for burrowing and nesting, and corridors for wildlife movement.

Other Cover Types

Agriculture

In fallow agricultural areas, ruderal vegetation is recolonizing previously farmed areas including Russian thistle, Sahara mustard, and other exotic plant species interspersed with native vegetation from past agricultural disturbance and activities (Tetra Tech EC and Karl, 2011a). Fallow and active agriculture fields provide habitat value to local and migratory wildlife in the form of food, cover, and shelter habitat, especially if fields are actively irrigated.

Developed

Developed areas consist of paved and unpaved areas associated with I-10, dirt access roads and cleared land within the study area. Paved roadways are often used by mammals and cold-blooded species as movement corridors and/or as heat sources during cooler months or periods of the day in order to increase body temperatures.

3.3.1.2 Invasive and Noxious Weeds

Noxious weeds are species of non-native plants included on the weed lists of the California Department of Food and Agriculture (CDFA) (2010), the California Invasive Plant Council (Cal-IPC), or those weeds of special concern identified by the BLM. They are of particular concern in wildlands because of their potential to degrade habitat and disrupt the ecological functions of an area (Cal-IPC, 2006). Specifically, noxious and invasive weeds can alter habitat structure, increase fire frequency and intensity, decrease forage (including for special-status species, such as desert tortoise), exclude native plants, and decrease water availability for both plants and wildlife. Soil disturbance and gathering and channeling water create conditions favorable to the introduction of

new noxious and invasive weeds or the spread of existing populations. Construction equipment, fill, and mulch can act as vectors introducing noxious and invasive weeds into an area.

Non-native plant species were recorded as a part of surveys conducted in support of the proposed action (Tetra Tech EC and Karl, 2011a; AECOM, 2010). Sixteen non-native species were observed within the study area: Sahara mustard, Russian thistle, salt cedar, Mediterranean grass (*Schimus* spp.), red brome (*Bromus madritensis* ssp. *rubens*), Bermuda grass (*Cynodon dactylon*), barley (*Hordeum* sp.), sour clover (*Oxalis* sp.), London rocket (*Sisymbrium irio*), nettleleaf goosefoot (*Chenopodium murale*), red brome (*Bromus madritensis* var. *rubescens*), puncture vine (*Tribulus terrestris*), blue panicgrass (*Panicum*), cheeseweed (*Malva parviflora*), pigweed (*Amaranthus* spp.), and goosefoot (*Chenopodium* spp.) Of these, five are noxious weeds and are identified on a list of the region's worst weeds compiled by the Low Desert Management Area (NRCS, 2005 as cited in CEC, 2010b). Noxious weeds found in the study area are discussed further below.

Sahara mustard (*Brassica tournefortii*) was found in disturbed areas throughout the study area (Tetra Tech EC and Karl, 2011a; AECOM, 2010a as cited in CEC, 2010b). This species is of high concern; it is a BLM weed of special concern and Cal-IPC has declared this plant highly invasive (Cal-IPC, 2006) and recommends that it should be eradicated whenever encountered. This species is associated with impacts to habitat for native wildlife as well as for native plants. It promotes the spread of fire by increasing fuel load and competes with native plants for moisture and nutrients. In addition, it increases cover and works to stabilize sand, thereby affecting wildlife species dependent on open sandy habitat (Brossard et al., 2000; Barrows and Allen, 2007).

Russian thistle (*Salsola tragus*) was found in disturbed areas throughout the study area (Tetra Tech EC and Karl, 2011a; AECOM, 2010a as cited in CEC, 2010b). Although all invasive plants share the trait of being adapted to disturbed habitat, Russian thistle or tumbleweed particularly tends to be restricted to roadway shoulders and other sites where the soil has been recently disturbed. However, once an area is disturbed, this species competes readily and can affect native plant ecosystems and increase fire hazard (Orloff et al., 2008; Sanders, 1998). Dune habitat is particularly vulnerable to non-native species, which can stabilize sand or block sand movement, and Russian thistle is considered an invasive species of primary concern in this habitat (CDFG, 2007). There is a high potential that Russian thistle could become established in the construction area and this species should be eradicated if observed. Cal-IPC has determined that this plant has a limited invasiveness rating in California (Cal-IPC, 2006) and the CDFA has given it a "C" rating. A C rating means that the pest is of known economic or environmental detriment and, if present in California, it is usually widespread. If found in the state, it is subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state-enforced action other than providing for pest cleanliness.

Mediterranean tamarisk or salt cedar (*Tamarix ramosissima*) is a riparian plant and is therefore restricted to habitats where there is perennial saturation such as springs and seeps, or runoff from poorly maintained water pipelines or well pumps. It was observed interspersed throughout desert dry wash woodland within the study area. Cal-IPC has declared this plant highly invasive (Cal-IPC, 2006) and it is a CDFA "B" rated species. A B-rated pest is of known economic or environmental detriment and, if present in California, it is of limited distribution. If found in the

state, it is subject to state-endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner it is subject to eradication, containment, suppression, control, or other holding action. Salt cedar is associated with many ecological impacts including impacts to channel geomorphology, groundwater availability, plant species diversity, and fire frequency (Sanders, 1998). Salt cedar can also affect sand dunes by blocking sand movement, a vital part of the natural function of these habitats (CDFG, 2007).

Mediterranean grass (*Schismus arabicus, S. barbatus*) is prevalent throughout Sonoran creosote bush scrub within the study area. Mediterranean grass is an annual that reproduces by seed, and is widespread in arid and semi-arid California landscapes. This species competes effectively with native plants for nutrients and water and can provide cover that prevents native annuals from sprouting (VanDevender et al., 1997; Brossard et al., 2000) and contributes to dune stabilization (CDFG, 2007). Historically, fire was rare in the Colorado Desert. However, the presence of Mediterranean grass or other annual non-native grasses has provided a continuous and increased fuel load, influencing the extent, frequency, and intensity of fire in these ecosystems (Brooks and Pyke, 2001; Brooks et al., 2004). BLM and other agencies recognize that because of the widespread distribution of Mediterranean grass, this species is not considered feasible to eradicate.

Red brome (*Bromus madritensis* ssp. *rubens*) is an introduced Eurasian grass adapted to microhabitats that can be frequently found at the base of desert shrubs. It can also form carpet cover in pockets of fine-grained soils in rough terrain off the bajada. It is found throughout California, especially in southern California, and is spreading rapidly in many vegetation communities including desert scrub. Seeds from this species can disperse readily and across large distances. Cal-IPC has declared this plant highly invasive (Cal-IPC, 2006). Because of its widespread distribution, red brome is not considered feasible for general control.

3.3.1.3 Special-Status Plants

Special-status plants are those species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

1. Listed as threatened or endangered or candidates for future listing as threatened or endangered under the FESA or CESA;

2. Listed as species of concern by CDFG;

3. A plant species considered by the CNPS to be “rare, threatened, or endangered in California” (CNPS List 1A, 1B, and 2) as well as CNPS List 3 and 4[1] plant species;

[1] List 3 and 4 plants are included in the CNDDB’s Special Plants, Bryophytes, and Lichens List. [Refer to the current online published list available at: http://www.dfg.ca.gov/biogeodata.] Data on Lists 3 and 4 plants should be submitted to CNDDB. Such data aids in determining or revising priority ranking (CDFG, 2011).

4. A plant listed as rare under the California Native Plant Protection Act[2];

5. Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances; or

BLM designates "Sensitive" species as those requiring special management considerations to promote their conservation and reduce the likelihood and need for future listing under FESA. BLM Sensitive species include all Federal Candidate and Federally Delisted species that were so designated within the last 5 years, and CNPS List 1B species that occur on BLM lands. For the purposes of this document, all BLM Sensitive species are included as special-status species.

Table 3.3-2 lists those special-status plant species evaluated during the analysis that are known or could potentially occur in the vicinity of the Project. Six special-status plants were observed within the study area during spring 2011 floristic surveys, and include: desert unicorn plant, Harwood's milk-vetch, Las Animas colubrina, ribbed cryptantha, Utah milkvine, and Abram's spurge (Tetra Tech EC and Karl, 2011a; 2011b).

Rare plant surveys are pending for the gen-tie line corridor. Special-status species detected within the vicinity are discussed in more detail below. The findings of spring 2011 botanical surveys of the study area are incorporated into the discussion below. The location of identified special-status plants in the study area is presented in Figure 3.3-5.

Desert Unicorn Plant

Status: Desert unicorn plant is a CNPS List 4.3 species meaning it is not currently threatened or vulnerable but considered to have limited distribution in California. Desert unicorn plant is also a plant species covered under the NECO Plan (BLM, 2002) and it has a CNDDB (NatureServe) Global and State Rank of G5 S3.3.

Distribution: This plant occurs in Sonoran desert scrub habitats in San Bernardino, Imperial, and Riverside counties of California, and extends south into Baja and east into New Mexico. There are 13 records known from the NECO planning area in Milipitas Wash, Chuckwalla Valley, and Chemehuevi Valley (BLM, 2002). There are no records in the CNDDB for the state of California, but there are 36 records in the Consortium of California Herbaria from Riverside, Imperial, San Bernardino, and San Diego counties, several of which are from the Chuckwalla Mountains and Desert Center area and the Ford Dry Lake area (Consortium of California Herbaria [CCH], 2011).

Habitat and Biology: This perennial herb grows on deep, alluvial sands in Sonoran Desert Scrub habitat at elevations below 3,300 feet. Desert unicorn plant has a fleshy root system that can remain dormant in dry years. It typically grows and flowers between July and September after substantial summer rains. However, some individuals have aboveground growth in spring, and

[2] As defined by the California Native Plant Protection Act, a plant is rare when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901) (CDFG, 2011).

TABLE 3.3-2
SPECIAL-STATUS PLANTS KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name[a]	Scientific Name	Status State/Fed/CNPS/BLM/ Global Rank/State Rank [e]
Plants		
Chaparral sand verbena	*Abronia villosa var. aurita*	__/__/1B.1/S/G5T3T4/S2.1
Angel trumpets	*Acleisanthes longiflora*	__/__/2.3/__/G5/S1.3
Desert sand parsley	*Ammoselinum giganteum*	__/__/2.3/__/G2G3/SH
Small-flowered androstephium	*Androstephium breviflorum*	__/__/2.2/__/G5/S2[b]
Harwood's milk-vetch	***Astragalus insularis var. harwoodii***	**__/__/2.2/__/G5T3/S2.2?**
Coachella Valley milk-vetch	*Astragalus lentiginosus var. coachellae*	__/FE/1B.2./S/G5T2/S2.1
California ayenia	*Ayenia compacta*	E/__/2.3/__/G4/S3.3
Pink fairy duster	*Calliandra eriophylla*	__/__/2.3/__/G5/S2.3
Sand evening-primrose	*Camissonia arenaria*	__/__/2.2/__/G4?/S2
Crucifixion thorn	*Castela emoryi*	__/__/2.3/__/G3/S2.2
Abram's spurge	***Chamaesyce abramsiana***	**__/__/2.2/__/G4/S1.2**
Arizona spurge	*Chamaesyce arizonica*	R/__/2.3/__/G5/S1.3
Flat-seeded spurge	*Chamaesyce platysperma*	__/__/1B.2/S/G3/S1.2?
Las Animas colubrina	***Colubrina californica***	**__/__/2.3/__/G4/S2S3.3**
Spiny abrojo/Bitter snakeweed	*Condalia globosa var. pubescens*	__/__/4.2/__/G5T3T4/S3.2
Foxtail cactus	*Coryphantha alversonii*	__/__/4.3/__/G3/S3.2
Ribbed cryptantha	***Cryptantha costata***	**__/__/4.3/__/G4G5/S3.3**
Winged cryptantha	*Cryptantha holoptera*	__/__/4.3/__/G3G4/S3?
Wiggins' cholla	*Cylindropuntia wigginsii (syn=Opuntia wigginsii)*	__/__/3.3/__/G3?Q/S1.2?
Utah milkvine	***Cynanchum utahense***	**__/__/4.2/__/G4/S3.2**
Glandular ditaxis	*Ditaxis claryana*	__/__/2.2/__/G4G5/S1S2
California ditaxis	***Ditaxis serrata var. californica***	**__/__/3.2/__/G5T2T3/S2.2**
Harwood's eriastrum	***Eriastrum harwoodii***	**__/__/1B.2/S/G2/S2**
California satintail	*Imperata brevifolia*	__/__/2.1__/G2/S2.1
Cottontop cactus	*Echinocactus polycephalus* var. *polycephalus*	**__/__/__/__/__/__**
Pink velvet mallow	*Horsfordia alata*	__/__/4.3/__/G4/S3.3
Bitter hymenoxys	*Hymenoxys odorata*	__/__/2/__/G5/S2
Spearleaf	*Matelea parvifolia*	__/__/2.3/__/G5?/S2.2
Argus blazing star[c]	*Mentzelia puberula*	__/__/__/__/__/__
Slender woolly-heads	*Nemacaulis denudata var. gracilis*	__/__/2.2/__/G3G4T3?/S2S3
White-margined penstemon	*Penstemon albomarginatus*	__/_ /1B.1/S/G2/S1
Lobed cherry	*Physalis lobata*	__/__/2.3/__/G5/S1.3
Desert portulaca	*Portulaca halimoides*	__/__/4.2/__/G5/S3
Desert unicorn plant	***Proboscidea althaeifolia***	**__/__/4.3/__/G5/S3.3**
Orocopia sage	*Salvia greatae*	__/__/1B.3./S/G2/S2.2
Desert spikemoss	*Selaginella eremophila*	__/__/2.2./__/G4/S2.2?
Cove's cassia	*Senna covesii*	__/__/2.2/__/G5?/S2.2

TABLE 3.3-2 (Continued)
SPECIAL-STATUS PLANTS KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name	Scientific Name	Status State/Fed/CNPS/BLM/ Global Rank/State Rank [e]
Plants (cont.)		
Mesquite nest straw	*Stylocline sonorensis*	__/__/1A/__/G3G5/SX
Dwarf germander	*Teucrium cubense ssp. depressum*	__/__/2.2/__/G4G5T3T4/S2
Jackass clover	*Wislizenia refracta ssp. refracta*	__/__/2.2/__/G5T5?/S1.2?
Palmer's jackass clover[d]	*Wislizenia refracta ssp. palmeri*	__/__/--/__/__/__

NOTES:

a Species highlighted in **bold-face type** were identified during surveys of the study area.
b As defined by the California Native Plant Protection Act, a plant is rare when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901) (CDFG, 2011).
c Proposed new addition to the CNPS Inventory (Andre, 2010, as cited in CEC, 2010a)
d Proposed new addition to the CNPS Inventory (Silverman, 2010, as cited in CEC, 2010b)
e Note that question marks signify CDFG uncertainty due to a lack of comprehensive distribution data

Status Codes:

Federal

FE = Federally listed, endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future

State

SE = State listed as endangered
ST = State listed as threatened
R = State characterized as rare

California Native Plant Society

List 1A = Includes plants that are both presumed extinct in California, as well as those plants which are presumed extirpated in California
List 1B = Rare, threatened, or endangered in California and elsewhere
List 2 = Rare, threatened, or endangered in California but more common elsewhere
List 3 = Plants which need more information
List 4 = Limited distribution – a watch list
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

Bureau of Land Management

BLM Sensitive = Species that require special management consideration to avoid potential future listing under the FESA and that have been identified in accordance with procedures set forth in BLM Manual section 6840 (BLM, 2008).

Global Rank/State Rank

Global rank (G-rank) is a reflection of the overall condition of an element throughout its global range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values

G1 or S1 = Fewer than 6 viable element occurrences (EOs) OR fewer than 1,000 individuals
G2 or S2 = 6-20 EOs OR 1,000-3,000 individuals
G3 or S3 = 21-100 EOs OR 3,000-10,000 individuals
G4 or S4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 or S5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
State rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. An H-rank indicates that all sites are historical

.1 = very threatened
.2 = threatened
.3 = no current threats known

SOURCES: CNDDB, 2011; Tetra Tech EC and Karl, 2011a; 2011b

fruits (seed pods) from the previous year are large and moderately visible, so presence of this species can be established outside the flowering season.

Status in Project Site: While thought to be uncommon in California, Desert unicorn plant was found to be quite common on the Project solar plant site, primarily in swales that held water for a short time. This species is distributed throughout the central part of the solar plant site and in portions of the gen-tie line. Greater than 55 plants were detected throughout the Survey Area in spring 2011, and 622 plants were found in fall 2011 (Tetra Tech EC and Karl, 2011a; 2011b).

Abram's Spurge

Status: Abram's spurge is a CNPS List 2.2 species, meaning it is rare in California but more common elsewhere.

Distribution: This annual herb is native to California at elevations ranging between sea level and 915 feet in Imperial, Riverside, San Bernardino, and San Diego Counties. The CNDDB notes 15 records in California. Two observations are from Riverside County: a 1968 record from the Coachella Valley and a 2000 record about 22 miles west of Blythe (CNDDB, 2011).

Habitat and Biology: Abram's spurge is reported from creosote bush scrub communities in sandy or silty soils. Observed plants on the Project site were found in very fine, compacted silt soils with low sand composition.

Status in Project Site: During fall 2011 surveys, Abram's spurge was found on the Project site primarily within the central portion of the solar plant site and an additional population along the gen-tie line north of I-10. Abram's spurge was not found south of I-10. The total population size in the Survey Area is estimated to be approximately 4,000 individuals. It was found almost exclusively in shallow depressions and runnels where it was patchily distributed.

Based on a follow-up survey of suitable habitats (swales and playas) in the Blythe area and Chuckwalla Valley, tens of thousands of plants were noted along Ford Dry Lake and also on Hayfield Dry Lake, approximately 20 and 60 miles west of Project, respectively. Abram's spurge was the dominant or co-dominant understory species in both locations. So, although the species occurs on Project, it is neither restricted to that site nor does it reach its highest abundance there. This species is more widespread in the Blythe region than formerly known or documented in the scientific literature base (Tetra Tech EC and Karl, 2011b).

California Ditaxis

Status: California ditaxis is a CNPS List 3 species, meaning that more information is needed about this species to determine its rarity.

Distribution: The CNPS reports 20 occurrences with several records near the I-10 corridor between approximately Palm Desert and Desert Center (CNPS, 2011). The nearest reported record to the Project is from the Chuckwalla Valley approximately 30 miles west of the Project.

Habitat and Biology: This perennial herb occurs at elevations ranging between 30 and 1,000 feet in sandy soils of creosote bush scrub. It grows in spring and fall, in response to rain, with aboveground portions dying back in dry periods.

Status in Project Site: Two populations consisting of four plants were found to the immediate west of the solar plant site boundary during fall 2011 surveys (Tetra Tech EC and Karl, 2011b). This species also blooms in spring; however, was not observed during Project spring 2011 surveys (Tetra Tech EC and Karl, 2011a). The identified plants were located within the study area but outside of the area of Project disturbance.

Harwood's Milk-vetch

Status: Harwood's milk-vetch is a CNPS List 2.2 plant species, which means that it is classified as fairly endangered in California, but more common elsewhere (CNPS, 2011); it is also a plant species covered under the NECO Plan (BLM, 2002) (Figure 3.3-6).

Distribution: This is an annual herb species that mainly occurs in Sonoran desert scrub habitat and occurs throughout the Colorado Desert (BLM, 2002). It is documented with 21 occurrences in CNDDB and 42 records in the California Consortium of California Herbaria (roughly half of which are duplications of the CNDDB occurrences).

Habitat and Biology: This annual herb in the Fabaceae family grows in sand-based soils of the Sonoran creosote bush scrub community, at elevations of 300 to 1,200 feet. Blooming occurs from February to May, depending on ambient temperatures and rainfall. In most years, the species is present within its range in low numbers, often in graded areas such as otherwise denuded road shoulders, probably a response to scarification of the seed coat by machinery. In high rainfall years, it is very abundant, especially in old road berms. It can be distinguished from the generally more common and widespread, sympatric *Astragalus aridus* by its nearly glabrous, spreading to reflexed, inflated pods; more subtle differences include leaflet separation and shape (Tetra Tech EC and Karl, 2011a).

Status in Project site: Harwood's milk-vetch was found on the Project site in swales of the eastern portion of the solar plant site, and scattered on the linear corridors, and switchyard. The population size in the entire Survey Area is estimated to be greater than 465 individuals (Tetra Tech EC and Karl, 2011a).

Las Animas Colubrina

Status: Las Animas colubrina is a CNPS List 2.3 species, indicating it is rare but not very endangered in California and more common elsewhere; it is also a plant species covered under the NECO Plan (BLM, 2002) (Figure 3.3-7).

Distribution: This 6- to 10-foot-tall, deciduous shrub is native to southeastern California, Arizona, Baja California and northern Sonora, Mexico (CNPS, 2011).

Habitat and Biology: The Las Animas colubrina is commonly found in the drainages and runoff areas of rocks in the creosote bush scrub plant community of the Sonoran Desert at elevations below 3,300 feet. The species usually blooms in April and May, depending on the timing of winter storms.

Status in Project Site: The conspicuous species is common in the drainages of the western portion of the solar plant site, although never abundant. The total approximate population size estimated at greater than 267 plants (Tetra Tech EC and Karl, 2011a).

Ribbed Cryptantha

Status: Ribbed cryptantha is a CNPS List 4.3 species, meaning it has a limited distribution but is not very endangered in California.

Distribution: Ribbed cryptantha typically occurs in loose friable soils in the eastern Mojave and Sonoran deserts in Imperial, Riverside, San Diego, and San Bernardino counties (CNPS, 2011). Ribbed cryptantha occurs in the eastern Mojave Desert and the Sonoran Desert from California to Arizona and south to Baja California, Mexico.

Habitat and Biology: The Ribbed cryptantha commonly occurs in stabilized and partially stabilized desert dunes and sandy areas of Sonoran and Mojavean desert creosote bush scrub, which is the primary vegetation community that characterizes the study area. There are 116 records of this species in the Consortium of California Herbaria database from several locations throughout Riverside, San Diego, and Imperial counties (CCH, 2010 as cited in CEC, 2010b).

Status in Project Site: Most sand sheets in the study area were found to host ribbed cryptantha, which was distributed on the gen-tie line south of I-10. Populations were scattered but large, with total numbers estimated at greater than 1,715 plants (Tetra Tech EC and Karl, 2011a).

Harwood's Eriastrum (Harwood's phlox)

Status: Harwood's eriastrum, also known as Harwood's phlox, is a BLM Sensitive spring annual known from fewer than 20 occurrences worldwide. It is a CNPS List 1B.2 species, which indicates it is rare, threatened, or endangered throughout its range.

Distribution: The distribution of this species is restricted to 14 known occurrences in San Diego, Riverside, and San Bernardino counties, typically in dunes associated with the margins of dry lakes such as Dale, Cadiz, and Soda lakes.

Habitat and Biology: This species is associated with sandy plains or dunes, but typically semi-stabilized soils (CNPS, 2011).

Status in Project Site: Harwood's phlox is distributed in the sand dunes and sheets of the switchyard and gen-tie line. The total population size identified in the Survey Area is greater than 386 individuals (Tetra Tech EC and Karl, 2011a).

Utah Milkvine

Status: Utah milkvine is on CNPS List 4.2, which indicates it is not rare or endangered from a statewide perspective but there are known or documented threats.

Distribution: The range of this species in California includes San Diego, Imperial, Riverside, and San Bernardino counties, and also extends into portions of Arizona, Nevada, and Utah. As a CNPS List 4, it is not tracked by CNDDB, but there are 58 records of this species from the Consortium of California Herbaria database, primarily from San Bernardino and San Diego counties. There is one local record from the nearby Big Maria Mountains from wash and stabilized dune habitat at approximately 1,200 feet elevation (CCH, 2010 as cited in CEC, 2010b).

Habitat and Biology: This species occurs in Mojavean and Sonoran desert scrub habitats, typically sandy or gravelly soils, from approximately 500 feet to 4,300 feet in elevation (CNPS, 2011).

Status in Project Site: On the Project site, it is common to patchily abundant in many drainages, including small runnels. Plants most frequently grew through other plants, using the latter for structure, but also grew independently on the ground. Population size within the Survey Area is estimated at greater than 5,180 plants (Tetra Tech EC and Karl, 2011a).

Other special-status plants that were not detected and not expected in the study area are found in Table 3.3-3.

3.3.2 Applicable Regulations, Plans, and Standards

This section provides a discussion of federal, state, and regional environmental regulations, plans, and standards applicable to the Project for vegetation resources and federal and state jurisdictional areas.

3.3.2.1 Federal

National Environmental Policy Act

NEPA (42 USC §4321 et seq.) declares a continuing federal policy that directs "a systematic, interdisciplinary approach" to planning and decision-making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the CEQ (40 CFR Parts 1500-1508) requires federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of federal actions. The BLM is the Lead Agency under NEPA for the Project.

TABLE 3.3-3
SPECIAL-STATUS PLANTS WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT STUDY AREA

Species	Habitat Requirements and Geographic Range	Potential to Occur or Presence On Site
Plants		
Angel trumpets *Acleisanthes longiflora*	This species occurs in Sonoran desert scrub habitats on carbonate soils from approximately 200 to 300 feet amsl. There are two records from the Consortium of California Herbaria from the Colorado Desert, Palo Verde area (CCH, 2010 as cited in CEC, 2010b).	This species is not expected to occur within the study area primarily since carbonate/limestone derived soils in mountainous areas do not occur within the study area (Tetra Tech EC and Karl, 2011a). Also, the Project site is located at a higher elevation than the typical elevation where this species has been reported. The nearest record of this species is in the Big Maria Mountains approximately 11 miles east of the study area (Tetra Tech EC and Karl, 2011a).
Argus blazing star *Mentzelia puberula*	This plant species occurs in desert scrub and desert woodlands with limestone and granitic slopes above 2,000 feet in elevation. Based on 13 Consortium of California Herbaria database records for this species, this species has been collected from Riverside, San Bernardino, and Imperial counties from the Little and Big Maria Mountains in Riverside County.	This species is not expected to occur in the study area due to lack of limestone and granitic slopes which are soil types preferred by this species that are absent from the study area (Tetra Tech EC and Karl, 2011a). The Project site is located at or below 800 feet amsl, which is below the typical elevation where this species typically occurs.
Arizona spurge *Chamaesyce arizonica*	This species occupies sandy, Sonoran desert scrub habitat areas and has been reported from Imperial, Riverside, San Diego counties and portions of Arizona and Baja, California (CNPS, 2011) from approximately 150 feet to 1,200 feet amsl. There are 7 database records from the Consortium of California Herbaria primarily from San Diego County but also Riverside and Imperial counties often from sandy areas and transition areas between chaparral and desert habitats. The record from Riverside County is near Palm Springs from Andreas Canyon (CCH, 2010 as cited in CEC, 2010b).	Arizona spurge has a low potential to occur within the study area due to the presence of suitable habitat and appropriate elevation range of the Project site. Surveys are pending for this species.
Bitter hymenoxys *Hymenoxys odorata*	Bitter hymenoxys grows riparian scrub and Sonoran desert scrub habitats from 150 feet to 500 feet amsl. This plant species blooms from February through November (CNPS, 2011). There are five CNDDB records for this species for the entire state of California, two of which occur in Riverside County; the nearest CNDDB occurrence is a historical record approximately 5 miles southeast of the site from sandy slope, low bottom lands and overflow flats (CNDDB, 2011).	This species is unlikely due to its association with the Colorado River floodplain; not observed during appropriately timed field surveys.
Bitter snakeweed *Condalia globosa* var. *pubescens*	Also referred to by the common name, spiny abrojo. Bitter snakeweed occurs in Sonoran desert scrub from approximately 400 feet to 3,000 feet amsl. Bitter snakeweed blooms from March through May (CNPS, 2011). Based on 35 records Consortium of California Herbaria database, all records are from Imperial County except one from Riverside County, a record from 1,900 feet elevation from a relatively flat alluvial fan from Chuckwalla Bench (CCH, 2010 as cited in CEC, 2010b). There are no CNDDB records for this species for the State of California. The nearest record for this species is located approximately 22 miles south of the study area (AECOM, 2010a as cited in CEC, 2010b).	This species was not observed during spring 2011 field surveys and is considered unlikely in the study area.
California ayenia *Ayenia compacta*	This species occurs in Mojavean and Sonoran desert scrub habitats from approximately 500 to 3,300 feet amsl. This species blooms from March through April. There are 29 records from the Consortium of California Herbaria database from the Anza Borrego	This species was not observed during spring 2011. There is a possibility that populations may occur due to the presence of suitable habitat is present in the study area.

TABLE 3.3-3 (Continued)
SPECIAL-STATUS PLANTS WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT STUDY AREA

Species	Habitat Requirements and Geographic Range	Potential to Occur or Presence On Site
Plants (cont.)		
California ayenia *Ayenia compacta* (cont.)	area alone, one from Riverside County from a sandy wash in the Santa Rosa Mountains off Martinez Canyon (CCH, 2010 as cited in CEC, 2010b). The nearest CNDDB occurrence is a historical record from 1776 approximately 30 miles southwest of the site in the Chuckwalla Mountains (CNDDB, 2011). There is also a known extant population in the vicinity of the adjacent BSPP (AECOM, 2010a as cited in CEC, 2010b).	
California ditaxis *Ditaxis serrata* var. *californica*	This species occupies Sonoran desert scrub habitat and has been reported as occurring from San Bernardino, Riverside, Imperial, San Diego, and Sonora, Mexico (CNPS, 2011) from approximately 100 to 3,000 feet amsl. There are 23 records from the Consortium of California Herbaria database primarily from Riverside County from sandy, open alluvial fans.	This species was not observed during spring 2011. There is a possibility that populations may occur due to the presence of suitable habitat is present in the study area.
California satintail *Imperata brevifolia*	This species occurs in grassy areas found near chaparral, desert scrub, riparian scrubs, coastal scrub, wet springs, meadows, stream sides and floodplains (Solar Millennium, 2009a as cited in CEC, 2010b) from sea level to approximately 1,500 feet amsl. There are 64 records from the Consortium of California Herbaria database from many northern and southern California counties. Records from Riverside County are from the Palm Springs and San Jacinto Mountains area along irrigation ditches or streams.	California satintail is not expected to occur within the study area due to lack of suitable habitat. Not observed during surveys.
Chaparral sand verbena *Abronia villosa* var. *aurita*	This species occupies sandy soil areas of chaparral, coastal sage scrub, and sandy desert dune habitats (CNPS, 2011) from approximately 240 feet to approximately 4,800 feet amsl. There are 147 records in the Consortium of California Herbaria database many from Riverside County in the San Jacinto Mountains area.	Chaparral sand verbena has a low potential to occur in dune portions of the study area; not observed during surveys.
Coachella Valley milk-vetch *Astragalus lentiginosus* var. *coachellae*	The Coachella Valley Multiple Species Habitat Conservation Plan states that this species occurs on "dunes and sandy flats, along the disturbed margins of sandy washes, and in sandy soils along roadsides and in areas formerly occupied by undisturbed sand dunes. Within the sand dunes and sand fields, this milk-vetch tends to occur in the coarser sands at the margins of dunes, not in the most active blowsand areas. As this species is strongly affiliated with sandy substrates, it may occur in localized pockets where sand has been deposited by wind or by active washes. It may also occur in sandy substrates in creosote bush scrub, not directly associated with sand dune habitat (CVAG, 2007). This plant species blooms from February to May, producing pink to deep magenta-colored flowers. This species occurs on aeolian deposits with fewer than 25 occurrences in the Coachella Valley. Coachella Valley milk-vetch depends on natural disturbances from fluvial and aeolian processes for seedling establishment (BLM, 2002).	This species is not expected to occur in the Project area. The distribution of Coachella Valley milk-vetch is restricted to the Coachella Valley in Riverside County, between Cabazon and Indio. CVAG (2007) identifies six outlying occurrences within a 5-mile area along Rice Road in the Chuckwalla Valley north of Desert Center, California (CVAG 2007); however, USFWS staff has indicated that these occurrences are not of the listed taxon (Engelhard, pers. comm. as cited in CEC, 2010a).
Cove's cassia *Senna covesii*	This species occurs on dry, sandy desert washes and slopes of the Sonoran Desert between 1,600 to 2,000 feet amsl. This species occurs in sandy washes, roadsides, alkaline flats in the Mojave Desert and northern Sonoran Desert between 1,600 to 2,000 feet amsl (Solar Millennium, 2009a as cited in CEC, 2010b).	Cove's cassia was not observed during surveys and considered unlikely in the study area. The study area is located below the typical elevation range where this species is known.

TABLE 3.3-3 (Continued)
SPECIAL-STATUS PLANTS WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT STUDY AREA

Species	Habitat Requirements and Geographic Range	Potential to Occur or Presence On Site
Plants (cont.)		
Crucifixion thorn *Castela emoryi*	This species occurs in Sonoran Desert and Mojavean Desert in scrub habitats and playas with dry, gravelly washes, slopes, and plains from approximately 300 to 2,100 feet amsl. There are 64 records in the Consortium of California Herbaria database from Riverside, San Bernardino, Imperial counties among others and often times prefers grassy or hayfield habitats. There is a record from a hayfield in Chuckwalla Valley.	Crucifixion thorn was not observed during surveys and is considered unlikely in the study area.
Desert portulaca *Portulaca hamiloides*	This species occurs in Joshua tree woodlands and has been reported from Riverside, San Bernardino, and portions of Arizona and Baja, California from 3,000 feet to 3,600 feet amsl (CNPS, 2011).	This species is not expected to occur within the study area due to lack of typical habitat associations and the site being located outside of the elevation range. Not observed during surveys.
Desert sand parsley *Ammoselinum giganteum*	This species occupies Sonoran desert scrub habitat and has been reported from Riverside County, California and portions of Arizona (CNPS, 2011) at approximately 1,200 feet elevation. There are 2 records from the Consortium of California Herbaria database from Riverside County from the Chuckwalla Valley where this species was observed growing in dry basins at 500 feet amsl (CCH, 2010 as cited in CEC, 2010b).	Desert sand parsley was not observed during surveys and is considered unlikely in the study area.
Desert spike moss *Selaginella eremophila*	This is a dense, mat-forming, non-flowering plant. This species occurs in Sonoran creosote bush scrub habitats in gravelly or rocky soils from approximately 600 to 2,700 feet. There are 56 records in the Consortium of California Herbaria database from Riverside and San Diego counties with several records from Anza Borrego State Park, Palm Springs, Palm Canyon, and San Jacinto Mountain Range. One collection from Riverside County is from the vicinity of the Chocolate-Chuckwalla Mountain region near the north side of the Orocopia Mountains from sloped rocky, shady surfaces in gravelly soils (CCH, 2010 as cited in CEC, 2010b).	This species is not expected to occur within the study area due to lack of typical habitat. Not observed during surveys.
Dwarf germander *Teucrium cubense* ssp. *depressum*	This species occurs in desert dune, playa margins, and Sonoran desert scrub habitats from approximately 100 feet to 1,200 feet amsl. This species typically blooms from March to May but may also bloom from September through November. This species typically occurs in sandy soils and wash habitats and is known from fewer than 10 occurrences in California (CNPS, 2011). There are 15 records from Consortium of California Herbaria database from Riverside and Imperial counties; there are records from the Chuckwalla Valley in the Hayfield area and Palo Verde Valley. There is a CNDDB record from Wiley's Well Road (400 feet elevation) during 1979 (CNDDB, 2011). Another CNDDB occurrence is a historical record from 1912 located approximately 7 miles southeast of the site from the Palo Verde Valley (CNDDB, 2011).	Dwarf germander has a low potential to occur in the study area; not observed during surveys.
Foxtail cactus *Coryphantha alversonii*	This species occurs on rocky, granitic soils in Sonoran and Mojavean desert scrub habitats from 200 feet to 4,600 feet amsl. Prior to conducting spring 2009 field surveys, a reference population was observed on April 9, 2009 at a gravel pit northwest of Blythe along State Route 95 and several individuals were observed in relatively undisturbed Sonoran creosote bush scrub	Foxtail cactus was not observed during surveys and is considered unlikely in the study area.

TABLE 3.3-3 (Continued)
SPECIAL-STATUS PLANTS WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT STUDY AREA

Species	Habitat Requirements and Geographic Range	Potential to Occur or Presence On Site
Plants (cont.)		
Foxtail cactus *Coryphantha alversonii* (cont.)	on granitic rock, a preferred habitat type of this species (CNPS, 2011). This species was not found during surveys performed in the study area (AECOM, 2010a as cited in CEC, 2010b). There are 25 records of this species from the Consortium of California Herbaria database from Riverside, Imperial, and San Bernardino counties. There are records from the Chuckwalla Valley from rocky, granitic slopes (CCH, 2010 as cited in CEC, 2010b).	
Mesquite nest straw *Stylocline sonorensis*	This species occupies Sonoran desert scrub habitats around 1,300 feet elevation and has been reported from Riverside County and portions of Arizona and Sonora, Mexico (CNPS, 2011). There are 2 records from the Consortium of California Herbaria database from Riverside County both from the Chuckwalla Mountains, Hayfields region from 1930 (CCH, 2010 as cited in CEC, 2010b).	Mesquite nest straw was not observed during surveys and is considered unlikely in the study area.
Orocopia sage *Salvia greatae*	This species occurs in the southeastern Sonoran Desert and is associated with the Orocopia and Chocolate Mountains on alluvial slopes between 100 and 800 feet amsl. This species has been recorded in the mountainous areas 30 miles west of the study area (Solar Millennium, 2009a as cited in CEC, 2010b). There are 49 records from the Consortium of California Herbaria database several from the Chocolate, Chuckwalla, and Orocopia mountain areas (CCH, 2010 as cited in CEC, 2010b).	This species was not documented within the study area.
Pink fairyduster *Calliandra eriophylla*	This species occurs in the Sonoran Desert in sandy washes, slopes and mesas from 350 to 5,000 feet amsl. There are 62 records from the Consortium of California Herbaria database several from the Chocolate-Chuckwalla Mountains area in Imperial and San Diego counties (CCH, 2010 as cited in CEC, 2010b).	Pink fairy duster was not observed during surveys and is considered unlikely in the study area.
Pink velvet mallow *Horsfordia alata*	This species occurs in the Sonoran Desert in California, Arizona, and Mexico. It occurs in Sonoran desert scrub habitats from approximately 300 to 1,500 feet amsl.	Pink velvet mallow has a low potential to occur in the study area; not observed during surveys.
Sand evening-primrose *Camissonia arenaria*	This species occupies sandy and gravelly areas of Sonoran desert scrub habitat and has been reported from Imperial and Riverside counties and areas of Arizona and Mexico from 200 feet to 2,700 feet amsl (CNPS, 2011). There are 13 records of this species in the Consortium of California Herbaria database several from the Chocolate-Chuckwalla Mountains, Palo Verde Valley, and Ogilby Pass area (CCH, 2010 as cited in CEC, 2010b).	This species has a low potential to occur in the study area; not observed during surveys.
Slender woolly-heads *Nemacaulis denudata* var. *gracilis*	This species occupies desert sand dunes, coastal dunes, and Sonoran desert scrub (CNPS, 2011) from 150 to 1,200 feet amsl. There are 45 records in the Consortium of California Herbaria database from the Palm Springs, Indian Wells area in Riverside County (CCH, 2010 as cited in CEC, 2010b).	Slender woolly-heads have a low potential to occur in the study area; not observed during surveys.
Small-flowered androstephium *Androstephium breviflorum*	This species occurs in desert dune and Mojavean desert scrub habitats from approximately 700 feet to 2,000 feet amsl (CNPS, 2011). This species blooms from March through April and often occurs on desert bajadas.	This species was not documented within the study area.

TABLE 3.3-3 (Continued)
SPECIAL-STATUS PLANTS WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT STUDY AREA

Species	Habitat Requirements and Geographic Range	Potential to Occur or Presence On Site
Plants (cont.)		
Spearleaf *Matelea parvifolia*	This species occurs in Mojavean and Sonoran desert scrub habitats from 1,320 feet to approximately 3,300 feet amsl. This species blooms from March through May (CNPS, 2011). The nearest CNDDB record for this species is from the Chuckwalla Bench area during 1986 from desert dry wash woodland and creosote scrub habitats (CNDDB, 2011).	This species has a low potential to occur in the study area; not observed during surveys.
Wiggins' cholla *Cylindropuntia wigginsii*	Wiggins' cholla is not recognized as a species, but is considered a hybrid of silver cholla (*C. echinocarpa*) and pencil cholla (*C. remosissima*). Wiggins' cholla is not found as a separate species in The Jepson Manual nor in Munz's et al. A California Flora and Supplement; however, the BLM's Proposed Northern and Eastern Colorado Desert Coordinated Management Plan identifies Wiggins' cholla as a special-status species (BLM, 2002). The CNPS recognizes Wiggins' cholla as a CNPS List 3.3 species meaning more information is needed about this species and is not considered very endangered in California and also considers this species a sporadic hybrid of the two *Cylindropuntia* species mentioned above (CNPS, 2011).	Since this species is not a recognized subspecies, Wiggins' cholla is not expected to occur in the vicinity of the proposed action.
White-margined penstemon *Penstemon albomarginatus*	This species is a perennial herb restricted to sandy substrates in desert dunes and Mojavean desert scrub habitats, from 2,000 to 3,000 feet elevation. It appears to be restricted to the southeastern Mojave Desert ecoregion (BLM, 2006; The Nature Conservancy [TNC], 2007) and has no known occurrences as far south as Riverside County. It blooms March through May and flowering does not always appear to be dependent on the amount of rainfall (CNPS, 2011, BLM, 2006). It is believed that established plants may bloom even in very dry years by utilizing water and food resources that are stored in the large taproot (1 to 4 feet long); however rain probably affects germination rates of this species (BLM, 2006; TNC, 2007). In California, this plant often occurs in fine alluvial sand and in wide canyons within a creosote bush scrub community; sandy environments help establish and hold the deep taproot of this species. This species also occurs in deep, loose to stabilized sand, sometimes on sand dunes or in sandy to gravelly washes. Common associate plant species are white bursage, galleta grass, rice-grass, creosote bush, range rattany, goldenhead, and winterfat (TNC, 2007). In Nevada, this species commonly grows along the base of hills and mountains in wind-blown sand dune-like areas, but is also found in deep loose sand in wash bottoms.	White-margined penstemon was not documented within the study area. This species occurs in southern Nevada, western Arizona, and in the western Mojave Desert in San Bernardino County (BLM, 2006). Its distribution in the western Mojave Desert is restricted, occurring in a large four-mile long wash near Pisgah Crater and Lavic Lake, extending southwest from Sleeping Beauty Peak, crossing Interstate 40, and terminating in a flat spreading basin south of Interstate 40 (BLM, 2006). There are 19 recent CNDDB records for the entire state of California all of which are from San Bernardino County near the vicinity of Highway 40 and Pisgah Crater (CNDDB, 2011). There are 40 records of this species from the Consortium of California Herbaria database from the same general Ludlow and Lavic areas in San Bernardino County; most of these records are from sandy substrates associated with dry desert washes and desert scrub habitats (CCH, 2010 as cited in CEC, 2010b). It has low potential to occur in the Project area but is included here because it has been found outside its previously documented range (Andre, 2010, as cited in CEC, 2010a) and is a species of particular concern to BLM due to threats across its restricted range. Applicants were directed to include this species in botanical survey lists.

SOURCES: CEC 2010; CNDDB 2011; Tetra Tech and Karl, 2011

Executive Order 13112 – Invasive Species

Executive Order 13112 was signed in February 1999 and established the National Invasive Species Council. This Order requires agencies to identify actions that may affect the status of invasive species. It also directs federal agencies not to authorize, fund, or carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that the agency has prescribed, it has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Plant Protection Act of 2000

The Plant Protection Act of 2000 (7 USC Ch. 104) established a federal program to control the spread of noxious weeds. The Secretary of Agriculture is authorized to publish a list of plants designated as noxious weeds (7 USC §7712(f)). The movement of all such weeds in interstate or foreign commerce is prohibited except under permit.

Lacey Act, as amended

The Lacey Act (16 USC §§3371-3378) protects plants and wildlife by creating civil and criminal penalties for a wide variety of violations including illegal take, possession, transport or sale of protected species.

Federal Endangered Species Act

The FESA (16 USC §1531 et seq.) designates threatened and endangered species, both animal and plant species, and provides measures for their protection and recovery. “Take” of listed species is prohibited without obtaining a federal permit. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage the habitat of (i.e., harm) listed wildlife species require approval from the USFWS for terrestrial species. The FESA also generally requires determination of critical habitat for listed species. If critical habitat has been designated, impacts to areas that contain the primary constituent elements identified for the species, whether or not it is currently present, is also prohibited. FESA §7 and §10 provide two pathways for obtaining authority to take listed species.

For projects proposed on federal lands, federal agencies, such as the BLM are required by the FESA to ensure that any action they authorize, implement, or fund, including energy developments, will not jeopardize the continued existence of any federally threatened or endangered species or destroy or adversely modify designated critical habitat. In a §7 consultation, the lead agency (e.g., BLM) prepares a BA that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat, and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, the USFWS then has 135 days to respond to the BA by issuing its

BO determining whether the project is likely to jeopardize the species or result in adverse modification of critical habitat.

If a "nonjeopardy" or "no adverse modification" opinion is provided by the USFWS, the action agency may proceed with the action as proposed. If a jeopardy or adverse modification opinion is provided, the USFWS may prepare a BO with reasonable and prudent measures to minimize take and associated, mandatory terms and conditions that describe the methods for accomplishing the reasonable and prudent measures. In a BO that results in a jeopardy or adverse modification conclusion, the USFWS may develop mandatory reasonable and prudent alternatives to the proposed action.

FESA §10 requires the issuance of an incidental take permit before any public or private action may be taken that would harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that provides specific measures to avoid, offset, or minimize impacts on threatened or endangered species.

BLM Sensitive Species

BLM Sensitive Species are species designated by the State Director that are not already federally listed, proposed, or candidate species, or state listed because of potential endangerment. BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered." Various offices of the BLM maintain a list of special-status plant and wildlife species that are to be considered as part of the management activities carried out by the BLM on the lands that they administer.

CDCA Plan

The CDCA Plan covers approximately 25 million acres of land in southern and southeastern California, with approximately 10 million acres being administered by the BLM. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development and protection of the resources and public lands within the CDCA and is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality.

The multiple use classes comprise the backbone of the CDCA Plan, essentially zoning the CDCA into four major use categories, as a city or county is zoned for land use classes. The CDCA Plan categories include approximately 4 million acres of Class C (controlled) lands (including roughly 3,600,000 acres of wilderness areas created under the 1994 CDPA) to be preserved in a natural state with access generally limited to non-motorized, non-mechanized means; approximately 4 million acres of Class L (limited use) lands, providing for generally lower intensity, carefully controlled uses that do not significantly diminish resource values; approximately 1.5 million acres of Class M (moderate use) lands designated for mining, livestock grazing, recreation, energy, and utility development with mitigation required for any damage caused by permitted uses; and approximately 500,000 acres of Class I (intensive use) lands managed for concentrated uses with reasonable protection provided for sensitive natural values and mitigation of impacts and rehabilitation of impacted areas occurring when possible (BLM, 2007).

The CDCA Plan's goals and actions for each resource are established in its 12 elements including the Vegetation Element and the Energy Production and Utility Corridors Element, among several others (BLM, 2007). The Project site is located within Class L lands (BLM, 1980, fold-out map).

According to the Plan's Multiple Use Class Guidelines, wind/solar power plants may be allowed within Class L lands after NEPA requirements are met (BLM, 1980). The Energy Production and Utility Corridors Element section of the Plan states, however, that "Plan amendment procedures will adequately provide for the coordination needed for assuring rapid implementation of these important fuel-replacement alternative energy programs in an environmentally sound manner" (BLM, 1980).

NECO Plan

The NECO Plan is a landscape-scale, multi-agency planning effort approved in 1992 that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over 5 million acres and hosts 60 sensitive plant and animal species. NECO amends the 1980 CDCA plan to provide additional protections to wildlife and plants, particularly the desert tortoise. A summary of the major plan amendment decisions of NECO includes:

1. Establish Regional Standards for Public Land Health and set forth guidelines for grazing management

2. Establish two DWMAs encompassing about 1.75 million acres that are managed as Areas of Critical Environmental Concern for recovery of the desert tortoise.

3. Establish the Southern Mojave and Sonoran WHMAs or bighorn sheep totaling over 1 million acres and 13 multi-species WHMAs totaling over 500,000 acres such that 80 percent of the distribution of all special-status species and all natural community types are included in conservation management areas.

4. Combine Herd Management Areas for wild horses and burros and adjust the Appropriate Management Levels.

5. Designate routes of travel (approximately 95 percent of existing routes will remain available for vehicle access).

6. Identify priorities for potential acquisition of private lands and disposal of public lands.

7. Provide access to resources for economic and social needs.

8. Incorporate 23 wilderness areas (totaling over 1 million acres) established by the 1994 California Desert Protection Act in the CDCA.

Approved mitigation measures were presented in Appendices D through G of the Proposed NECO Plan and Final Environmental Impact Statement (FEIS) relating to desert tortoise, desert restoration, public education, and limitations on cumulative new surface disturbance. All practicable means to avoid or minimize environmental harm by the plan have been adopted.

Executive Order 11990 - Protection of Wetlands

This order establishes a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC §§661-666) applies to any federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the NEPA process and §404 permit process.

3.3.2.2 State

California Endangered Species Act

The CESA (Fish and Game Code §2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take is defined similarly to FESA, and is prohibited for both listed and candidate species. Take authorization may be obtained by the project applicant from CDFG under the CESA §2081, which allows take of a listed species for educational, scientific, or management purposes. In this case, private developers consult with CDFG to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

Other Sections of the California Fish and Game Code

Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. CDFG cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock. Furthermore, it is the responsibility of the CDFG to maintain viable populations of all native species. To that end, the CDFG has designated certain vertebrate species as Species of Special Concern because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

California Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 directed the CDFG to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. The CESA expanded

on the original NPPA and enhanced legal protection for plants, but the NPPA remains part of the Fish and Game Code. To align with federal regulations, the CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in the CESA, mitigation measures for impacts to rare plants are specified in a formal agreement between CDFG and the project proponent.

Porter-Cologne Water Quality Control Act

The intent of the Porter-Cologne Water Quality Control Act (Water Code Div. 7, §13000 et seq.) is to protect water quality and the beneficial uses of water, and applies to both surface and groundwater. Under this law, the California State Water Resources Control Board develops statewide water quality plans, and the RWQCBs develop basin plans that identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans. Waters regulated under Porter-Cologne include isolated waters that are no longer regulated by ACOE. Developments which impact jurisdictional waters must demonstrate compliance with the goals of the Act by developing Storm Water Pollution Prevention Plans (SWPPP), Standard Urban Storm Water Mitigation Plans, and other measures in order to obtain a CWA §401 certification.

Lake and Streambed Alteration Program

Prior to commencement of any activity that would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank (which may include associated riparian resources) of a river, stream or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, the applicant shall submit a complete Lake or Streambed Alteration Program notification package and fee to the CDFG. The Lake and Streambed Alteration Program is a California law that requires that any person, state or local government agency, or public utility notify the CDFG prior to beginning of the activities listed above. The CDFG has 30 days to review the proposed actions and propose measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFG and the project proponent becomes the Lake or Streambed Alteration Agreement. The conditions of agreement and a CWA §404 permit often overlap.

3.4 Biological Resources – Wildlife

This section describes the environmental setting and wildlife resources present or with potential to occur on the Project site. The Wildlife Resources study area describes the area characterized and surveyed for biological resources and included the 4,900-acre Project site with general and focused wildlife surveys performed at 100 percent ground coverage, an additional 500 foot buffer for burrow owls that was surveyed at 100 percent ground coverage, and two walking transects at 1,310 feet (400 meters) and 1,970 feet (600 meters) for desert tortoise. The total study area thus included up to approximately 7,700 acres of public land administered by the BLM and approximately 477 acres of private land under the land use jurisdiction of the County. Desert tortoise surveys were also conducted in the 1,733-acre desert tortoise translocation area located immediately west of the Project site. Helicopter surveys for golden eagle considered the Project site and a 10-mile survey buffer, for a total survey area of approximately 314 square miles.

The entirety of the Project site and study area supports a variety of desert-adapted wildlife that use the natural plant communities described in Section 3.3, *Biological Resources - Vegetation.* This section was compiled, in part, based on the focused studies for the Project and the findings and supporting technical analysis for the CEC's Revised Staff Assessment for the adjacent BSPP, March 2010.

Reptile residents include side-blotched lizard (*Uta stansburiana*), Mojave fringe-toed lizard (*Uma scoparia*), common chuckwalla (*Sauromalus ater*), desert iguana (*Dipsosaurus dorsalis*), western whiptail (*Aspidoscelis tigris*), sidewinder (*Crotalus cerastes*), and desert patch-nosed snake (*Salvadora hexalepis* ssp. *hexalepis*). Typical birds include verdin (*Auriparus flaviceps*), greater roadrunner (*Geococcyx californianus*), black-tailed gnatcatcher (*Polioptila melanura*), ash-throated flycatcher (*Myiarchus cinerascens*), and great-tailed grackle (*Quiscalus mexicanus*), while mammals are represented primarily by round-tailed ground squirrel (*Xerospermophilus tereticaudus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), desert kangaroo rat (*Dipodomys deserti*), pocket mice (*Chaetodipus* spp.), and black-tailed jackrabbit (*Lepus californicus*) (Tetra Tech EC and Karl, 2011a).

3.4.1 Environmental Setting

3.4.1.1 Special-Status Animal Species

Special-status wildlife consists of species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. Special-status wildlife is defined as meeting one or more of the following criteria:

1. Listed as threatened or endangered or candidates for future listing as threatened or endangered under the CESA or FESA;

2. Protected under other regulations (e.g., Migratory Bird Treaty Act (MBTA); Bald and Golden Eagle Protection Act (BGEPA));

3. Identified as a species of special concern by the CDFG;

4. Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region, or is so designated in local or regional plans, policies, or ordinances; or

5. Fully protected species protected under FGC §§3511, 4700, 5050, and 5515; or

6. Nesting birds protected under FGC §§3503 and 3513.

The BLM designates Sensitive species as those requiring special management considerations to promote their conservation and reduce the likelihood and need for future listing under FESA. BLM Sensitive species include all Federal Candidate and Federally Delisted species which were so designated within the last 5 years, and CNPS List 1B species that occur on BLM lands. For the purposes of this document, all BLM Sensitive species are treated as special-status species.

An assessment of the distribution of special-status wildlife resources in the study area relied on a literature review, biological reconnaissance surveys and coordination with appropriate permitting agencies and resource specialists. In advance of surveys, researchers reviewed the CNDDB and the distribution of special-status species reported by the BLM in the CDCA NECO Plan area. The following site-specific and Project-specific documents also were reviewed:

1. Tetra Tech EC, Inc. and Alice E. Karl, Ph.D., 2011a. *Biological Resources Technical Report, McCoy Solar Energy Project, Riverside County, CA* (August 8, 2011).

2. Tetra Tech EC, Inc. and Alice E. Karl, Ph.D., 2011b. *Fall 2011 Plants and Supplemental Wildlife Survey Report, McCoy Solar Energy Project, Riverside County, CA* (December, 2011).

3. Tetra Tech EC, Inc., 2011. *Golden Eagle Risk Assessment, McCoy Solar Energy Project, Riverside County, CA* (August 8, 2011).

Focused biological surveys were conducted by qualified wildlife biologists who were familiar with wildlife resources in the Project vicinity. Field surveys for desert tortoise, burrowing owl, golden eagle, and other wildlife species were conducted from April to June, 2011 (Tetra Tech EC and Karl, 2011a). The purpose of field surveys was to characterize wildlife use of the study area. Surveys focused on the proposed 4,900-acre solar plant site and linear facilities ROW, with additional buffer areas depending upon species. Desert tortoise surveys were performed to a distance of 1,968 feet (600 meters) from the Project site; burrowing owl surveys considered a study buffer of 500 feet from the Project site; and golden eagle helicopter surveys included an approximately 10-mile study buffer. Results of the literature review and field surveys were summarized in two biological resources reports (Tetra Tech EC and Karl, 2011a; 2011b). The BLM's consultant, Environmental Science Associates (ESA), verified the biological conditions of the Project site on September 13, 2011. Table 3.4-1 identifies those special-status wildlife species that were evaluated during the analysis and their likelihood to occur in the Project area and vicinity. Only special-status wildlife detected within the study area, or likely to occur within the study area, are discussed in more detail below.

TABLE 3.4-1
SPECIAL-STATUS WILDLIFE KNOWN TO OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name[a]	Scientific Name	Status State/Federal/BLM
WILDLIFE		
Reptiles/Amphibians		
Desert tortoise	***Gopherus agassizii***	**ST/FT**
Couch's spadefoot toad	*Scaphiopus couchii*	CSC/__/BLM Sensitive
Mojave fringe-toed lizard	***Uma scoparia***	**CSC/__/BLM Sensitive**
Desert rosy boa	*Charina (Lichanura) trivirgata*	__/__/__
Chuckwalla	***Sauromalus obesus***	__/__/__
Birds		
Western burrowing owl	***Athene cunicularia hypugaea***	**CSC/BCC/BLM Sensitive**
Golden eagle	***Aquila chrysaetos***	**CFP/__/BLM Sensitive**
Short-eared owl	*Asio flammeus*	CSC/__/__
Ferruginous hawk	*Buteo regalis*	WL/__/BLM Sensitive
Swainson's hawk	***Buteo swainsoni***	**ST**/__/__
Vaux's swift	***Chaetura vauxi***	**CSC**/__/__
Mountain plover	*Charadrius montanus*	CSC/__/BLM Sensitive
Northern harrier	***Circus cyaneus***	**CSC**/__/__
Gilded flicker	*Colaptes chrysoides*	SE/__/__
Yellow warbler	***Dendroica petechia sonorana***	**CSC**/__/__
Prairie falcon	***Falco mexicanus***	**WL**/__/__
American peregrine falcon	***Falco peregrinus anatum***	**CFP**/__/__
California horned lark	***Eremophila alpestris actia***	**WL**/__/__
Yellow-breasted chat	*Icteria virens*	CSC/__/__
Loggerhead shrike	***Lanius ludovicianus***	**CSC/__/BCC**
Gila woodpecker	*Melanerpes uropygialis*	SE/__/__
Black-tailed gnatcatcher	***Polioptila melanura***	__/__/__
Purple martin	*Progne subis*	CSC/__/__
Vermilion flycatcher	*Pyrocephalus rubinus*	CSC/__/__
Bendire's thrasher	*Toxostoma bendirei*	CSC/__/BLM Sensitive
Crissal thrasher	*Toxostoma crissale*	CSC/__/__
Le Conte's thrasher	***Toxostoma lecontei***	**WL/BCC/BLM Sensitive**
Mammals		
Pallid bat	*Antrozous pallidus*	CSC/__ /BLM Sensitive
Townsend's big-eared bat	*Corynorhinus townsendii*	CSC/__/BLM Sensitive
Burro	***Equus asinus***	__/__/__
Spotted bat	*Euderma maculatum*	CSC/__/ BLM Sensitive
Western mastiff bat	*Eumops perotis californicus*	CSC/__/ BLM Sensitive
Hoary bat	*Lasiurus cinereus*	__/__/__
California leaf-nosed bat	*Macrotus californicus*	CSC/__/ BLM Sensitive
Arizona myotis	*Myotis occultus*	CSC/__/__
Cave myotis	*Myotis velifer*	CSC/__/ BLM Sensitive
Yuma myotis	*Myotis yumanensis*	__/__/BLM Sensitive
Colorado Valley woodrat	*Neotoma albigula venusta*	__/__/__
Pocket free-tailed bat	*Nyctinomops femorosaccus*	CSC/__/__
Big free-tailed bat	*Nyctinomops macrotis*	CSC/__/__
Burro deer[a]	*Odocoileus hemionus eremicus*	__/__/__
Nelson's bighorn sheep	*Ovis canadensis nelson*	__/__/BLM Sensitive
Yuma mountain lion	***Puma concolor browni***	**CSC**/__/__

TABLE 3.4-1 (Continued)
SPECIAL-STATUS WILDLIFE KNOWN TO OR WITH POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name	Scientific Name	Status State/Federal
WILDLIFE (cont.)		
Mammals (cont.)		
American badger	***Taxidea taxus***	**CSC/__/__**
Desert kit fox	***Vulpes macrotis arsipus***	**__/__/__**

NOTES:

[a] Species highlighted in **bold-face type** were identified during surveys of the study area.

Status codes:

Federal

FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities

State

SE = State listed as endangered
ST = State listed as threatened
CSC = California Species of Special Concern. Species of concern to CDFG because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction
CFP = California Fully Protected Species
WL = State watch list

Bureau of Land Management

BLM Sensitive = = Species that require special management consideration to avoid potential future listing under the FESA and that have been identified in accordance with procedures set forth in BLM Manual section 6840.
http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.43545.File.dat/6840.pdf

SOURCE: CNDDB, 2011; Tetra Tech EC and Karl, 2011a; 2011b; Tetra Tech EC, 2011

Desert Tortoise

Natural History

The desert tortoise was state-listed in California as threatened on August 3, 1989. The Mojave population was federally listed as threatened on April 2, 1990, and critical habitat was designated on February 8, 1994. The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (USFWS, 2011a). The desert tortoise's range, outside the listed Mojave population, extends into the Sonoran Desert, where tortoises occur in the lower Colorado River Valley, Arizona uplands, plains of Sonora, and the central Gulf Coast; the species has not been documented in northeastern Baja California (USFWS, 2011a) (Figures 3.4-1 and 3.4-2).

Desert tortoises are well adapted to living in a highly variable and often harsh desert environment. They spend much of their lives in burrows, even during their seasons of activity, which generally coincides with the greatest annual forage availability. In late winter or early spring, they emerge from over-wintering burrows and typically remain active through fall. Activity does decrease in summer, but tortoises often emerge after summer rain storms (Henen

et al., 1998; USFWS, 2011a). During activity periods, desert tortoises eat a wide variety of herbaceous vegetation, particularly grasses and the flowers of annual plants (USFWS, 2011a). During periods of inactivity, they reduce their metabolism and water loss and consume very little food. Adult desert tortoises lose water at such a slow rate that they can survive for more than a year without access to free water of any kind and can apparently tolerate large imbalances in their water and energy budgets (Nagy and Medica, 1986 as cited in CEC, 2010; USFWS, 2011a).

The size of desert tortoise home ranges varies with respect to location and year (Berry, 1986 as cited in CEC, 2010) and also serves as an indicator of resource availability and opportunity for reproduction and social interactions (USFWS, 2011a). Females have long-term home ranges that may be as little or less than half that of the average male, which can range to up to 200 acres. Core areas used within tortoises' larger home ranges depend on the number of burrows used within those areas (Harless et al., 2009 as cited in CEC, 2010). Over its lifetime, each desert tortoise may use more than 1.5 square miles of habitat and may make periodic forays of more than 7 miles at a time (Berry, 1986 as cited in CEC, 2010).

Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (Turner et al., 1984a as cited in CEC, 2010; USFWS, 2011a). Mating occurs during spring, summer, and fall (Black, 1976; USFWS, 2011a), and the number of eggs as well as the number of clutches (set of eggs laid at a single time) that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (USFWS, 2011a). Egg-laying occurs primarily from April to July (USFWS 2011a); the female typically lays 2 to 14 eggs (average 5 to 6 eggs) in an earthen chamber excavated near the mouth of a burrow or under a bush (Woodbury and Hardy, 1948 as cited in CEC, 2010; USFWS 2011a). The eggs typically hatch 90 to 120 days later, between August and October. The success rate of clutches has proven difficult to measure, but predation appears to play an important role in clutch failure (Boarman, 1993).

The majority of threats to the desert tortoise and its habitat are associated with human land uses. Many of those that formed the basis for listing the species as threatened continue to affect the tortoise today (USFWS, 2011a). Some of the continued threats to desert tortoise populations include urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens and domestic and feral dogs, unauthorized off-road vehicle activity, authorized vehicle activity, illegal collecting, mortality on paved roads, vandalism, drought, livestock grazing, feral burros, non-native plants, changes to natural fire regimes, and environmental contaminants (USFWS, 2011a).

Although a wide range of threats is known to affect desert tortoises and their habitat, very little is known about these threats' demographic impacts on tortoise populations or the relative contributions each threat makes to tortoise mortality (Boarman, 2002). Extensive research shows that all of these threats can directly kill or indirectly affect tortoises; research has also clarified many mechanisms by which these threats act on individuals. While current research results can lead to predictions about how local tortoise abundance should be affected by the presence of

threats, quantitative estimates of the magnitude of these threats, or of their relative importance, have not yet been developed. Thus, the *Revised Recovery Plan* focuses on expanding the knowledge of individual threats and places emphasis on understanding their multiple and combined effects on tortoise populations (USFWS, 2011a).

The 1994 *Desert Tortoise (Mojave Population) Recovery Plan* identified six recovery units (Upper Virgin River, Northeastern Mojave, Eastern Mojave, Eastern Colorado, Northern Colorado, and Western Mojave) and recommended the establishment of 14 DWMAs throughout the recovery units (USFWS, 1994) (Figure 3.4-2). Since 1994, greater insight into patterns of both ecological and genetic variation within the Mojave desert tortoise population has been gained. The 2011 *Revised Recovery Plan* combined the Eastern Colorado and Northern Colorado recovery areas into the Colorado Desert unit to reflect newly obtained information (USFWS, 2011a).

Within the Colorado Desert Recovery Unit where the Project is located, desert tortoise are found primarily in "the valleys, on bajadas, desert pavements, rocky slopes, and in the broad, well-developed washes (especially to the south)" (USFWS, 2011a). Habitat within this recovery unit has been described as being in excellent condition despite declines in tortoise densities over the past several decades; disturbance was estimated at less than 1.3 percent throughout (USFWS, 2006a). The highest desert tortoise densities within this recovery unit occur in Chemehuevi and Ward valleys approximately 60 miles north of the Project site, on the Chuckwalla Bench within the Chuckwalla DWMA and the associated Chuckwalla critical habitat unit for desert tortoise approximately 50 miles west of the Project site, and in Joshua Tree National Park approximately 40 miles northwest of the Project site (Figure 3.4-2). Desert tortoise densities at the Chuckwalla Bench from 1979 to 1996 were among the highest of California survey plots, though have shown declining trends (Berry, 1997; Tracy et al., 2004).

The 1994 Recovery Plan estimated tortoise densities in the Eastern Colorado Recovery Unit between 5 and 175 adult tortoises per square mile (USFWS, 1994); however, density estimates from 2001 to 2005 (USFWS, 2006b) were lower than estimates from earlier studies (USFWS, 2011a). Differences may reflect a difference in scale between survey methods; however, low tortoise densities across recovery units in later years may also represent continued decline of populations throughout the Mojave Desert since the species was listed (USFWS, 2006b; 2011a). The 2006 Recovery Plan indicated a threat level of 4 out of 5 (5 = extremely high) for tortoises within the Recovery Unit. A threat designation was not made in the 2011 Recovery Plan.

Survey Methods and Results

As part of the application process, the Applicant evaluated the availability and quality of desert tortoise habitat in the study area based on direction provided by the USFWS (Engelhard, 2011 as cited in Tetra Tech EC, Inc. and Karl, 2011a). Survey methods for the desert tortoise generally followed the USFWS survey protocol and included the 4,792-acre solar plant site at 100 percent survey ground coverage (30-foot wide transects), with three additional 30-foot-wide buffer transects at 500 feet (152 meters), 1,310 feet (400 meters), and 1,970 feet (600 meters) from the

site (except south of the site where the BSPP was under construction).[1] The 1,733-acre potential tortoise translocation area located immediately west of the Project site was also surveyed at 100 percent coverage. The 146-acre linear corridors were surveyed at 100 percent coverage, with three additional 30-foot-wide buffer transects at 655 feet (200 meters), 1,310 feet, and 1,970 feet.

Protocol-level surveys of the Project disturbance area and buffer areas were conducted from April 7 through April 21, 2011 (Tetra Tech EC and Karl, 2011a). Additional focused desert tortoise surveys were performed on the solar plant site portions of the gen-tie line, and areas north of the CRS site in September 2011 (Tetra Tech EC and Karl, 2011b). Spring 2011 surveys of the Project site included 1 adult desert tortoise, 30 tortoise carcasses, 7 scat, 22 known or potential burrows, and 210 tortoise shell remains (Table 3.4-2) (Tetra Tech EC and Karl, 2011a). Fall 2011 surveys detected additional tortoise sign (tracks, recent scat, and active burrows) in portions of the solar plant site and gen-tie line and access road route (Tetra Tech EC and Karl, 2011b). No desert tortoises were observed during buffer area surveys, though three tortoises were observed in the potential translocation area each about 0.25-mile west of the Project site (Tetra Tech EC and Karl, 2011a; 2011b).

TABLE 3.4-2
SUMMARY OF DESERT TORTOISE SIGN IN THE PROJECT STUDY AREA

	Number of Observations				
Tortoise Sign Type	**Solar Plant Site**	**Gen-tie Line**	**Within 600 Meters of Solar Plant Site and Gen-tie Line**	**Potential Translocation Area**	**Total**
Individual	1	1	0	3	5
Burrow	8	2	0	13	23
Potential Burrow	14	0	1	5	20
Scat (not associated with burrow)	7	0	0	9	16
Carcass < 4 years old	4	0	1	5	10
Carcass > 4 years old	26		0[a]	14[a]	40
Shell Fragment < 4 years old	4	1	0	0	5
Shell Fragment > 4 years old	170	2	11	8	191
Permineralized Shell Fragment	36	7	7	0	50

[a] Three carcasses in the potential translocation area were identified within 600 m of the Project site

SOURCE: Tetra Tech EC and Karl, 2011a; 2011b

[1] Note that the 600 foot (200 meter) survey transect was replaced by a 500 foot transect, thus, the protocol deviated somewhat from the standard USFWS desert tortoise survey protocol.

Tortoise sign was strongly associated with vegetated, incised drainages on the west portion of the Project site. Other portions of the Project site did not show evidence of current or past tortoise inhabitation (i.e., no scat, burrows, or tortoises were detected), supporting the observation that tortoise use of the site is patchy and that not all potentially suitable habitat is occupied. Following surveys, two methods were used to estimate density on the Project site. The first used the USFWS (2010) protocol that estimates density based on the number of live tortoises observed. This method yielded a population estimate of 1.8 adult tortoises (range: 0.33 to 9.65), which is equivalent to 0.2 adult tortoises per square mile (Tetra Tech EC, Inc. and Karl, 2011a).

An alternative method was also used to estimate density based on the type and distribution of sign, taking into account tortoise home range sizes. Recent tortoise sign (scat and burrows) on the site was grouped into two areas of relatively low concentrations in the northwestern portion of the Project site. One group was associated with a single observed tortoise; the second concentration consisted of adult-sized burrows. Using a 1,980-foot (600-meter) home range radius generates an estimate of two tortoises on the solar plant site, or 0.2 adult tortoises per square mile, which is comparable to the USFWS protocol estimate (Tetra Tech EC, Inc. and Karl, 2011a).

These low densities and uneven use of the Project site, with nearly all use concentrated in the western portion of the Project site and west to the mountains, are consistent with the results from the BSPP surveys in 2009 and 2010 (AECOM, 2010a as cited in CEC, 2010). The BSPP surveys found only three adult tortoises in one year of surveys and four in the next year. Tortoise sign indicating use (i.e., burrows, scat, and tortoises) was noted in the western portion of the BSPP site and areas further west near the McCoy Mountains. The area between the McCoy Mountains and the Project site and BSPP sites forms a continuous corridor of occupied habitat that links tortoise populations north of the Project site to those south of the site.

There are 4,792 acres of suitable desert tortoise habitat on the solar plant site, including 2,194 for Unit 1 and 2,598 for Unit 2 (Tetra Tech EC and Karl, 2011a). Because areas south of I-10 are sandier and provide less favorable habitat for tortoises (Tetra Tech EC and Karl, 2011a), of the 146 acres of off-site disturbance areas associated with the gen-tie line, and switchyard, 108 acres provide habitat for desert tortoise (Tetra Tech EC, Inc. and Karl, 2011a). The total area of desert tortoise habitat in the Project disturbance area is 4,900 acres.

Mojave Fringe-toed Lizard

Natural History

Mojave fringe-toed lizards are widespread geographically across the Mojave and northern Colorado deserts, occurring primarily in San Bernardino, eastern Riverside, and southeastern Inyo counties (Figures 3.4-3 and 3.4-4). Their distribution is naturally fragmented because of their obligate habitat specificity to loose sand, a patchy habitat type (Murphy et al., 2006 as cited in CEC, 2010). Many local populations of this species are quite small, with small patches of sand supporting small populations of lizards. This fragmented pattern of distribution leaves the species vulnerable to local extirpations from additional habitat disturbance and fragmentation (Murphy et al., 2006 as cited in CEC, 2010). The loose wind-blown sand habitat upon which the species is

dependent is a fragile ecosystem requiring the protection against both direct and indirect disturbances (Griffiths et al., 2002; Barrows, 1996 as cited in CEC, 2010).

Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors will also affect this species (Turner et al., 1984b as cited in CEC, 2010; Jennings and Hayes, 1994). Additional threats to this species include habitat loss or damage from urban development, off-highway vehicles (OHVs), and agriculture. Aside from the direct loss of land, development can also increase predators, such as the common raven, in Mojave fringe-toed lizard-occupied habitat. The BLM allows intensive OHV use over a majority of the species' range in California and Arizona. The restricted range of this species and intensive uses of habitat both contributed to its characterization as a BLM sensitive species.

The Mojave fringe-toed lizard is found in arid, sandy, sparsely vegetated habitats and is associated with creosote scrub throughout much of its range (Norris, 1958 as cited in CEC, 2010; Jennings and Hayes, 1994). This species is totally restricted to habitats of fine, loose aeolian sand, typically with sand grain size no coarser than 0.375 mm in diameter (Turner et al., 1984b as cited in CEC, 2010; Jennings and Hayes, 1994; Stebbins, 1944 as cited in CEC, 2010). They burrow in the sand for both cover from predators and protection from undesirable temperatures (Stebbins, 1944 as cited in CEC, 2010), though they will also seek shelter in rodent burrows. They are primarily insectivorous, but also eat plant food including leaves, seeds, and buds (Stebbins, 1944 as cited in CEC, 2010; USFWS, 2011b).

Mojave fringe-toed lizards normally hibernate from November to February, emerging from hibernation sites from March to April. The breeding season is April to July, and adult Mojave fringe-toed lizards reach sexual maturity two summers after hatching (Jennings and Hayes, 1994; USFWS, 2011b). From April to May, while temperatures are relatively cool, this species is active during mid-day; from May to September, they are active in mornings and late afternoon, but seek cover during the hottest parts of the day. Common predators of the Mojave fringe-toed lizard include burrowing owls, leopard lizards, badgers, loggerhead shrikes, roadrunners, various snakes, and coyotes (Jennings and Hayes, 1994).

Survey Results

There are no formal survey protocols for Mojave fringe-toed lizards; therefore, surveys were conducted concurrently with desert tortoise surveys from April 7 through April 21, 2011, with incidental observations also recorded during fall 2011 botanical surveys. Surveys were conducted when temperatures were sufficiently warm to detect lizards during a period when lizards were active. Survey intensity was sufficient to document the presence of Mojave fringe-toed lizards within suitable habitat, as well as document the boundaries of Mojave fringe-toed lizard habitat.

Mojave fringe-toed lizards are loose-sand specialists, found only in aeolian sand dunes, sand fields, hummocks, and other areas with loose sand deposits, between 300 and 3,000 feet in elevation (Stebbins, 2003). The sand dunes on the gen-tie line route south of I-10 provide the only suitable Mojave fringe-toed lizard habitat in the Project Area, with no suitable habitat north of the I-10 or at the solar plant site. Biologists observed 75 Mojave fringe-toed lizards in spring 2011

and 188 additional lizards in fall 2011 during surveys, and sand dune and sand sheet habitat along a 4-mile portion of the gen-tie line route south of I-10 during spring 2011 surveys (Tetra Tech EC and Karl, 2011a).

Chuckwalla

Natural History

The chuckwalla is a large iguanid lizard that occurs in the desert regions of southeastern California, as well as in portions of Utah, Arizona, Nevada, and Mexico. Principally active from March through August, this herbivore inhabits rocky areas and often uses rock cover to escape from predators. In the Project area, the rocky landscape is typically vegetated by creosote bush and other drought-tolerant scrub habitats.

Survey Results

Though focused surveys were not performed to characterize chuckwalla populations on the Project site, this species was incidentally noted during desert tortoise and burrowing owl surveys (Tetra Tech EC, Inc. and Karl, 2011a). Habitat for this species is presumed to occur in rocky portions of the Project site.

Couch's Spadefoot Toad

Natural History

Couch's spadefoot toads are found in southeastern California east through Arizona, New Mexico, Texas, and Oklahoma, south to San Luis Potosi, Nayarit, Mexico, at the southern tip of Baja California, Mexico, and as an isolated population in Colorado. In California, they are found in the extreme southeast, including southeastern San Bernardino County and eastern Riverside and Imperial Counties (Jennings and Hayes, 1994) (Figure 3.4-5).

Couch's spadefoot toads are found in a variety of plant communities, including desert dry wash woodland, creosote bush scrub, and alkali sink scrub. They require habitat with substrate capable of sustaining temporary pools for breeding, and loose enough to permit burial in subterranean burrows (Jennings and Hayes, 1994; BLM, 2002). Breeding habitat includes temporary impoundments at the base of dunes as well as road or railroad embankments, temporary pools in washes or channels, pools that form at the downstream end of culverts, and playas. The majority of known Couch's spadefoot toad breeding ponds are artificial, though this may be because of the difficulty of locating natural ponds within the limited amount of time ponds may retain water. Couch's spadefoot toads' food source consists primarily of alate termites, but also includes beetles, ants, grasshoppers, spiders, and crickets.

This species is dormant from 8 to 10 months of the year, emerging from burrows at the onset of warm summer rains. Emergence appears to be triggered by the low-frequency sound caused by falling rain, though it appears to be inhibited by low soil temperatures.

Threats to Couch's spadefoot toads include loss of habitat from urbanization and agriculture and impacts from OHVs, which can destroy potential pool habitat. There are also indications that the

low-frequency sound created by OHVs may trigger emergence cues, and result in emergence in poor environmental conditions (Jennings and Hayes, 1994).

Survey Results

No Couch's spadefoot toads were observed during surveys in spring 2011; however, surveys were conducted outside the proper identification season for this species, which is after summer rains. Local breeding records for this species include sites near the intersection of I-10 and Wiley's Well Road about 8 miles from the CRS site; another near I-10 and State Route 78 about 6 miles from the substation site; and another approximately 9 miles north of the Project site on the Blythe-Midland Road. The nearest CNDDB records include two from Imperial County (1989 and 2002) that are between 12 and 17 miles south of the Project area (CNDDB, 2011). The Project is within the geographic range for this species as described in the NECO Plan (BLM, 2002) and Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes, 1994).

Potential breeding habitat was detected at nine pools and ponds on the gen-tie line and access road route and one location in the southwest portion of the solar plant site. High-quality breeding habitat was found at the borrow pit and graded depression north of I-10. During sufficient rain events, these areas may collect water both from runoff from the McCoy Mountains and direct precipitation.

Western Burrowing Owl

Natural History

Western burrowing owls inhabit arid lands throughout much of the western United States and southern interior of western Canada and are typically year-round residents in much of California (Gervais et al., 2008). They are protected under the MBTA in the United States, Canada, and Mexico.

Burrowing owls are unique among the North American owls in that they nest and roost in abandoned burrows, especially those created by California ground squirrels, kit fox, desert tortoise, and other wildlife. Burrowing owls have a strong affinity for previously occupied nesting and wintering habitats. They often return to burrows used in previous years, especially if they were successful at reproducing there in previous years (Gervais et al., 2008). The southern California breeding season, defined as from pair bonding to fledging, is from February to August, with a peak of breeding activity from April through July.

In the Colorado Desert, burrowing owls generally occur at low densities in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant, including along the lower Colorado River (Gervais et al., 2008) (Figure 3.4-6). Burrowing owls tend to be opportunistic feeders. Their diet consists primarily of large arthropods, mainly including beetles and grasshoppers. Small mammals, especially mice and voles (*Microtus*, *Peromyscus*, and *Mus* spp.), are also important food items for this species. Other prey animals include reptiles and amphibians, young cottontail rabbits, bats, and birds, such as sparrows and horned larks. Consumption of insects increases during the breeding season.

Threats to burrowing owls include habitat modification and destruction of ground squirrel burrows. Other threats include pesticide accumulation, burrow destruction from farming practices and canal and road maintenance, roadside shooting, and direct mortality from squirrel poisons (BLM, 2002; Gervais et al., 2008).

Survey Results

Based on survey findings, the entire Project disturbance area (approximately 4,900 acres) is considered to provide potentially suitable burrowing owl nesting and foraging habitat. Three phase protocol-level burrowing owl surveys were performed from 2007 to 2011 consistent with the current CDFG survey standard, which is the California Burrowing Owl Consortium (CBOC) Guidelines (CBOC, 1993).

Focused surveys identified 10 recently active owl burrows and two burrowing owl pairs on the solar plant site, mostly from the eastern portion of the site. An owl pair and one active burrow were also noted on the gen-tie line and access road route north of I-10. No burrowing owls or owl burrows were identified within the 500-foot buffer area.

Golden Eagle

Natural History

Golden eagles are typically year-round residents throughout most of their western United States range. They breed from late January through August with peak activity March through July (Kochert et al., 2002). Migratory patterns are usually fairly local in California where adults are relatively sedentary, but dispersing juveniles sometimes migrate south in the fall. This species is generally considered to be more common in southern California than in the northern part of the state (U.S. Forest Service [USFS], 2008).

Habitats for this species typically include rolling foothills, mountain areas, and deserts. Golden eagles need open terrain for hunting and prefer grasslands, deserts, savanna, and early successional stages of forest and shrub habitats. Golden eagles primarily prey on lagomorphs and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al., 2002). This species prefers to nest in rugged, open habitats with canyons and escarpments, with overhanging ledges and cliffs and large trees used as cover (Figures 3.4-7 and 3.4-8).

The status of golden eagle populations in the United States is not well known, although there are indications that populations may be in decline (USFWS, 2009; Kochert et al., 2002). Accidental death from collision with man-made structures, electrocution, gunshot, and poisoning are the leading causes of mortality for this species, and loss and degradation of habitat from agriculture, development, and wildfire continues to put pressure on golden eagle populations (Kochert et al., 2002; USFWS, 2009).

Absent interference from humans, golden eagle breeding density is determined by either prey density or nest site availability, depending upon which is more limiting (USFWS, 2009). A compilation in Kochert (2002) of breeding season home ranges from several western United States studies showed an average home range of 20 to 33 square kilometers (7.7 to 12.7 square

miles) that ranged from 1.9 to 83.3 square kilometers (0.7 to 32.2 square miles). In San Diego, a study of 27 nesting pairs found breeding season home ranges to be an average of 36 square miles with a range from 19 to 59 square miles (Dixon, 1937 as cited in CEC, 2010). Other studies from within and outside the United States include home ranges from 9 to 74.2 square miles (McGahan, 1968 as cited in CEC, 2010; Watson et al., 1992 as cited in CEC, 2010), though golden eagles in the Mojave Desert are believed to have somewhat larger ranges due to low prey densities. In 2009, the USFWS published a Final Eagle Permit Rule authorizing limited issuance of permits to take bald and golden eagles where the take is associated with but not the purpose of an otherwise lawful activity (74 Fed. Reg. 46836, September 11, 2009).

Survey Results

In spring 2010 and 2011, the Applicant along with applicants of other adjacent proposed solar development projects jointly funded golden eagle helicopter surveys to detect golden eagle nesting activity, in accordance with the USFWS Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al., 2010). The 2010 helicopter survey was a collaborative effort among three solar developers for four proposed projects located north of I-10 between the town of Desert Center and Blythe. The survey coverage included an approximate 10-mile survey buffer from each project's ROW boundary. One of the projects was the BSPP directly south of the Project, and therefore, surveys also covered the entire Project and portions of its 10-mile buffer.

At the request of the USFWS and to provide a second consecutive year of golden eagle nest data within 10 miles of the solar plant site boundary, aerial surveys were conducted on March 23 and 24 (Phase 1), and May 5, 6, and 7, 2011 (Phase 2). These survey periods coincided with the most appropriate time to observe nesting activity and productivity, and focused on areas containing suitable nesting habitat within the search area. The Wildlife Research Institute (WRI) conducted the surveys following the USFWS protocols (Pagel et al., 2010), and covered approximately 314 square miles.

The spring 2010 helicopter surveys detected two golden eagle nests (one active and one inactive) within 10 miles of the Project boundary, and five additional nests were detected in 2011. For 2010, the active eagle nest was located 9.2 miles northeast of the Project boundary, and the inactive (and nearest) nest was 2.3 miles southwest of the Project boundary. The 2011 nest survey located five golden eagle nests within the 10-mile search radius; though no golden eagles were observed during the surveys (Tetra Tech EC, 2011). The inactive golden eagle nests were observed approximately 1.7 miles west, 3 miles southwest, 5.6 miles west-northwest, and 8.4 miles northwest of the Project in the McCoy Mountains. An additional 11 inactive golden eagle nests were detected outside the 10-mile search radius, at distances of 10.5 to 13.5 miles from the Project boundary.

Based on the distribution and evaluation of nests, WRI concluded that nests observed in 2011 represented eight inactive golden eagle territories[2], four of which were within and four of which

[2] Golden eagle breeding territories or "territories" refer to the portion an individual eagle's home range this is actively defended against others of the same sex or species.

were outside of the 10-mile search radius. Surveyors considered it likely that portions of the foraging areas of other eagle territories overlapped the 10 mile search area (Tetra Tech EC, Inc. and Karl, 2011a). No successful breeding by golden eagles was detected within any of the territories within or outside the 10-mile search radius on either phase of the aerial survey (Tetra Tech EC, Inc. and Karl, 2011a; Tetra Tech EC, Inc., 2011).

Loggerhead Shrike

Natural History

Loggerhead shrikes are uncommon residents throughout most of the southern portion of their range, including southern California. In southern California they are generally much more common in interior desert regions than along the coast (Humple, 2008). Loggerhead shrikes initiate their breeding season in February and may continue with raising a second brood as late as July; they often re-nest if their first nest fails or to raise a second brood (Yosef, 1996).

This species can be found within lowland, open habitat types, including creosote scrub and other desert habitats, sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. In general, loggerhead shrikes prey upon large insects, small birds, amphibians, reptiles, and small rodents over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding (Yosef, 1996). Loss of habitat to agriculture, development, and invasive species is a major threat; this species has shown a significant decline in the Sonoran Desert (Humple, 2008).

Survey Results

The entire 4,900-acre Project site contains suitable habitat for loggerhead shrike, as this was the fifth most common bird species (39 sightings) observed during avian point count surveys. Loggerhead shrikes were observed in eight of the 12 survey locations during spring and fall 2011 surveys (Tetra Tech EC, Inc. and Karl, 2011a; 2011b). Loggerhead shrikes are year-round residents of the region (Yosef, 1996) and were observed nesting in ironwood and palo verde trees in the study area. The entire Project site is loggerhead shrike habitat because of the open and relatively low shrub vegetation that also contains taller structures that are used for nesting and as lookout posts to spot potential predators and prey.

Le Conte's Thrasher

Natural History

In California, Le Conte's thrashers are resident in the San Joaquin Valley and the Mojave and Colorado deserts (Figure 3.4-9). They occur in desert flats, washes, and alluvial fans with sandy and/or alkaline soil and scattered shrubs. They rarely occur in monotypic creosote scrub habitat, because creosote bush is unable to support a nest, or in massive Sonoran Desert woodlands (BLM, 2005). Preferred nest substrate includes thorny shrubs and small desert trees. Breeding activity occurs from January to early June, with a peak from mid-March to mid-April (BLM, 2002). Le Conte's thrashers forage for food by digging and probing in the soil. They eat

arthropods, small lizards and snakes, and seeds and fruit; the bulk of their diet consists of beetles, caterpillars, scorpions, and spiders.

Survey Results

Le Conte's thrashers were observed throughout the solar plant site during spring and fall 2011 surveys. Five adult birds and one active nest were identified on the site (Tetra Tech EC, Inc. and Karl, 2011a; 2011b). The entire 4,900-acre Project site is Le Conte's thrasher habitat, providing cholla and low shrubs for cover and dense, spiny wash vegetation for nesting.

Black-tailed Gnatcatcher

Natural History

Black-tailed gnatcatchers are year-round residents in southwestern United States and central and northern Mexico; in California they are found in the southeast desert wash habitat from Palm Springs and Joshua Tree National Monument south, and along the Colorado River. They are now rare in eastern Mojave Desert north to the Amargosa River, Inyo County. This species nests primarily in wooded desert wash habitat, but also occurs in creosote scrub habitat during the non-breeding season.

Survey Results

Black-tailed gnatcatchers were observed on 11 instances on the solar plant site, occurring predominantly in association with vegetated areas dominated by creosote bush scrub/desert dry wash woodland (Tetra Tech EC, Inc. and Karl, 2011a).

California Horned Lark

Natural History

California horned larks are found throughout California except the north coast, and are less common in mountainous areas. This species prefers open areas that are barren or with short vegetation including deserts, brushy flats, and agricultural areas. Eggs are laid March to early June, and this species frequently lays a second clutch.

Survey Results

The Project site contains suitable habitat for the California horned lark, especially in creosote bush scrub habitat, which is the dominant vegetation community on the solar plant site. This species was the most frequently detected bird as it was observed during 50 percent of all surveys (Tetra Tech EC, Inc. and Karl, 2011a).

American Badger

Natural History

American badgers were once fairly widespread throughout open grassland habitats of California. Badgers are an uncommon permanent resident with a wide distribution across California, except from the North Coast area. Badgers inhabit burrows and often predate and forage on other small

mammal burrows as evidenced by claw marks along the edges of existing burrows. This species is most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas (Zeiner et al., 1990a). Badgers feed mainly on various species of small mammals and capture some of their prey above ground, foraging on birds, eggs, reptiles, invertebrates, and carrion. Most of the CNDDB records from the Palo Verde Valley area of Riverside County are prior to 1960 and the closest to the Project site is a 1915 record from the Little Chuckwalla Mountains approximately 7 miles southwest of the CRS (CNDDB, 2011).

Survey Results

The entire study area is considered suitable habitat for badgers (Figure 3.4-10) and badger sign was detected during field surveys. Biologists observed one badger approximately 0.35 mile west of the gen-tie line and access road route north of the I-10 in the McCoy Mountains, as well as six badger digs on the solar plant site and one dig at the CRS (Tetra Tech EC, Inc. and Karl, 2011a). The badger is a resident of a wide variety of habitats, including level, open areas in grasslands, agricultural areas, and open shrub habitats. Suitable habitat for the American badger occurs throughout the Project disturbance area.

Desert Kit Fox

Natural History

Desert kit fox are an uncommon to rare permanent resident of arid regions of the southern portion of California. Kit fox occur in annual grasslands, or grassy open, arid stages of vegetation dominated by scattered herbaceous species. Kit fox occur in association with their prey base which is primarily cottontail rabbits, ground squirrels, kangaroo rats, and various species of insects, lizards, or birds (Zeiner et al., 1990b). Protection provided by kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Title 14 CCR §460 identifies the desert kit fox as non-game species that may not be hunted or captured.

Survey Results

Desert kit fox burrows, complexes, and scat were observed throughout the Project disturbance area and the entire study area is considered habitat for this species (Figure 3.4-10). Surveyors detected 57 kit fox natal dens during spring 2011 surveys, of which 34 were within the solar plant site and 8 were along the gen-tie line and access road route; the rest were observed outside of the disturbance area. Of the 42 natal dens in the Project disturbance area, 12 of 15 active sites were on the solar plant site. Suitable prey base (wood rats, pocket mice, ground squirrels, cottontail rabbits) and habitat to support this species occur throughout much of the undeveloped portions of the Project site.

Nelson's Bighorn Sheep

Natural History

Nelson's desert bighorn sheep is a BLM California Sensitive Species, a State Fully Protected Species, and a State Game Species (BLM, 2002). The Nelson's bighorn sheep includes bighorns

from the Transverse Ranges through most of the desert mountain ranges of California and adjacent Nevada and northern Arizona to Utah. Essential habitat for bighorn sheep includes steep, rocky slopes of desert mountains, termed "escape terrain." Their agility on steep rocky terrain is an adaptation used to escape predators such as coyotes, eagles, and cougars (Wehausen, 1992 as cited in CEC, 2010). Surface water is another element of desert bighorn habitat considered essential to population health. Male and female bighorn sheep inhabiting desert ecosystems can survive without consuming surface water (Krausman et al., 1985 as cited in CEC, 2010), and males appear to drink infrequently in many situations; however, there are no known large populations of bighorn sheep in the desert region that lack access to surface water. In the spring, when annual plants are available, bighorn tend to disperse downhill to bajadas and alluvial fans to forage. Desert bighorn sheep have a long lambing season that can begin in December and end in June in the Mojave Desert, and a small percentage of births commonly occur in summer as well (Wehausen, 1992 as cited in CEC, 2010).

Over the past 140 years, bighorn sheep have suffered considerable population declines throughout their range, and metapopulations have been fragmented by roads and other barriers with a resulting decline in genetic diversity (Bleich et al., 1996 as cited in CEC, 2010). Disease, sometimes brought about by contacts with domestic sheep, drought, and predation, interacting with other anthropogenic factors, may also have contributed to declines in bighorn sheep populations (BLM, 2005). Loss of surface water sources may also diminish the viability of existing populations (BLM, 2005).

Two metapopulations of bighorn sheep occur within the NECO planning area, the Southern Mojave and Sonoran (Figure 3.4-11). Within these metapopulations, there are smaller, somewhat isolated subpopulations of bighorn sheep known as demes (BLM, 2002). The NECO Plan addresses the conservation of the bighorn sheep through the designation of Bighorn Sheep WHMAs, which overlay the entire range of their occurrence and movement corridors. At its nearest point, the solar plant site is located approximately 0.5 mile from the boundary of a bighorn sheep WHMA (Figure 4 in Tetra Tech EC, Inc. and Karl 2011a). The gen-tie line and access road route does not overlap any special management areas, except at the interconnection to the switchyard, where it overlaps the Mule Mountains Multiple-species WHMA. The switchyard is located entirely within the Mule Mountains Multiple-species WHMA.

The NECO Plan shows the McCoy Mountains and the Little Maria Mountains as unoccupied ranges; however, three ewes were observed more than 10 miles north of the solar plant site in the Little Maria Mountains during golden eagle helicopter surveys. No bighorn sheep were observed in the McCoy Mountains during helicopter surveys; however, sheep occur in the ranges adjacent to the McCoy Mountains and have the ability to naturally recolonize that range in the future.

Sheep are difficult to detect in ranges with a very low number of individuals such as the McCoy Mountains. The McCoy mountain range has been determined to be an important area for sheep recovery and is designated as a desert bighorn sheep WHMA within BLM.

Sheep are capable of crossing large expanses of lands between mountain ranges. For example, five Peninsular bighorn sheep ewes were documented on the Imperial Valley Solar 2 site, which is approximately 7 miles from the nearest mountain range. Telemetry data have documented

animals traveling across the flats approximately 10 to 12 miles between the Old Dad's and Marble Mountains (Rodriguez, 2010 as cited in CEC, 2010).

Survey Results

No sign or evidence of Nelson's bighorn sheep was found within the study area during field surveys; however, potential sign was observed in the adjacent BSPP site in 2009 (Tetra Tech EC, Inc. and Karl, 2011a; CEC, 2010). The study area is not within a known bighorn sheep movement corridor.

Burro Deer

Natural History

Burro deer is a subspecies of mule deer (*Odocoileus hemionus*) found in the Colorado region of the Sonoran Desert both near the Colorado River and substantially away from the river, especially associated with arboreal washes (Figure 3.4-12). This species is found in the Colorado region of the Sonoran Desert near the Colorado River and within desert dry wash woodland communities. Some burro deer are resident along the Colorado River, but a significant portion move into desert areas in response to water and forage. During the hot summers, water is critical, and burro deer concentrate along the Colorado River or the Coachella Canal where water developments have been installed and where the microphyll (small-leaved) woodland is dense and provides good forage and cover. With late summer thundershowers and cooler temperatures, deer move away from the Colorado River and Coachella Canal and then up the larger washes into mountains or wash complexes in the foothills (BLM, 2002). Burro deer are a big game species managed by CDFG.

Survey Results

Biologists found a partial hide of a burro deer on the solar plant site, indicating that burro deer occur in the area. No other sign was observed (Tetra Tech EC, Inc. and Karl, 2011a). There is suitable habitat for the burro deer on the solar plant site, and suitable habitat within the larger washes that would be crossed by the gen-tie line and access road route north of I-10. Suitable habitat is also present to the east in McCoy Wash and near the Colorado River.

Pallid Bat

Natural History

The pallid bat (*Antrozous pallidus*) is a California species of concern and a BLM Sensitive species indicating it is covered under the NECO Plan. Pallid bats inhabit low elevation (less than 6,000 feet) rocky, arid deserts and canyon lands, and shrub/steppe grasslands, but also occur in higher-elevation coniferous forests, greater than 7,000 feet in elevation. This species is most abundant in xeric landscapes including the Great Basin, Sonoran, and Mojave Deserts (WBWG, 2009). Pallid bats are known from Cuba, Mexico, and throughout the southwestern and western United States. Population trends are not well known, but there are indications of decline. Pallid bats roost alone, in small groups (two to 20 bats), or gregariously (hundreds of individuals). Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees with exfoliating bark, and various human structures such as bridges, barns, porches, bat boxes, and human-occupied or vacant buildings (WBWG, 2009).

Survey Results

A natural cavity with a small amount of bat guano, but no current use by bats, was detected on the southwest corner of the solar plant site (Tetra Tech EC, Inc. and Karl, 2011a). This cavity may have been used as a pallid bat daytime roost, as they typically use buildings, mines, bridges, rock shelters, or other sites with overhead protection. Based on the presence of suitable habitat, this species has a potential to roost and forage on the site. The nearest CNDDB records are a historical (1919) occurrence approximately 5 miles east of the gen-tie line north of I-10 and a second 1937 observation in the McCoy Mountains about 8 miles northwest of the Project site. All habitats within the Project disturbance area are suitable for foraging, though potential roost sites are limited to the single cavity.

Spotted Bat

Natural History

The spotted bat (*Euderma maculatum*) is known from all the states west of and including Montana, Wyoming, Colorado, New Mexico and Texas. This broadly distributed though uncommon species occurs from southern British Columbia to northern Arizona, Arizona/Utah border, and western Texas from below sea level to 8,100 feet amsl. Spotted bats occur in arid, low desert habitats to high elevation conifer forests and prominent rock features appear to be a necessary feature for roosting.

Survey Results

This species has a potential to forage on the entire Project site and possibly roost in the natural cavity the southwest corner of the solar plant site based on what is understood of its habitat requirements and roosting habits. The nearest CNDDB record is a historical occurrence from 1907 in the Colorado Desert near Mecca (CNDDB, 2011).

Western Mastiff Bat

Natural History

Western mastiff bats (*Eumops perotis californicus*) range from central Mexico across the southwestern United States including parts of California, southern Nevada, Arizona, southern New Mexico, and western Texas. Recent surveys have extended the previously known range to the north in both Arizona with several localities near the Utah border and California. They are found in a variety of habitats, from desert scrub to chaparral to oak woodland and into the ponderosa pine belt and high-elevation meadows of mixed conifer forests. Surveys in northern Arizona have documented roosts at approximately 3,600 feet elevation and foraging bat species at 7,500 feet (WBWG, 2009).

Survey Results

The entire Project site supports suitable foraging habitat for western mastiff bats, and potential roosting habitat is available in the natural cavity the southwest corner of the solar plant site. There are no CNDDB occurrences within 10 miles of the site.

Big Free-tailed Bat

Natural History

Big free-tailed bats (*Nyctinomops macrotis*) range from most of South America northward to include Mexico, Arizona, New Mexico, southern and western Texas, southern California, southeastern Nevada, southern Utah, and north and western Colorado from generally sea level to 8,000 feet in elevation. They occur in desert shrub, woodlands, and coniferous forests and roost mostly in the crevices of rocks, although they may roost in buildings, caves, and tree cavities.

Survey Results

This species has the potential to forage on the entire Project site and potential roosting habitat is available in the natural cavity the southwest corner of the solar plant site. The nearest reports for this species are from the vicinity of El Centro, 60 miles to the south, and Joshua Tree National Park, 80 miles to the west (CNDDB, 2011).

California Leaf-nosed Bat

Natural History

California leaf-nosed bats (*Macrotus californicus*) occur in the deserts of California, southern Nevada, Arizona and south to northwestern Mexico. In California, they are now found primarily in the mountain ranges bordering the Colorado River Basin. In California, the two largest roosts (each sheltering 1,500 bats during winter months) are in mines in extreme southeastern California. This species depends on either caves or mines for roosting habitat. All major maternity, mating, and overwintering sites are in mines or caves (BLM, 2002). Radio-telemetry studies of *Macrotus* in the California desert show that California leaf-nosed bats forage almost exclusively among desert wash vegetation within 6 miles (10 km) of roosts (WBWG, 2009).

Survey Results

A natural cavity with a small amount of bat guano, but no current use by bats, was detected on the southwest corner of the solar plant site (Tetra Tech EC, Inc. and Karl, 2011a). This cavity may have been used as a California leaf-nosed bat daytime roost, as they typically use buildings, mines, bridges, rock shelters, or other sites with overhead protection. Based on the presence of suitable habitat, this species has a potential to roost and forage on the solar plant site. There are several CNDDB records in the vicinity of the Project. The nearest record is approximately 3 miles south of the Project from 1993 from the McCoy Mountains from creosote bush scrub habitat (CNDDB, 2011) where approximately 300 adults were observed roosting (CNDDB, 2011). All habitats within the Project disturbance area are suitable for California leaf-nosed bat foraging; though potential roost sites are limited to the single cavity.

Species Not Expected in the Study Area

Other special-status wildlife species that were not detected during surveys and not expected in the study area are presented in Table 3.4-3.

TABLE 3.4-3
SPECIAL-STATUS WILDLIFE WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT SITE

Reptiles/Amphibians		
Desert rosy boa *Charina (=Lichanura) trivirgata*	In California, desert rosy boas are found only in the southern part of the state south of Los Angeles, from the coast to the Mojave and Colorado deserts (Zeiner et al., 1990c; BLM, 2002). They are uncommon throughout their range. Desert rosy boas are found in habitats with moderate to dense vegetation and rocky cover, such as desert canyons, washes, and mountains. They have been found under rocks, in boulder piles and along rock outcrops and vertical canyon walls. Their diet consists of small mammals and birds. Rosy boas are primarily nocturnal, but may be out in the evening or morning in the spring and may appear during the day. The greatest activity occurs in late spring to early or mid-summer. They hibernate in winter. Desert rosy boas are not listed, but are included in the NECO Plan and the Project area is within the range of this species.	There are four CNDDB records of this species from Riverside County, the majority of which are reported from western Riverside County near Cabazon, Lake Matthews, Lake Elsinore, and Hemet areas from disturbed sage scrub habitats with rocky soils and outcroppings. Field surveys noted that the Project site does not contain the preferred substrate for this species, and it is therefore unlikely to occur on site (Tetra Tech EC, Inc. and Karl, 2011a).
Birds		
Bendire's thrasher *Toxostoma bendirei*	Bendire's thrashers are known in California from scattered locations in Kern, Inyo, San Bernardino, and Riverside counties. This species is a summer resident in southeastern California, and arrives at breeding grounds from mid-March through May, and departs by late August. This species favors open grassland, shrubland, or woodland with scattered shrubs, primarily in areas that contain large cholla, Joshua tree, Spanish bayonet, Mojave yucca, palo verde, mesquite, catclaw, desert-thorn, or agave. The status of populations of this species is poorly understood, but threats are believed to be loss of habitat due to urbanization, harvesting of yucca and Joshua trees, overgrazing, and off-road vehicle activity. In parts of the range, grazing may increase habitat suitability by increasing the area with scattered junipers.	The desert dry wash vegetation community provides potential habitat for this species, although this species was not observed during surveys. There are no CNDDB (2011) records within 15 miles of the Project site.
Crissal thrasher *Toxostoma crissale*	Crissal thrashers are non-migratory residents ranging from southern Nevada and southeastern California to western Texas and central Mexico. This species prefers habitats characterized by dense, low, scrubby vegetation, which, at lower elevations, includes desert and foothill scrub and riparian brush. Nests of this species typically consist of an open cup of twigs, lined with finer vegetation, and are placed in the middle of a dense shrub.	Based on a review of the vegetation community descriptions provided by the Applicant, the Project site does not contain suitable dense scrub habitat preferred by this species. They are known from the area, including from McCoy Spring, Palen Valley, and Chuckwalla Well (Fitton, 2008). The nearest occurrences based on the CNDDB (2011) are two historical records about 6 to 7 miles east of the gen-tie line and access road route on- and south of I-10 (from 1917 and 1919) and a 1977 record approximately 7 miles west of the CRS and south of I-10.
Ferruginous hawk *Buteo regalis*	Ferruginous hawks do not breed in California, but are winter residents and in California are most common in grassland and agricultural areas in the southwest. Ferruginous hawks are found in open terrain from grasslands to deserts, and are usually associated with concentrations of small mammals. Threats to this species include loss of wintering habitat from urbanization and cultivation.	The Project site contains suitable wintering habitat for this species. No ferruginous hawks were observed during Project surveys (Tetra Tech EC, Inc. and Karl, 2011a). There are four ferruginous hawk records within 50 miles of the Project site (CNDDB, 2011).

TABLE 3.4-3 (Continued)
SPECIAL-STATUS WILDLIFE WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT SITE

Birds (cont.)		
Gila woodpecker *Melanerpes uropygialis*	The Gila woodpecker's range is limited to a small area of southwestern United States and northwestern Mexico. In California, this species is found only along the Colorado River and in small numbers in Imperial County. In southeastern California, Gila woodpeckers were formerly associated with desert washes extending up to 1 mile from the Colorado River. Currently, they are found only in riparian areas along the Colorado River.	In California, this species is currently known only from the Colorado River; therefore this species is not expected on the Project site. The Applicant has also indicated in the Biological Technical Report (Tetra Tech EC, Inc. and Karl, 2011a) that the site does not contain suitable nesting habitat for this species. The nearest CNDDB (2011) records for this species are a 1986 record 9.4 miles east of the site at the Colorado River and a 2002 record from Sand Wash (Imperial County), 10.2 miles south of the CRS
Gilded flicker *Colaptes chrysoides*	In California, the gilded flicker is known from the southeast; habitat includes stands of giant cactus, Joshua tree, and riparian groves of cottonwoods and tree willows in warm desert lowlands and foothills. Until the mid-1990's, this species was considered a subspecies of northern flicker (*C. atratus*). This species nests primarily in cactus, but also will use cottonwoods and willows of riparian woodlands. This species may be nearly extinct in California.	This species is not expected to regularly use the Project site due to lack of suitable habitat. The closest CNDDB (2011) record for this species is a 1983 record approximately 13 miles northeast of the site, along the Colorado River.
Mountain plover *Charadrius montanus*	Mountain plovers do not breed in California, but are winter visitors primarily from September to mid-March. In California they are found in the Central Valley, Antelope Valley, San Jacinto Valley, Imperial Valley, and Palo Verde Valley. Mountain plover habitat includes short-grass prairie or their equivalents, and in southern California deserts are associated primarily with agricultural areas, though use of these areas is suspected to be because of loss of native grassland and playa habitats.	This species is not expected to extensively use the site, but may use nearby agricultural areas. The closest CNDDB (2011) record for this species is a 1974 sighting 25 miles to the southwest in Imperial County, at the southern end of the Salton Sea.
Northern harrier *Circus cyaneus*	In western North America, the northern harrier breeds from northern Alaska south to Baja California, Mexico. This species does not commonly breed in desert regions of California, where suitable habitat is limited, but winters broadly throughout California in areas with suitable habitat. Northern harriers forage in open habitats including deserts, pasturelands, grasslands, and old fields.	The Project site contains suitable wintering habitat for the northern harrier, and one wintering bird was observed during 2011 Project surveys (Tetra Tech EC, Inc. and Karl, 2011a). There are reported nesting records for this species in eastern Riverside County (CNDDB, 2011).
Peregrine falcon *Falco peregrines*	The Peregrine falcon's year-round range includes coastal and northwestern California and the Sierra Nevada and other California mountains. Additionally, this species winters inland throughout the Central Valley and in northeastern California. They are rare in the arid southeast, but they occur and are suspected to breed in the lower Colorado River Valley. Peregrine falcons require open habitat for foraging, and prefer breeding sites near water. Nesting habitat includes cliffs, steep banks, dunes, mounds, and some human-made structures.	This species may forage on the Project site though the site does not provide potential nesting habitat. One falcon was observed during 2011 Project surveys and this species may nest in nearby mountains. There are no reported nesting records for Riverside County (CNDDB, 2011).

TABLE 3.4-3 (Continued)
SPECIAL-STATUS WILDLIFE WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT SITE

Birds (cont.)		
Prairie falcon *Falco mexicanus*	The prairie falcon inhabits dry environments in the North American west from southern Canada to central Mexico. They are found in open habitat from annual grasslands to alpine meadows at all elevations up to 3,350 m, but are associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. They require cliffs or bluffs for nesting though will sometimes nest in trees, on power line structures, on buildings, or inside caves or stone quarries. Ground squirrels and horned larks are the primary food source, but prairie falcons will also prey on lizards, other small birds, and small rodents.	Three prairie falcons were observed during surveys, and the entire Project disturbance area (4,900 acres) contains suitable foraging habitat for this species. The Project site does not contain suitable nesting habitat, although adjacent mountains may. There are numerous CNDDB (2011) records in the region for this species, including eyrie records from Little Maria Mountains to the north (1977) and the Chuckwalla Mountains to the southwest (1978).
Purple martin *Progne subis*	The historical breeding range of the purple martin includes southern California, though populations have shrunk dramatically. Neither the historical or current breeding range, however, includes the Colorado Desert. Purple martins' habitat requirements include adequate nest sites and availability of large aerial insects, and therefore are most abundant near wetlands and other water sources. Threats to this species include loss of large tree and snags and competition from European starlings.	This species was observed migrating through the Project site, but is not expected to extensively use the site. There are six nesting records for this species from western Riverside County, each greater than 100 miles from the Project site (CNDDB, 2011).
Short-eared owl *Asio flammeus*	Short-eared owls breed through much of northern North America, and are year-round residents in some areas of California. Historically, this species occurred throughout much of California, west of the southern deserts, in low numbers. Currently, small populations breed in regularly in the Great Basin and in the Sacramento/San Joaquin River Delta area, but sporadically in other parts of its former range. Short-eared owls require open country that supports small mammal populations, and that also provides adequate vegetation to provide cover for nests. This includes salt- and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures.	The Project site contains suitable wintering habitat for the short-eared owl. This species was not observed during Project surveys. There are no Riverside County nesting records for this species (CNDDB, 2011).
Swainson's hawk *Buteo swainsoni*	Swainson's hawks require large areas of open landscape for foraging, including grasslands and agricultural lands that provide low-growing vegetation for hunting and high rodent prey populations. Swainson's hawks typically nest in large native trees such as valley oak, cottonwood, walnut, and willow, and occasionally in nonnative trees, such as eucalyptus within riparian woodlands, roadside trees, trees along field borders, isolated trees, small groves, and on the edges of remnant oak woodlands. While there are historical breeding records of this species from the Colorado Desert, this species is now known from southern California only as a spring and fall migrant. This reduction in breeding range is believed to be from loss of nesting habitat.	The Project site may provide foraging habitat for migrating individuals, and four individuals were observed in the Project site during surveys. There are no CNDDB-reported nesting records for this species in Riverside County; as the project is generally outside of this species' breeding range (Bechard et al., 2010).
Vaux's swift *Chaetura vauxi*	Vaux's swifts are not known to breed in Riverside County or elsewhere in southern California. Very few nests have been found, so their breeding range has been inferred from sightings of birds flying over potential nesting areas during their nesting season, in June and July. Vaux's swifts prefer to nest in the hollows formed naturally inside of large old conifer trees, especially snags, which are entirely lacking from the Project site.	This species was incidentally observed during surveys, and occurrences are expected to be migrants.

TABLE 3.4-3 (Continued)
SPECIAL-STATUS WILDLIFE WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT SITE

Birds (cont.)		
Vermilion flycatcher *Pyrocephalus rubinus*	Vermilion flycatchers are rare breeders or residents in localized areas of southern California, including along the Colorado River. They are usually found near water in arid scrub, farmlands, parks, golf courses, desert, savanna, cultivated lands, and riparian woodlands; nesting substrate includes cottonwood, willow, and mesquite.	In the Project vicinity, occurrences of this species are limited to the Colorado River. This species is not expected on the Project site. The closest CNDDB (2011) records are a historical record from 6 miles west of the study area from 1919, and a recent (1983) record from the Blythe golf course.
Yellow warbler *Dendroica petechia*	Yellow warblers historically bred throughout much of California except for high elevations, the Colorado Desert, and most of the Mojave Desert. Breeding abundance for this species has declined in much of California, as has the breeding range, especially in the Central Valley and parts of Owens Valley. In southeastern California, this species is known only from the lower Colorado River Valley from the middle of San Bernardino County through Riverside and Imperial Counties. Currently, this species no longer breeds in much of the Riverside County segment of the lower Colorado River Valley. This species commonly uses wet, deciduous thickets for breeding, and seeks a variety of wooded, scrubby habitats in winter.	This species was observed during surveys, but is not expected to nest on the Project site due to lack of suitable habitat. The nearest nesting records for this species are a 1952 sighting near the Salton Sea and an undated record from Joshua Tree National Park; both greater than 45 miles from the Project site (CNDDB, 2011).
Yellow-breasted chat *Icteria virens*	The yellow-breasted chat occurs as a summer resident and migrant in California. In the southeastern California, the yellow-breasted chat breeds primarily in scattered locations in Owen's Valley and the Mojave, from the Salton Sea, and from the lower Colorado River Valley. This species occupies shrubby riparian habitat with an open canopy, and will next in non-native species including tamarisk. Threats to this species include loss of riparian habitat, and, it is suspected, pressure from cowbird parasitism.	In this region, this species is associated with the Colorado River only. The Project site does not contain suitable habitat for this species. CNDDB (2011) records in the region are associated with the Salton Sea and the Colorado River. The nearest nesting records for this species are two 1986 records 9.3 and 11.6 miles east of the Project site at the Colorado River (CNDDB, 2011).
Mammals		
Arizona myotis *Myotis occultus*	This species has been found from southeastern California through Arizona, New Mexico, and south into Chihuahua, Mexico. Arizona myotis is most commonly known from conifer forests from 6,000 to 9,000 feet in elevation, although maternity roosts are known from much lower elevations including areas along the Colorado River in California.	This species is not expected to occur due to lack of suitable habitat and the Project occurring below elevations where roosts typically occur. The closest CNDDB (2011) record is a historical occurrence from 1945 approximately 6 miles east of the gen-tie line south of the I-10 near the town of Ripley.
Cave myotis *Myotis velifer*	The cave myotis occurs from western Texas, to southern Nevada, southeastern California (only along the Colorado River), southward into Mexico, and is also widely distributed in Arizona. This species is found primarily at lower elevations (the Sonoran and Transition life zones) of the arid southwest in areas dominated by creosote bush, palo verde, and cactus. This species is a "cave dweller" and caves are the main roosts although this species may also use mines, buildings, and bridges for roosts.	The nearest CNDDB record for this species is from 2002 near the I-15 bridge over the Colorado River in Blythe, where individual bats of this species were detected during acoustic surveys (CNDDB, 2011).
Colorado Valley wood rat *Neotoma albigula venusta*	Occurs from southern Nevada, southeastern California, northeastern Baja California, to western Arizona. Colorado Valley wood rats are found in a variety of habitats including low desert, pinyon-juniper woodlands, and desert-transition chaparral. Suitable habitat elements for this species include washes where organic debris gathers, areas of prickly pear cactus and mesquite, rocky areas, and crevices in boulders which are used for cover and nest sites.	The nearest CNDDB record is from 1934 near Blythe and approximately four miles south and east of the gen-tie line and access road route north of the I-10 (CNDDB, 2011).

TABLE 3.4-3 (Continued)
SPECIAL-STATUS WILDLIFE WITH LOW TO MODERATE POTENTIAL TO OCCUR AT THE PROJECT SITE

Mammals (cont.)		
Hoary bat *Lasiurus cinereus*	Hoary bat is the most widespread of North American bats and are highly associated with forested habitats in the west. They are highly associated with forested habitats in the west. Hoary bats roost are usually located at the edge of a clearing although more unusual roosting sites have been reported in caves, beneath rock ledges, woodpecker holes, squirrel nests, and building sides.	This species may occur in the area as a foraging bat species. The closest CNDDB (2011) record is a historical (1919) occurrence approximately five miles east of the gen-tie line and access road route, south of the I-10.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	Pocketed free-tailed bat is a California species of concern. This species occurs in western North America, from southern California, central Arizona, southern New Mexico, western Texas, south into Mexico and Baja, California (WBWG 2009). Despite only a limited number of records, pocketed free-tailed bats are known to occur in the desert from March through August, when they then migrate out of the area. In California, they are found primarily in creosote bush and chaparral habitats in proximity to granite boulders, cliffs, or rocky canyons.	The nearest CNDDB record for this species is from 2002 near the I-15 bridge over the Colorado River in Blythe, where individual bats of this species were detected during acoustic surveys (CNDDB, 2011).
Townsend's big-eared bat *Corynorhinus townsendii*	This species has been reported in a wide variety of habitat types ranging from sea level to approximately 9,000 feet amsl. Habitat associations include coniferous forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Foraging associations include edge habitats along streams, adjacent to and within a variety of wooded habitats.	This species has a potential to roost and forage on the Project site. There are no CNDDB occurrences within 10 miles of the Project site (CNDDB, 2011).
Yuma mountain lion *Puma concolor browni*	In the NECO planning area, mountain lions primarily inhabit the low mountains and extensive wash systems in and around Chuckwalla Bench, Chuckwalla Mountains, Chocolate Mountains, Picacho Mountains, Milpitas Wash, Vinagre Wash, and other washes in that area. Mountain lions typically occur in habitat areas with extensive, well-developed riparian or shrubby vegetation interspersed with irregular terrain, rocky outcrops, and community edges. Mountain lions are restricted to the southern Colorado Desert from Joshua Tree National Park south and east to the Colorado River. Burro deer, the primary prey item, are known to spend the hot summer and fall in riparian areas along the Colorado River and in dense microphyll woodlands near the Coachella Canal.	Mountain lion sign (scat) was found west of the solar plant site. This species likely uses the Project site but no definitive sign for this species was noted on the site during surveys. High quality habitat is available in the McCoy Mountains and McCoy Wash.
Yuma myotis *Myotis yumanensis*	This species ranges across the western third of North America from British Columbia, Canada, to Baja California and southern Mexico. Yuma myotis is usually associated with permanent sources of water, typically rivers and streams, feeding primarily on aquatic emergent insects, but Yuma myotis also use tinajas in the arid west. It occurs in a variety of habitats including riparian, arid scrublands and deserts, and forests. The species roosts in bridges, buildings, cliff crevices, caves, mines, and trees.	The nearest CNDDB record for this species is from 2002 near the I-10 bridge over the Colorado River in Blythe, where individual bats of this species were detected during acoustic surveys (CNDDB, 2011).

SOURCES: CEC, 2010; CNDDB, 2011; Tetra Tech and Karl, 2011a

3.4.2 Applicable Regulations, Plans, and Standards

3.4.2.1 Federal

NEPA

NEPA (42 USC 4321 et seq.) declares a continuing federal policy that directs "a systematic, interdisciplinary approach" to planning and decision-making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the CEQ (40 CFR Parts 1500-1508) requires federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environmental and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of federal actions. The BLM is the Lead Agency under NEPA for the Project.

Federal Endangered Species Act

The FESA designates threatened and endangered animals and plants and provides measures for their protection and recovery. "Take" of listed animal species and of listed plant species in areas under federal jurisdiction is prohibited without obtaining a federal permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" (16 USC §§1531-1544). Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage the habitat of (i.e., harm) listed wildlife species require approval from the USFWS for terrestrial species. The FESA also generally requires determination of critical habitat for listed species. If critical habitat has been designated, impacts to areas that contain the primary constituent elements identified for the species, whether or not it is currently present, is also prohibited. FESA §7 and §10 provide two pathways for obtaining authority to take listed species.

Under FESA §7, a federal agency that authorizes, funds, or carries out a project that "may affect" a listed species or its critical habitat must consult with USFWS. For example, the USACE must issue a permit for projects impacting non-wetland Waters of the U.S. or wetlands under USACE jurisdiction. In a §7 consultation, the lead agency (e.g., USACE) prepares a BA that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat, and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, USFWS then has 30 days to respond to the BA by issuing its BO determining whether the project is likely to jeopardize the species or result in adverse modification of critical habitat. If a "no jeopardy" opinion is provided, the project may proceed. If a jeopardy or adverse modification opinion is provided, the USFWS may suggest "reasonable and prudent measures" that would result in no jeopardy.

Under §10 of the FESA, private parties with no federal nexus (i.e., no federal agency will authorize, fund, or carry out the project) may obtain an Incidental Take Permit to harm listed species incidental to the lawful operation of a project. To obtain an incidental take permit, the applicant must develop a habitat conservation plan (HCP) which specifies effects to listed species, provides minimization and mitigation measures and funding, discusses alternatives considered and the reasons why such alternatives are not being used. If the USFWS finds that the HCP will not "appreciably reduce the likelihood of the survival and recovery of the species" it will issue an incidental take permit. Issuance of incidental take permits requires the USFWS to conduct an internal §7 consultation, thus triggering coverage of any listed plant species or critical habitat present on site (thus, listed plants on private property are protected under FESA if a listed animal is present). Unlike a §7 consultation, the USFWS is not constrained by a time limit to issue an incidental take permit.

BLM Sensitive Species

BLM Sensitive Species are species designated by the State Director that are not already federally listed, proposed, or candidate species, or state-listed because of potential endangerment. BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered." Various offices of the BLM maintain a list of special-status plant and wildlife species that are to be considered as part of the management activities carried out by the BLM on the lands that they administer.

CDCA Plan

The CDCA covers approximately 25 million acres of land in southern and southeastern California, with approximately 10 million acres being administered by the BLM. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development and protection of the resources and public lands within the CDCA and is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality.

The MUCs form the backbone of the Plan, essentially zoning the CDCA into four major MUCs, as a city or county is zoned for land use classes. The Plan categories include approximately 4 million acres of Class C (controlled) lands (including roughly 3,600,000 acres of wilderness areas created under the 1994 California Desert Protection Act) to be preserved in a natural state with access generally limited to non-motorized, non-mechanized means; approximately 4 million acres of Class L (limited use) lands, providing for generally lower intensity, carefully controlled uses that do not significantly diminish resource values; approximately 1.5 million acres of Class M (moderate use) lands designated for mining, livestock grazing, recreation, energy, and utility development with mitigation required for any damage caused by permitted uses; and approximately 500,000 acres of Class I (intensive use) lands managed for concentrated uses with reasonable protection provided for sensitive natural values and mitigation of impacts and rehabilitation of impacted areas occurring when possible (BLM, 2007).

The Plan's goals and actions for each resource are established in its 12 elements including the Wildlife Element and the Energy Production and Utility Corridors Element, among several others (BLM, 2007).

The Project site is located within lands designated "Class L," or limited use. Solar energy facilities are permitted in Class L areas provided NEPA is complied with and the CDCA Plan Amendment process is followed.

NECO Plan

The NECO Plan is a landscape-scale, multi-agency planning effort approved in 1992 that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over 5 million acres and hosts 60 sensitive plant and animal species. The NECO Plan amends the 1980 CDCA plan to provide additional protections to wildlife and plants, particularly the desert tortoise. A summary of the major plan amendment decisions of the NECO Plan includes:

1. Establish Regional Standards for Public Land Health and set forth guidelines for grazing management.

2. Establish two DWMAs encompassing about 1.75 million acres that are managed as ACECs for recovery of the desert tortoise.

3. Establish the Southern Mojave and Sonoran WHMAs or bighorn sheep totaling over a million acres and 13 multi-species WHMAs totaling over 500,000 acres such that 80 percent of the distribution of all special-status species and all natural community types are included in conservation management areas.

4. Combine Herd Management Areas for wild horses and burros and adjust the Appropriate Management Levels.

5. Designate routes of travel (approximately 95 percent of existing routes will remain available for vehicle access).

6. Identify priorities for potential acquisition of private lands and disposal of public lands.

7. Provide access to resources for economic and social needs.

8. Incorporate 23 wilderness areas (totaling over 1 million acres) established by the 1994 CDPA in the CDCA.

Approved mitigation measures were presented in Appendices D through G of the Proposed NECO Plan/FEIS relating to desert tortoise, desert restoration, public education, and limitations on cumulative new surface disturbance. All practicable means to avoid or minimize environmental harm by the plan have been adopted.

Flat-tailed Horned Lizard Rangewide Management Strategy

The Project is outside of the current and historical range of the flat-tailed horned lizard and the outside of the Flat-tailed Horned Lizard Rangewide Management Strategy planning area (Flat-tailed Horned Lizard Interagency Coordinating Committee [FTHLICC], 2003).

Migratory Bird Treaty Act

The MBTA implements international treaties between the U.S. and other nations that protect migratory birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

Lacey Act

The Lacey Act, as amended (16 USC 3371-3378) protects plants and wildlife by creating civil and criminal penalties for a wide variety of violations including illegal take, possession, transport, or sale of protected species.

The Bald and Golden Eagle Protection Act

The BGEPA prohibits take, which is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, disturb, or otherwise harm eagles, their nests, or their eggs." Under the BGEPA, "disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. On September 11, 2009, the USFWS set in place rules (50 CFR parts 13 and 22) establishing two new permit types: (1) take of bald and golden eagles that is associated with, but is not the purpose of, the activity; and (2) purposeful take of eagle nests that pose a threat to human or eagle safety. Specifically, the BGEPA authorizes intentional take of eagle nests where: necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure; and/or the activity, or mitigation for the activity, will provide a net benefit to eagles; and allows inactive nests to be taken only in the case of safety emergencies.

As described in the USFWS Draft Eagle Conservation Plan (ECP) Guidance dated January 2011 (USFWS, 2011c), the USFWS recommends that project proponents prepare an ECP to avoid, minimize, and mitigate project-related impacts to eagles to ensure no net loss to the golden eagle population. If required by the USFWS, pursuant to BLM Instructional Memorandum (IM) 2010-156, the BLM will request "concurrence" from the USFWS that the ECP meets specific requirements.

3.4.2.2 State

California Endangered Species Act

The CESA provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take is defined similarly to FESA, and is prohibited for both listed and candidate species. Take authorization may be obtained by the project applicant from CDFG under CESA §2081, which allows take of a listed species for educational, scientific, or management purposes. In this case, private developers consult with

CDFG to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

California Fish and Game Code

Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. In October 2011, SB 618 amended Fish and Game Code provisions that relate to fully protected species. Prior to SB 618, CESA prohibited the "take" of species that have been listed as fully protected. The amendment allows for incidental take of fully protected species when a conservation plan has been approved and implemented to ensure protection of the species. Other exceptions in which CDFG may issue permits or licenses to authorize the take of fully protected species include scientific research and live capture and relocation of fully protected species pursuant to a permit for the protection of livestock. Furthermore, it is the responsibility of the CDFG to maintain viable populations of all native species. To that end, the CDFG has designated certain vertebrate species as Species of Special Concern because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

3.5 Cultural Resources

A cultural resource is a location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include both archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups, e.g., "traditional cultural property." The cultural resources that are evaluated in this section may fall under one of the following resource types: prehistoric archaeological resource, ethnographic resource, and historic-period archaeological and built environment resources. Cultural resources may be but are not necessarily eligible for the National Register of Historic Places (NRHP).

Prehistoric resources are associated with human occupation and use prior to sustained European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the 18th century until 1769, when the first Europeans permanently settled in California.

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape features, cemeteries, shrines, or ethnic neighborhoods and structures.

Historic-period resources, both archaeological and built environment (i.e. structures, buildings, or other built features) are associated with Euroamerican exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity.

Under federal and state historic preservation law, cultural resources generally must be at least 50 years old to have sufficient historical importance to merit consideration of eligibility for listing in the NRHP or in the California Register of Historical Resources (CRHR). A resource less than 50 years of age must be of exceptional historical importance to be considered for listing. Groupings of resources may also be recognized as districts. Under NEPA, impacts on all cultural resources are considered, regardless of whether they qualify for listing in the NRHP or CRHR.

Cultural resources are categorized as buildings, sites, structures, objects, and districts for the purposes of complying with federal law (NEPA and the National Historic Preservation Act of 1966 [NHPA] §106).

The term "historic property" is used for the purposes of NEPA and NHPA §106, and is defined in 36 CFR Part 800, the implementing regulations for §106, as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the [NRHP] . . . , [which] includes artifacts, records, and remains that are related to and located within such properties" (36 CFR §800.16(*l*)(1)). The term also includes "properties of traditional religious and cultural importance to an Indian tribe . . . that meet the National Register criteria" pursuant to

36 CFR §60.4 (36 CFR §800.16(*l*)(1)). For definitions of other terms used in this section, please refer to Chapter 7, *Glossary*.

A Class III Cultural Resources Survey Report has been completed by AECOM in support of this PA/EIS (Jordan and Tennyson, 2011). In addition, the BLM has initiated consultation with Indian tribes to identify places of traditional religious and cultural importance that may otherwise be left unidentified by these studies. Chapter 5 provides a discussion of the BLM's tribal consultation process.

3.5.1 Environmental Setting

3.5.1.1 Cultural Setting

The following discussion of the geology of the Project area is excerpted from a study conducted by AECOM for the Project (Jordan and Tennyson, 2011).

The Project is located on the Palo Verde Mesa, a series of ancient raised river terraces associated with the Pleistocene course of the lower Colorado River. The relatively flat topography of the mesa slopes gently down from the northwest to the southeast and is bounded by the McCoy Mountains to the west and the Little and Big Maria Mountains to the north and east. To the south, the Palo Verde Mesa grades into an east-west-trending valley pass, through which modern I-10 was built adjacent to the Coco-Maricopa Trail (CA-RIV-53T), an important prehistoric transportation corridor from the Colorado River to the Pacific Coast.

The Palo Verde Mesa is part of the northern extent of the Colorado Desert, a subdivision of the greater Sonoran Desert. Encircling the northern Gulf of California, the Colorado Desert spans portions of northwest Mexico, southwest Arizona, and southeast California (Schaefer, 1994a). It is a subtropical desert that is periodically influenced by tropical weather conditions, including massive seasonal rain storms known locally as monsoons.

Sediments in the Project vicinity generally originate from quaternary riverine deposits from the Colorado River, and alluvial fan deposits from the mountains to the northwest. Much of the Project contains well-developed, heavily patinated desert pavements subject to deflation from frequent winds. Running northwest to southeast, several alluvial washes cut through stable desert pavement surfaces and transition to active ephemeral washes consisting of sandy silts combined with small cobbles and poorly sorted gravels.

The western portion of the Project area is located at the base of the McCoy Mountains. Much of the area includes well-developed desert pavement that is cut by deep alluvial channels trending generally from northwest to southeast. Most of the pavements consist of basalt with outcrops of quartz eroding from the McCoy Mountains. The drainages that bisect this ridge are shallow at the western edge of the Project and get progressively deeper as they continue eastward down the slopes at the base of the McCoy Mountains.

Along the linear facilities of the Project, extensive, linear deposits of water-rounded cobbles sit atop remnant river terraces associated with the Pleistocene course of the Colorado River. These terrace-top cobble deposits, known as "pebble terraces" (Schaefer, 1985), consist primarily of fist-sized water-rounded rocks representing a variety of stone materials collected from the length of the Colorado River. The pebble terraces were used by the prehistoric inhabitants of the region as a ready source of fine-grained stone for the production of flaked stone tools (Flenniken and Spencer, 2001; Schaefer, 1985). The most common tool stones present on the pebble terraces are quartzite, crypto-crystalline silicate (CCS), and chalcedony. Two such pebble terraces exist along the linear facilities, and both were previously recorded as archaeological sites CA-RIV-2846 and CA-RIV-3419.

At the beginning of the Holocene, the Colorado River retreated to the east and began to cut deeply into the surrounding sediments. Periodically, though, the river dramatically flooded, changed course, and flowed into previously dry inland areas. After large flood episodes, water from the Colorado River was occasionally impounded and diverted into the Salton Trough, creating a vast inland freshwater lake in the area of the historical Lake Cahuilla. Impounded waters from the Colorado River would continue to flow into the Salton Trough for years or even centuries until another major flood event sufficiently reworked the river delta at the Gulf of California to allow the river to resume its typical course. At these times, numerous ethnically and linguistically distinct Native American groups converged on the newly formed lake. Some of the intermittent prehistoric use of the Palo Verde Mesa likely dates from these episodes of inland lake activity.

3.5.1.2 Paleoclimate

Identifying the kinds and distribution of resources necessary to sustain human life in an environment and the changes in that environment over time is central to understanding whether and how an area was used during prehistory and history. During the time that humans have lived in California, the region in which the Project is located, the Mojave Desert, has undergone several climatic shifts. These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the vicinity of the site. Consequently, it is important to consider the historical character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the area and its ecology.

The Pleistocene (1.8 million to 10,000 years ago), and the Holocene (10,000 years ago to the present) environmental record from the Mojave Desert provides a model for the Colorado Desert. Summaries of the development and changes in vegetation in the Mojave Desert and surrounding region during these periods are provided by Grayson (1993, pp. 119–128, 139–143, 194–195, 199–202, 215, as cited in CEC, 2010), Spaulding (1990, as cited in CEC, 2010), Tausch et al. (2004, as cited in CEC, 2010), Thompson (1990, as cited in CEC, 2010), and Wigand and Rhode (2002, pp. 332–342, as cited in CEC, 2010). All note the vegetation history of this region has been primarily studied by analysis of plant macrofossils contained in prehistoric packrat middens. Pollen studies from this region are largely lacking.

In general, Tausch et al. (2004, fig. 2.3; see also Wigand and Rhode, 2002, pp. 321–332, as cited in CEC, 2010) note the Early Holocene (8500 to 5500 BC) in the Mojave Desert was

characterized by a post-glacial warming trend, accompanied by periods characterized by variable moisture. The subsequent Mid-Holocene (5500 to 3000 BC) was the warmest, driest part of the entire Holocene. During the post-Mid-Holocene transition (3000 to 1500 BC), relatively warm, dry conditions prevailed.

In the approximate period from 1500 to 600 BC, a cool, wet interval has been termed the Neoglacial by climate scientists. It was followed by a much drier, and possibly relatively cooler, period, the Post-Neoglacial Drought (600 BC to 400 AD). The next interval, the Medieval Climatic Anomaly (400 to 1350 AD) was characterized by intensified drought and relatively warm conditions (Meko et al., 2001; Stine 1994, 1996, 1998, 2000 as cited in CEC, 2010). A period called the Little Ice Age followed (1350 to 1850 AD) that was cold and somewhat dry (Fagan, 2000; Grove, 1988; Meko et al., 2001; Scuderi, 1987a, 1987b, 1990, 1993 as cited in CEC, 2010). Present climate conditions then commenced.

During the wetter periods (the Late Pleistocene, the Neoglacial, and the Little Ice Age), some of the basins in the Mojave Desert Region (and in the Colorado Desert region, as well) became shallow lakes, with extensive marshy shorelines. Being sources of food and materials, these lakes would have drawn Native Americans and perhaps would have encouraged settlement (Gallegos et al. 1980, p. 93, as cited in CEC, 2010). The elevation of the Palo Verde Mesa prevented a lake from forming where the Project would be located, but within a few miles to the west, two lakes, Ford Dry Lake and Palen Dry Lake, are known to have formerly existed.

3.5.1.3 Prehistoric Background

The shortage of data prior to the Late Prehistoric period (discussed below) in the Colorado Desert has hindered development of a comprehensive scheme detailing the cultural chronology for the region. The following chronology is extrapolated from Sutton et al.'s (2007, p. 236, table 15.4, as cited in CEC, 2010) concordance of terms for temporal periods and complexes in the Mojave Desert. Other pertinent chronological schemes for the Colorado Desert occur in Love and Dahdul (2002, p. 69, fig. 2, as cited in CEC, 2010), Warren (1984, pp. 409–430, fig. 8.27, as cited in CEC, 2010), and Weide (1976, p. 82, table 3, as cited in CEC, 2010).

Late Pleistocene

Paleoindian

The Late Pleistocene Paleoindian Period (about 10000 to 8000 BC) is better represented in the Mojave Desert than in the Colorado Desert (Beck and Jones, 1997, as cited in CEC, 2010). Isolated fluted projectile points assignable to the Western Clovis Tradition have been recovered from the Pinto Basin, Ocotillo Wells, Cuyamaca Pass, and the Yuha Desert (Dillon, 2002, p. 113; Rondeau et al., 2007, pp. 64–65, fig. 5.1, table 5.1; Moratto, 1984, pp. 77, fig. 3.1, 87, as cited in CEC, 2010). All are surface finds and have no associations with extinct fauna.

Early Holocene

Lake Mojave Complex

The Lake Mojave complex (about 8000 to 6000 BC) is also known as the Western Pluvial Lakes/Western Stemmed Tradition (see Beck and Jones, 1997; Erlandson et al., 2007; papers in Graf and Schmitt, 2007; Schaefer 1994b, pp. 63–64; Sutton et al., 2007; papers in Willig et al., 1988; as cited in CEC, 2010). As with the preceding Paleo-Indian Period, the Lake Mojave Period is better represented in the Mojave Desert than in the Colorado Desert. It is characterized by Great Basin Stemmed Series projectile points (Lake Mojave and Silver Lake), abundant bifaces, steep-edged unifaces, crescents, and occasional cobble tools and ground stone tools. These artifacts often occur in undated surface contexts. Assemblage composition and site structure suggest highly mobile foragers, often traveling considerable distances. Little reliance upon vegetal resources is evidenced. The value of wetland habitats remains unclear. Lake Mojave lifeways may result from relatively rapidly changing climate and habitats during the Early Holocene. This would have produced unpredictability in resource distribution and abundance, producing a high degree of residential mobility.

Middle Holocene

Pinto Complex

The Pinto complex, dated at about 8000 to 3000 BC, appears to overlap the Lake Mojave complex. During the Lake Mojave and Pinto complexes, stone tools were made from materials other than obsidian and CCS. Pinto Series points are stemmed with indented bases, and display high levels of reworking. Bifacial and unifacial cores/tools are common. Ground stone tools are moderately to very abundant, indicating greatly increased use of plant resources. Pinto complex sites occur in a broad range of topographic and environmental settings, especially within remnant pluvial lake basins. Large apparent residential bases occur. They probably were occupied for prolonged periods by moderate to large numbers of people, practicing a collector subsistence strategy. Logistical forays into surrounding resource patches probably were made from these sites.

Deadman Lake Complex

Currently, the Deadman Lake complex, dating about 7500 to 5200 BC, appears to be confined to the Twentynine Palms area. Sites usually are surficial and located on old alluvial pediments. Artifacts include small-to-medium-size contracting stemmed or lozenge-shaped points, large concentrations of battered cobbles and core tools, and abundant bifaces, simple flake tools, and ground stone tools. The abundance of cobble tools suggests an emphasis upon plant processing. The Deadman Lake and Pinto complexes may represent two different human populations practicing different seasonal or annual rounds, or Deadman Lake may represent a component of the overall Pinto complex adaptation.

Late Holocene

In the approximate period of 3000 to 2000 BC, environmental conditions in the Mojave Desert were warmer and drier. Few archaeological sites date to this period. This suggests population densities were very low. Some areas may have been largely abandoned.

Gypsum Complex

Dating between about 2000 BC and 200 AD, the Gypsum complex is characterized by the presence of corner-notched Elko Series points, concave-base Humboldt Series points, and well-shouldered contracting-stemmed Gypsum Series points. Numerous bifaces also occur. Manos and metates are relatively common. During the early portion of the Gypsum complex, settlement-subsistence appears focused near streams. At this time, increased trade and social complexity apparently occurred. Gypsum complex components are smaller, more abundant, and occur over a more diverse suite of settings than those dating previously. Evidence for ritual activities includes quartz crystals, paint, split-twig animal figurines, and rock art. Gypsum complex sites are uncommon in the southern and eastern Mojave Desert.

Rose Spring Complex

Around 200 to 500 AD, cultural systems profoundly changed in the southern California deserts. Introduction of the bow and arrow, represented by Rosegate Series points, occurred. Previously, at about the beginning of the first millennium AD, moister conditions may have increased wetlands. During Rose Spring complex times, population increased, and significant changes in artifact assemblages took place. Well-developed middens yielded artifact assemblages containing knives, drills, pipes, bone awls, various ground stone tools, marine shell ornaments, and large amounts of obsidian. Obsidian procurement and processing apparently significantly structured settlement-subsistence.

Rose Spring sites often are located near springs, along washes, and sometimes along lakeshores. Intensive occupation is indicated by the presence of pit houses and other types of structures. Human populations appear to have peaked, possibly resulting from a more productive environment and a more efficient hunting technology. During the middle of Rose Spring times, climatic conditions became warmer and dryer. Increased populations, the warmer, drier climate, and increased hunting efficiency may have produced resource depletion. This may have resulted in changes ending the Rose Spring complex around 1100 AD.

Late Prehistoric

Starting at approximately 1000 to 1100 AD, the Late Prehistoric period began. During this time, new technologies were introduced; populations appear to have declined, and historic Native American cultures became established. Lake Cahuilla was a focal point of settlement-subsistence. A complex cultural landscape composed of rock art, trails, and geoglyphs[1] developed. Trade and exchange were elaborated, with an emphasis on links between coastal southern California and the Southwest. In addition to pottery, artifact assemblages include Desert Series projectile points, shell and steatite beads, and a variety of milling tools. Obsidian use declined significantly, with CCS becoming the dominant type of stone used for stone tools.

[1] Geoglyphs, also known as intaglios, were created on desert pavements by rearranging and/or clearing pebbles and rocks to form alignments, clearings, and/or figures. Rock alignments are present throughout this region, while representational figures only occur close to the Lower Colorado River. It is assumed that they played some role in sacred or ritual activities.

In the Late Prehistoric period, too, agriculture and pottery were introduced to the native peoples of the Colorado Desert. Agriculture probably began around 700 AD in the Colorado Desert. It most likely was introduced from the Hohokam area in southern Arizona or from northern Mexico and had its greatest impact along the Lower Colorado River (McGuire and Schiffer, 1982; Schaefer, 1994b, pp. 65–74; Schaefer and Laylander, 2007, pp. 253–254, as cited in CEC, 2010). At approximately the start of the first millennium AD, ceramic artifacts began to appear in the Colorado Desert. They included pottery types assigned to the Lowland Patayan (Lower Colorado Buff Ware) and Tizon Brown Ware traditions (Lyneis, 1988; Waters, 1982 as cited in CEC, 2010). At the time of the advent of sustained Euroamerican contact in 1769 AD, a number of Native American groups inhabited the Colorado Desert, using a complex cultural landscape, which appears to have been largely developed during the preceding millennium.

3.5.1.4 Ethnographic Background

Currently, the region in which the Project site is located is believed to have been occupied at various times by the Chemehuevi, Serrano, Cahuilla, Mojave, Quechan, Maricopa, and Halchidhoma.

Singer (1984, pp. 36–38, as cited in CEC, 2010) concluded the Chuckwalla Valley was not clearly assigned to any Native American group on maps depicting group territories. Following Johnston and Johnston (1957), Singer observed that the west end of the Chuckwalla Valley was near the intersecting boundaries of Cahuilla-Serrano-Chemehuevi territory. Possibly before 800 BC, the Chemehuevi may have expanded into Serrano territory, occupying the Chuckwalla Valley. No physical evidence suggested that the Cahuilla occupied the area. Given its east-west orientation and location, however, the Chuckwalla Valley may have been neutral territory, occupied by no Native American group in particular, which served as an east-west trade and travel route.

The Cahuilla

A wealth of information exists regarding traditional and historic Cahuilla society and culture (see Bean and Lawton, 1967 for a comprehensive bibliography of sources, as cited in CEC, 2010). Primary sources for the Cahuilla include Bean (1972, 1978 as cited in CEC, 2010), Bean and Saubel (1972 as cited in CEC, 2010), Drucker (1937 as cited in CEC, 2010), Gifford (1918 as cited in CEC, 2010), Hooper (1920 as cited in CEC, 2010), James (1960 as cited in CEC, 2010), Kroeber (1908, 1925, pp. 692–708, as cited in CEC, 2010), and Strong (1929, pp. 36–182, as cited in CEC, 2010). The Cahuilla language, divided into Desert, Pass, and Mountain dialects, has been assigned to the Takic subfamily of the Uto-Aztecan family (Golla, 2007; Shipley, 1978; Moratto, 1984 as cited in CEC, 2010).

Territory traditionally claimed by the Cahuilla was topographically complex, including mountain ranges, passes, canyons, valleys, and desert. Bean (1978, p. 375, as cited in CEC, 2010) described it as, "…from the summit of the San Bernardino Mountains in the north to Borrego Springs and the Chocolate Mountains in the south, a portion of the Colorado Desert west of Orocopia Mountain to the east, and the San Jacinto Plain near Riverside and the eastern slopes of Palomar Mountain to the west." The natural boundaries of the desert, mountains, hills, and plains

separated the Cahuilla from surrounding Native American groups. The Cahuilla interacted with surrounding peoples via intermarriage, ritual, trade, and war. The Cahuilla, Cupeno, Gabrielino, Serrano, and Luiseño shared common cultural traditions. The neighboring Cupeno were closest linguistically to the Cahuilla.

Cahuilla villages usually were located in canyons or on alluvial fans near water and food patches. The area immediately around a village was owned in common by a lineage. Other lands were divided into tracts owned by clans, families, and individuals. Numerous sacred sites with rock art were associated with each village. Villages were connected by trail networks used for hunting, trading, and social visiting. Trading was a prevalent economic activity. Some Cahuilla were trading specialists. The Cahuilla went as far west as the Channel Islands and east to the Gila River to trade.

Hunting and meat processing were done by men. Game included deer, mountain sheep, pronghorn, rabbits, rodents, and birds. These were hunted by individuals and communal hunting groups. Blinds, pits, bows and arrows, throwing sticks, nets, snares, and traps were used to procure game. Communal hunts with fire drives sometimes occurred.

The Cahuilla had access to an immense variety of plant resources present within a diverse suite of habitats (Barrows, 1900; Bean and Saubel, 1972 as cited in CEC, 2010). Several hundred plant species were used for food, manufacture, and medicine. Acorns, mesquite and screw beans, pinyon nuts, and cactus fruits were the most important plant foods. They were supplemented by a host of seeds, tubers, roots, bulbs, fruits and berries, and greens. Corn, beans, squash, and melons were cultivated. Over 200 species of plants were used as medicines.

Structures varied in size from brush structures to dome-shaped or rectangular houses, 15 to 20 feet long, and ceremonial houses. The chief's house usually was the largest. Used for many social, ceremonial, and religious functions, it was located near a good water source. It generally was next to the ceremonial house, which was used for rituals, curing, and recreational activities. Other structures included a communal men's sweathouse and granaries.

Mortars and pestles, manos and metates, pottery, and baskets were used to process and prepare plant and animal foods. Cahuilla material culture included a variety of decorated and plain baskets; painted/incised pottery; bows, arrows, and other hunting-related equipment; clothing, sandals, and blankets; ceremonial and ritual costumes and regalia; and cordage, rope, and mats. Games and music were important social and ritual activities for the Cahuilla.

The Cahuilla had named clans, composed of 3 to 10 lineages, with distinct dialects, common genitors, and a founding lineage. Each lineage owned particular lands, stories, songs, and anecdotes. Each lineage occupied a village and controlled specific resource areas. Clan territory was jointly owned by all clan members. Territory ownership was established by marked boundaries (rock art, geographic features), and oral tradition. Most of a clan's territory was open to all Cahuilla. Kinship rules determined rights to assets and responsibilities within a lineage. Each lineage cooperated in defense, large-scale subsistence activities, and ritual performance. The founding lineage within a clan often owned the office of ceremonial leader, the ceremonial house,

and sacred bundle. Artifacts and equipment used in rituals and subsistence were owned by individuals and could be sold or loaned.

The office of lineage leader usually passed from father to eldest son. He was responsible for correct performance of rituals, care of the sacred bundle, and maintenance of the ceremonial house. The lineage leader also determined when and where people could gather and hunt, administered first-fruits rites, and stored food and goods. He knew boundaries and ownership rights, resolving conflict with binding decisions. The lineage leader met with other lineage leaders concerning various issues. He was assisted in his duties by a hereditary official responsible for arranging details for performance of rituals. Other functionaries included song leaders/ceremonialists, assisted by singers and dancers.

Laws were enforced by ritual, stories, anecdotes, and direct action. Supernatural and direct sanctions were used. Tradition provided authority. The past was the referent for the present and future. Old age provided access to privilege, power, and honor. Reciprocity was a significant expectation. Doing things slowly, deliberatively, and thoughtfully was stressed. Integrity and dependability in personal relations were valued. Secrecy and caution were exercised in dealing with knowledge.

Disputes between Cahuilla villages usually arose over access to resources. Other causes included sorcery, personal insults, kidnapping of women, nonpayment of bride price, and theft. Armed conflict occurred after all other efforts to resolve things had failed. A lineage leader and/or skillful warrior lead a temporary war party. Community rituals were held before and after a fight, which usually involved ambush.

Ritual and ceremony were a constant factor in Cahuilla society. Some ceremonies were scheduled and routine, while others were sporadic and situational. The most important ceremonies were the annual mourning ceremony, the eagle ceremony, rites of passage (especially those associated with birth, naming, puberty, and marriage), status changes of adults, and rituals directed towards subsistence resources. The main focus was upon performance of cosmologically oriented song cycles, which placed the Cahuilla universe in perspective, reaffirming the relationship(s) of the Cahuilla to the sacred past, present, to one another, and to all things.

The descendants of the Cahuilla live on two principal reservations. One is the Agua Caliente Indian Reservation, located in the Palm Springs area and occupying 127 square kilometers (km^2) (49 square miles [mi^2]). The Agua Caliente Band has important influences in the local economy since its members operate an array of business enterprises, including land leasing, hotel and casino operations, and banking. The Morongo Indian Reservation is the second reservation that has many Cahuilla descendants. The Morongo Reservation is located in northern Riverside County, has a land base of 127 km^2 (49 mi^2), and a resident population of 954, the majority of Native American heritage. The Morongo Band of Mission Indians operates the Morongo Casino Resort and Spa. Smaller bands of Cahuilla are located in various locations around southern California (Jordan and Tennyson, 2011).

The Serrano

Literary sources about the Serrano include Bean and Smith (1978 as cited in CEC, 2010), Benedict (1924, 1929 as cited in CEC, 2010), Drucker (1937 as cited in CEC, 2010), Gifford (1918 as cited in CEC, 2010), Johnston (1965 as cited in CEC, 2010), Kroeber (1925, pp. 615–619 as cited in CEC, 2010), and Strong (1929, pp. 5–35, as cited in CEC, 2010). The Serrano shared many traits and artifacts with the Cahuilla, discussed above. The Serrano spoke a language belonging to the Serean Group of the Takic subfamily of the Uto-Aztecan family (Golla, 2007; Shipley, 1978; Moratto, 1984 as cited in CEC, 2010).

It is nearly impossible to assign definite boundaries to Serrano territory. Territory traditionally claimed by the Serrano included the San Bernardino Mountains east of Cajon Pass, lands at the base and north of the San Bernardinos in the desert near Victorville, and territory extending east in the desert to Twentynine Palms and south to and including the Yucaipa Valley.

The Serrano occupied small village hamlets located mainly in the foothills near water sources. Others were at higher elevations in coniferous forest, or in the desert. The availability of water was a critical determinant of the nature, duration, and distribution of Serrano settlements.

Women gathered, and men hunted and occasionally fished. Topography, elevations, and biota present within the Serrano territory varied greatly. Primary plant foods varied with locality. In the foothills, they included acorns and pinyon nuts. In the desert, honey mesquite, pinyon, yucca roots, and cactus fruits were staples. In both areas they were supplemented by a variety of roots, bulbs, shoots, and seeds, especially chia. Among primary game animals were deer, mountain sheep, pronghorn, rabbits, rodents, and quail. Large game was hunted with bows and arrows. Small game was taken with throwing sticks, traps, snares, and deadfalls. Meat was cooked in earth ovens. Meat and plant foods were parched or boiled in baskets. Plant foods were ground, pounded, or pulverized in mortars and pestles or with manos and metates. Processed meat and plant foods were dried and stored. Occasional communal deer and rabbit hunts were held. Communal acorn, pine nut, and mesquite gathering expeditions took place. These communal activities involved several lineages under a lineage leader’s authority.

Serrano houses were circular, domed, individual family dwellings, with willow frames and tule thatching. They were occupied by a husband and wife along with their children, and often other kin. Houses were mainly used for sleeping and storage. Most daily activities occurred outside, often in the shade of a ramada (a flat-roofed, open-sided shade structure) or other sun cover.

Settlements usually had a large ceremonial house where the lineage leader and his family lived. It was the social and religious center for each lineage or lineage set. The latter was two or more lineages linked by marriage, economic reciprocity, and ritual participation. Other structures included semi-subterranean, earth-covered sweathouses located near water, and granaries.

Serrano material culture was very similar to that of the Cahuilla. Stone, wood, bone, plant fibers, and shell were used to make a variety of artifacts. These included highly decorated baskets, pottery, rabbit skin blankets, bone awls, bows and arrows, arrow straighteners, fire drills, stone pipes, musical instruments, feathered costumes, mats, bags, storage pouches, cordage, and nets.

The clan was the largest autonomous landholding and political unit. No pan-tribal union between clans existed. Clans were aligned through economic, marital, and ceremonial reciprocity. Serrano clans often were allied with Cahuilla clans and Chemehuevi groups. The core of a clan was the lineage. A lineage included all men recognizing descent from a common ancestor, their wives, and their descendants. Serrano lineages were autonomous and localized, each occupying and using defined, favored territories. A lineage rarely claimed territory at a distance from its home base.

The head of a clan was a ceremonial and religious leader. He also determined where and when people could hunt and gather. Clan leadership was passed down from father to son. The clan leader was assisted by a hereditary ceremonial official from a different clan. This official held ceremonial paraphernalia (the sacred bundle), notified people about ceremonies, and handled ceremonial logistics.

Serrano shamans were primarily healers who acquired their powers through dreaming. A shaman cured illness by sucking it out of the sick person and by the administration of herbal medicines. Various phases of an individual's life cycle were occasions for ceremonies. After a woman gave birth, the mother and baby were "roasted," and a feast held. Differing puberty ceremonies were held for boys (*datura* ingestion used in a structured ceremonial vision quest) and girls ("pit roasting," ingestion of bitter herbs, dietary restrictions, instruction on how to be good wives). The dead were cremated, and a memorial service was held. During the annual 7-day mourning ceremony, the sacred bundle was displayed, the eagle-killing ceremony took place, a naming ceremony for all those born during the preceding year was held, images were made and burned of those who had died in the previous year, and the eagle dance was performed.

The Chemehuevi

Primary sources for the Chemehuevi include Drucker (1937 as cited in CEC, 2010), Kelly (1934, 1936 as cited in CEC, 2010), Kelly and Fowler (1986 as cited in CEC, 2010), Kroeber (1925, pp. 593–600, as cited in CEC, 2010), Miller and Miller (1967 as cited in CEC, 2010), and Roth (1976, 1977 as cited in CEC, 2010). Carobeth Laird married a Chemehuevi and collected a large corpus of data, primarily on ritual, religion, and myth (Laird 1974a, 1974b, 1975a, 1975b, 1976, 1977a, 1977b, 1977c, 1978a, 1978b, 1984 as cited in CEC, 2010). The Chemehuevi spoke a language belonging to the Southern Group of the Numic subfamily of the Uto-Aztecan family (Golla, 2007, Shipley, 1978; Moratto, 1984 as cited in CEC, 2010). Many traits characterizing Chemehuevi culture are very similar or identical to those of the Mojave, discussed below. Several probable Quechan traits also were noted for the Chemehuevi.

For the territory traditionally claimed by the Chemehuevi, the Colorado River formed the eastern boundary south to the Palo Verde Mountains. The boundary then ran northwest, passing east of the Ironwood Mountains, crossing the Maria Mountains, paralleling the Iron Mountains, and then running between Old Woman Mountain and Cadiz Dry Lake (Kelly, 1934; Kelly and Fowler, 1986, p. 369, fig. 1, as cited in CEC, 2010). Mojave territory lay to the northeast, and that of the Las Vegas group of Southern Paiute to the north-northwest.

The Chemehuevi lacked any form of overall "tribal" organization. Anthropologists refer to territorial subdivisions among the Chemehuevi as "bands." Each band was composed of a small number of camps/communities/villages. Bands most likely correspond to economic clusters (Kelly, 1964 as cited in CEC, 2010). Each group was a geographic unit, associated with a definite territory. In general, each band was economically self-sufficient.

In general, Chemehuevi settlement was mobile and scattered, with residence recurring within a fixed area. Houses were closely grouped. Their occupants usually were related by blood or marriage. Settlement size ranged from one to two households to 10 to 20. Springs often were inherited private property. Married siblings often camped at the same spring.

The Chemehuevi traveled widely. They had amicable contact with the Serrano, Cahuilla, Quechan/Yumans, and other Native American groups. The Chemehuevi sometimes joined with the Mojave/Quechan to fight the Cocopa/Halchidhoma. The Chemehuevi often crossed the Colorado River and hunted deer in Quechan, Yavapai, and Western Walapai territory. They also traded, intermarried, and competed in games with the Yavapai. To the west, the Chemehuevi hunted in the Tehachapi area and went to the Pacific Coast along the Santa Barbara Channel to get abalone shell. Sometimes, a party of 8 to 10 Chemehuevi men joined men from neighboring groups to make a 2-month journey to the Hopi villages (in what is now New Mexico) to trade.

The Chemehuevi apparently did not eat fish, but bighorn sheep, deer, pronghorn, and desert tortoise were among the animal food resources they used (Kelly and Fowler 1986, p. 369, as cited in CEC, 2010). Plant foods in this region included pinyon nuts and mescal. Men inherited rights to hunt large game within certain tracts, defined in songs using geographic references. Women gathered a great variety of plant foods, which were more important in the Chemehuevi diet than game. In addition to pinyon nuts and mescal, agave and seeds were staples. Along the Colorado River, the Chemehuevi practiced floodplain agriculture. They grew corn, squash, gourds, beans, sunflowers, amaranth, winter wheat, grasses, and devil's claw using techniques similar to Mojave agricultural practices (see below).

Chemehuevi winter houses were conical/subconical structures. They also built earth-covered houses without a front wall, similar to those constructed by the Mojave. During the summer, many Chemehuevi lived outside, often building and occupying armadas and windbreaks.

Chemehuevi baskets and cradles were made from plant fibers. Plant fibers also provided materials for rope, string, and cordage nets. Pottery, which followed Mojave patterns and styles, included cooking pots, water jars, seed germination and storage pots, spoons/scoops, and large pots for ferrying children across the Colorado River. Watercraft included log rafts and reed balsas. Clothing consisted of double skin or fiber aprons and sandals for men and women. The Chemehuevi commonly had pierced ears and wore body paint.

Monogamy was the most common form of marriage among the Chemehuevi, but some men had more than one wife. Women gave birth in a special enclosure, followed by a 30-day period of seclusion for mother, father, and child. Puberty rites for boys and girls were held, with the former

focused on acquisition of hunting skills. Cremation of the dead was traditional, replaced by in-ground burial in the historic period.

In general, no central political control existed. Territorial boundaries were not rigid, and some bands were named, while others were not. The basic social and economic unit was the nuclear family and could include other close kin. Groups of individual households moved together on hunting and gathering trips, returning to the same spring or agricultural site. Most large bands had a headman whose leadership was more advisory than authoritative. He was usually succeeded by his eldest son.

The principal role of Chemehuevi shamans was curing illness. They acquired their healing powers through dreams rather than through the use of *datura* or a trance. Chemehuevi families held a mourning ceremony ("cry"), with which several speeches and songs were associated, within the year after the death of a relative. The "cry" was sponsored by the family and included the ceremonial burning of material goods.

The Chemehuevi had deer and mountain sheep song-dances, held for entertainment and hunting success. The Chemehuevi had other songs, as well: bird, salt, quail, and funeral songs. During winter evenings, men narrated a rich body of traditional stories and myths. These performances often included mimicry, song, and audience participation. Oral tradition related people to social norms, their territories, and to the subsistence resources present within them.

The Chemehuevi lost their traditional lands to the U.S. government in 1853. A little more than a half-century later (in 1907), the Chemehuevi Valley Reservation was established. The tribe received formal federal recognition and was reinstated in 1970. The Chemehuevi have a contemporary land base of 32,000 acres of trust land that incorporates 30 miles of Colorado River frontage. Descendants of the Chemehuevi live on the Colorado River Indian Tribes Reservation and also reside on several other reservations, including the Twentynine Palms Reservation (Jordan and Tennyson, 2011).

The Mojave

Information regarding the traditional lifeways of the Mojave has mainly been drawn from the accounts of early explorers and/or fur trappers who were among the first to encounter native groups, as well as from the later ethnographic accounts of anthropologists, usually well after the influences of Euroamerican contact had begun to alter traditional ways of life. The following summary derives mainly from Kroeber (1925 as cited in CEC, 2010) and Stewart (1983a, 1983b as cited in CEC, 2010).

The name Mojave is a variation on the name Hamakhava, which is what the tribal people called themselves (Kroeber, 1925, p. 727, as cited in CEC, 2010). The Mojave language is classified into the Yuman subfamily of the Hokan language family. The Mojave were the northernmost and largest tribe of the River and Delta Yumans, who comprised a series of agricultural tribes that occupied the lower Colorado and Gila Rivers. The traditional ethnographic territory attributed to the Mojave includes the Mojave, Chemehuevi, and Colorado River Valleys along the lower Colorado River at the intersection of the borders of Arizona, Nevada, and California. In

pre-contact times, Mojave tribal settlement is reported to have centered in the Mojave Valley where their population densities were observed to be the greatest (Stewart, 1983b, p. 55, as cited in CEC, 2010).

The Colorado River served as something of an oasis in the otherwise harsh, dry environment that surrounded the river valleys. The spring overflow of the river, which spread gently over the bottomlands, left behind a rich silt deposit in its recession. Within these bottomlands, the Mojave cultivated crops, which served as the foundation of their subsistence economy. Their agricultural methods were relatively simple, consisting of planting seeds on the richly silted floodplains and allowing their crops to mature with a minimum of maintenance or effort. Corn was the primary crop, but several varieties of tepary beans, pumpkins, melons, and other plants were also grown. Once harvested, the portions of the harvest that were not immediately consumed were dried in the sun and stored in large basketry granaries. The Mojave supplemented their diet mainly by gathering wild plants and by fishing, which served as their principle source of flesh non-plant food. Hunting played a minor role in the Mojave subsistence economy (Stewart, 1983b, pp. 56–59, as cited in CEC, 2010).

Technology of the Mojave was relatively simple, and tools were reported to have been crafted to meet only the minimum requirements of utility (Stewart, 1983b, p. 59, as cited in CEC, 2010). According to Kroeber (1925, p. 736, as cited in CEC, 2010), the farming implements consisted of only two items: a heavy wooden staff or digging stick for planting and a spatulate wooden hoe-like implement, whose square edge was pushed flat over the ground to control weeds. Metates, consisting of a rectangular block of stone, were used for grinding corn, wheat, and beans, and both stone and wooden pestles, as well as stone mortars, were also used for food processing (Kroeber, 1925, pp. 736–737, as cited in CEC, 2010). Fish were commonly taken with seines, large basketry scoops, sieves, dip nets, and weirs. The bow and arrow and cactus-spine fish hooks were also used for fishing. Mojave basketry was crudely woven, and their pottery was basic and utilitarian (Stewart, 1983b, p. 59, as cited in CEC, 2010). Since hunting was of relatively little significance to the Mojave, hunting devices and techniques were not well developed, consisting mainly of snares, nets, bow and arrow, or curved throwing sticks (Stewart, 1983b, pp. 59–61, as cited in CEC, 2010).

Mojave political and social organization was very informal, and no one individual or group had significant authority over another. Despite the Mojave's loose division into bands or local groups that were spread out over great distances, their cohesion as a tribe was very strong, and they considered themselves as one people occupying a nation with a well-defined territory (Stewart, 1983a, 1983b as cited in CEC, 2010).

The nuclear family was the basic unit of economic and social cooperation, although the extended family constituted the core of a settlement. Rather than large centralized villages, Mojave settlements were widely distributed along the riverbanks in close proximity to arable lands. Houses were situated on low rises above the floodplain and often separated by as much as a mile or two (Stewart, 1983b, p. 57, as cited in CEC, 2010). During most of the year, the Mojave slept under ramadas; however, during the colder season, they occupied more substantial, semi-subterranean, rectangular earth-covered houses.

Warfare was a dominant strain in River Yuman culture, and the Mojave's strong tribal unity served them well in times of warfare. They apparently traveled great distances to do battle, and their principle weapons were bows and arrows and hard wood clubs. According to Kroeber (1925, p. 727, as cited in CEC, 2010), their main motivation for traveling was sheer curiosity, as they liked to see other lands and were eager to know the manners of other peoples, but were not heavily interested in trade.

The Mojave were culturally similar to the other River and Delta Yumans: the Quechan, Halchidhoma, Maricopa, and Cocopa. During ethnographic times, the Quechan were considered friends and allies of the Mojave, while the Halchidhoma, Maricopa, and Cocopa were considered to be enemies with whom the Mojave engaged in warfare (Stewart, 1983b, p. 56, as cited in CEC, 2010). The Mojave were also friendly with the Upland Yuman tribes of the Yavapai and Walapai of western Arizona, although relations with the Walapai were somewhat mixed.

One of the most important rituals observed by the Mojave centered on death, namely the funeral and subsequent commemorative mourning ceremony. As soon as possible after death, the deceased was cremated upon a funeral pyre along with all of his or her possessions. The house and granary of the deceased were also burned. It was believed that by burning, these things would be transmitted to the land of the dead along with the soul of the deceased (Stewart, 1983b, pp. 65–67, as cited in CEC, 2010).

Due to their relatively remote location inland, the Mojave maintained their independence throughout the Spanish period of the 16th and 17th centuries and were only rarely visited by explorers during that time. The few Spanish accounts of encounters with the Mojave provided similar descriptions of Mojave lifeways as those reported later by ethnographers. The ancestors of the Mojave are believed to have resided in the area for at least 1,000 years, and their mode of life in prehistoric times is thought to be similar to that observed historically (Stewart, 1983b, p. 56, as cited in CEC, 2010).

Today, many of the descendants of the indigenous Mojave reside on or near one of two reservations located on the Colorado River. The Fort Mojave Indian Reservation includes areas of California, Arizona, and Nevada. The reservation covers 42,000 acres, with its headquarters in Needles, California. Two tribal casinos are operated on the reservation, and there are also a variety of recreational facilities and a resort (Jordan and Tennyson, 2011).

The Colorado River Indian Reservation is composed of land in California and Arizona and is shared by the Mojave, Chemehuevi, Hopi, and Navajo nations. This reservation includes almost 300,000 acres of land and includes business interests centering on agriculture, a casino, outdoor recreation, and light industry. The original Colorado River and Fort Mojave reservations were established in 1865 and 1870, respectively. Although the four combined groups are united within the Colorado River Indian Reservation and act as a single geo-political unit, each Colorado River Indian Tribe continues to maintain and observe its individual traditions, distinct religions, and culturally unique character (Jordan and Tennyson, 2011).

The Quechan/Yuma

The following summary of the Quechan or Yuma is derived mainly from Bee (1983 as cited in CEC, 2010), Kroeber (1925 as cited in CEC, 2010), and Stewart (1983a as cited in CEC, 2010).

Quechan is a variation on the names Kwichyan or Kuchiana, which are the names the tribe called themselves, but this group was also commonly known as the Yuma. The Quechan are among the Yuman-speaking tribes who occupied the lower Colorado River where it forms the boundary between California and Arizona. According to Kroeber (1925, p. 782, as cited in CEC, 2010), the Quechan and their neighbors to the north, the Mojave, appear to be virtually identical in terms of their agriculture, manufactures, clothing, hair dress, houses, warfare, and sense of tribal unity.

The ethnographic territory traditionally associated with the Quechan, now divided between the states of California and Arizona, is centered on the confluence of the Colorado and the Gila Rivers, extending several miles north and south along the Colorado and east along the Gila. Quechan legend tells of a southward migration of their ancestors from a sacred mountain; however, it is not known when the ancestors of the Quechan first settled near the confluence (Bee 1983, p. 86, as cited in CEC, 2010). No group of this name was mentioned in the account of Hernando de Alarcón when he passed through the area during an expedition in 1540, and the first reference to this group did not appear in Spanish documents until the late 17th century, at which time they were settled around the river confluence area (Bee, 1983, p. 86, as cited in CEC, 2010).

In an environment otherwise surrounded by dry desert terrain, the subsistence economy of the Quechan focused on riverine agriculture, which was one of the main sources of food for the tribe. Crops were cultivated in the richly silted river bottomlands following the recession of the spring floods and provided a relatively high yield in exchange for relatively low labor output (Bee, 1983, pp. 86–87, as cited in CEC, 2010). The main cultivated crops included corn, tepary beans, pumpkins, and gourds. In post-contact times, watermelons, black-eyed peas, muskmelons, and wheat were introduced by Europeans and brought into cultivation by the Quechan, as well. The Quechan also relied on the gathering of wild foods, the most important of which were mesquite and screw-bean pods, although a variety of other wild plants were also collected (Bee, 1983, p. 87; Castetter and Bell, 1951, pp. 187–188, as cited in CEC, 2010). Fishing was of minor importance, as there were few species in the lower Colorado River suitable for eating. Among the fish sought were the humpback, white salmon, and boneytail, which were sometimes caught with unfeathered arrows or cactus spine hooks, but more often taken with traps and nets during floods (Forde, 1931, pp. 107–120, as cited in CEC, 2010). Given the low incidence of game available in the area, hunting played a minor role in the overall subsistence economy (Bee, 1983, p. 86, as cited in CEC, 2010).

Like the Mojave, Quechan tribal settlements, or rancherias, consisted of extended family groups that were widely dispersed along the riverbanks. Settlements shifted throughout the year, dispersing into smaller groups along the bottomlands during the spring and summer farming seasons and reconvening into larger groups on higher ground, away from the river, during the winter and spring flood periods (Bee, 1983, pp. 87–88, as cited in CEC, 2010). The geographic dispersion of the households within the rancheria groups was closely correlated with the

condition of the rivers and the technology of riverine agriculture (Bee, 1983, p. 89, as cited in CEC, 2010). The warm climate and scant precipitation made substantial housing unnecessary for most of the year, so most people made use of ramadas or dome-shaped arrowweed shelters. Each rancheria typically had one or two large, earth-covered shelters for the rancheria leaders' families, but these shelters also accommodated small crowds during colder weather (Forde, 1931, p. 122, as cited in CEC, 2010).

Much like the Mojave, Quechan technology lacked technical or decorative elaboration beyond the demands of minimal utility (Bee, 1983, p. 89, as cited in CEC, 2010). Quechan bows did not feature "backed" construction and so lacked power, and their arrows were frequently untipped, so the bow and arrow's range was short and the penetrating power weak. Sharpened staffs served as digging sticks or, when cut in longer lengths, as weapons (Bee, 1983, p. 89, as cited in CEC, 2010).

There were no marked gradations in wealth, and social pressure favored the sharing of one's abundance with others who were less fortunate. Land ownership was informal, and people did not show much interest in the accumulation of material goods beyond the immediate needs of the family group or the surplus maintained by local leaders for redistribution to needy families within their rancheria (Bee, 1983, p. 89, as cited in CEC, 2010). Lands were not inherited by family members upon the death of an individual; rather, the lands of the deceased were abandoned, and replacement plots were sought by the family members.

Despite the wide distribution of settlements, the Quechan had a strong sense of tribal unity. As with their neighbors and allies, the Mojave, warfare played a major role in Quechan culture, and it was during times of warfare that tribal unity was most prevalent among the individual settlements (Bee, 1983, p. 92, as cited in CEC, 2010). Their major enemies were the Cocopa and the Maricopa, and they often allied themselves with the Mojave in strikes against common enemies (Bee, 1983, p. 93, as cited in CEC, 2010). Bee (1983, p. 93, as cited in CEC, 2010) suggests that warfare among the riverine peoples may have increased in scale and intensity during the 18th and early 19th centuries due to new economic incentives, such as the opportunity to trade captives to the Spaniards or to other tribes for horses or goods.

Quechan social and political organization, like that of the Mojave, appears to have been very informal, with no one individual or group having significant authority over others. Two types of tribal leadership have been reported for the Quechan, one for civil affairs and the other for war, but it is questionable how influential these leadership roles may have been. Each rancheria had one or more headmen, but their authority was contingent upon public support and continued demonstration of competence. According to Bee (1983, p. 92, as cited in CEC, 2010), important matters at either the tribal or the rancheria level were always decided by consensus, sometimes after long debates dominated by the better and more forceful speaker.

Another important aspect of Quechan society that was shared with the Mojave concerns the commemoration of the dead, which was an elaborate ceremony involving wailing and the destruction of property and ritual paraphernalia. All possessions of the deceased, including the family home, were destroyed or given away (Bee, 1983, pp. 89, 93–94, as cited in CEC, 2010).

The contemporary Quechan community is concentrated in the lands of the Fort Yuma-Quechan Reservation and has its main headquarters in Fort Yuma, Arizona. The reservation is approximately 45,000 acres and is located along the lower Colorado River in both Arizona and California just north of the U.S./Mexico border. The Tribal Enrollment Office numbers the registered members of the Quechan population as 2,475 members. The economic basis for the tribe consists of farming, sand and gravel operation, recreational vehicle parks, a grocery store, a museum, a utility company, a fish and game department, and a resort/casino (Jordan and Tennyson, 2011).

The Maricopa and the Halchidhoma

Ethnographic information for the Maricopa and the Halchidhoma is meager in comparison to the Mojave and the Quechan. The following brief summary is derived from Harwell and Kelly (1983 as cited in CEC, 2010) and Stewart (1983a as cited in CEC, 2010).

The Halchidhoma first entered written history in the early 17th century with the account of Juan de Oñate, who encountered the "Alebdoma" or "Halchedoma" during a Spanish expedition on the lower Colorado River, below its junction with the Gila River. When later encountered by missionary-explorer Eusebio Francisco Kino in the early 18th century, the Halchidhoma (or "Alchedoma," as they were referred to by Kino) had moved farther north up the Colorado beyond the Gila. The traditional territory attributed to the Halchidhoma lay along the lower Colorado between the Mojave and the Quechan territories. They were later driven from that area under pressure from their hostile Mojave and Quechan neighbors and moved to the middle Gila River area, where some merged with the Maricopa (Stewart, 1983a as cited in CEC, 2010).

The term Maricopa refers to the Yuman-speaking groups who in the early 19th century occupied the area along or near the Gila River and its tributaries (in what is now southern Arizona), but who earlier had occupied the lower Colorado River area. The Maricopa language is closely related to Quechan and Mojave, all three of which are classified as members of the River branch of the Yuman language family (Harwell and Kelly, 1983, p. 71, as cited in CEC, 2010). The Maricopa call themselves *pi•pa•s*, "the people." The name Maricopa is an English abbreviation of the name Cocomaricopa, first used by Eusebio Kino in the late 17th century (Harwell and Kelly, 1983, p. 83, as cited in CEC, 2010).

The Maricopa, who by the early 19th century included remnant tribes of the Halyikwamai, Kahwan, Halchidhoma, and Kavelchadom, share common origins and are culturally similar to both the Quechan and the Mojave, the most prominent traits of which included floodwater agriculture and cremation of the dead. Their material culture was also essentially the same (Harwell and Kelly, 1983, p. 71, as cited in CEC, 2010). The Colorado River Maricopa lived in low, rectangular, earth-covered houses, but the Maricopa of the Gila River had adopted the round houses of their Piman neighbors. Technology was of little interest to the River Yumans and remained at a low level of development (Stewart, 1983a as cited in CEC, 2010).

Today, the Halchidoma are part of the Salt River Pima–Maricopa Indian community that is recognized as a sovereign tribe and is located in the metropolitan Phoenix, Arizona, area. This reservation is bounded by the cities of Scottsdale, Tempe, Mesa, and Fountain Hills. This tribal

community encompasses 52,600 acres. Two distinct backgrounds and cultures are joined within this single community composed of the Pima: Akimel O'Odham (river people) and Maricopa Xalychidom Piipaash (people who live toward the water). Approximately 12,000 acres are under cultivation in a variety of crops, including cotton, melons, potatoes, onions, broccoli, and carrots. Commercial development is reserved along the community's western boundary. The community owns and operates several business interests, including a golf course, financial services, gaming resort, recreational facility, and landfill (Jordan and Tennyson, 2011).

3.5.1.5 Historical Background

The Colorado Desert area, in which the Project would be located, has remained one of the more sparsely populated regions of the American West. The harsh arid environment and shortage of natural water supply has presented a challenge to the development of trans-desert routes for the movement of people and goods, the exploitation of resources in the area, and the establishment of permanent settlement. The major historical themes for the Colorado Desert region and the Project area in eastern Riverside County, in particular, are centered on the establishment of transportation routes, water access and control, agriculture, ranching, mineral exploitation, and military uses. The following brief historical background of the Colorado Desert area in eastern Riverside County is derived from the following sources: Bischoff, 2000; Castillo, 1978; Farmer et al., 2009; Solar Millennium, 2009; Von Till Warren et al., 1980; and WESTEC, 1982 as cited in CEC, 2010.

The earliest recorded history of the lower Colorado River region began with the expeditions of Spanish explorers, who were lured by rumors of a rich northern Indian civilization. However, due to the Spaniards' failure to find the fabled northern treasures and the remoteness of the region, the Colorado Desert was seldom visited during the Spanish and Mexican periods.

The desert region has produced a variety of mineral deposits, including gold, silver, fluorite, manganese, copper, gypsum, iron, and uranium, and mining activities played a significant role in stimulating early occupation and travel across the arid desert. Following the end of the Mexican period in 1848 and the onset of the California Gold Rush in 1849, a flood of gold-seeking emigrants began to pour into California, some choosing the southern overland route through the desert, many of whom were unprepared and suffered extreme hardships. The construction and expansion of the Southern Pacific Railroad into the desert in the late 1870s was a major factor in facilitating travel and transport of supplies to the remote areas of eastern Riverside County, enabling further development of mines, irrigation, and settlement in the area.

The 1880s and 1890s were years of relative prosperity for mining regions of eastern Riverside County. Intermittent mining activity has occurred in the area since that time; however, in the Palo Verde Valley area, mining has remained a relatively small part of the local economy. Evidence of past mining activity in the region is evidenced by a scattering of abandoned prospecting pits, collections of food trash and other debris, and a handful of prospect claim markers in the form of wooden stakes, small stone cairns, and metal cans, which may have originally contained claim papers.

Automobile travel across and within the Colorado Desert area initially developed using existing wagon roads or following railroad rights of way. By the early 20th century, the automobile became the preferred mode of transportation. In 1914, Riverside County established the route from Mecca to Blythe as an official County road, which served as a main route across the desert. County officials dug wells and erected signposts along this road to serve its few travelers. In the early 1920s, Highway 60 was built to the south of the original route through Shavers Valley and Chuckwalla Valley. In the 1960s, the current Interstate Highway 10 was constructed along the old route of Highway 60. With the arrival of roads, settlement patterns changed from occasional miners' camps to roadside businesses serving travelers.

With the passage of the Homestead Act in 1862, vast areas of public land were opened up to private citizens, and agriculture became an economically important industry in California. Although much of the desert lands were poorly suited to farming, the Palo Verde Valley of the lower Colorado River was an exception. Thomas H. Blythe, who is known as "the father of the Palo Verde Valley," was the first to develop large tracts of land along the west bank of the Colorado River across from the established portage point at Ehrenberg, Arizona, near the present-day town of Blythe. Blythe died in 1883 before his development could be fully completed, but agricultural practices had already begun to take place and continued to be developed in the area. The town of Blythe was incorporated in 1916.

By the late 1920s, the Palo Verde Irrigation District Act was passed, and the region's irrigation and drainage needs were facilitated by one district. Farming continues to be a commercial industry in Blythe. On the Palo Verde Mesa, however, in the vicinity of the Project, agriculture was never a significant pursuit due to the poor soils and lack of readily accessible water. In the early 20th century, some ranching activities were attempted on the mesa.

In the 1930s, the Metropolitan Water District was created to effect transport of water from the Colorado River to Los Angeles. The Metropolitan Aqueduct was constructed from Parker Dam through the mountains east of Indio to Riverside, and finally, to Los Angeles. It was the largest construction project in the world at the time and provided jobs during the depression (Pittman, 1995 as cited in Tennyson, 2011).

The Project area falls within the limits of Gen. George S. Patton's World War II Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA), which was in operation from 1942 to 1944. The area was chosen by Patton to prepare troops for the harsh conditions and environment of combat for the North Africa Campaign. At 12 million acres, the DTC/C-AMA was the largest-ever military training center, stretching from west of Pomona, California, to Yuma, Arizona, and north into Nevada. The valley bordered by the Palen, Little Maria, and McCoy Mountains is considered one of the most extensive maneuver areas in the DTC/C-AMA. After two years in operation and the training of one million troops, the DTC/C-AMA was closed in 1944 as a result of the allied victory in North Africa and the need for trained troops elsewhere. Following the closure of the DTC/C-AMA, dismantling and salvage efforts began, and the land was ultimately returned to private and government holdings (Bischoff, 2000 as cited in CEC, 2010). The remains of the DTC/C-AMA areas consist of rock features; faint roads; structural features; concertina wire; tank tracks; footprints of runway and landing strips; large base camps such as those at Camp

Rice, Coxcomb, and Young; foxholes and bivouacs; concrete defensive positions; refuse; and trails. The Blythe Army Airbase, a major military camp at the DTC/C-AMA, is located to the southeast of the Project.

3.5.1.6 Identified Cultural Resources

This subsection provides the results of cultural resource inventories conducted to identify cultural resources within the Project area, including literature and records searches (California Historical Resources Information System [CHRIS] and local records), archival research, Native American consultation, and field investigations. For purposes of this discussion, the Project area for NEPA is equivalent to the Area of Potential Effects (APE) under the NHPA. The regulations implementing NHPA §106 define the APE as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

Previous Research

CHRIS Records Search

With the intent of compiling information on known cultural resources and previously conducted cultural resources studies pertinent to the location of the Project, a records search was conducted for the Project and a 1-mile buffer around it on February 3, 2011 at the Eastern Information Center (EIC, part of CHRIS), located at the University of California, Riverside. The records and literature search results indicated that a total of 22 previous investigations had been conducted within a 1-mile radius of the study area (Appendix D, Table 1). These consist of 17 survey-level investigations, four regional overviews, and one impact study for a project. Of these, 10 are located within the Project area (Jordan and Tennyson, 2011).

The previous investigations identified 267 previously recorded cultural resources within a 1-mile radius of the Project. Of these, 56 cultural resources are located within the boundaries of the Project. The remaining identified cultural resources are located within the 1-mile buffer zone. The majority of the sites identified are World War II-era military sites, small lithic scatters, and historic roads. These sites are primarily located in or within 1 mile of the linear facilities and were identified during archaeological studies conducted in support of the Blythe Solar Power Project (BSPP) to the immediate south (Jordan and Tennyson, 2011).

Several archaeological surveys were conducted in the general vicinity of the Project between 2006 and 2011. Portions of these surveys overlapped with the Project as currently designed, including the BSPP and several surveys for the CRS. Surveys for the BSPP were conducted by AECOM between 2009 and 2011. Surveys for the CRS were completed between 2006 and 2011 by ASM Affiliates, Applied Earthworks, and ICF Jones & Stokes. Also, survey work associated with the GSEP was conducted near the CRS (Jordan and Tennyson, 2011).

Types of archaeological sites that have been found during previous investigations of the general area within which the Project is located are described below (excerpted from Jordan and

Tennyson, 2011). These site types are presented in order to provide examples of the types of archaeological resources that may be found in the region.

Prehistoric Site Types

The following discussion of the prehistoric site types of the Project area is excerpted from a study conducted by AECOM for the Project (Jordan and Tennyson, 2011).

Habitation Sites. Habitation sites are characterized by a wide variety of occupation debris and, occasionally, the remains of domestic architecture. These sites can contain living areas (see also rock rings and cleared circles, below), cooking hearths, subsistence remains (faunal bone and plant remains), midden deposits, and artifact scatters. Within the habitation site type, a range of subtypes exist, distinguished primarily by the intensity and longevity of the use of the site as a living space.

Habitation sites can range from very large, permanent villages occupied year-round by several families, to small, temporary camp sites occupied once for a matter of days or weeks. Even temporary habitation sites can contain discrete activity areas devoted to a variety of activities such as lithic reduction, milling, butchery, cooking, and other subsistence-related activities. Prehistoric habitation sites of any duration are unlikely on the Palo Verde Mesa, as there is no reliable water source nearby.

Quarries and Lithic Procurement Sites. In North America, stone tools of various kinds were some of the most important implements of daily life. Flaked stone tools were used to cut, scrape, chop, carve, and take down game animals. Groundstone tools were largely milling implements used to grind plant foods, medicinal herbs, and minerals. The manufacture of these tools required specific types of stone that was distributed unevenly across the landscape. Deposits of high-quality toolstone were mined repeatedly over centuries and even millennia. While some quarries were claimed by particular ethnic or family groups, most were used by a variety of groups with overlapping ranges.

Lithic raw material procurement sites can take the form of quarries where rock was dug and chiseled out of the ground, and free deposits of rock, typically transported and aggregated through water or glacial action. One quarry is located south of the Project area. Site CA-RIV-9792 is a quartz quarry located at the base of the McCoy Mountains that includes flakes, debitage, possible digging sticks, and trail segments (Vargas, 2010). There is also a stratum of clay that occurs below the topsoil. It can be seen in erosional cuts around the quartz deposits.

In the Project area, the long pebble terraces associated with the Pleistocene course of the Colorado River were frequented by prehistoric groups who used the river cobbles to create flaked stone tools of various types. Much of the initial work of removing the weathered outer cortex of the cobbles was completed where the cobbles were found on the pebble terraces. Thus, the pebble terraces contain clear evidence of their use for lithic raw material procurement and tool production.

Evidence of groundstone quarries and production sites has been found in the Palo Verde Hills (Apple et al., 2001), at Palo Verde Point (Johnson, 2001), in the Picacho Basin (Pendleton et al., 1986), and along the Colorado and Gila Rivers (Ezzo and Altschul, 1993; Schneider and Altschul, 2000). Boma Johnson's (2001) work suggests that there are large quarries in the Palo Verde Point area that were used for the manufacture of mano, metate, and pestle blanks. At temporary campsites and larger habitation sites, mobile groups often cached groundstone tools for use upon their return to the same locales.

Lithic Scatters and Flaking Stations. Lithic scatters and flaking stations can range from single-use flaking stations to large scatters that contain numerous flaking episodes with a light background scatter of debitage. Discrete flaking stations, where a single episode of lithic reduction occurred, often include cores and debitage, but rarely finished tools or useable flakes. When tools are found in lithic scatters, they are usually broken blanks from early in the manufacturing process, or expedient tools. The debitage in lithic scatters may be the result of various core and biface reduction technologies. Debitage size and character is often associated with the size of the parent material.

A lithic study in the nearby McCoy Wash included a detailed in-field analysis of reduction techniques as reconstructed from the preserved debitage and cores (Flenniken and Spencer, 2001). The researchers concluded that four discrete reduction technologies were represented in the wash, all of them apparently contemporaneous and directly related to the size and shape of the source materials chosen for reduction (Flenniken and Spencer, 2001:61). Although lithic scatters are generally interpreted by archaeologists as places where toolstone acquisition and tool manufacture occurred, Native American representatives have pointed out that certain ritual activities also result in the production of scatters of flaked stone materials (Altschul and Ezzo, 1994; Cachora, 1994).

Trails. Trails are generally tamped into stable surfaces, sometimes with larger gravel and pebbles pushed to the sides to form slight berms along the edges of the trail. In the desert, trails are typically found along the tops of ridge systems, on stable alluvial fans, on desert pavements, and in upland areas where they often disappear into washes. Prehistoric trails can follow washes for considerable distances. Several trails have been documented along the lower Colorado River where they are often associated with petroglyphs, ground figures, and cairns (Altschul and Ezzo, 1994; Cachora, 1994; Johnson, 1985; McGuire and Schiffer, 1982; Pendleton et al., 1986; Pigniolo et al., 1997; Rogers, 1939; Schaefer, 1994a; Schaefer, 1994b; Von Werlhof, 1987).

Ceramic Scatters and Pot Drops. "Ceramic scatter" refers to a dispersed surface distribution of ceramics, typically from multiple vessels. A "pot drop" is traditionally defined as a small, distinct concentration of sherds from a single vessel. As early as the 1930s, Malcolm Rogers recognized that shrines along trails and other ceremonially significant sites in the Colorado Desert frequently contain concentrations of prehistoric ceramics (Rogers, n.d.).

Cleared Circles. Cleared circles, sometimes referred to as "sleeping circles," are commonly found throughout the regional study area. These are cleared areas in the desert pavement that are roughly circular in outline. Following Malcolm Rogers' (1966) initial work, archaeologists have

interpreted larger cleared circles as sleeping or resting places, and identified smaller ones as vision quest or meditation circles (Davis, 1980; Ezzo and Altschul, 1993; Pigniolo et al., 1997; Rogers, 1966; Von Werlhof and Von Werlhof, 1977). Habitation debris is rarely found in direct association with cleared circles (Rogers, 1966), and subsurface deposits at cleared circles in the Colorado Desert generally are very rare (Marmaduke and Dosh, 1994; Pendleton et al., 1986; Schaefer, 1986). Lorann Pendleton (1984) has suggested that some cleared circles lacking associated artifacts may be natural features created by wind action around creosote bushes.

Prehistoric Cairns. Within the Colorado Desert, prehistoric cairns are typically situated on stable surfaces. The cairns, which may be partially collapsed, are composed of multiple courses of dry-stacked rocks ranging from pebbles to small boulders. Prehistoric cairns are frequently found associated with trails or other prehistoric features. Researchers have also documented a number of human inhumations associated with cairns, most of which appear to date to the Archaic period (McDonald, 1992; Schaefer, 1994a).

Thermal Cobble Features. Thermal cobble features interpreted as the remains of roasting pits are occasionally found away from domestic debris as isolates or in groups. Roasting pits sometimes occur in association with natural stands of specific food resources, such as agave, pinyon nuts, and saltbush seeds. These plant foods were often harvested, processed, and roasted before consumption or transport to established habitation sites (Lightfoot and Parrish, 2009:347, 354). A roasting pit is a type of earth oven constructed by digging an oval to circular hole and lining it with vegetation or cobbles and small boulders. A fire may be built over the rocks to heat them before placing the plant food materials in the earth oven, or the foodstuffs may be placed directly on the cobbles and then covered with other materials (e.g., green plants, rocks, soil) before a fire is built over the entire feature.

The remains of roasting pits are typically 1 m to 3 m in diameter, roughly circular concentrations of fist-sized cobbles, most showing evidence of thermal alteration. These may be the in situ remains of earth ovens, or they may be "clean out" concentrations of stones removed from an oven to access the roasted foods within. Several examples of this site type were identified along the pebble terraces that bound the eastern side of the Project. Similar features, identified as "agave baking pits" were excavated by Steven Shackley (1984) approximately 140 miles southwest of the Project in the In-ko-pah Gorge area.

Petroglyphs. Petroglyphs are formed by removing, by various means, the varnish or weathered surface from boulders or bedrock outcrops. Considered ceremonial, petroglyphs in the Colorado Desert include anthropomorphic, zoomorphic, abstract, and geometric forms (Cleland and Apple, 2003 as cited in CEC, 2010; Ezzo and Altschul, 1993). Although single, isolated petroglyphs are occasionally found, petroglyphs usually occur clustered on rock faces forming panels, possibly with compositional significance.

Ground Figures – Geoglyphs and Rock Alignments. For the purposes of this study, two types of ground figures are recognized: geoglyphs and rock alignments. Both are considered to have ceremonial or ritual significance. Geoglyphs, sometimes referred to as intaglios, are lines and figures created through various means on stable ground surfaces (Harner, 1953 as cited in CEC,

2010; Johnson, 1985; Rogers, 1945). Geoglyphs may be formed through a deliberate subtractive process, or incidentally from repetitive motion upon the land.

In the Colorado Desert, geoglyphs are typically formed by removing the uppermost layer of desert pavement rocks and gravel, exposing the lighter colored soil beneath. The removed gravel is often pushed to the edge of the exposed surfaces, forming a low gravel berm around the geoglyph figure. Depending on the construction method and the degree of erosion, these berms can range from well-defined to ill-defined or nonexistent (Von Werlhof, 1987 as cited in CEC, 2010). Geoglyphs may alternatively be tamped into the desert pavement rather than incised. For example, tamped rings are features in which the pavement surface is compressed but not actually removed, possibly as a result of the repetitive movements involved in ritual circle dances (Johnson, 1985; Von Werlhof, 2004; Solari and Johnson, 1982 as cited in CEC, 2010).

Ground figures can also be formed by an additive process wherein cobbles and/or small boulders are arranged on the ground surface in various shapes and alignments (Johnson, 1985; Von Werlhof, 1987). For this Project, these additive ground features are referred to as "rock alignments."

Cremations and Human Remains. All cultures maintain specific practices and profound beliefs concerning the treatment and disposition of the dead. For that reason, the disturbance of human remains is always a sensitive issue culturally, ethically, and legally. Traditionally, the Late Prehistoric and Proto-historic peoples of the Colorado River area practiced cremation, although other practices, including burial, are known archaeologically. In situ burials and cremations in the Colorado Desert are frequently associated with small collections of artifacts such as ceramics, lithic artifacts, basketry, faunal and botanical materials, and shell ornaments and beads. Very often, cremations and burials were placed in depressions or holes specifically dug for the purpose of interring the dead. For that reason, burials and cremations may be minimally evident or completely imperceptible on the present-day ground surface.

While relatively rare, sites with cremations or burials have been recorded in the Colorado Desert. Burials and cremations are more common in and near habitation sites, and relatively uncommon in non-habitation, resource procurement areas like the Palo Verde Mesa. Nevertheless, special circumstances and special individuals, such as shamans or suspected witches, sometimes necessitated burial far from habitation and in unexpected locales. Human remains are afforded special protection under federal and state law.

Historic Site Types

The following discussion of the historic site types of the Project area is excerpted from a study conducted by AECOM for the Project (Jordan and Tennyson, 2011).

Transportation Routes. Transportation routes consist of historical trails and roads. The condition of the roads may vary from faint two-tracks to graded or paved alignments where the route, not the road, is significant. Several unimproved roads run through and adjacent to the Project area, most associated with the initial survey of the land and the transport of goods and people to mining activities in the region. Most of these roads were likely also used during the WWII-era military training activities of the DTC/C-AMA.

Historic Camps. Temporary historical camps are found throughout the Colorado Desert. These camps often include features such as campfire/hearths and debris scatters, as well as rectangular cleared areas, often called "tent pads," that may have been cleared to create a more comfortable sleeping area for sleeping bags and tents. Specific types of temporary historical camps in the Project may include construction camps for linear facilities (railroads, transmission lines, water conveyance, etc.), mining camps, sheep-herding camps, and military camps and bivouacs.

Residential Structures and Features. Formal structures built of wood, stone, concrete, metal, and other materials are not common in the Palo Verde Mesa owing to the harsh environment, which inhibited homesteading. In the Project vicinity, one collection of stone and concrete structures with attendant features and refuse scatters is known along a road following a General Land Office (GLO) section line surveyed in 1917. Other types of historical structures and features include concrete foundations; structures and features built of milled lumber; and metal features, including well heads and pipelines.

Historic Cairns. Many of the rock piles within the Colorado Desert are associated with historical mining claims. These can vary in size and composition. Rarely, a can or other container in the cairn will contain information regarding the claim. In addition, some historical cairns in the Project may be related to the use of the area during WWII as part of the DTC/C-AMA, possibly as aerial markers for flight training or for the guidance of air support during simulated maneuvers.

Debris Scatters and Dumps. This feature type ranges from small discrete deposits to large debris concentrations. Often these are found along trails or roads, complicating temporal and cultural assignments. The Project is located within the former boundaries of the DTC/C-AMA, which was a large-scale military training facility during WWII. To the south of the Project is the Blythe Army Air Base, developed in its present form as an air support and heavy-aircraft training facility for the DTC/C-AMA. Debris scatters dating to the early 1940s, and particularly the period from 1942 to 1945, are likely representative of DTC/C-AMA activities, including ground maneuvers and aircraft training. Other debris scatters falling outside of this time period are likely associated with sporadic mining activities in the vicinity, as well as a few brief attempts to establish farms or ranches on the Palo Verde Mesa.

Refuse scatters from the later 20th century may represent a variety of activities that may be difficult to distinguish. From the end of WWII forward, the Palo Verde Mesa has supported limited mining and prospecting, farming and ranching, recreational activity, rock hunting on the pebble terraces (for prized multicolor cobbles), and a brief reoccupation of the area as part of Exercise Desert Strike, a joint Army/U.S. Air Force training maneuver in May 1964.

Emplacements. Within the APE and its vicinity, there are remnants of various landscape modifications likely associated with active battles during the training maneuvers of WWII and possibly 1964. Most appear to be fortified positions consisting of shallow dug-out depressions surrounded by low earthen berms and, occasionally, low walls of dry-stacked stones, usually including only a few emplacements in a small area. These are found most commonly in broken terrain, such as the water-cut bajada ridges along the western portion of the Project site, where some cover and concealment would have been provided by the natural terrain. In several sites in

the Project boundary, 12 or more emplacements were recorded along natural drainage channels, suggesting that larger military operations/training took place in these areas.

Isolated Finds. Isolated finds consist of single, occasionally multiple, prehistoric or historical artifacts. Isolates have been found on a variety of surfaces, including desert pavement, gravel beds, and washes.

Secondary Deposits. Some of the Project site is located within or near ephemeral drainages. Over time, alluvial and Aeolian actions have caused intact cultural deposits to be redistributed from their primary depositional locations. This phenomenon has been observed near the current Project site (see Keller, 2010; Tennyson and Apple, 2010; Vargas, 2010). Due to their secondary nature, the resources often retain little more than generalized temporal information, and offer little in terms of context. Many times, deposits from several depositional episodes become intermixed with one another, further confusing contextual, chronological, and diagnostic data about the site.

Archival and Library Research

A review of Project site maps was conducted to identify architectural resources. No architectural resources were identified within 0.5 mile of the Project site. A review of resources within 0.5 mile of the linear facilities did not identify any additional resources beyond what was previously recorded for the BSPP (Jordan and Tennyson, 2011).

Historic maps on file at California State University Chico and the University of Alabama were referenced online. No structures are evident in the vicinity of the Project site on any historical maps. BLM references include GLO plat maps of the Project site, desert land entries, and various survey reports. Report information was provided to AECOM during archival research for the BSPP (Keller, 2010, as cited in Jordan and Tennyson, 2011). Much of that data is relevant to the Project as well, and was reviewed for the Project (Jordan and Tennyson, 2011).

Native American Coordination

Native Americans in the Colorado Desert maintain strong traditional ties to the land and to the cultural resources that have been left by their ancestors. AECOM contacted the California Native American Heritage Commission (NAHC) for a list of local Native Americans who might have concerns about the Project area. A search of the Sacred Lands File was also requested to determine whether there were any known places of traditional importance in the vicinity of the Project. The NAHC responded with a list of individuals and organizations potentially interested in the Project (see Appendix D, Table 2). No TCPs were identified in the Sacred Lands File, and no TCPs have been identified by tribes to date.

AECOM sent letters in November 2011 to each individual on the NAHC contact list for the purpose of providing information about the Project, to solicit guidance about the scope and content of the environmental information to be included in the Draft PA/EIS, and to invite the tribes' participation in the environmental review process. Following the letters, phone calls were made to each individual on the list to ensure receipt of the letter and to record any comments or concerns that individual wished to share over the phone. Individuals to whom letters were sent, and responses received to date, are shown in Appendix D, Tables 2 and 3.

Individuals from the following tribes were contacted:

1. Torres-Martinez Desert Cahuilla Indians
2. Santa Rosa Band of Cahuilla Indians
3. San Manual Band of Serrano Mission Indians
4. Ramona Band of Cahuilla Mission Indians
5. Morongo Band of Cahuilla Mission Indians
6. Fort Mojave Indian Tribe
7. Cocopah Indian Tribe
8. Chemehuevi Indian Tribe
9. Cahuilla Band of Mission Indians
10. Cabazon Band of Mission Indians
11. Augustine Band of Cahuilla Indians
12. Fort Yuma Quechan Indian Nation
13. Agua Caliente Band of Cahuilla Indians

Field Inventory Investigations

Between March 8 and May 5, 2011, and on November 9, 2011, project archaeologists conducted a Class III pedestrian survey of 6,321 acres including the 4,792-acre APE (Jordan and Tennyson, 2011). The Class III survey was an intensive pedestrian survey designed to identify cultural resources to the extent possible on the basis of surface observations. The survey was conducted by four- to eight-person survey teams, each led by a qualified crew chief. A maximum survey interval of 15 meters was employed. When archaeological sites were encountered, the survey crews determined the location of the site using sub-meter global positioning system (GPS) units, and then flagged and mapped the location. After the initial pedestrian survey phase, resource-recording teams returned to the identified sites to record resources in greater detail. For the Project, four or more artifacts within a 30-meter-square area were considered an archaeological site. Isolated single artifacts and collections of three or fewer artifacts that were separated from other cultural materials by more than 30 meters were recorded as isolated finds, or isolates. The survey crews also attempted to relocate previously recorded resources.

Recorded resources were identified as prehistoric, historic, multi-component (containing both prehistoric and historic cultural resources), or undetermined (sites whose temporal age could not be identified at the time of recordation).

A total of 114 archaeological sites and 167 isolated artifacts were identified within the ROW application area (20 prehistoric, 79 historic-period, 9 multi-component, and 6 of undetermined age). A total of 101 of these archaeological sites (see Appendix D, Table 4) and 116 isolates were identified within the APE. Of the 114 archaeological sites, the BLM has determined that seven are eligible for the NRHP. These include six historic sites associated with the DTC/C-AMA, and one prehistoric archaeological site. Two prehistoric archaeological sites (CA-RIV-2486 and CA-RIV-3419) were previously determined eligible for the NRHP. Isolated finds are generally not considered eligible for listing in the NRHP.

The majority of the sites and isolates identified in the Project area are historical in age and consist predominantly of metal cans, with smaller quantities of glass bottles and jars, milled lumber, broken ceramics, and sundry metal items. Historical features include survey markers, rock features,

prospect pits, cleared areas, emplacements, debris scatters, and tank tracks associated with the WWII-era use of the Project vicinity as part of the DTC/C-AMA. Six of the historic period sites (MS-CM-H-009, MS-MT-H-003, MS-MT-H-007, MS-MT-H-009, MS-MT-H-014, and MS-MT-H-016) have been determined eligible for the NRHP under Criterion A for significant values associated with events important in history (the DTC/C-AMA) and Criterion D for their ability to provide important information in history.

Prehistoric cultural materials include flaked stone tools and debitage, tested cobbles, ceramic sherds, and thermal cobble features. One prehistoric archaeological site (MS-MH-P-001) has been determined eligible for the NRHP under Criterion D for its potential to yield significant scientific information about prehistory of the area. Table 3.5-1 describes these sites.

TABLE 3.5-1
ARCHAEOLOGICAL SITES DETERMINED ELIGIBLE FOR THE NRHP WITHIN THE APE

Site Name	Site Type	NRHP Criteria
MS-MT-H-003	Historic debris scatter (DTC/C-AMA)	A, D
MS-CM-H-009	Historic military camp site, historic debris scatter (DTC/C-AMA)	A, D
MS-MH-P-001	Prehistoric ceramic scatter	D
MS-MT-H-007	Historic military debris scatter, tank tracks (DTC/C-AMA)	A, D
MS-MT-H-009	Historic military debris scatter, tank tracks, ground features/emplacements (DTC/C-AMA)	A, D
MS-MT-H-014	Historic military maneuver area, tank tracks, ground features/emplacements (DTC/C-AMA)	A, D
MS-MT-H-016	Historic military maneuver area, tank tracks, ground features/emplacements (DTC/C-AMA)	A, D

The distribution of artifacts across the Project site shows that few cultural resources were identified in the southwestern and eastern portions of the Project site. This may be a result of flooding events that have taken place over time. The area in question has deep washes, suggesting that a high volume of water has the potential to move through the area. There is also evidence of flooding from the McCoy Wash near the eastern edge of the Project site and beyond the surveyed area. Historic deposits in the area have likely been displaced by these flooding events.

Cultural Landscapes

Often, cultural resources may relate to other cultural resources across temporal, chronological, or physical spaces, commonly referred to as landscapes. To date, two potential cultural landscapes, the Desert Training Center Cultural Landscape (DTCCL) and the Prehistoric Trails Network Cultural Landscape (PTNCL), have been identified in or near the current Project area as part of ongoing studies and analyses. Archaeological sites that may not be eligible for inclusion in the NRHP or CRHR on their own may still be eligible as contributing elements to these potential cultural landscapes if the sites have integrity and can be tied to significant elements of the district as a whole.

NRHP eligibility criteria for the potential DTCCL and PTNCL are still being developed. Although existing information is not sufficient to determine the boundaries of the potential DTCCL and PTNCL or to specify all the sites that may contribute to them, the two potential cultural landscapes could be described as follows:

> **DTCCL.** A DTCCL would consist of all the remains of the WWII military training activities that were conducted across the entire region, including the DTC-C/AMA, as described in 3.5.1.5 and 3.5.1.6. The DTC-C/AMA is a NRHP-eligible historic district that has been previously nominated for listing on the NRHP. The period of significance would be 1942 to 1944. The remains would consist primarily of refuse scatters and dumps, with some fortified positions, cleared areas, tank tracks, and possible tent camps. These sites are important for their association with General George S. Patton and for their ability to contribute to an understanding of how American soldiers were trained during WWII. Six NRHP-eligible archaeological sites within the APE are contributing elements to the NRHP-eligible DTC-C/AMA and may also be contributing elements to the potential DTCCL.
>
> **PTNCL.** During Late Prehistoric and ethnohistoric times, an extensive network of Native American trails was present in the Colorado Desert. Segments of many trails are still visible, connecting natural and cultural elements of the landscape such as springs and rock art sites. Trails, cairns, geoglyphs, cleared circles, rock rings, rock art sites and artifact scatters can be seen as elements of a cultural landscape. A PTNCL would consist of the Halchidhoma Trail and the associated joining and diverging trails (and trail-related features such as pot drops and rock cairns), and the varied loci of importance to prehistoric Native Americans that these trails connected. These loci included springs and other water sources, food and materials resource areas, and ceremonial sites (geoglyphs, rock alignments, and petroglyphs). Three NRHP-eligible archaeological sites within the APE may be contributing elements to a potential PTNCL.

Survey for Built-Environment Resources

No architectural resources were identified in the Project solar plant site. For the proposed linear facilities, previous studies had encompassed the entire 0.5-mile Architectural Survey Area (Meiser, 2009 as cited in Jordan and Tennyson, 2011). Two resources are either in or within 0.5 mile of the proposed gen-tie line and access road ROW. The first is a buried water pipeline that crosses the ROW and was previously recorded as part of the Blythe Army Air Base, portions of which are eligible for the NRHP (Meiser, 2009 as cited in Jordan and Tennyson, 2011). The second is a radio facility south of I-10 that is within 0.5 mile of the ROW. The radio facility is not eligible for the NRHP (Meiser, 2009 as cited in Jordan and Tennyson, 2011) and would therefore not be subject to adverse direct or indirect effects from the Project.

Geoarchaeological Investigations

A geoarchaeological study conducted for the Project determined that the proposed Project area is underlain by late Pleistocene and Holocene-age alluvial fan, valley fill, fluvial wash, and eolian deposits that are separated by age and depositional regimes. The conclusion of the geoarchaeological research is that Holocene-age deposits are known to contain surface and buried archaeological deposits near the Project area. Other Holocene-age deposits, such as dry washes and eolian deposits, also have a high potential for surface and buried archaeological deposits. Late Pleistocene deposits, as well as the older fluvial deposits, have a high potential for surface

archaeological deposits, a medium to high potential for shallow subsurface deposits, and a low potential for deep subsurface deposits. Bedrock units within the Project are very unlikely to contain buried archaeological materials (Dietler et al., 2011 as cited in Jordan and Tennyson, 2011).

3.5.2 Applicable Regulations, Plans, and Standards

3.5.2.1 Federal

There are numerous federal regulations, executive orders, and policies that direct management of cultural resources on federal lands and by federal agencies. These include NEPA, the NHPA, the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), Executive Order 13007, and the Antiquities Act. The following is a discussion of the most pertinent laws affecting the proposed Project.

National Environmental Policy Act

This law establishes national policy for the protection and enhancement of the environment. Part of the function of the federal government in protecting the environment is to "preserve important historic, cultural and natural aspects of our national heritage." Cultural resources need not be determined eligible for the National Register of Historic Places (as in the NHPA) to receive consideration under NEPA. The act is implemented by CEQ regulations (40 CFR Parts 1500-1508). A procedural statute, the Act provides for public participation in the consideration of cultural resource issues, among others, during agency decision making.

National Historic Preservation Act

The principal federal law addressing historic properties is the NHPA, as amended (16 USC §470f), and its implementing regulations (36 CFR Part 800). Section 106 of the NHPA requires a federal agency with jurisdiction over a proposed federal action (referred to as an "undertaking" under the NHPA) to evaluate the potential effects of the undertaking on historic properties, to seek to resolve such adverse effects, and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The Project is an undertaking with the potential to affect historic properties (36 CFR §800.3(a)), and therefore is subject to compliance with the requirements of the §106 process.

The term "historic properties" refers to "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the [NRHP]" (36 CFR §800.16(*l*)(1)). The implementing regulations (36 CFR Part 800) describe the process for identifying and evaluating historic properties, for assessing the potential adverse effects of federal undertakings on historic properties, and seeking to develop and evaluate alternatives or modifications to the proposed undertaking that could avoid, minimize, or mitigate adverse effects. The steps of the §106 process must be accomplished through consulting with the State Historic Preservation Office (SHPO), Indian tribes, local governments, and other consulting parties. The agency also must provide an opportunity for public involvement. Consultation with Indian tribes regarding issues related to §106 of the NHPA, as well as other authorities like NEPA, must recognize the

government-to-government relationship between the Federal government and Indian tribes. (See Section 5.2.3, *Tribal Consultation for the Project*).

In order to be eligible for the NRHP, historic properties are generally, but not always, at least 50 years old, must retain integrity, and must meet at least one of the four criteria listed below. Integrity is the property's ability to convey its demonstrated historical significance through location, design, setting, materials, workmanship, feeling, and association. The four eligibility criteria set forth in 36 CFR §60.4 are as follows:

A. Association with events that have made a significant contribution to the broad patterns of history;

B. Association with the lives of persons significant in the past;

C. Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Resources that have yielded or may be likely to yield information important in prehistory or history.

Section 106 of the NHPA sets forth the procedures for identifying and evaluating historic properties and assessing the effects of federal undertakings on those historic properties through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties. The goal of consultation is to identify potentially affected historic properties, assess effects to such properties, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties. Historic properties are not required to be formally listed on the NRHP. As part of the §106 process, agencies are required to consult with the SHPO. The §106 process does not require the preservation of historic properties; instead, it is a procedural requirement mandating that federal agencies take into account effects to historic properties from an undertaking prior to approval.

American Indian Religious Freedom Act

AIRFA establishes a policy of federal protection for traditional American Indian religious freedoms. It seeks to correct federal policies and practices that could (a) deny access to sacred sites required in traditional religions, (b) prohibit use and possession of sacred objects necessary for religious ceremonies, and (c) intrude upon or interfere with religious ceremonies. The BLM complies with AIRFA by obtaining and considering the views of traditional religious practitioners as part of the NEPA compliance process.

Executive Order 13007

Executive Order 13007 directs federal agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners. It requires federal agencies to avoid adversely affecting the physical integrity of sacred sites to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions. Executive Order 13007

reinforces the purposes expressed in AIRFA. The BLM complies with Executive Order 13007 by consulting with tribal governments and Indian religious practitioners as part of the NEPA compliance process.

Native American Graves Protection and Repatriation Act

Requirements for responding to discoveries of Native American human remains and associated funerary objects on federal land are addressed under the NAGPRA (Public Law 101-601) and its implementing regulations found at 43 CFR Part 10. If human remains or associated funerary objects are discovered on public lands within the Project area, the BLM will comply with the law and regulations by determining lineal descendants and culturally affiliated Indian tribes and by carrying out appropriate treatment and disposition of the discovered remains, including transfer of custody.

3.5.2.2 State

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code (PRC) §5024.1[a]).

To be eligible for the CRHR, a prehistoric or historic-period property must be significant at the local, state, and/or federal level under one or more of the following four criteria, which are based upon NRHP criteria (PRC §5024.1[b]):

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the CRHR must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. It is possible that a historic resource may not retain sufficient integrity to meet the criteria for listing in the NRHP, but it may still be eligible for listing in the CRHR.

Additionally, the CRHR consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

1. California properties listed on the NRHP and those formally determined eligible for the NRHP;

2. California Registered Historical Landmarks from No. 770 onward; and,

3. Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the CRHR.

Other resources that may be nominated to the CRHR include:

1. Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register);

2. Individual historical resources;

3. Historical resources contributing to historic districts; and,

4. Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

3.6 Environmental Justice

This section provides an overview of the applicable policies, regulations, and existing conditions for environmental justice, or ". . . the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (BLM, 2005). The study area is defined by the boundaries of several planning areas for which demographic data are available and which encompass the potential affected area for environmental justice, including communities within a 2-hour travel radius centered on the Project site. Data on minority populations, low income populations, and Indian Tribes who may be impacted by the proposed Project are provided these planning areas, including Riverside County, La Paz County, and the City of Blythe.

3.6.1 Environmental Setting

The Project site is located in Chuckwalla Census County Division (CCD) (a county subdivision defined by the U.S. Census) in eastern Riverside County, approximately 13 miles northwest of the City of Blythe. The site and its immediately adjoining areas are vacant, with no existing population. For reference, data on minority populations and incidence of poverty are provided for Riverside County, Chuckwalla CCD, Blythe CCD, City of Blythe, La Paz County (Arizona), and Colorado River Indian Reservation (located in both Arizona and California). Chuckwalla CCD and Blythe CCD together correspond generally to "Eastern Riverside County," as defined in the Riverside County General Plan (Riverside County, 2003).

Chuckwalla CCD is a sparsely populated, rural area of Riverside County, bordered by Coachella Valley to the west and Blythe CCD and the Colorado River (also the California-Arizona border) to the east. Its largest population center consists of two state prisons (Ironwood and Chuckawalla Valley State Prisons), which have been annexed to the City of Blythe, and its largest non-institutional community is Desert Center, located approximately 35 miles west of the Project site. Blythe CCD includes the City of Blythe, community of Ripley, and the surrounding agricultural areas, but excludes the two state prisons.

La Paz County in Arizona is located east of Blythe CCD. Its largest cities are Parker and Quartzsite; the community of Ehrenberg is also located in the county, 4 miles east of Blythe and across the Colorado River. Colorado River Indian Reservation is located mostly in La Paz County and partly in Riverside County. The Reservation extends along the river north of Ehrenberg and includes the City of Parker. Although most of the Reservation would be unaffected by the Project, demographic and income data have been included, since sections of the Reservation are located in Blythe CCD.

3.6.1.1 Minority Populations

According to the CEQ, minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of environmental justice, is identified when the

minority population of the potentially affected area is greater than 50 percent or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis (CEQ, 1997).[1]

Table 3.6-1 presents the minority population composition of the planning areas surrounding the Project site, based on the 2010 Census. Data are provided for Riverside County, Census tract (CT) 469 (which forms the main part of Chuckwalla CCD and includes the communities of Mesa Verde and Nicholls Warm Springs, south of the Blythe Airport), CT 9810 (which represents the two state prisons), Blythe CCD, City of Blythe, La Paz County (AZ), and Colorado River Indian Reservation (located mostly in La Paz County). Minority population, defined as racial or ethnic groups other than non-Hispanic White, represents from 37.3 percent of total population in La Paz County to 81.5 percent in CT 9810. Minorities represent 57.3 percent of the total population in CT 469, the planning area in which the Project site is located. This is close to the proportion of minority population in Riverside County as a whole, which is 60.3 percent. Thus, in all planning areas around the Project site, with the exception of La Paz County, minority populations exceed 50 percent of total population.

Hispanic and Latino populations comprise the majorities of minority populations in these areas, ranging from 52.3 percent in CT 469 to 54.3 percent in Blythe CCD. For Riverside County as a whole, Hispanic and Latino population represents 45.5 percent of total population, and in La Paz County, 23.5 percent.

3.6.1.2 Low-Income Populations

Unlike the CEQ (1997) guidance on minority populations, none of the environmental justice guidance documents contain a quantitative definition of how many low-income individuals it takes to comprise a low-income population. In the absence of guidance, for this analysis the density used to identify minority populations (i.e., 50 percent or greater) was also used as a minimum to identify low-income populations. In addition, a local population is judged to be "meaningfully greater" than the general population if the proportion of individuals living under the poverty line is 150 percent or more than that of the general population.

For this analysis, proportions of people living in poverty were obtained from the 2009 and 2010 American Community Survey, as available (U.S. Census Bureau, 2009, 2010a). The U.S. Census Bureau defines poverty using standards set by the U.S. Office of Management and Budget's Statistical Policy Directive 14 (U.S. Office of Management and Budget, 1978; U.S. Census Bureau, 2011a). Family income is compared to thresholds that vary according to family size, age, and number of children under 18 years old. If a family's total income is less than the applicable threshold, then every person in the family is considered to be in poverty. Poverty thresholds are the same for all geographic areas and are adjusted annually by the Consumer Price Index. The U.S. Census Bureau does not define poverty status for institutionalized persons and others living in group quarters.

[1] According to the CEQ guidelines, "Minority" is defined as all persons except non-Hispanic whites. In other words, minority is defined as all racial groups other than white, and all persons of Hispanic origin, regardless of race.

TABLE 3.6-1
RACIAL AND INCOME CHARACTERISTICS FOR RESIDENTS WITHIN THE STUDY AREA

	Riverside County, CA	CT 469[a]	CT 9810[b]	Blythe CCD, CA[c]	Blythe City, CA[d]	La Paz County, AZ[e]	Colorado River Indian Reservation, AZ-CA[f]
Total Population	2,189,641	2,043	7,634	15,045	20,817	20,489	8,764
Hispanic or Latino (All Races)	45.5%	52.3%	51.6%	54.3%	53.2%	23.5%	34.6%
Non-Hispanic							
White	39.7%	42.7%	18.5%	34.2%	28.3%	62.7%	37.6%
Black or African American	6.0%	1.7%	26.0%	7.7%	14.5%	0.6%	0.7%
American Indian and Alaska Native	0.5%	0.6%	0.9%	0.6%	0.7%	10.7%	23.6%
Asian	5.8%	0.6%	0.7%	1.6%	1.4%	0.4%	0.4%
Native Hawaiian and Other Pacific Islander	0.3%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
Some Other Race	0.2%	0.2%	2.0%	0.0%	0.8%	0.1%	0.0%
Two or More Races	2.2%	1.9%	0.1%	1.4%	1.0%	2.0%	3.0%
Percent Minority (Other Than Non-Hispanic White)	60.3%	57.3%	81.5%	65.8%	71.7%	37.3%	62.4%
Percent of People Below Poverty Level	16.3%	26.2%[g]	n.a.[h]	20.4%	13.6%	19.1%	25.6%

NOTE: All population, race, and ethnicity data are from 2010 Census; data on poverty level from American Community Survey (most recent data, as applicable).

[a] Rural areas of Chuckwalla Valley CCD; excludes state prisons and Colorado River Indian Reservation.
[b] Census tract covers Ironwood and Chuckawalla Valley State Prisons only.
[c] Formerly Palo Verde CCD; excludes state prisons.
[d] Incorporated Blythe city; includes Ironwood and Chuckawalla Valley state prisons.
[e] Includes the part of Colorado River Indian Reservation that is located in Arizona.
[f] Includes portions of California and Arizona.
[g] Poverty data for Chuckwalla Valley CCD (formerly Chuckwalla CCD) as a whole, excludes institutionalized persons.
[h] The American Community Survey (ACS) does not define poverty for institutionalized persons.

SOURCE: U.S. Census Bureau, 2009, 2010a, 2010b.

In 2010, the poverty threshold for a single person under 65 years of age was $11,344 and for a person 65 years and over was $10,458. For a four-person family with two children under 18 years of age, the poverty threshold was $22,113. Other thresholds are defined for different family sizes and compositions (U.S. Census Bureau, 2011b).

As shown in Table 3.6-1, 26.2 percent of all persons in CT 469 belonged to families with income below the poverty level (U.S. Census Bureau, 2009). This was the highest proportion among planning areas examined for this analysis. By comparison, 20.4 percent of total population in Blythe CCD belonged to families with income below the poverty level, 13.6 percent in the City of Blythe (excluding institutionalized persons), 16.3 percent in Riverside County, 19.1 percent in La Paz County (AZ), and 25.6 percent in Colorado River Indian Reservation. Accordingly, no planning area in the vicinity of the Project site had a poverty rate exceeding 50 percent.

3.6.2 Applicable Regulations, Plans, and Standards

3.6.2.1 Federal

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 FR 7629). The order requires the 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.

The CEQ has oversight responsibility for the Federal Government's compliance with Executive Order 12898 and NEPA. The CEQ, in consultation with the USEPA and other agencies, has developed guidance to assist Federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. According to the CEQ's "Environmental Justice Guidance Under the National Environmental Policy Act," agencies should consider the composition of the affected area to determine whether minority populations or low-income populations are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse environmental effects (CEQ, 1997).

BLM Land Use Planning Handbook, H-1601-1, Appendix D, Section IV (Environmental Justice Requirements) provides guidance for assessing potential impacts on population, housing, and employment as they relate to environmental justice. It also describes variables such as lifestyles, beliefs and attitudes, and social organizations with respect to environmental justice. These variables were not evaluated in this analysis, as they are cannot be readily quantified for the purposes of impact assessment and do not provide any additional analytical value in terms of evaluating potential environmental justice impacts.

3.6.2.2 State

No state regulations, plans, or standards related to environmental justice would be applicable to the MSEP.

3.7 Geology and Soils Resources

This section describes the existing geology, soil conditions, and seismicity in the Project area in terms of local topography, geology, soil resources, and regional seismicity. This section also identifies local geologic and seismic hazards that could potentially affect structures associated with the Project. The study area relevant to geology, soils and geologic hazards is the physical footprint of Project construction, operation and maintenance, and decommissioning. The study area relevant to faulting and seismic hazards is the broader southern California region, because distant faults can produce ground shaking and secondary seismic hazards at the Project site. Regulations, plans, and policies including federal and state laws related to geologic and seismic considerations that may be relevant to the proposed action are also discussed.

3.7.1 Environmental Setting

3.7.1.1 Regional Geology

The Project site is located in the southeastern portion of the Mojave Desert geomorphic province (California Geological Survey [CGS], 2002). The Mojave Desert is a broad interior region of isolated mountain ranges that separate vast expanses of desert plains and interior drainage basins. To the west, the boundaries of the geomorphic province are marked by major mountain ranges (e.g., the Sierra Nevada and Transverse ranges) and regional faults (e.g., the Garlock Fault and the San Andreas Fault). To the east, the Colorado River has carved out a flood plain that marks the boundary between California and Arizona.

3.7.1.2 Local Geology

The Project site is located atop the Palo Verde Mesa, which is an alluvial-filled basin bounded by the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains to the west, northwest, and northeast, respectively (United States Geological Survey [USGS], 2006). To the southeast, the mesa rises above the Palo Verde Valley, which is formed by flood plain deposits of the Colorado River (USGS, 2006). The Project site slopes gently downward in a generally southeasterly direction at an approximate gradient of less than 1 percent. The elevation of the solar plant site varies from 210 meters above mean sea level (amsl) in the west to 140 meters amsl in the east.

The Project site is underlain by younger and older Quaternary age alluvial fan deposits (USGS, 2006). Figure 3.7-1 illustrates the geologic units underlying the Project site, which are denoted by italicized symbols in the text below. These deposits consist of loose sedimentary material that has been shed from the Palen-McCoy Mountains over the course of the Quaternary period (up to 1.8 million years ago). The age of the deposits are determined based on how recently the land surface has undergone active sediment build up through periodic flooding and sediment deposition. The older alluvial fan deposits (*Qa_3*, *Qpv*), located on the western side of the solar plant site, are distinguished from younger alluvial fan deposits based on the extent to which modern washes have dissected (i.e., down-cut) the ground surface, and the presence of smooth, varnished desert pavement (USGS, 2006). Younger alluvial fan deposits (*Qa_6*), which underlie

the eastern portion of the solar plant site, are characterized by evidence of recent sediment transport and the presence finer-grained silt, sand and gravel deposits (USGS, 2006). In several locations along the gen-tie line, modern washes (*Qw*) and wind-blown sand dunes (*Qs*) composed of cohesionless silts and sands intersect the Project site. In general, sedimentary deposits underlying the Palo Verde Mesa become increasingly fine-grained toward the center axis of the valley, and coarse-grained closer to base of the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains. To the south of the Project solar plant and to the east of the gen-tie line, an old Pleistocene- to Pliocene-age sedimentary unit (*QTmw*) crops out above the Palo Verde Mesa, forming a series subdued topographic knolls aligned in a northeast direction (USGS, 2006). The local stratigraphy is presented in Table 3.7-1.

TABLE 3.7-1
CORRELATION AND AGES OF STRATIGRAPHIC UNITS IN THE PROJECT VICINITY

Age	Unit/Description	Map Symbol	Project Facility
Holocene	Alluvium of modern washes	Qw	Gen-tie Line, Access Road
	Eolian Sand	Qs	Gen-tie Line
	Alluvial-fan and alluvial-valley deposits	Qa_6	Unit 1, Unit 2, Gen-tie Line, Access Road, Distribution Line
Holocene ± Pleistocene	Alluvial-fan deposits (Intermediate Alluvium)	Qa_3	Unit 1, Unit 2, Gen-tie Line, Access Road, Distribution Line
Pleistocene	Alluvial deposits of Palo Verde Mesa	Qpv	Gen-tie Line, Access Road, Distribution Line
Pleistocene ± Pliocene	Alluvial deposits of the McCoy Wash area	QTmw	Access Road, Distribution Line
Pleistocene ± Miocene	Alluvial-fan and alluvial-valley deposits (Older Alluvium)	QTa_2	None[a]
Cretaceous and Jurassic	McCoy Mountains Formation	Km*(x)*[b]	None[a]

NOTES:

[a] Not mapped at the surface within the Project area but may be present at depth below the alluvial-filled basin.
[b] The McCoy Mountains formation has numerous sub-units that are not distinguished in this table.

SOURCE: USGS, 2006

3.7.1.3 Soils

The National Resource Conservation Service (NRCS) is the leading source for soil surveys that detail soil characteristics of an area. Soil units described by the NRCS are classified via a 2nd order survey at a scale of 1:20,000 with delineations of 1.5 to 10 acres. Soil survey maps are normally obtained from the NRCS's Geographic Database (United States Department of Agriculture [USDA], 2009); however, this area has not been included in their dataset. Therefore, the California Soil Resource Lab (CSRL) database was used to assess the Project site in conjunction with a historic University of California and USDA 1922 soils map (Tetra Tech, 2011). Both maps depict soils that are generally gravelly loams and sandy loams derived from the upland McCoy Mountain Mesozoic sedimentary and metasedimentary rocks. CSRL indicated that

the two soil units underlying the Project solar plant site are the Cheriano-Hyder-Cipriano complex (65 percent) and the Gunight-Rillito-Chuckwalla (35 percent) (Figure 3.7-2). The gen-tie corridor crosses both of these two units in addition to the southerly Aco-Rositas-Carrizo complex and the Rositas-Carsitas-Dune land complex. Soil grades from gravelly and coarser alluvial sediments near the McCoy Mountains to finer and sandy alluvial sediments with increasing distance away from the mountains; in addition, Project soils have severe limitations that make them unsuitable for cultivation (Tetra Tech, 2011). Table 3.7-2 summarizes the soil units within the Project area.

TABLE 3.7-2
SOIL UNITS IN PROJECT AREA

Soil Name	Description
Gunsight-Rillito-Chuckawalla	The Gunsight-Rillito-Chuckwalla series consists of very gravelly loam to gravelly sandy loam to very gravelly silt loam formed in mixed alluvium. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. Runoff characteristics vary based on individual soil units, but range from very low to high in Gunsight soils, slow to medium in Rilito soils, and moderate in Chuckawalla soils.
Cheriono-Hyder-Cipriano	The Cheriono-Hyder-Cipriano series consists of gravelly fine to sandy loam formed in fan alluvium. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. Runoff characteristics vary based on individual soil units, but range from low to very high in Cipriano soils, high in Hyder soils, and medium to rapid in Cheriono soils.
Aco-Rositas-Carrizo	The Aco-Rositas-Carrizo series consists of gravelly sand to sandy loam to fine sand in fan remnants and eolian sands. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils re considered prime farmland if irrigated. Runoff characteristics are considered low in all three soil units.
Rositas-Carsitas-Dune	The Rositas-Carsitas-Dune series consists of gravelly sand to fine sand in fan remnants, valley fill, and eolian sandy material. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. Runoff characteristics are considered low in all three soil units.

SOURCE: Tetra Tech, 2011

The western portion of the Project area is located at the base of the McCoy Mountains. Much of the area includes well-developed desert pavement that is cut by deep alluvial channels trending generally from northwest to southeast. Most of the pavements consist of basalt with outcrops of quartz eroding from the McCoy Mountains. The drainages that bisect this ridge are shallow at the western edge of the Project and get progressively deeper as they continue eastward down the slopes at the base of the McCoy Mountains.

3.7.1.4 Geologic Hazards

The Project is located in a moderately active geologic area of southeastern California within the eastern Mojave Desert geomorphic province. This discussion presents the existing geologic hazards in the region of the Project.

Faulting and Seismicity

The Project site is not crossed by any known active faults[1] or designated Alquist-Priolo Earthquake Fault Zones (CGS, 2002). The closest active faults to the Project are (in order of increasing distance) the Coachella Valley section of the San Andreas Fault, the Brawley Seismic Zone, the Pinto Mountains Fault Zone, and the Mesquite Lake Fault. All of these active faults are located 58 miles or more to the west of the Project site (CGS, 2010). The closest potentially active fault[2] is the Aztec Mine Wash Fault, located approximately 30 miles southeast of the Project site (CGS, 2010).

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults, or even along different strands of the same fault. Ground rupture is considered most likely along active faults.

As discussed above there are no active or potentially active faults are mapped within the Project site (CGS, 2010), with the closest active fault zoned under the Alquist-Priolo Special Studies Zone Act being approximately 58 miles from the Project site (CGS, 2002). Therefore, the potential for surface fault rupture within the Project site is low.

Ground Shaking

Terminology and Concepts

Generally, the greater the earthquake magnitude and the closer the fault rupture to a site, the greater the intensity of ground shaking. The amplitude and frequency of ground shaking are related to the size of an earthquake, the distance from the causative fault, the type of fault (e.g., strike-slip), and the response of the geologic materials at the site. Ground shaking can be described in terms of acceleration, velocity, and displacement of the ground.

A common measure of ground motion during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g. hard bedrock, soft sediments, or artificial fills).

The primary tool that seismologists use to describe ground shaking hazard is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources and estimates their characteristic magnitudes to generate a

1 According to the CGS, an active fault is defined as a fault that has had surface displacement during Holocene time (last 11,000 years).
2 A potentially active fault is a Quaternary-age (last 1.8 million years) fault that lacks evidence of Holocene-age displacement.

probability map for ground shaking. The PSHA maps depict values of PGA that have a 10 percent probability of being exceeded in 50 years. Use of this probability level allows engineers to design structures to withstand ground motions that have a 90 percent chance of not occurring in the next 50 years, making buildings safer than if they were merely designed for the most probable events.

The Modified Mercalli (MM) Intensity Scale (Table 3.7-3) assigns an intensity value based on the observed effects of ground-shaking produced by an earthquake. Unlike measures of earthquake magnitude, the MM intensity scale is qualitative in nature (i.e. it is based on actual observed effects rather than measured values). MM intensity values for an earthquake at any one place can vary depending on its magnitude, the distance from its epicenter, and the type of geologic material. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage. Because the MM Intensity Scale is a measure of ground-shaking effects, intensity values can be related to a range of PGA values, also shown in Table 3.7-3.

Ground Shaking Potential on the Project Site

As discussed above, the Project site is located over 58 miles from the closest active faults in the region. Relative to the more seismically active areas to the west and northwest, the Project site will experience lower levels of shaking less frequently (CGS, 2008). According to PSHA for the State of California, the Project site has a 10 percent probability of exceeding a PGA value of 0.129 over the next 50 years (CGS, 2003). This PGA corresponds to a MMI value of VI, which is most commonly associated with a moderate shaking severity (CGS, 2008). Such an earthquake would be strong enough to be felt widely by the public, but unlikely to cause substantial damage beyond moving or toppling of unsecured equipment, cracks in plaster, and/or damage to older masonry buildings (CGS, 2008). Buildings and structures built according to modern construction codes are unlikely to sustain appreciable damage in such an earthquake. There is a low probability that the site could be subject to a higher severity of ground shaking, for example, if a large earthquake occurs on a potentially active or previously unknown fault closer to the Project site. However, the PGA value for the site given by the PSHA for California represents a conservative estimate of ground shaking levels that can be reasonably anticipated for the purposes of designing and constructing buildings. There is a 90 percent chance PGAs experienced on the Project site over the next 50 years will be less than 0.129g.

Secondary Earthquake Hazards

Liquefaction

Liquefaction is a condition in which a saturated cohesionless soil may lose shear strength because of a sudden increase in pore water pressure caused by an earthquake. This typically occurs near the surface in poorly consolidated, highly saturated, well-sorted, and finer-grained materials (Tetra Tech, 2011). The potential for liquefaction in strata deeper than approximately 40 feet is considered negligible due to the increased confining pressure and because geologic strata at this depth are generally too compact to liquefy. Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope; that is, a nearby steep hillside or deeply eroded stream bank. Other factors such

TABLE 3.7-3
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Ground Acceleration[a]
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	0.0017-0.014 g
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated.	0.0017-0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014–0.039g
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	0.035 – 0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	0.092 – 0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18 – 0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34 – 0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65 – 1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

NOTES:

[a] Value is expressed as a fraction of the acceleration due to gravity (g). Gravity (g) is 9.8 meters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCE: ABAG, 2010

as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers also affect the amount of lateral spreading.

Soils underlying the Project site have a low susceptibility to liquefaction because they are composed of poorly sorted, coarse grained material, and the water table is typically found at a depth of greater than 100 feet below ground level (California Department of Water Resources [DWR], 2010 as cited in Tetra Tech, 2011). Given these conditions and the low likelihood of strong ground shaking at Project site, the potential for the site to experience earthquake-induced liquefaction is low (CGS, 2008).

Settlement

Earthquake-induced settlement of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume as the soil grains tend to rearrange into a more dense state. This decrease in volume and consolidation of soil can result in the settlement of overlying structural improvements. Because the Project site is underlain by unconsolidated alluvial fan deposits consisting primarily of loose gravel and sand, the nature of the soils coupled with the variation in density among strata indicate that earthquake-induced soil settlement could occur.

Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Slope stability can depend on several complex variables, including the geology, structure, and the amount of groundwater present, as well as external processes such as climate, topography, slope geometry, and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. Landslides typically occur within slide-prone geologic units that contain excessive amounts of water or are located on steep slopes, or where planes of weakness are parallel to the slope angle. Landslide potential at the Project site is low since the Project site is located on the broad, gently southeast-sloping alluvial fan and alluvial valley deposits of the Palo Verde Mesa.

Subsidence and Settlement

Potential hazards in the study area include subsidence, settlement, and earthquake-induced settlement (discussed above). Subsidence of the land surface is a general process that can be attributed to natural phenomena, such as tectonic deformation, consolidation, hydrocompaction, collapse of underground cavities, oxidation of organic-rich soils, or rapid sedimentation, and also by the activities of man, such as the withdrawal of groundwater. Local subsidence or settlement may also occur when areas containing compressible soils are subjected to foundation or fill loads.

The Riverside County Land Information System (RCLIS) indicates the alluvial-filled basin sediments in the Palo Verde Mesa are susceptible to subsidence[3] (Riverside County, 2011). Regional ground subsidence is typically caused by petroleum or groundwater withdrawal that increases the weight per unit volume of the soil profile, which in turn increases the effective stress on the deeper soils. This results in consolidation or settlement of the underlying soils. As discussed in Section 3.11, Mineral Resources, petroleum and natural gas withdrawal do not occur within the vicinity of the Project site. Potential subsidence impacts are limited to groundwater drawdown. The EIS prepared for the Blythe Solar Power Project (BSPP), the approved project adjacent to the Project's southern boundary, concluded that no regional subsidence due to the historic groundwater withdrawal has been reported in the vicinity of the BSPP (BLM, 2010). This includes localized or regional subsidence during the 1980's and 1990's, when regional groundwater extraction was at its historic maximum of approximately 48,000 AFY in the general area (BLM, 2010).

Hydrocompaction

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when water infiltration dissolves the weak cementation that is preventing the immediate collapse of the soil structure. The depositional environment of the Palo Verde Mesa suggests that the soils within the Project area may be subjected to hydrocompaction. However, local conditions across the Project site may vary and specific information regarding the susceptibility of soils to hydrocompaction would be evaluated based exploratory borings and soils tests to be performed as part of the Project-specific geotechnical investigation discussed in Section 4.7, *Geology and Soils*.

Expansive Soils

Expansion and contraction of expansive soils in response to changes in moisture content can cause movements that result in damage and/or distress to structures and equipment with shallow foundations. Issues with expansive soils occur near the ground surface where changes in moisture content typically occur. Often, grading, site preparations, and backfill operations associated with subsurface structures can eliminate the potential for expansion. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. As depicted in Table 3.7-2, the soils encountered within the Project site are primarily granular soils that exhibit a low shrink / swell potential and do not have expansive properties. However, local conditions across the Project site may vary and specific information regarding the expansive properties of site soils would be evaluated based exploratory borings and soils tests to be performed as part of the Project-specific geotechnical investigation discussed in Section 4.7, *Geology and Soils*.

[3] The Palo Verde Mesa is considered 'susceptible to subsidence' on an RCLIS susceptibility map. This indicates that the area contains suitable conditions for subsidence, not that it has or will occur.

Corrosive Soils

Corrosivity refers to potential soil-induced electrochemical or chemical action that could corrode or deteriorate concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to these soils. The rate of corrosion is related to factors such as soil moisture, particle-size distribution, and the chemical composition and electrical conductivity of the soil. Fine grain soils with high in-situ moisture contents that contain sulfides can be corrosive to buried metal pipe, which can lead to premature pipe failure and leaking.

Erosion

Erosion is a natural process whereby soil and highly weathered rock materials are worn away and transported to another area, most commonly by wind or water. Natural rates of erosion can vary depending on slope, soil type, and vegetative cover (regional erosion rates are also dependant on tectonics and changes in relative sea level). Soils containing high amounts of silt are typically more easily eroded, while coarse-grained (sand and gravel) soils are generally less susceptible to erosion. The Project site would be located in an area that is presently drained by sheet flow and desert washes (see Section 3.20.1.3 for additional information on surface water hydrology). Low frequency, high intensity monsoonal storms in the region can result in high rates of surface water runoff within the vicinity of the Project site. The runoff characteristics of each soil unit underlying the Project site are described in Table 3.7-2. Natural rates of runoff from soils on the Project site are highly variable, ranging from low to very high. Maps compiled by Riverside County indicate soils within the Project site have a ‘high’ wind erodibility rating along the gen-tie line to a ‘moderate’ wind erodibility rating on the Project solar plant site (LSA, 2000).

Due to the dry climate and infrequent nature of precipitation events, wind is arguably the prevailing erosion process acting on the study area. Wind can move soil particles by three general processes: surface creep (rolling along the ground surface), saltation (a bouncing movement along the ground surface caused by particle collisions that help force a particle into the air for a brief time before it falls back to the ground), and suspension transport (particles lofted into the air and remaining suspended for more than a minute). Surface creep and saltation typically account for most soil mass movement associated with wind erosion, and normally involve larger sand-size soil particles. Suspension transport normally involves smaller silt and clay size soil particles.

The extent of fugitive dust generated by wind erosion is affected by numerous factors, including:

1. Soil texture (the mix of clay, silt, and sand sized particles in a soil);
2. Particle aggregation (mostly due to clay content);
3. Organic matter content of soils;
4. Non-erodible surface features (gravel, rocks, boulders, rock outcrops, etc.);
5. Extent and density of vegetation cover;
6. Surface crusting – mineral or biological crusts – especially between vegetation stems;
7. Soil moisture conditions;
8. Wind speed;

9. Vertical air turbulence;
10. Sedimentation of erodible material from upslope water erosion or from flood deposits; and
11. Active disturbance of surface soils.

Soil moisture conditions and surface conditions are important factors determining the vulnerability of an area to wind erosion. In desert areas, soil moisture levels are high only during and after rainfall or flash flood events. Consequently, soil moisture levels in desert areas are high enough to influence wind erosion processes for only brief intermittent periods. The surface features of greatest importance are non-erodible surface material, vegetation cover, mineralized soil crusts, and biological soil crusts. The most common types of non-erodible surface materials in deserts include scattered rocks and boulders, rock formation outcrops, and desert pavement. Desert pavements are areas with rock fragments of pebble to cobble size that cover an underlying layer of sand, silt, or clay. Desert pavement areas typically have little or no vegetation cover. The extent to which desert pavement reduces wind erosion and resulting fugitive dust depends on the density of the rock fragments covering the underlying soil.

Soil erosion can become problematic when human intervention causes rapid soil loss and the development of erosional features (such as incised channels, rills, and gullies) that undermine roads, buildings, or utilities. Vegetation clearing and earth-moving reduces soil structure and cohesion, resulting in abnormally high rates of erosion, referred to as *accelerated erosion.* This typically occurs during construction activity involving grading and soil moving activities (i.e., presence of soil stockpiles, earthen berms, etc.) that loosen soils and makes them more susceptible to wind and water erosion. Further, the operation of associated heavy machinery and vehicles over access roads, staging areas, and work areas can compact soils and decrease their capacity to absorb runoff, resulting in rills, gullies, and excessive sediment transport. The effect of the Project on natural drainage and erosion rates in the area is described in Section 4.7, *Geology and Soils*.

3.7.2 Applicable Regulations, Plans, and Standards

3.7.2.1 Federal

International Building Code

The 2009 International Building Code (IBC) is a model building code developed by the International Code Council that sets rules specifying the minimum acceptable level of safety for constructed objects such as buildings in the United States. As a model building code, the IBC has no legal status until it is adopted or adapted by government regulation. California has adopted the IBC. The IBC was developed to consolidate existing building codes into one uniform code that provides minimum standards to ensure the public safety, health and welfare insofar as they are affected by building construction and to secure safety to life and property from all hazards incident to the occupancy of buildings, structures and premises. With some exceptions, the CBC discussed below is based on the IBC.

Federal Land Policy and Management Act

FLPMA establishes policy and goals to be followed in the administration of public lands by the BLM. The intent of FLPMA is to protect and administer public lands within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality. Particular emphasis is placed on the protection of the quality of scientific, scenic, historical, ecological, environmental, and archaeological values and air, atmospheric, and water resources. FLPMA is also charged with the protection of life and safety from natural hazards.

California Desert Conservation Area Plan

The CDCA Plan defines multiple-use classes for BLM-managed lands within the CDCA, which includes land area encompassing the Project site. With respect to geological resources, the CDCA Plan aims to maintain the availability of mineral resources on public lands for exploration and development.

3.7.2.2 State

California Building Code

The CBC, which is codified in Title 24 CCR Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction.

The 2010 CBC is based on the 2009 IBC. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site, and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act) signed into law in December of 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Fault Zoning Act is to regulate development on or near active fault traces to reduce the hazard of potential fault rupture and to

prohibit the location of most structures for human occupancy[4] across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 2007). The Project is not subject to this act because it is not within an earthquake fault zone. Nevertheless, this act is included in the regulatory framework because it requires the State of California to identify and disseminate information about the location of earthquake fault zones, which is considered relevant to the environmental setting.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate "zones of required investigation" (i.e., seismic hazard zones) where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide ground displacements. The act requires cities, counties, and other local permitting agencies to regulate certain development projects by implementing the provisions of the act through various local building codes, permits, and ordinances. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design, consistent with CGS Special Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. Because the CGS has not established seismic hazard zones for the Project area, the Applicant is not required to comply with the evaluation and mitigation guidelines. Nevertheless, this act is included in the regulatory framework because it requires the State of California to identify and disseminate information about seismic hazards, which is considered relevant to the environmental setting.

[4] A structure for human occupancy is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year (14 CCR §3601).

3.8 Greenhouse Gas Emissions and Global Climate Change

This section provides an overview of the environmental and regulatory setting with respect to greenhouse gas (GHG) emissions and global climate change. A brief overview of climate change is followed by a discussion of the various GHGs that have been identified as drivers of climate change, and pertinent regulations, including those relevant at federal and state levels.

3.8.1 Environmental Setting

3.8.1.1 Climate Change

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Some of the potential effects of global warming in California may include loss of snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (ARB, 2009). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2007):

1. Higher maximum temperatures and more hot days over nearly all land areas;
2. Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
3. Reduced diurnal temperature range over most land areas;
4. Increase of heat index over land areas; and
5. More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

ARB estimated that in 2008, California produced 478 million gross metric tons of carbon dioxide-equivalent (CO_2e) emissions. ARB found that transportation was the source of 37 percent of the state's GHG emissions; followed by electricity generation at 24 percent, and industrial sources at 19 percent (ARB, 2010).

3.8.1.2 Greenhouse Gases

Generation of electricity can produce GHGs in addition to the criteria air pollutants that have been traditionally regulated under the federal and state CAAs. For traditional sources of electricity,

such as fossil fuel-fired power plants, GHG emissions include primarily carbon dioxide (CO_2), with much smaller amounts of nitrous oxide (N_2O), and methane (CH_4; often from unburned natural gas). Other sources of GHG emissions include sulfur hexafluoride (SF_6) from high voltage power equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because these different GHGs have different warming potential (i.e., the amount of heat trapped by a certain mass of a GHG), and CO_2 is the most common reference gas for climate change, GHG emissions often are quantified and reported as CO_2 equivalents (CO_2e). For example, SF_6, while representing a small fraction of the total GHGs emitted annually worldwide, is a very potent GHG with 23,900 times the global warming potential of CO_2. Therefore, an emission of one metric ton of SF_6 would be reported as an emission of 23,900 metric tons CO_2e. Large emission sources are reported in million metric tons[1] of CO_2e.

GHG emissions from the electricity sector are dominated by CO_2 emissions from carbon-based fuels. Other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds that have very high global warming potentials. These air pollutants are considered to be GHGs because their presence in the atmosphere results in increased solar absorbance, and/or prevents heat from the surface of the Earth from escaping to space. The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

Carbon Dioxide (CO_2)

CO_2 is a naturally occurring gas that enters the atmosphere through natural as well as anthropogenic sources. Key anthropogenic sources include: the burning of fossil fuels (e.g., oil, natural gas, coal, etc.); solid waste; trees, wood products, and other biomass; and industrially relevant chemical reactions such as those associated with manufacturing cement. CO_2 is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH_4)

Like CO_2, CH_4 is emitted from both natural and anthropogenic sources. Key anthropogenic sources of CH_4 include gaseous emissions from landfills, releases associated with mining and materials extraction industries, in particular coal mining, and fugitive releases associated with the extraction and transport of natural gas and crude oil. CH_4 emissions also result from livestock and agricultural practices. Small quantities of CH_4 are released during fossil fuel combustion.

Nitrous Oxide (N_2O)

N_2O is also emitted from both natural and anthropogenic sources. Important anthropogenic source activities include industrial activities, agricultural activities (primarily application of nitrogen fertilizer), the use of explosives, combustion of fossil fuels, and decay of solid waste.

[1] A metric ton is 1,000 kilograms; it is equal to approximately 1.1 U.S. tons and approximately 2,204.6 pounds.

Fluorinated Gases

HFCs, PFCs, and SF_6 are synthetic gases that are emitted from a variety of industrial processes and contribute substantially more to the greenhouse effect than the GHGs described previously. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in small quantities, but because they are potent GHGs, they are sometimes referred to as high global warming potential gases.

Greenhouse Gas Sources

Anthropogenic GHG emissions in the United States derive mostly from the combustion of fossil fuels for transportation and power production. Energy-related CO_2 emissions, resulting from fossil fuel exploration and use, account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half of the energy-related emissions come from large stationary sources such as power plants; approximately a third derive from transportation; while industrial processes, agriculture, forestry, other land uses, and waste management compose a majority of the remaining of sources (USEPA, 2011a).

In California, renewable electricity sources have been given preference over fossil fuel fired electricity sources. This means that when renewable energy is available on the grid, the California Independent Systems Operator (CAISO) requests turndown of fossil power production. When the renewable facility goes off-line, if there is still demand, the CAISO requests turnup of fossil power production. Some fossil fuel load-following plants will adjust automatically as renewable sources come on- and off-line. As a result of these operating scenarios, new renewable energy power plants operating in California offset the production of electricity from fossil fuel fired power plants.

Existing Greenhouse Gas Emissions at the Project Site

No industrial, residential, or other emitters of GHGs are currently located or operating at the Project site. There are no other existing on-site operations that result in the combustion of fossil fuel, or otherwise result in direct anthropogenic emissions of GHGs on-site. There is, however, existing vegetation located on-site, and this vegetation is expected to provide ongoing natural carbon uptake. Wohlfahrt et al. (2008) completed an evaluation of carbon uptake by natural vegetation in Mojave Desert systems. The study indicates that desert plant communities may result in the uptake of carbon in amounts as high as 102 to 110 grams per square meter per year; however, the study showed a high degree of uncertainty around these amounts. This analysis assumes that on-site vegetation could uptake as much as 100 grams per square meter per year as a conservative estimate. Under existing conditions, this would equate to a natural carbon uptake, expressed in CO_2, of approximately 1.48 metric tons of CO_2 per acre per year.

3.8.2 Applicable Regulations, Plans, and Standards

3.8.2.1 Federal

U.S. Environmental Protection Agency

On April 2, 2007, in *Massachusetts v. EPA*, 549 US 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the CAA. The Court held that the USEPA must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the USEPA is required to follow the language of §202(a) of the CAA. The Supreme Court decision resulted from a petition for rulemaking under §202(a) filed by more than a dozen environmental, renewable energy, and other organizations.

On April 17, 2009, the USEPA Administrator signed proposed endangerment and cause or contribute findings for GHGs under §202(a) of the CAA. The USEPA held a 60-day public comment period, which ended June 23, 2009, and received over 380,000 public comments. These included both written comments as well as testimony at two public hearings in Arlington, Virginia, and Seattle, Washington. The USEPA carefully reviewed, considered, and incorporated public comments and has now issued these final Findings.

The USEPA found that six GHGs taken in combination endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under CAA §202(a) (USEPA, 2011b).

Specific GHG Regulations that the USEPA has adopted to date are as follows:

> ***40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule*.** This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year (USEPA, 2011c). The Project would not trigger GHG reporting as required by this regulation.
>
> ***40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*.** USEPA recently mandated to apply Prevention of Significant Deterioration (PSD) and Title V requirements to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2011b). The Project would not trigger PSD or Title V permitting under this regulation.

Order No. 3289

On September 14, 2009, Secretary of the Interior Ken Salazar issued Secretarial Order No. 3289, addressing the impacts of climate change on domestic water, land, and other natural and cultural resources. The Order establishes an approach for increasing understanding of climate change and responding to potential climate change related impacts as relevant to the resources that the

Department of the Interior (DOI) manages. The document specifically identifies potential impact areas including potential changes in flood risk and water supply, sea level rise, changes in wildlife and habitat populations and their migration patterns, new invasions of exotic species, and increased threat of wildland fire. The Order includes Climate Change Response Planning Requirements, which require each bureau and office within the DOI (including BLM) to consider and analyze potential climate change impacts when undertaking long range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under DOI's purview.

3.8.2.2 State

There are a variety of statewide rules and regulations which have been implemented or are in development in California that mandate the quantification or reduction of GHGs.

Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS) was established in 2002 by SB 1078, and the initial standard has since been accelerated through a number of executive and legislative actions, the most recent of which are described below. The RPS program currently requires investor-owned utilities, electric service providers, and community choice aggregators to procure 33 percent of electricity from eligible renewable energy resources by 2020. The program is jointly implemented by the CPUC and CEC.

Executive Order S-3-05

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006, and establishes statewide emission reduction targets through the year 2050:

1. by 2010, reduce GHG emissions to 2000 levels;
2. by 2020, reduce GHG emissions to 1990 levels; and
3. by 2050, reduce GHG emissions to 80 percent below 1990 levels.

This Executive Order does not include any specific requirements that pertain to the Project. However, future actions taken by the state to implement these goals may affect the Project, depending on the specific implementation measures that are developed.

Executive Order S-14-08

Executive Order S-14-08 was established by Governor Arnold Schwarzenegger in November 2008. Executive Order S-14-08 improves processes for licensing renewable projects by directing state agencies to create comprehensive plans to prioritize regional renewable projects based on an area's renewable resource potential and the level of protection for plant and animal habitat. To implement and track the progress of the Executive Order, the CEC and CDFG signed a Memorandum of Understanding formalizing a Renewable Energy Action Team which will concurrently review permit applications filed at the state level to streamline the application process for renewable energy development. The specifics of this executive order include the following:

1. Requires retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020;

2. Requires various state agencies to streamline processes for the approval of new renewable energy facilities and determine priority renewable energy zones; and

3. Establishes the requirement for the creation and adoption of the Desert Renewable Energy Conservation Plan (DRECP) process for the Mojave and Colorado Desert regions.

This Executive Order does not include any specific requirements that pertain directly to the MSEP. However, the MSEP, as a renewable energy project, would help the utility contracting the power from this Project to meet the established RPS standard. Senate Bill 2, enacted in 2011, codifies the requirement of 33 percent renewable electricity sources by 2020.

Senate Bill 1368

SB 1368 was enacted in 2006, and required the CPUC to establish a CO_2 emissions standard for base load generation owned by or under long-term contract with publicly owned utilities. The CPUC established a GHG Emissions Performance Standard of 1,100 pounds of CO_2 per megawatt-hour (MWh). SB 1368 also requires the posting of notices of public deliberations by publicly owned companies on the CPUC website and establishes a process to determine compliance with the Emissions Performance Standard. The Project, as a renewable energy generation facility, is determined by rule to comply with the GHG Emission Performance Standard requirements of SB 1368.

Assembly Bill 32

California Assembly Bill (AB) 32, *the Global Warming Solutions Act of 2006*, requires ARB to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. AB 32 required ARB to adopt regulations by January 1, 2008, that identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions, and ARB is authorized to enforce compliance with the program. Under AB 32, ARB also was required to adopt, by January 1, 2008, a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. ARB established this limit in December 2007 at 427 million metric tons of CO_2e. This is approximately 30 percent below forecasted "business-as-usual" emissions of 596 million metric tons of CO_2e in 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (ARB, 2009).

By January 1, 2011, ARB was required to adopt rules and regulations (to be implemented by January 1, 2012), to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 permits the use of market-based compliance mechanisms to achieve those reductions. AB 32 also requires ARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts.

In June 2007, ARB directed staff to pursue 37 early strategies for reducing GHG emissions under AB 32. The broad spectrum of strategies that were developed, including a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, guidance and protocols for local governments to facilitate GHG reductions, and green ports, reflects that the serious threat of climate change requires action as soon as possible.

In addition to approving the 37 GHG reduction strategies, ARB directed staff to further evaluate early action recommendations made at its June 2007 meeting, and to report back to ARB within 6 months. The general sentiment of ARB suggested a desire to try to pursue greater GHG emissions reductions in California in the near-term. Since the June 2007 ARB hearing, ARB staff has evaluated all 48 recommendations submitted by stakeholders and several internally generated staff ideas and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration* in September 2007 (ARB, 2007). ARB adopted nine Early Action Measures for implementation, including Ship Electrification at Ports, Reduction of High Global-Warming-Potential Gases in Consumer Products, Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency), Reduction of Perfluorocarbons from Semiconductor Manufacturing, Improved Landfill Gas Capture, Reduction of Hydroflourocarbon-134a from Do-It-Yourself Motor Vehicle Servicing, Sulfur Hexafluoride Reductions from the Non-Electric Sector, a Tire Inflation Program, and a Low Carbon Fuel Standard.

Climate Change Scoping Plan

In December 2008, ARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit (ARB, 2009). This Scoping Plan, developed by ARB in coordination with the Climate Action Team, proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The measures in the Scoping Plan will continue to be developed over the next year and are scheduled to be in place by 2013. The Scoping Plan expands the list of the nine Early Action Measures into a list of 39 Recommended Actions contained in Appendices C and E of the Scoping Plan. The measures relevant to the Project include T-7, Heavy Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency; E-3, Renewables Portfolio Standard; and H-6, High GWP Reductions from Stationary Sources.

17 CCR §95350 et seq.

The purpose of this regulation is to achieve GHG emission reductions by reducing SF_6 emissions from gas-insulated switchgear. Gas-insulated switchgear owners must not exceed maximum allowable annual emissions rates, which are reduced each year until 2020, after which annual emissions must not exceed 1.0 percent. Owners must regularly inventory gas-insulated switchgear equipment and measure quantities of SF_6 and maintain records of these for at least 3 years. Additionally, by June 1, 2012, and June 1 of each year thereafter, each gas-insulated switchgear owner must submit an annual report to the Executive Officer for emissions that occurred during the previous calendar year.

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3.9 Hazards and Hazardous Materials

The following discussion addresses existing environmental conditions in the affected area of the proposed MSEP site, and describes existing laws and regulations relevant to public health and safety. The affected environment for public health and safety includes evaluation of several program areas, including aircraft operations, hazardous materials, and public health. The affected environment related to geologic and seismic hazards is discussed in Section 3.7, *Geology and Soils*. The affected environment related to abandoned mine lands, unexploded ordnance, and electric and magnetic field (EMF) exposure is discussed in Section 3.22, *Additional NEPA Considerations*.

3.9.1 Environmental Setting

3.9.1.1 Aircraft Operations

The Blythe Municipal Airport is located 6 miles west of Blythe; the MSEP site is located about 4 miles northwest of the airport. The airport is owned by Riverside County and is open to the public. The airport has two operating runways, Runway 8-26 (oriented east-west), the primary runway, is 6,562 feet long, 150 feet wide. Runway 17-35 (oriented north-south) is 5,820 feet long, 100 feet wide (Riverside County Airport Land Use Commission [ALUC], 2004). The Blythe Airport is used for general aviation, i.e., flights other than military and regularly scheduled airline service and cargo flights. The 2001 Airport Master Plan estimated a total of 15 based aircraft in 1999. Five aircraft are based on the field and the airport averaged 69 aircraft operations per day for the 12-month period ending May 2010 (Air Nav, 2011).

The Riverside County ALUC adopts Airport Land Use Compatibility Plans (ALUCPs) for the areas surrounding the airports within its jurisdiction (Airport Influence Areas) to protect the public from the adverse effects of aircraft noise, ensure that facilities and people are not concentrated in areas susceptible to aircraft accidents, and ensure that no structures or activities adversely affect or encroach upon the use of navigable airspace (Riverside County ALUC, 2012). The Riverside County ALUC adopted an ALUCP for the Blythe Municipal Airport in 2004. The ALUCP is based on the Airport Master Plan adopted by the Riverside County Board of Supervisors in 2001. The ALUCP envisions a future long-range activity level of 58,100 annual aircraft operations including up to 2,200 airline aircraft operations (which could ultimately include large jet transport aircraft operations), consistent with the Airport Master Plan forecast. The Airport Master Plan also anticipates a 3,450-foot westward extension of Runway 8-26, resulting in a total length of 10,012 feet (Riverside County ALUC, 2004).

The airport influence area boundary for the Blythe Airport is measured from a point 200 feet beyond where the runways end (14 CFR Part 77), and includes Zones A, B1, B2, C, D, and E. The ALUCP identifies allowable and prohibited uses within each of these zones. Table 3.9-1 summarizes the compatible and potentially compatible land uses by Zone for electrical substations, power plants, and power lines. Power lines are listed as “potentially compatible with restrictions” in Zones B1, B2, C, and D. However, Table 3.9-1 addresses generalized situations regarding the placement of a power line.

TABLE 3.9-1
COMPATIBLE LAND USES BY ZONE

Component	Zone A	Zone B1	Zone B2	Zone C	Zone D	Zone E
Electrical Substations	-	0	0	0	0	+
Power Plants	-	-	-	0	0	+
Power Lines	-	0	0	0	0	+

NOTES:

- Generally Incompatible
0 Potentially compatible with restrictions
+ Generally Compatible

SOURCE: Riverside County ALUC, 2005a

The ALUCP notes that in Zones B1 and B2, airspace review is required for proposed structures greater than 35 feet in height; in Zone C, such review is required for structures taller than 70 feet; and in Zones D and E, such review is required for structures taller than 150 feet. These are generalized concepts. The provisions of Part 77 of the FAA Regulations govern whether a proposed project requires the submittal of Form 7460-1 to the FAA for preparation of an aeronautical study. Portions of a transmission line that are not in an Airport Influence Area still could potentially be subject to FAA review through the Form 7460-1 process if within 20,000 feet of a runway, especially if located at a higher elevation than the runway. Land uses that create hazards to air navigation are prohibited in all Airport Land Use Compatibility Zones. Such hazards include physical (e.g., tall objects), visual, and electronic forms of interference with the safety of aircraft operations. Land uses that may increase the attraction of birds to the area are also prohibited (Riverside County ALUC, 2005b). Potential hazards to aviation from solar energy projects located in sufficient proximity to airports include potential electromagnetic interference from the power plant and transmission lines, potential glare from the PV panels used to collect solar energy, and bird attraction from ponds.

3.9.1.2 Hazardous Materials

Existing Environmental Site Contamination

The Phase I Environmental Site Assessment conducted for the Project site in 2011 found no "Recognized Environmental Conditions" per the ASTM definition (Tetra Tech, 2011). This means that there was no evidence of any releases of hazardous substances or petroleum products on the Project site or in the immediate vicinity. De minimis conditions identified during the site reconnaissance included utility lines, trash, and a pit with a wooden shaft (a potential former well). The following utility lines were observed: a potentially active high-pressure gas line trending north-south across the MSEP site about 20 to 50 feet west of Black Creek Road, and an east-west trending buried communication line and high-pressure gas pipeline and an overhead transmission line, both on the southern side of I-10, crossing the proposed gen-tie line. Scattered trash and debris were observed in the gen-tie line corridor, particularly near I-10, that could include lead debris from shooting target practice. A former well, identified in the records search, was not observed at its exact known location; however, a pit with a collapsed wood-buttressed

shaft and debris was observed nearby. In addition, above-ground storage tanks were identified outside of the MSEP boundary at a transient mobile home compound located to the south of the proposed gen-tie line and access road route. Although not considered a "Recognized Environmental Condition" according to ASTM guidance, an additional environmental concern at the Project site is the potential presence of unexploded ordnance due to its use as a military practice area during the World War II era (Tetra Tech, 2011). The affected environment related to unexploded ordnance is discussed further in Section 3.22, *Additional NEPA Considerations*.

Pesticide Use

Pesticides are used to control living organisms that cause damage or economic loss, or that transmit or cause disease. Pests include insects, fungi, weeds, rodents, nematodes, algae, viruses, and bacteria. Pesticides include herbicides, fungicides, insecticides, rodenticides, and disinfectants, as well as insect growth regulators. In California, adjuvants (substances added to enhance the efficacy of a pesticide) also are subject to the regulations that control pesticides. The amount of pesticides applied in Riverside County increased from 1,787,288 pounds in 2009 to 2,339,739 pounds in 2010. Riverside County is currently the 18th highest pesticide user of the state's 58 counties (California Department of Pesticide Regulation, 2011). Based on historical information and existing conditions identified in the Phase I Environmental Site Assessment (Tetra Tech, 2011), the MSEP site has not been used for agriculture and therefore would not have been subject to pesticide applications.

3.9.1.3 Emergency Response

The Office of Emergency Services maintains two fully functional emergency operations centers in the cities of Riverside and Indio for coordination of response and recovery to extraordinary emergencies and disasters affecting Riverside County. The Riverside County Operational Area Emergency Operations Plan (RCFD, 2006) addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Riverside County and establishes the framework for coordinating various Riverside County departments and other agencies in their emergency response activities.

The 2010 California Fire Code and 2010 CBC regulate and govern the safeguard of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials, and devices and from conditions hazardous to life or property in the occupancy of buildings and premises. Accordingly, emergency services access roads must be installed and made serviceable prior to and during the time of construction. The grade of the fire department access road must be within the limits established by the Fire Chief and may not exceed 15 percent.

3.9.1.4 Public Health

Location of Exposed Populations and Sensitive Receptors

The general population includes sensitive subgroups that could be at greater risk from exposure to hazardous materials or emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. However, there are no sensitive receptors in the immediate vicinity of the MSEP site. The nearest sensitive receptors are a residence off Black Creek Road, approximately 2.7 miles south of the site boundary, and a residence near 7th Avenue that is approximately 2.6 miles to the southeast. In addition, there are several residences that would be within 1 mile of the proposed gen-tie line, the closest of which is south of I-10 at a distance of approximately 0.6 mile. The nearest school is located approximately 7 miles from the MSEP site.

Existing Public Health Concerns

Analyses of existing public health issues typically are prepared in order to identify the current status of respiratory diseases (including asthma), cancer, and general health in the population located near proposed action sites to provide a basis on which to evaluate any additional health impacts from the proposed action. Because of the very low population in the immediate vicinity of the MSEP and because no data regarding existing health concerns specific to the local area was located, a detailed analysis of existing public health issues has not been conducted. Instead, statistics related to the public health status of Riverside County residents were obtained through database searches of the California Health Interview Survey (CHIS) conducted by the UCLA Center for Health Policy Research in collaboration with the California Department of Public Health (CDPH) and the Department of Health Care Services (CDHCS). Survey results reported comparable health status of Riverside County residents as compared with California as a whole. The following County incidence rates as compared to statewide numbers (in parentheses) were reported: cancer 11.5 percent (8.7 percent), lung disease 3.1 percent (2 percent), heart disease 5.2 percent (5.9 percent) and asthma 51.1 percent (58.5 percent) (CHIS, 2005, 2009).

Vector-Borne Diseases

Mosquitoes and other arthropods are known to be carriers of many serious diseases. Arthropod-borne viruses (“arboviruses”) are viruses that are transmitted by blood-feeding arthropods, such as mosquitoes and ticks, when they bite susceptible humans and animals. There are four main virus agents of encephalitis in the United States: eastern equine encephalitis, western equine encephalitis, St. Louis encephalitis, and La Cross encephalitis, all of which are transmitted by mosquitoes. Most human infections are asymptomatic or result in nonspecific flu-like symptoms such as fever, headache, nausea, and tiredness. However, infection may lead to encephalitis, an inflammation of the brain, with a fatal outcome or permanent neurologic damage in a small proportion of infected persons. West Nile Virus (WNV) is closely related to the SLE virus and causes similar symptoms.

Of these diseases, only the WNV was reported in California in 2011. Six cases of WNV were reported in Riverside County and 144 cases were reported in the state during 2011 (USGS, 2011).

Valley Fever

Coccidioidomycosis, commonly known as Valley Fever, is primarily a disease of the lungs that is common in the southwestern U.S. and northwestern Mexico. Valley Fever is caused by the fungus Coccidioides, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. These fungal spores become airborne when the soil is disturbed by winds, construction, farming, and other activities. In susceptible people and animals, infection occurs when a spore is inhaled. Valley Fever symptoms generally occur within 3 weeks of exposure. Valley Fever is not a contagious disease, and secondary infections are rare.

It is estimated that more than 4 million people live in areas where Valley Fever fungus is prevalent in the soils. According to the CDPH, between 2001 and 2010, Riverside County has an incidence rate for Valley Fever of 1.5 to 3.8 cases per 100,000 people, which is relatively low compared to the higher incidence rate in counties such as Kern County, which had an incidence rate of 73 to 227 cases per 100,000 people over the same time period (CDPH, 2011).

People working in certain occupations such as construction, agriculture, and archaeology have an increased risk of exposure and disease because these jobs result in the disturbance of soils where fungal spores are found. Valley Fever infection is highest in California from June to November. In addition, many domestic and native animals are susceptible to the disease, including dogs, horses, cattle, coyotes, rodents, bats, and snakes. Most Valley Fever cases are very mild. It is estimated that 60 percent or more of infected people either have no symptoms or experience flu-like symptoms and never seek medical attention.

3.9.1.5 Intentionally Destructive Acts

The number and high profile of international and domestic terrorist attacks during the last decade presents a new and realistic threat to the safety and security of the people of the U.S., infrastructure, and resources. There is a potential for intentional destructive acts, such as sabotage or terrorism events, to cause impacts to human health and the environment. As opposed to industrial hazards, collisions, and natural events, where it is possible to estimate event probabilities based on historical statistical data and information, it is not possible to accurately estimate the probability of an act of terrorism or sabotage; therefore, related analysis generally focuses on the consequences of such events. In general, the consequences of a sabotage or terrorist attack on a solar facility would be expected to be similar to accidental and natural events that could result in an interruption of power service, fire, or hazardous materials release.

The energy generation sector is one of 14 areas of Critical Infrastructure listed by the U.S. Department of Homeland Security. Nearly all of the other areas of Critical Infrastructure are reliant, at least in part, on the energy sector. The level of security needed for any particular facility depends on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event.

The Department of Homeland Security Interim Final Rule setting forth Chemical Facility Anti-Terrorism Standards (6 CFR Part 27) requires facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. Although the proposed facility would not be covered by the standards, the BLM's position is that the Applicant should implement a minimum level of security consistent with the Standards. The DOE published a draft Vulnerability Assessment Methodology for Electric Power Infrastructure in 2002 (DOE, 2002). Energy sector members also are leading a significant voluntary effort to increase planning and preparedness, including infrastructure protection and cyber security. The North American Electric Reliability Corporation (NERC) has established a Critical Infrastructure Protection Program to coordinate and improve physical and cybersecurity for the bulk power system of North America as it relates to reliability (NERC, 2011).

For setting information regarding fire hazards, see Section 3.21, *Wildland Fire Ecology*.

3.9.2 Applicable Regulations, Plans, and Standards

3.9.2.1 Federal

Comprehensive Environmental Response and Liability Act and Superfund Amendments and Reauthorization Act

The Superfund Amendments and Reauthorization Act (SARA) amends the Comprehensive Environmental Response and Liability Act (CERCLA) and governs hazardous substances. The applicable part of SARA for the proposed MSEP is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA). EPCRA establishes requirements for federal, state, and local governments, as well as Indian Tribes and industry members regarding emergency planning and reporting on hazardous and toxic chemicals (USEPA, 2000). Key sections of the law include:

> ***§304*:** Requires immediate notification to the local emergency planning committee (LEPC) and the state emergency response commission (SERC) when a hazardous material is released in excess of its reportable quantity (RQ). If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
>
> ***§311*:** Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.

Clean Air Act

Regulations under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a Threshold Quantity (TQ) or greater of listed regulated substances to develop an RMP, including hazard assessments and response programs to prevent accidental releases of listed chemicals.

Toxic Substances Control Act, Resource Conservation and Recovery Act

The Federal Toxic Substances Control Act of 1976 (TSCA) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the USEPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes.

Hazardous Materials Transport Act

The U.S. Department of Transportation (USDOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the USDOT to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. 49 CFR Parts 171–180 regulate the transportation of hazardous materials, the types of material that are defined as hazardous, and the marking of vehicles transporting hazardous materials.

Federal Aviation Administration

The FAA regulates aviation at regional, public, private, and military airports. The FAA regulates objects affecting navigable airspace and structures taller than 200 feet. USDOT and Caltrans also require the applicant to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration (USDOT, 2007). According to 14 CFR Part 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 14 CFR Part 77, requires issuance of a permit from Caltrans's Division of Aeronautics. The permit is not required if the FAA aeronautical study determines that the structure has no impact on air navigation.

Occupational Safety and Health Administration

The OSHA's mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs.

3.9.2.2 State

Safe Drinking Water and Toxics Enforcement Act

The Safe Drinking Water and Toxics Enforcement Act (Health and Safety Code §25249.5 et seq.) identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment (OEHHA).

Aboveground Petroleum Storage Act

Assembly Bill 1130 (2007) updated the Aboveground Petroleum Storage Act of 1990 (Health and Safety Code §§25270 to 25270.13) and requires the owner or operator of a tank facility with an aggregate storage capacity greater than 1,320 gallons of petroleum to file an inventory statement with the local Certified Unified Program Agency (CUPA) and to prepare an SPCC plan. An SPCC plan must identify appropriate spill containment or equipment for diverting spills from sensitive areas, as well as discuss facility-specific requirements for the storage system, inspections, recordkeeping, security, and personnel training.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act (Health and Safety Code §25500 *et seq*.; 19 CCR §2620, *et seq*.), requires local governments to regulate local businesses using hazardous materials in excess of certain quantities to prepare a Hazardous Materials Business Plan (HMBP) that describes their facilities, inventories, emergency response plans, and training programs to their local CUPA and to report releases to their CUPA and the California Office of Emergency Services. 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. HMBPs shall include the following: (1) a hazardous material inventory in accordance with 19 CCR §§2729.2 to 2729.7; (2) emergency response plans and procedures in accordance with 19 CCR §2731; and (3) training program information in accordance with 19 CCR §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 shall 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:

1. 500 pounds of a solid substance,
2. 55 gallons of a liquid,
3. 200 cubic feet of compressed gas,
4. A hazardous compressed gas in any amount, and
5. Hazardous waste in any quantity.

Health and Safety Code §25531

This code section and the California Accidental Release Program (CalARP) regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III. Health and Safety Code §25531 overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing regulated substances at or above Threshold Planning Quantities must register with their local CUPA and prepare an RMP.

8 CCR §5189

This regulation requires facility owners that store a TQ of hazardous materials to develop and implement effective safety management plans that ensure that hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Health and Safety Code §41700

This code section states, "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Hazardous Waste Control Law

The Hazardous Waste Control Law (HWCL) (Health and Safety Code §§25100-25249) 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 22 CCR §66250 et seq., which describes the following required aspects for the proper management of hazardous waste:

1. Identification and classification;
2. Generation and transportation;
3. Design and permitting of recycling, treatment, storage, and disposal facilities;
4. Treatment standards;
5. Operation of facilities and staff training; and
6. 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 HWCL and its implementing regulations, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)

This program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a CUPA. The Program Elements consolidated under the Unified Program are:

1. Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a., Tiered Permitting),
2. Aboveground Petroleum Storage Tank SPCC,
3. Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or "Community-Right-To-Know"),

4. CalARP,
5. Underground Storage Tank (UST) Program, and
6. Uniform Fire Code Plans and Inventory Requirements.

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA. The Riverside County Department of Environmental Health is the CUPA in the Project area.

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) was created in 1991, which unified California's environmental authority in a single cabinet-level agency and brought the ARB, State Water Resources Control Board (SWRCB), RWQCBs, Integrated Waste Management Board (now CalRecycle), DTSC, and the OEHHA under one agency. These agencies were placed within the CalEPA "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

The DTSC is a department of CalEPA and is the primary agency in California that regulates hazardous waste, cleans-up existing contamination, and looks for ways to reduce the hazardous waste produced in California. The DTSC regulates hazardous waste in California primarily under the authority of the federal RCRA and the California Health and Safety Code (primarily Title 22, 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.

Government Code §65962.5 (commonly referred to as the Cortese List) includes the DTSC-listed hazardous waste facilities and sites, CDPH lists of contaminated drinking water wells, sites listed by the SWRCB as having UST leaks and which have had a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites that have had a known migration of hazardous waste and/or material.

California Office of Emergency Services

In order to protect the public health and safety and the environment, the California Office of Emergency Services 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. Basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and the health risks) needs to be available to firefighters, public safety officers, and

regulatory agencies. Such information needs to be included in business plans in order to prevent or mitigate the 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.

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. An 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 California Highway Patrol, is required by the laws and regulations of Vehicle Code §3200.5 for transportation of either:

1. Hazardous materials shipments for which the display of placards is required by state regulations; or

2. 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 California Highway Patrol under the authority of the Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (14 CCR §§1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (13 CCR §§1157-1157.8). Radioactive materials are restricted to specific safe routes for transportation of such materials.

Public Resources Code §§4292-4293, Powerline Hazard Reduction

PRC §4292 requires and presents guidelines for a 10-foot firebreak consisting of a clearing of not less than 10 feet in each direction from the outer circumference of the base of power poles. PRC §4293 requires and presents guidelines for maintaining a 4-foot clearance in all directions between all vegetation and all conductors carrying between 2.4 and 72 kV, and a 10-foot clearance for lines carrying over 110 kV. The proposed distribution line would operate at 12 kV and the gen-tie line would operate at 230 kV.

California Code of Regulations

The CCR is a catalog of regulations adopted by state agencies, including:

1. 8 CCR §2700 et seq., High Voltage Electrical Safety Orders, which establish essential requirements and minimum standards for installation, operation, and maintenance of electrical equipment to provide practical safety and freedom from danger.

2. 14 CCR §§1250-1258, Fire Prevention Standards for Electric Utilities, which provide specific exemptions from electric pole and tower firebreak and electric conductor clearance standards, and specifies when and where standards apply. It establishes minimum clearance requirements for flammable vegetation and materials surrounding structures.

3.9.2.3 Local

Riverside County Fire Department Fire Prevention Standards

In accordance with the 2010 California Fire Code, the RCFD incorporated the Fire Apparatus Access Roads standard (§503) and Knox Box Emergency Access System standard (§506) into its operational standards. Under these standard, all required building plans must be submitted to the RCFD for review and approval of access roads and points and Knox Box mounting location and position and operating standards prior to installation (RCFD, 2011a, 2011b).

Riverside County Airport Land Use Compatibility Plan

Policy 4.3.7 of the Compatibility Plan states, "New land uses that may cause visual, electronic, or increased bird strike hazards to aircraft in flight shall not be permitted within any airport's influence area." Specifically, glare or distracting lights that could be mistaken for airport lights; sources of dust, steam, or smoke that may impair pilot visibility; sources of electrical interference with aircraft communications or navigation; and any proposed use, especially landfills and certain agricultural uses, that creates an increased attraction for large flocks of birds, should all be avoided (Riverside County ALUC, 2005b). A portion of the gen-tie line would be located within the Blythe Airport's influence area.

3.10 Lands and Realty

This section describes existing land use conditions in the Project area. Land use can be assessed by analyzing current land activities, land ownership, and land use designations in adopted land use plans and policies. An assessment of land use must also consider legal guarantees or limitations on land use such as those provided by easements, deeds, ROWs, claims, leases, licenses, and permits. BLM-administered lands may be encumbered by easements, ROWs, mining claims, and permits.

Land uses on the BLM-administered portion of the Project site are governed by the CDCA Plan, the purpose of which is to "provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality."

The principle of multiple use is defined in the FLPMA §103(c) as follows:

> *The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.*

3.10.1 Environmental Setting

BLM manages a diverse combination of lands and resources administered by BLM in eastern Riverside County, including but not limited to, land uses for utility corridors, communication sites, land tenure (disposal, acquisition, or easement) issues, land use authorizations (permits and ROWs), withdrawals, and renewable energy activities.

3.10.1.1 General Characteristics

The Project would be located almost entirely on BLM-administered lands in eastern Riverside County (see Figure 2-2). The site currently consists of vacant and undeveloped desert land. Development in the surrounding area includes the City of Blythe to the southeast. The Project encompasses all or portions of BLM-administered land in Sections 25 through 30 and 32 through 35, Township 5 South, Range 21 East. Non-federal land proposed for development includes the west half and the southeast quarter of Section 36, Township 5 South, Range 21 East. With the exception of a short segment of the gen-tie line (west half of the southwest quarter of Section 2,

Township 7 South, Range 21 East) and a short segment of the distribution line (south half of the southwest quarter, Section 8, Township 6 South, Range 22 East), the linear facilities avoid crossing non-federal land (Kershaw, 2011).

3.10.1.2 Land Ownership/Management

BLM Land Use Designations

The CDCA encompasses 25 million acres in southern California designated by Congress in 1976 through the FLPMA. The BLM manages about 10 million of those acres. Congress directed the BLM to prepare and implement a comprehensive long-range plan for the management, use, development, and protection of public lands within the CDCA. The CDCA Plan (BLM 1980, as amended) is based on the concepts of multiple-use, sustained yield, and maintenance of environmental quality. The CDCA Plan provides overall regional guidance for BLM-administered lands in the CDCA and establishes long-term goals for protection and use of the California desert.

The CDCA Plan developed a classification system that places BLM-administered public lands in the CDCA into one of four multiple-use classes, based on the sensitivity of the resources and types of uses for each geographic area. The CDCA lands in Eastern Riverside County are assigned to the classes in the proportions shown in Table 3.10-1 below.

TABLE 3.10-1
MULTIPLE-USE CLASS DESIGNATIONS

Class	Acreage	% of Total Planning Area Public Lands
C	576,858	37.8
L	550,087	36.0
M	399,024	26.1
I	0	0
U	1,886	0.1
Total	***1,527,855***	***100***

The Multiple-Use Class Guidelines, as delineated in Table 1, pages 15-20 of the CDCA Plan (BLM, 1980), apply to CDCA lands in Eastern Riverside County.

Descriptions of the multiple-use classes are as follows:

> **Class C:** Multiple-Use Class C (Controlled) has two purposes. First, it shows those areas which are being "preliminarily recommended" as suitable for wilderness designation by Congress. This process is explained in the Wilderness Element of the CDCA Plan (BLM 1980). Second, it will be used in the future to show those areas formally designated as "wilderness" by Congress.
>
> The Class C Guidelines are different from the guidelines for other classes. They summarize the kinds of management likely to be used in these areas when and if the areas are formally

designated wilderness by Congress. These guidelines will be considered in the public process of preparing the final Wilderness Study Reports. However, the final management decisions depend on Congressional direction in the legislation that makes the formal designation.

Class L: Multiple-Use Class L (Limited Use) protects sensitive natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished.

Class M: Multiple-Use Class M (Moderate Use) is based upon a controlled balance between higher-intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Class M management is also designed to conserve desert resources and to mitigate damage to those resources which permitted uses may cause.

Class I: Multiple-Use Class I (Intensive Use) provides for concentrated use of lands and resources to meet human needs. Reasonable protection will be provided for sensitive natural and cultural values. Mitigation of impacts on resources and rehabilitation of impacted areas will occur insofar as possible.

Unclassified Lands: Scattered and isolated parcels of public land in the CDCA that have not been placed within multiple-use classes are "unclassified" land. These parcels will be managed on a case-by-case basis, as explained in the Land Tenure Adjustment Element of the CDCA Plan.

Plan Elements: The CDCA Plan Elements provide specific application of the multiple-use class guidelines for specific resources or activities about which the public has expressed significant concern.

Donated Lands

The BLM can be the recipient and trustee of land donated by individuals or groups. Often such lands are donated with the express interest of preserving the resources that characterize these lands. In so doing, a restrictive instrument such as a conservation easement or deed restriction is attached to the donation and land that would control its use, often in terms of prohibiting development or change to the landscape. There is no record of such a donation and accompanying restrictive instrument associated with the Project site.

Riverside County

The privately owned portion of the Project site is under Riverside County jurisdiction and land uses are governed by Riverside County plans and policies.

3.10.1.3 Existing Uses

There are no existing authorized uses within the proposed boundaries of the Project site. Within the immediate and surrounding areas of the Project, there are no communications sites, land use permits, leases or easements of record, nor are any land tenure issues identified in close proximity to or that would be affected by the Project. There are, however, multiple-use class management

guidelines for the site, utility corridors, ROWs, renewable energy activities, an authorized withdrawal for the Eagle Mountain Pumped Storage Project, and withdrawal applications (see Figure 4.1-1) (Kershaw, 2011).

Multiple-Use Guidelines

The Project site is located within lands designated "Class L," or limited use. Solar energy facilities are permitted in Class L areas provided that the BLM complies with NEPA and follows the CDCA Plan Amendment process. For MUC-L lands, applicable guidelines from the CDCA Plan, Table 1 are as included in Table 3.10-2.

TABLE 3.10-2
MULTIPLE-USE CLASS L LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines
1. Agriculture	Agricultural uses (excluding livestock grazing) are not allowed.
2. Air Quality	These areas will be managed to protect their air quality and visibility in accordance with Class II objectives of Part C of the Clean Air Act Amendments unless otherwise designated another class by the State of California as a result of recommendations developed by any BLM air-quality management plan.
3. Water Quality	Areas designated in this class will be managed to provide for the protection and enhancement of surface and groundwater resources, except for instance of short-term degradation caused by water development projects. Best management practices, developed by the Bureau during the planning process outlined in the Clean Water Act, Section 208, and subsequently, will be used to keep impacts on water quality minimal and to comply with Executive Order 12088.
4. Cultural and Paleontological Resources	Archaeological and paleontological values will be preserved and protected. Procedures described in 36 CFR 800 will be observed where applicable. A Memorandum of Agreement has been signed by the BLM, the California State Historic Preservation Officer, and for cultural resources the President's Advisory Council on Historic Preservation to protect cultural resources.
5. Native American Values	Native American cultural and religious values will be preserved where relevant and protected where applicable. Native American group(s) shall be consulted. Memorandums of Agreement and Understandings have been signed between BLM and the Native American Heritage Commission pertaining to Native American concerns and cultural resources.
6. Electrical Generation Facilities	Electrical generation plants may be allowed, Existing facilities may be maintained and upgraded or improved in accordance with special-use permits or by amendments to rights-of-way. a. Wind/Solar may be allowed after NEPA requirements are met. b. Geothermal may be allowed pursuant to licenses issued under 43 CFR Section 3250 et seq. NEPA requirements will be met.
7. Transmission Facilities	New gas, electric, and water transmission facilities and cables for interstate communication may be allowed only within designated corridors (see Energy Production and Utility Corridors Element). NEPA requirements will be met. Existing facilities within designated corridors may be maintained and upgraded or improved in accordance with existing rights-of way grants or by amendments to right-of-way grants. Existing facilities outside designated corridors may only be maintained but not upgraded or improved.
7a. Distribution Facilities	New distribution systems may be allowed and will be placed underground where feasible except where this would have a more detrimental effect on the environment than surface alignment. In addition, new distribution facilities shall be placed within existing ROW where they are reasonably available. Existing facilities may be maintained and utilized in accordance with right-or-way grants and applicable regulations.

TABLE 3.10-2 (Continued)
MULTIPLE-USE CLASS L LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines
8. Communication Sites	Existing facilities may be maintained and utilized in accordance with right-or-way grants and applicable regulations.
9. Fire Management	Fire suppression measures will be taken in accordance with specific fire management plans subject to such conditions as the authorized officer deems necessary, such as use of motorized vehicle, aircraft, and fire retardant chemicals.
10. Vegetation	Removal of vegetation, commercial or non-commercial, may be allowed by permit only after NEPA requirements are met and after development of necessary stipulation. Harvesting by mechanical means may be allowed by permit only. All state and federally listed species will be fully protected. Actions which may jeopardize the continued existence of federally listed species will require consultation with the U.S. Fish and Wildlife Service. Identified sensitive species will be given protection in management decisions consistent with BLM policies. Identified UPAs will be considered when conducting all site-specific environmental impact analyzes to minimize impact. See also Wetland/Riparian Areas guidelines. Mechanical control will not be allowed. Aerial broadcasting application of chemical controls will not be allowed. Noxious weed eradication may be allowed after site-specific planning. Types and uses of pesticides, in particular herbicides must conform to Federal, State and local regulations. Enclosures may be allowed. Prescribed burning may be allowed after development of a site-specific management plan.
11. Land-Tenure Adjustment	Public Land will not be sold.
12. Livestock Grazing	Grazing will be allowed subject to the protection of sensitive resources. Support facilities such as corrals, loading chutes, water developments, and other facilities, permanent or temporary, may be allowed consistent with protection of sensitive resources. Manipulation of vegetation by chemical or mechanical means will not be allowed, except for site-specific needs.
13. Mineral Exploration and Development	Except as provided in Appendix 5.4, 516, DM 6, NEPA procedures titled “Categorical Exclusions”, prior to approving any lease, notice, or application that was filed pursuant to 43 CFR 3045, 3100, 3200, 3500 and S.O. 3087, as amended, an EA will be prepared on the proposed action. Mitigation and reclamation measures will be required to protect and rehabilitate sensitive scenic, ecological, wildlife vegetative and cultural values. Location of mining claims is nondiscretionary. Operations on mining claims are subject to the 43 CFR 3809 Regulations and applicable State and local law. NEPA requirements will be met. BLM will review plans of operations for potential impacts on sensitive resources identified on lands in this class. Mitigation, subject to technical and economic feasibility, will be required. Except as provided in Appendix 5.4, 516 DM 6, NEPA Procedures titled “Categorical Exclusions”, new material sales locations, including sand and gravel sites, will require an EA. Continued use of existing areas of sand and gravel extractions is allowed subject to BLM permits as specified in 43 CFR 3600.
14. Motorized-Vehicle Access/ Transportation	New roads and ways may be developed under ROW grants or pursuant to regulations or approved plans of operation. Vehicle use on some significant dunes and dry lakebeds may be is allowed (see Motorized Vehicle Access Element). Periodic or seasonal closures or limitations of routes of travel may be required.

TABLE 3.10-2 (Continued)
MULTIPLE-USE CLASS L LAND USE AND RESOURCE MANAGEMENT GUIDELINES

Land Uses / Resources	MUC L Guidelines
14. Motorized-Vehicle Access/ Transportation (cont.)	Access will be provided for mineral exploration and development. Railroads and trams may be allowed to serve authorized uses if no other visible alternative is possible. Temporary landing strips may be allowed by permit.
15. Recreation	This class is suitable for recreation which generally involved low to moderate user densities. Recreation opportunities include those permitted in Class C: a. land-sailing on dry lakes b. non-competitive vehicle touring and events only on "approved" routes of travel All organized vehicle events, competitive or not, require a permit specifying the condition of use. These conditions will include, but are not limited to: a. approved routes b. no pitting, start, finish or spectator areas Permanent or temporary facilities for resource protection and public health and safety are allowed. Trails are open for non-vehicle use and new trails for non-motorized access may be allowed.
16. Waste Disposal	Hazardous waste disposal sites will not be allowed. New non-hazardous waste disposal sites will not be allowed.
17. Wildlife Species and Habitat	All State and federal listed species and their critical habitat will be fully protected. Actions which may affect or jeopardize the continued existence of federally listed species will require formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act. Identified species will be given protection in management decisions consistent with BLM policies. Control of depredation wildlife and pests will be allowed in accordance with existing State and Federal laws. Projects to improve wildlife habitat may be allowed subject to environmental assessment. Reintroduction or introduction of native species or established exotic species is allowed.
18. Wetland-Riparian Areas	Wetland/riparian areas will be considered in all proposed land-use actions. Steps will be taken to provide that these unique characteristics and ecological requirements are managed in accordance with Executive Order 11990, Protection of Wetlands (42 CFR 26951), legislative and Secretarial direction, and BLM Manual 6740, "Wetland Riparian Area Protection and Management." as outlined in the Vegetation Element.
19. Wild Horses and Burros	Populations of wild and free-roaming horses and burros will be maintained in healthy, stable herds, in accordance with the Wild and Free-Roaming Horse and Burro Act of 1971 but will be subject to controls to protect sensitive resources.

Utility Corridors

The CDCA Plan (1980, as amended), identifies "planning" and "contingency" utility corridors on BLM-administered land. One of the broad goals of the BLM system of utility corridors is to implement the network of joint-use planning corridors to meet projected utility needs. Planning corridors, commonly referred to as "designated" corridors, are the locations where the BLM requests that applicants focus their attention in developing proposals for linear facilities on BLM-administered land. "Contingency" corridors are identified as having potential for use in the future

and can become a "designated" corridor after completion of a land use plan amendment. Both types of corridors are identified in the CDCA Plan using an alphabetic designation (Kershaw, 2011).

CDCA-designated corridors in proximity to the Project are Corridor J, a 2-mile-wide, north-south corridor lying roughly 1 mile to the east; and Corridor K, a 2- to 4-mile-wide, east-west corridor lying approximately 5 miles to the south (see Figure 4.1-1).

Additionally, §368 of the EPAct (Public Law 109-58) requires the DOI to examine and designate energy transportation corridors in the West. In response, the BLM issued the "*Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States*" (January, 2009) which designated §368 Corridors in the western United States. Section 368 corridors are identified with a numeric designation and are often overlain on locally designated corridors, as is the case with the east-west §368 2-mile wide Corridor 30-52 overlying Corridor K (see Figure 4.1-1).

The Project would not lie within or adjacent to CDCA-designated Corridors J or K, or §368-designated Corridor 30-52. Linear facilities would not lie within Corridor J. Linear facilities would lie within and directly affect Corridors K and 30-52 in Section 35, Township 6 South, Range 21 East, and Sections 2 through 6, Township 7 South, Range 21 East. This analysis focuses on the potential conflicts with this 5-mile section of Corridors K and 30-52.

I-10 lies within a Designated Corridor as defined by the EPAct §368[1] (identified as Corridor 30-52, 2 miles in width) as well as a locally designated Corridor K (1 mile in width) (each of which is shown in Figure 4.1-1, and both of which lie south of the site on a generally east-west heading). Numerous other linear rights-of-way also lie within and to the north and south of these designated corridors. Locally designated Corridor J (2 miles in width) follows a north-south heading to the east of the Proposed Action but would not be affected by it.

Although the solar generating facilities would not be within the designated corridors, ancillary facilities associated with the Project would. The proposed gen-tie line would cross I-10, and thus Corridors K and 30-52, on a nearly perpendicular path, to connect to the proposed CRS southwest of the Project. The primary fiber optic line would be co-located with the gen-tie line and another buried in a shallow ditch alongside the access road to the site within the corridors. Access to the Project site from I-10 would be from the existing Exit #232, Airport/Mesa Drive via Mesa Drive Road. A new access road from the frontage road on the north side of I-10 heading north to the site is proposed along the same alignment as the gen-tie line and fiber optic line. This road would cross, on a nearly perpendicular route, the northern portion of the Corridors 30-52 and K.

The Project site is within an area of land temporarily withdrawn from settlement, sale, location, or entry under the public land laws to allow for their study as solar energy study areas in the draft

[1] Section 368 of the EPAct directs the Secretaries to designate corridors for oil, gas, hydrogen pipe and electric transmission lines on federal land in the 11 western states, perform necessary reviews, and incorporate those designations into land use, land management, or equivalent plans.

Programmatic Environmental Impact Statement to Develop and Implement Agency-Specific Programs for Solar Energy Development (Solar PEIS), which is currently going through the decision-making process and being evaluated by the DOI and DOE in accordance with required federal laws. The lands remain open to discretionary actions, such as rights-of-way and land use permits, and to the mineral sales and leasing laws.

In addition to the Project, six other priority proposed solar generation projects in eastern Riverside County (BSPP, Genesis Solar Energy Project, Desert Sunlight Solar Farm Project, Rice Solar Energy Project, Palen Solar Power Project, and Desert Harvest Solar Farm) are currently under review or in pre-construction. Figure 4.1-1 identifies these proposed actions by letter: BSPP (N), Genesis (J), Desert Sunlight (P), Rice (L), Palen (H), and Desert Harvest (R). The combined total number of acres identified for consideration in these applications, including the Project, is approximately 34,000 acres. Each of these proposed actions has identified an "action area" that includes more acreage than what would be needed for construction, operation, and maintenance to allow for flexibility in final design. Should one or more ROW grants be authorized, the acreage included in the grant(s) would be only that which is actually needed for an action(s), not the total number of acres identified in the application(s).

The Devers-Palo Verde No. 1 (DPV1) is an existing 500 kV transmission line which spans approximately 128 miles of land within California paralleling I-10 (see Figure 4.1-1, Number 4). The transmission line is within Corridors K and 30-52. DPV1 was approved by the CPUC in 1979 and constructed in 1982.

The Blythe Energy Project Transmission Line Project involves the building of two 230 kV transmission lines spanning approximately 70 miles between the Julian Hinds and Bucks substations, and construction of a new midpoint substation (see Figure 4.1-1, Number 10). This transmission line went under construction in February 2009, was completed in 2010, and has since been energized. The transmission line lies within the existing federally approved utility corridor along I-10.

The Devers-Palo Verde No. 2 (DPV2) Transmission Line Project, approved by the CPUC in January 2007 and by BLM through its ROD issued in July 2011, involves the construction of two 500 kV transmission lines (See Figure 4.1-1, Letter D). The proposed route for the DPV2 Transmission Line is along the south side of I-10, parallel to the existing DPV1 transmission line route (BLM, 2011a). In 1989, the USFWS issued a Certificate of Right-of-Way Compatibility for the portion of the DPV2 route that crosses the Kofa National Wildlife Refuge in Arizona, but a Right-of-Way Permit authorizing construction across the refuge was never issued (CPUC, 2006, pg. A-2). The CPUC modified its permit to authorize only the California portion of the project, and, as discussed above, BLM prepared a ROD approving the project (BLM, 2011b).

The Desert Southwest Transmission Line project consists of construction of an approximately 118-mile 500 kV transmission line and a new substation/switching station (See Figure 4.1-1, Letter F). The BLM Palm Springs-South Coast Field Office approved a ROW grant for the construction of the transmission line which crosses public lands between Blythe and the western end of the Coachella Valley. The project is being constructed within an existing federal utility

corridor. Plans for development are being finalized with a possible near-term start date for construction. The project has an expected in-service date of June 30, 2013 (Federal Energy Regulatory Commission [FERC], 2011).

Two substations are identified as part of the solar generating facilities in the area: the Colorado River Substation and the Red Bluff Substation, which have been approved by BLM's ROD for DPV2 and the Desert Sunlight Solar Farm Project, respectively (BLM, 2011b; BLM, 2011c). The locations of the Colorado River and Red Bluff substations are shown in Figure 4.1-1, Letters E and Q, respectively.

3.10.2 Applicable Regulations, Plans, and Standards

3.10.2.1 Federal

FLPMA

The FLPMA establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. Title II of FLPMA, 43 USC §202(c)(1), requires the Secretary of the Interior to "use and observe the principles of multiple use and sustained yield set forth in this and other applicable law" in the development and revision of land use plans. Title V, 43 USC §501 et seq., establishes BLM's authority to grant ROWs for generation, transmission, and distribution of electrical energy, and §503 of FLPMA requires the establishment of corridors to the extent practical to minimize adverse environmental impacts and the proliferation of separate ROWs. Through its planning efforts, the BLM PSSCFO has designated corridors throughout the Field Office boundaries (generically identified as "locally designated corridors" and specifically identified by an alphabetical reference).

Additionally, the *Approved Resource Management Plan/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States* signed January 14, 2009 (BLM, 2009), established corridors (generically identified as "368 corridors") pursuant to §368 of the EPAct.

Further, lands identified in the Notice of Availability of Maps and Additional Public Scoping for the draft Solar PEIS identified proposed Solar Energy Zones (SEZs) determined to have high potential for development of solar energy facilities. As a result of the release of these maps, the BLM filed an application for withdrawal with the Secretary of the Interior identifying 676,048 acres of land in Arizona, California, Colorado, Nevada, New Mexico and Utah to be "withdrawn from settlement, sale, location or entry under the general land laws, including the mining laws, on behalf of the BLM to protect and preserve solar energy study areas for future solar energy development." The Notice of Proposed Withdrawal, published June 30, 2009 in the Federal Register (Vol. 74 No. 124), segregated certain lands for up to two years to provide time for various studies and analyses in support a final decision on the withdrawal application. On June 30, 2011, this withdrawal was renewed for two more years (Vol. 76 No. 126). Also in 2011, the departments of Energy and Interior released the Supplement to the Draft Solar PEIS, updating the proposed SEZ maps, including one proposed SEZ in eastern Riverside County, which

includes the Project area (Argonne National Laboratory, 2011). The lands remain open to discretionary actions, such as rights-of-way and land use permits and to the mineral leasing laws.

3.10.2.2 State

There are no applicable state regulations, plans, or standards that apply to the Proposed Action.

3.11 Mineral Resources

This section presents a discussion of mineral resources relevant to the proposed MSEP. Baseline geologic information was collected from the USGS, the CGS, the BLM, the California Department of Conservation (CDOC), Riverside County, and the Applicant. The study area for the purpose of assessing direct effects on mineral resources includes the footprint of the Project because the area would be unavailable for mineral exploration and/or extraction during the 30-year term of the BLM ROW grant. The study area for indirect effects would be any land area for which future mineral resource exploration or extraction would be precluded by Project-related closure or blockage of public roads or access routes.

3.11.1 Environmental Setting

3.11.1.1 Geologic Environment

The Project site is underlain by younger and older Quaternary age alluvial fan deposits (USGS, 2006). These deposits consist of loose sedimentary material that has been shed from the Palen-McCoy Mountains over the course of the Quaternary period (up to 1.8 million years ago). Figure 3.7-1 illustrates the geologic units underlying the Project site which are denoted by italicized symbols in the text below. The age of each deposit is determined based on how recently the land surface has undergone active sediment build up through periodic flooding and sediment deposition. The older alluvial fan deposits (*Qa_3*, *Qpv*), located on the western side of the Project site, are distinguished from younger alluvial fan deposits based on the extent to which modern washes have dissected (i.e., down-cut) the ground surface, and the presence of smooth, varnished desert pavement (USGS, 2006). Younger alluvial fan deposits (*Qa_6*), which underlie the eastern portion of the Project site, are characterized by evidence of recent sediment transport and the presence finer-grained silt, sand and gravel deposits (USGS, 2006). In several locations along the gen-tie line/access road route, modern washes (*Qw*) and wind-blown sand dunes (*Qs*) composed of cohesionless silts and sands intersect the Project site. In general, sedimentary deposits underlying the Palo Verde Mesa become increasingly fine-grained toward the center axis of the valley, and coarse-grained closer to base of the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains. To the south of the MSEP solar plant and to the east of the proposed subtransmission line, an old Pleistocene- to Pliocene-age sedimentary unit (*QTmw*) crops out above the Palo Verde Mesa, forming a series subdued topographic knolls aligned in a northeast direct (USGS, 2006). The geologic units underlying the study area are presented in Table 3.11-1.

3.11.1.2 Mineral Resources Potential

The BLM groups minerals on federal lands into three distinct categories: (1) locatable resources (subject to the General Mining Law of 1872, as amended); (2) leasable resources (subject to various Mineral Leasing Acts); and (3) salable resources (subject to mineral materials disposed of under the Materials Act of 1947, as amended) (BLM, 2011). Locatable minerals include hardrock resources that are typically metals with a unique or special use, such as gold and silver. Leasable minerals include those which are typically found in bedded deposits, such as oil, gas, and

TABLE 3.11-1
CORRELATION AND AGES OF STRATIGRAPHIC UNITS IN THE STUDY AREA

Age	Unit/Description	Unit Symbol	Project Component
Holocene	Alluvium of modern washes	Qw	Gen-tie Line, Access Road
	Eolian Sand	Qs	Gen-tie Line
	Alluvial-fan and alluvial-valley deposits	Qa_6	Unit 1, Unit 2, Gen-tie Line, Gen-tie Line, Access Road, Distribution Line
Holocene ± Pleistocene	Alluvial-fan deposits (Intermediate Alluvium)	Qa_3	Unit 1, Unit 2, Gen-tie Line, Gen-tie Line, Access Road, Distribution Line
Pleistocene	Alluvial deposits of Palo Verde Mesa	Qpv	Gen-tie Line, Access Road, Distribution Line
Pleistocene ± Pliocene	Alluvial deposits of the McCoy Wash area	QTmw	Access Road, Distribution Line

SOURCE: USGS, 2006

geothermal resources. Salable minerals include common variety of materials such as sand, stone, and gravel (BLM, 2010).

The Mineral Resources Data System (MRDS), administered by the USGS, provides data to describe metallic and nonmetallic mineral resources, including deposit name, location, commodity, deposit description, production status and references. To confirm the presence/absence of existing surface mines, closed mines, occurrences/prospects, and unknown/undefined mineral resources within the study area, the MRDS online database was reviewed. While the MRDS data indicates that there are several closed and current mineral resources and operations in the vicinity of the study area, none of these operations or mining claims occurs within the Project site boundary (including off-site linear features) (USGS, 2011).

Based on the geologic setting, the only mineral resources with the potential to occur within the study area are saleable resources. All of the geologic units referenced in Table 3.11-1 are potential sources of sand and gravel that could have value as a mineral resource commodity. Because sand and gravel are low-value, high-volume resources, the economic value and feasibility of developing them is predicated on the existence of high local demand from the construction industry. The closest active producer of sand and gravel is identified in the MRDS online database as being located along Midland Road in close proximity to the Blythe Landfill (USGS, 2011). Additional details on locatable, leasable, and saleable minerals are provided below.

Locatable Minerals

There are no active mining claims within 2.5 miles of the Project site, nor is there any locatable mineral activity within the Project site boundary (USGS, 2007). Based on the geological environment and historical trends, the potential for occurrence of locatable minerals is low within the study area. According to review of the MRDS online database, metallic resources and occurrences (such as gold, silver, manganese, and copper) are restricted to the surrounding

mountains, including the McCoy, Big Maria, and Mule Mountains (USGS, 2011). Numerous land sections within the mountainous areas have active mining claims, and there are two sites listed in the MRDS as mineral producers. However, none of these resources occurs within the vicinity of the Project site and they are unlikely to be found within the geologic units that underlie the study area.

Leasable Minerals

There are no leasable minerals within the study area. The BLM's Prospectively Valuable maps for leasable minerals show that there is low potential for the occurrence of oil and gas, geothermal resources, oil shale or tar sands, coal, sodium, potassium, and phosphate. Further, the CDOC indicates that there are no oil, gas, or geothermal resources present within the vicinity of the Project site (CDOC, 2001).

Saleable Minerals/Mineral Materials

Sand and gravel deposits are ubiquitous throughout the Quaternary geologic deposits in the vicinity of the Project site and the region. Based on the California statewide geologic map, deposits of similar age and lithology that are likewise potential sources of sand and gravel are estimated to underlie 1,544,000 acres of eastern Riverside County (USGS and CDOC, 2000). There are several past producers and one current producer of sand and gravel on the west side of the McCoy Wash, approximately 5 miles east of the Project site. In addition, there is one former producer of sand and gravel immediately to the east of the access road. None of the past or current producers of sand and gravel intersects the Project site.

3.11.2 Applicable Regulations, Plans, and Standards

3.11.2.1 Federal

Mining and Mineral Policy Act of 1970

This act (30 USC §21 et seq.) declared that the policy of the federal government is to encourage private enterprise in the development of a sound and stable domestic mineral industry and in orderly and economic development of mineral resources, research, and reclamation methods.

California Desert Conservation Area Plan

The CDCA Plan defines multiple-use classes for BLM-managed lands within the CDCA, which includes land area encompassing the Project site. With respect to mineral resources, the CDCA Plan aims to maintain the availability of mineral resources on public lands for exploration and development. The Project site is located within lands designated "Class L," or limited use. Mineral exploration and development is allowed on Class L lands provided that NEPA requirements are met.

3.11.2.2 State

State Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) (PRC §2710 et seq.) mandated the initiation by the State Geologist of mineral land classification in order to help identify and protect mineral resources in areas within the State subject to urban expansion or other irreversible land uses which would preclude mineral extraction. SMARA also allowed the State Mining and Geology Board (SMGB), after receiving classification information from the State Geologist, to designate lands containing mineral deposits of regional or statewide significance. Mineral lands are mapped according to jurisdictional boundaries (i.e., counties), mapping all mineral commodities at one time in the area, using the California Mineral Land Classification System. (CDOC, 2000)

The objective of classification and designation processes is to ensure, through appropriate lead agency policies and procedures, that mineral deposits of statewide or of regional significance are available when needed. The SMGB, based on recommendations from the State Geologist and public input, prioritizes areas to be classified and/or designated. Areas which are generally given highest priority are those areas within the state which are subject to urban expansion or other irreversible land uses which would preclude mineral extraction. (CDOC, 2000)

Classification is completed by the State Geologist in accordance with the SMGB's priority list, into MRZs, as defined below. Classification of these areas is based on geologic and economic factors without regard to existing land use and land ownership. The following MRZ categories are used by the State Geologist in classifying the state's lands:

> ***MRZ-1*:** Areas where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. This zone is applied where well developed lines of reasoning, based on economic-geologic principles and adequate data, indicate that the likelihood for occurrence of significant mineral deposits is nil or slight.
>
> ***MRZ-2a*:** Areas underlain by mineral deposits where geologic data show that significant measured or indicated resources are present. Areas classified MRZ-2a contain discovered mineral deposits that are either measured or indicated reserves as determined by such evidence as drilling records, sample analysis, surface exposure, and mine information. Land included in the MRZ-2a category is of prime importance because it contains known economic mineral deposits.
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> ***MRZ-2b*:** Areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present. Areas classified MRZ-2b contain discovered deposits that are either inferred reserves or deposits that are presently sub-economic as determined by limited sample analysis, exposure, and past mining history.
>
> ***MRZ-3a*:** Areas containing known mineral deposits that may qualify as mineral resources. Further exploration work within these areas could result in the reclassification of specific localities into the MRZ-2a or MRZ-2b categories. MRZ-3a areas are considered to have a moderate potential for the discovery of economic mineral deposits.

***MRZ-3b*:** Areas containing inferred mineral deposits that may qualify as mineral resources. Land classified MRZ-3b represents areas in geologic settings which appear to be favorable environments for the occurrence of specific mineral deposits. MRZ-3b is applied to land where geologic evidence leads to the conclusion that it is plausible that economic mineral deposits are present.

***MRZ-4*:** Areas where geologic information does not rule out either the presence or absence of mineral resources. It must be emphasized that MRZ-4 classification does not imply that there is little likelihood for the presence of mineral resources, but rather there is a lack of knowledge regarding mineral occurrence.

If new information becomes available for a MRZ, such as through sampling or mining exploration, re-classification of that MRZ can occur. For example, a MRZ-4 classification could be re-classified to any of the other MRZ classifications (CDOC, 2000).

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3.12 Noise

The following discussion addresses existing environmental conditions in the affected area, both regionally and specific to the Project site. In addition, existing laws and regulations relevant to noise are described.

3.12.1 Environmental Setting

3.12.1.1 General Information on Noise

Noise Background

Noise is defined as unwanted sound. Noise can be described in terms of three variables: amplitude (loud or soft), frequency (pitch), and time pattern (variability), and its potential effects can be described in terms of a noise generating source, a propagation path, and a receiver (Federal Transit Administration [FTA], 2006). The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually composed of sound emanating from natural sources (birds, leaves, etc.) and from human activities (yard maintenance, vehicles, talking, etc.). Ambient sound levels vary with time of day, wind speed and direction, and level of human activity. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Decibels (dB) are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. A ruler is a *linear* scale; it has marks on it corresponding to equal quantities of distance. One way of expressing this is to say that the ratio of successive intervals is equal to one. A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1; 10; 100; 1,000; 10,000; etc. Therefore, the cumulative noise level from two or more sources will combine logarithmically, rather than linearly. For example, if two identical noise sources produce a noise level of 50 dB each, the combined noise level would be 53 dB, not 100 dB.

Noise Exposure and Community Noise

Excessive noise exposure has been shown to cause interference with human activities at home, work, or recreation; and can cause community annoyance, hearing loss, and affect people's health and well-being. Even though hearing loss is the most clearly measurable health hazard, noise is also linked to other psychological, sociological, physiological, and economical effects, either temporary or permanent (USEPA, 1974). Potential human annoyance and health effects associated with noise may vary depending on factors such as: (1) the difference between the new noise and the existing ambient noise levels; (2) the presence of tonal noise, noticeable or discrete continuous sounds, such as hums, hisses, screeches, or drones; (3) low-frequency noise (frequency range of 8 to 1,000 Hertz [Hz]); (4) intermittent or periodic sounds, such as a single vehicle passing by, backup alarms, or machinery that operates in cycles; and (5) impulsive sounds from impacts or explosions (Brüel and Kjaer, 2000). In some cases, noise can also disrupt the normal behavior of wildlife. Although the

severity of the effects varies depending on the species being studied and other conditions, research has found that wildlife can suffer adverse physiological and behavioral changes from intrusive sounds and other human disturbances (National Park Service [NPS], 2009).

To describe environmental noise and to assess impacts on areas sensitive to community noise, a frequency weighting measure that simulates human perception is customarily used. The frequency weighting scale known as A-weighting best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. In general, a difference of more than 3 dBA is a perceptible change in environmental noise, while a 5 dBA difference typically causes a change in community reaction. An increase of 10 dBA is perceived by people as a doubling of loudness, and almost certainly causes an adverse community response.

The community noise environment and the consequences of human activities cause noise levels to be widely variable over time. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (L_{eq}) or by an average level occurring over a 24-hour period. The L_{eq}, or equivalent sound level, is a single value for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually 1 hour. The maximum sound level (L_{max}) during a period can also be described as the maximum instantaneous sound pressure level generated by a piece or group of equipment. Since the sensitivity to noise increases during evening and nighttime hours when people are typically trying to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time sounds. The Community Noise Equivalent Level (CNEL) is a measure of the day-night noise exposure, with a 5 dB penalty added to evening sounds (7:00 p.m. to 10:00 p.m.) and a 10 dB addition to nighttime sounds (10:00 p.m. to 7:00 a.m.). The day-night average sound level or L_{dn}, is equal to the 24-hour equivalent sound level with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m.

Community noise levels are closely related to the intensity of human activity and land use. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the L_{dn} is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas (e.g., downtown Los Angeles), and levels up to 85 dBA occur near major freeways and airports.

Effects of Noise on People

People experience a wide range of sounds in the environment. Typical noise levels of indoor and outdoor environments are shown in Figure 3.12-1. Excessive noise can be not only undesirable, but may also cause physical and/or psychological damage. The amount of annoyance or damage caused by noise is dependent primarily upon the amount and nature of the noise, the amount of ambient noise present before the intruding noise, and the activity of the person working or living in the area. Environmental and community noise levels rarely are of sufficient intensity to cause irreversible hearing damage, but disruptive environmental noise can interfere with speech and other communication and be a major source of annoyance by disturbing sleep, rest, and relaxation.

Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, the higher noise levels nevertheless are considered to be adverse to public health. The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments tend to be about 7 dB lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation that are subject to nighttime noise are often considered objectionable because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (USEPA, 1974).

Noise Attenuation

Sound level naturally decreases with more distance from the source. This basic attenuation rate is referred to as the *geometric spreading loss*. The basic rate of geometric spreading loss depends on whether a given noise source can be characterized as a point source or a line source. Point sources of noise, including stationary mobile sources such as idling vehicles or on-site construction equipment, attenuate (lessen) at a rate of 6.0 dBA per doubling of distance from the source. In many cases, noise attenuation from a point source increases by 1.5 dBA from 6.0 dBA to 7.5 dBA for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dBA per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

Widely distributed noises such as a street with moving vehicles (a “line” source) would typically attenuate at a lower rate of approximately 3.0 dBA for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases by 1.5 dBA to 4.5 dBA for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also influence noise attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to

compress the range of numbers required to describe vibration (FTA, 2006). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

3.12.1.2 Project Setting

The Project site is located in the Colorado Desert in eastern Riverside County. Most of the surrounding land is covered by desert scrub. The site is approximately 13 miles northwest of the City of Blythe and approximately 6 miles north of I-10. The land use of the Project site is undeveloped open space, and the surrounding land uses include undeveloped open space and agricultural.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

There are no residences or other sensitive receptors located within the Project boundary or in the immediate vicinity of the Project site. The nearest sensitive receptors to the Project site are residences located approximately 2.6 miles southeast and 2.7 miles south of the southern site boundary, respectively (Tetra Tech, 2011). In addition, there are several residences that would be within a mile of the proposed gen-tie line, the closest of which is south of I-10 at a distance of approximately 0.6 mile.

Existing Ambient Noise Conditions

The dominant persistent man-made noise source in the region is vehicle traffic on I-10. Secondary noise sources include aircraft operations associated with the Blythe Airport, agricultural operations, the Blythe Skeet and Trap Shooting Club, individual vehicles operating on surrounding local roadways, and occasional off-road vehicle recreationalists. Noise levels in the Project area tend to be dominated by wind, which ebbs and flows throughout the day as the temperature climbs and drops (Solar Millennium, 2009).

Ambient noise levels were measured at a residence located approximately 2.7 miles south of the southern Project boundary in June 2009, using acceptable equipment and techniques (Solar Millennium, 2009). One long-term measurement was taken over a 25-hour period (see Table 3.12-1). Average daytime noise levels were found to be 45 dBA L_{eq} and average nighttime noise levels were found to be 36 dBA L_{eq}.

TABLE 3.12-1
SUMMARY OF MEASURED NOISE LEVELS

Measurement Site	Measured Noise Levels, dBA	
	Average During Daytime Hours L_{eq}	Average During Nighttime Hours L_{90}/L_{eq}
Residence	45[a]	36[b]

NOTES:
[a] Average of the daytime hours
[b] Average of the nighttime hours. The nighttime L_{eq} and the corresponding L_{90} values are equal (Solar Millennium, 2009, p. 5.8-10); this is likely due to the proximity of the project site to I-10 (nighttime noise is likely dominated by the relatively steady noise from I-10).

SOURCE: Solar Millennium, 2009, Section 5.8.2.4; Tables 5.8-5, 5.8-6

3.12.2 Applicable Regulations, Plans, and Standards

Regulating environmental noise is generally the responsibility of local governments. The USEPA, however, has published guidelines on recommended maximum noise levels to protect public health and welfare.

3.12.2.1 Federal

Occupational Safety and Health Act

Under the Occupational Safety and Health Act of 1970 (29 USC §651 et seq.), the OSHA adopted regulations (29 CFR §1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list limits on noise exposure levels as a function of the amount of time during which the worker is exposed, as shown in Table 3.12-2. The regulations further specify requirements for a hearing conservation program (§1910.95(c)), a monitoring program (§1910.95(d)), an audiometric testing program (§1910.95(g)), and hearing protection (§1910.95(i)). There are no federal laws governing community noise.

Although no federal noise regulations exist, the USEPA has promulgated noise guidelines (USEPA, 1974). The USEPA guideline recommends an L_{dn} of 55 dBA to protect the public from the effect of broadband environmental noise outdoors in residential areas and farms, and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use (USEPA, 1974).

California Desert Conservation Area Plan

The CDCA Plan (BLM, 1980) contains provisions for public land-use management in the California Desert District under the BLM's jurisdiction. Since its first date of publication in 1980, the CDCA Plan has been amended in order to incorporate public concerns and congressional mandates in regard to the use of desert resources, such as the provisions of the CDPA.

TABLE 3.12-2
OSHA-PERMISSIBLE NOISE EXPOSURE STANDARDS

Duration of Noise (hours/day)	A-Weighted Noise Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

SOURCE: USEPA, 1974. 29 CFR §1910.95, Table G-16

In particular, noise-related guidelines established in the CDCA Plan include long-term monitoring of effects of vehicle noise on wildlife (Chapter 3, Wildlife Element) and implementation of land use compatibility standards with limited (vehicle use) areas in order to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands (Chapter 3, Motorized-Vehicle Access Element). The CDCA Plan also identifies energy and utility corridors and power plant sites within the California Desert District (Chapter 3, Energy Production and Utility Corridors Element).

3.12.2.2 State

The Cal-OSHA has promulgated Occupational Noise Exposure Regulations (9 CCR §§5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

3.13 Paleontological Resources

Paleontological resources, or fossils, are the remains of extinct organisms, and provide the only direct evidence of ancient life. They are considered to be non-renewable resources because they cannot be replaced once they are destroyed. For the purpose of this analysis, and in accordance with existing BLM policy, scientifically significant paleontological resources are defined as vertebrate fossils that are identifiable to taxon and/or element, noteworthy occurrences of invertebrate and plant fossils, and vertebrate trackways. The study area associated with paleontological resources would be the land disturbance area of the Project associated with construction, operation and maintenance, and decommissioning.

3.13.1 Environmental Setting

3.13.1.1 Geologic Setting

The Project site is underlain by younger and older Quaternary-age alluvial fan deposits (USGS, 2006). These deposits consist of loose sedimentary material that has been shed from the Palen-McCoy Mountains over the course of the Quaternary period (up to 1.8 million years ago). Figure 3.7-1 illustrates the geologic units underlying the Project site, which are denoted by italicized symbols in the text below. The ages of the deposits are determined based on how recently the land surface has undergone active sediment build-up through periodic flooding and sediment deposition. The older alluvial fan deposits (*Qa_3, Qpv*), located on the western side of the Project, are distinguished from younger alluvial fan deposits based on the extent to which modern washes have dissected (i.e., down-cut) the ground surface, and the presence of smooth, varnished desert pavement (USGS, 2006). Younger alluvial fan deposits (*Qa_6*), which underlie the eastern portion of the solar plant site, are characterized by evidence of recent sediment transport and the presence of finer-grained silt, sand, and gravel deposits (USGS, 2006). In several locations along the proposed gen-tie line and access road route, modern washes (*Qw*) and wind-blown sand dunes (*Qs*) composed of cohesionless silts and sands intersect the Project site. In general, sedimentary deposits underlying the Palo Verde Mesa become increasingly fine-grained toward the center axis of the valley, and coarse-grained closer to the base of the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains. To the south of the MSEP solar plant and to the east of the gen-tie line, an old Pleistocene- to Pliocene-age sedimentary unit (*QTmw*) crops out above the Palo Verde Mesa, forming a series of subdued topographic knolls aligned in a northeast direction (USGS, 2006).

3.13.1.2 Paleontological Resource Classifications

The potential for discovery of significant paleontological resources is assessed using the Potential Fossil Yield Classification (PFYC) System.

Potential Fossil Yield Classification System

The BLM uses the PFYC system to assess the potential for discovery of significant paleontological resources or the impact of surface disturbing activities to such resources by using a 5 class ranking system (BLM, 2007):

1. ***Class 1 – Very Low.*** Geologic units that are not likely to contain recognizable fossil remains. This class usually includes units that are igneous or metamorphic, excluding reworked volcanic ash units; or units that are Precambrian in age or older. Management concern for paleontological resources in Class 1 units is usually negligible or not applicable and assessment or mitigation is usually unnecessary except in very rare or isolated circumstances. The probability for impacting any fossils is negligible and assessment or mitigation of paleontological resources is usually unnecessary.

2. ***Class 2 – Low.*** Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. This class typically includes vertebrate or significant invertebrate or plant fossils not present or very rare, units that are generally younger than 10,000 years before present., recent aeolian deposits., or sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration). Management concern for paleontological resources is generally low. Assessment or mitigation is usually unnecessary except in rare or isolated circumstances and the probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Localities containing important resources may exist, but would be rare and would not influence the overall classification. These important localities would be managed on a case-by-case basis.

3. ***Class 3 – Moderate or Unknown.*** Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential. This class includes sedimentary rocks that are marine in origin with sporadic known occurrences of vertebrate fossils or other rocks where vertebrate fossils and scientifically significant invertebrate or plant fossils are known to occur intermittently. The predictability of fossils within these units is known to be low or the units have been poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance. This class is subdivided into two groups: Class 3(a) and Class 3(b).

    a. *Class 3(a)* is assigned to rock units where sufficient information has been developed to know that the unit has widely scattered occurrences of vertebrate fossils and/or scientifically significant invertebrate or plant fossils. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting.

    b. *Class 3(b)* is assigned to rock units that exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed.

4. ***Class 4 – High.*** Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases. This class is subdivided into two groups, based primarily on the degree of soil cover: Class 4(a) and Class 4(b):

    a. *Class 4(a)* is assigned to rock units that are exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions and illegal collecting activities may impact some areas.

b. *Class 4(b)* is assigned to areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

5. ***Class 5 – Very High*.** Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation. This class is subdivided into ***Class 5(a)*** and ***Class 5(b)*** in the same manner as Class 4 above.

3.13.1.3 Paleontological Resources Assessment

SWCA Environmental Consultants (2011) prepared a paleontological resources assessment in support of this PA/EIS, which is provided in Appendix E. As part of its assessment, SWCA requested a museum record search be performed by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County (LACM) and the Department of Earth Sciences at the San Bernardino County Museum. Museum collections records were searched to: 1) determine whether any known paleontological resources exist in the Project site, 2) identify the geologic units present in the Project site, and 3) determine the paleontological resource potential of the corresponding geologic unit (SWCA, 2011).[1] In addition, between November 7 and November 10, 2011, SWCA conducted a paleontological field survey of the Project site, including the proposed disturbance area and the associated linear alignments. The linear survey encompassed a 200-foot corridor (100-foot survey area on either side of centerline).

The purpose of the fieldwork was to inspect the study area for surface fossils and exposures of potentially fossil-bearing geologic units and to determine areas in which fossil-bearing geologic units could be exposed during Project-related ground disturbances.

Records Search Results

The review of museum collections records at the LACM and San Bernardino County Museum confirmed that no fossil localities have been previously recorded within the Project site or within a 1-mile radius (SWCA, 2011). However, at least three vertebrate fossil localities have been previously recorded southwest of the Project site within the same or similar sediments. LACM 5977, located west-southwest of the Project (north of I-10 and on the southwest side of Ford Dry Lake), yielded fossilized remains of *Perognathus* (pocket mouse). LACM 208 and LACM 3414, located west-northwest of the Project site between Eagle and Coxcomb mountains, yielded fossilized remains of *Gopherus* (tortoise), *Equus* (horse), *Camelops* (camel), and *Tanupolama stevensi* (llama).

A search of the UCMP online paleontological database revealed that at least 21 additional fossil localities of Quaternary age have been documented in Riverside County, 17 of which yielded

[1] All research was conducted in accordance with accepted assessment protocol of the Society for Vertebrate Paleontology's (SVP) *Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines* (SVP, 1995).

vertebrate fossil remains from Pleistocene-age deposits. UCMP V6004, also known as "Blythe," yielded unspecified fossils of Rancholabrean age. UCMP V99828, also known as "Blythe Energy Turtles," yielded two fossil specimens of *Gopherus agasizzi* (California desert tortoise).

Field Survey Results

No significant fossil resources were discovered as a result of the survey (SWCA, 2011). One non-significant fossil occurrence, a fossilized carapace fragment of a desert tortoise, was discovered in the gen-tie line and access road corridor during the course of the fieldwork. The fossil was found ex situ as a lag deposit transported an unknown distance and redeposited on top of alluvial sediments. For this reason, and due to the lack of diagnostic characteristics, it was not considered scientifically significant.

Paleontological Sensitivity

Based on the geologic setting, the museum records search, field survey, and SVP criteria, SWCA (2011) determined the paleontological resource potential of the underlying geologic units throughout the Project site. The PFYC Class is assigned by mapped geologic units, which are shown in Figure 3.13-1.

The paleontological resources assessment performed by SWCA (2011) did not identify the PFYC of each of the geologic units in the study area, and the BLM has not assigned PFYC classification for land within the Project site. However, SWCA gathered the information necessary to make a determination of the PFYC classes within the Project site. Based on the negative results of the field survey and museum records search and on the paleontological resources potential of each geologic unit, Holocene units underlying the Project site would be classified as PFYC Class 2 and Pleistocene or older sedimentary units would be classified as PFYC Class 4.

Summary

A paleontological records search and a surface survey found no evidence for the presence of significant paleontological resources within the footprint of the Project. However, based on the geologic setting and SWCA's paleontological resources assessment, the Pleistocene-age or older sedimentary deposits found beneath the western portion of the solar field site and various portions of the gen-tie line would be considered as Class 3(a) under the PFYC classification system (see Table 3.13-1). Even shallow excavations within these units have the potential to disturb yet unknown or undiscovered but potentially significant fossil resources. Younger alluvium, eolian sand, and modern wash deposits, which predominantly underlie the eastern part of the solar plant site, and portions of the gen-tie line, are units with a low paleontological resource potential. However, because these units are frequently underlain by older sedimentary deposits at undetermined but potentially shallow depths, these areas would be considered as PFYC Class 2. While shallow excavations within these areas have a low potential to disturb paleontological resources, deeper excavations in these areas could uncover yet unknown or undiscovered but potentially significant fossil resources.

TABLE 3.13-1
CORRELATION AND AGES OF STRATIGRAPHIC UNITS IN THE STUDY AREA SHOWING PALEONTOLOGICAL RESOURCE POTENTIAL

Age	Unit/Description	Map Unit Symbol	Project Component	PFYC Class[b]
Holocene	Alluvium of modern washes	Qw	Gen-tie Line, Access Road	2
	Eolian Sand	Qs	Gen-tie Line	2
	Alluvial-fan and alluvial-valley deposits	Qa_6	Unit 1, Unit 2, Gen-tie Line, Gen-tie Line, Access Road, Distribution Line	2
Holocene ± Pleistocene	Alluvial-fan deposits (Intermediate Alluvium)	Qa_3	Unit 1, Unit 2, Gen-tie Line, Gen-tie Line, Access Road, Distribution Line	3(a)
Pleistocene	Alluvial deposits of Palo Verde Mesa	Qpv	Gen-tie Line, Access Road, Distribution Line	3(a)
Pleistocene ± Pliocene	Alluvial deposits of the McCoy Wash area	QTmw	Access Road, Distribution Line	3(a)
Pleistocene ± Miocene	Alluvial-fan and alluvial-valley deposits (Older Alluvium)	QTa_2	None [a]	3(a)

NOTES:
[a] Not mapped at the surface within the MSEP site but may be present at depth below the alluvial-filled basin.
[b] BLM classification assigned based on BLM guidance (BLM, 2007)

SOURCE: USGS, 2006

3.13.2 Applicable Regulations, Plans, and Standards

3.13.2.1 Federal

The management and preservation of paleontological resources on public lands are governed under various laws, regulations, and standards. For the past several decades, the BLM has used the FLMPA as the legislative foundation for its paleontological resource management policies. The BLM has also developed general procedural guidelines (Manual H-8720-1; Instructional Memorandum [IM] 2008-009; IM 2009-011) for the management of paleontological resources (BLM, 2007). Paleontological resource management objectives include the evaluation, management, protection, and location of fossils on BLM-managed lands. Management policy also includes measures to ensure that proposed land-use projects do not inadvertently damage or destroy scientifically significant paleontological resources.

Federal Land Management and Policy Act

FLMPA defines significant fossils as: unique, rare or particularly well-preserved; an unusual assemblage of common fossils; being of high scientific interest; or providing important new data concerning [1] evolutionary trends, [2] development of biological communities, [3] interaction between or among organisms, [4] unusual or spectacular circumstances in the history of life, [5] or anatomical structure.

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA), Title VI, Subtitle D of the Omnibus Public Lands Act directs the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land using "scientific principles and expertise." The PRPA incorporates most of the recommendations of the report of the Secretary of the Interior entitled "Assessment of Fossil Management on Federal and Indian Lands (USDI, 2000) in order to formulate a consistent paleontological resources management framework. In passing the PRPA, Congress officially recognized the scientific importance of paleontological resources on some federal lands by declaring that fossils from these lands are federal property that must be preserved and protected. The PRPA codifies existing policies of the BLM, NPS, USFS, Bureau of Reclamation, and USFWS, and provides the following:

1. criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands;

2. minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants);

3. definitions for "paleontological resources" and "casual collecting"; and

4. requirements for curation of federal fossils in approved repositories.

Federal legislative protections for scientifically significant fossils apply to projects that take place on federal lands (with certain exceptions such as DOD), involve federal funding, require a federal permit, or involve crossing state lines. Because the vast majority of the Project site occurs on BLM-managed lands, federal protections for paleontological resources apply under NEPA and FLPMA.

Potential Fossil Yield Classification System

Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The BLM uses the PFYC system, which classifies geologic units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. It is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions. Each of the individual classes is described above under Section 3.13.1.2.

3.13.2.2 State

PRC §5097.5 includes additional state-level requirements for the assessment and management of paleontological resources, including the reasonable mitigation of adverse impacts to paleontological resources resulting from development on public lands (lands under state, county, city, or public district or agency ownership or jurisdiction). This regulation defines the removal of paleontological "sites" or "features" from public lands as a misdemeanor, and prohibits the removal of any paleontological "site" or "feature" from public land without permission of the applicable jurisdictional agency. These protections apply only to non-federal public lands within California, and thus apply only to the small portion of the gen-tie line that would be located on County-owned land.

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3.14 Recreation and Public Access (Off-Highway Vehicles)

The following discussion addresses existing recreational resources within the vicinity of the Project and describes existing laws and regulations relevant to those resources. For the purposes of this analysis, "vicinity" has been defined as the area within 20 miles of the Project site. This is an appropriate study area for recreation because it captures all major recreation resources (refer to Table 3.14-1, below) that contribute to baseline conditions and could potentially be affected by activities related to the Project.

For the purpose of this section, the terms o*ff-road vehicles* and *off-highway vehicles* (OHV) are used interchangeably (OHV is the term most used in BLM and other federal land use planning).

3.14.1 Environmental Setting

3.14.1.1 Recreation Resources on the Project Site

The types of recreational uses that may be made of the site are governed by the CDCA Plan (BLM, 1980); and the NECO Plan Amendment (BLM, 2002). The site is designated in the CDCA Plan for Multiple-use Class L, or Limited Use (BLM, 1980). Class L lands are suitable for recreation activities that generally involve low to moderate user densities, including backpacking, primitive unimproved site camping, hiking, horseback riding, rockhounding, nature study and observation, photography and painting, rock climbing, spelunking, hunting, landsailing on dry lakes, noncompetitive vehicle touring, mountain and trail biking, and events only on "approved" routes of travel (BLM, 1980; BLM, 2002). Stopping, parking, and vehicle camping are allowed to occur within 300 feet of a route, except within sensitive areas such as Areas of Critical Environmental Concern (ACECs), where the limit is 100 feet (BLM, 2002). Trails are open for non-vehicular use and new trails for non-motorized access may be allowed (BLM, 1980). Recreational vehicle use, including OHV use, is discussed below in Section 3.14.1.3. Additionally, the northern half of the Unit 2 site is identified as lands with wilderness characteristics, as shown in Figure 3.16-1 of Section 3.16, *Special Designations*. In order for an area to be classified as having wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. There are no recreation facilities, developments, or specific recreational attractions on the site. The BLM has no visitor counts for the site but visitor use is estimated to be low due to the availability and accessibility of recreation opportunities in the surrounding area (BLM, 2011i).

3.14.1.2 Recreation Resources In the Vicinity of the Project Site

The Palo Verde Valley offers multiple outdoor recreational opportunities for boating, water skiing, jet skiing, swimming, fishing, canoeing, camping, rock hounding, hiking, mountain and trail biking, archery, hunting, horseback riding, trapping, trap and skeet shooting, and OHV use.

BLM-Administered Recreation Resources

The BLM administers wilderness areas, long term visitor areas (LTVAs), ACECs, and other recreational opportunities in the vicinity of the site. ACECs and wilderness also provide dispersed recreation opportunities in the region. Overall, recreation use on BLM lands in the vicinity of the Project is limited to the cooler months of September through May, with little or no use in the summer. Popular recreation activities include car and recreational vehicle (RV) camping, OHV riding and touring, hiking, photography, hunting (dove, quail, deer), sightseeing, and visiting cultural sites. Outside of fee collection sites, the BLM has no accurate estimates of visitor use, but staff observations and ranger patrols indicate the area described in this section received 2,000 to 3,000 visitors per year (BLM, 2011i). Local residents and long-term winter visitors make up the majority of the use. Such areas are identified in Table 3.14-1, beginning with the area closest to the site, and are discussed below.

TABLE 3.14-1
BLM-ADMINISTERED RECREATIONAL AREAS AND OPPORTUNITIES IN THE PROJECT VICINITY

Recreation Area	Size	Distance from ROW Application Boundary (mi)	Distance from Solar Plant Site Boundary (mi)	Distance from Gen-Tie Line (mi)	Distance from CRS (mi)
Palen/McCoy Wilderness	236,488 ac	1.8	2.0	6.5	7.3
Midland LTVA	512 ac	4.6	4.2	3.9	12.8
Big Maria Mountains Wilderness	45,384 ac	7.5	7.1	6.8	15.7
Mule Mountains ACEC	4,092 ac	9.4	9.4	2.2	1.7
Chuckwalla Valley Dune Thicket ACEC	2,273 ac	8.5	8.8	5.4	5.3
Big Marias ACEC	4,500 ac	11.7	11.0	10.5	18.0
Rice Valley Wilderness	41,777 ac	10.5	10.5	11.0	20.0
Bradshaw Trail	65 mi	13.3	13.5	6.2	5.6
Mule Mountains LTVA	3,424 ac	13.4	13.6	6.3	5.8
Wiley's Well Campground	14 units	14.3	14.6	7.5	7.0
Little Chuckwalla Mountains Wilderness	28,034 ac	14.8	14.4	9.9	9.6
Coon Hollow Campground	28 units	17.5	17.7	10.6	10.0
Palen Dry Lake ACEC	3,632 ac	16.8	17.1	17.9	17.9
Palo Verde Mountains Wilderness	30,605 ac	17.9	17.8	10.7	10.3
Riverside Mountains Wilderness	24,004 ac	19.3	19.6	19.6	29.0

NOTE: Sizes and distances are approximate.

SOURCES: BLM, 2011a, 2011b, 2011c, 2011d, 2011e, 2011f, 2011g, 2011h; Wilderness.net, 2011a, 2011b, 2011c; Wildernet, 2011

Wilderness Areas

Wilderness Areas are shown in Figure 3.14-1 and described in Section 3.16, *Special Designations*. As indicated in Table 3.14-1, six wilderness areas are located in the vicinity of the site: the Palen-McCoy Wilderness, Big Maria Mountains Wilderness, Rice Valley Wilderness, Little Chuckwalla Mountains Wilderness, Palo Verde Mountains Wilderness, and Riverside Mountains Wilderness. The Wilderness Act limits allowable types of recreation on wilderness lands to those that are primitive and unconfined, depend on a wilderness setting, and do not degrade the wilderness character of the area. Motorized or mechanized vehicles or equipment are not permitted in wilderness. The BLM regulates such recreation on such lands within its jurisdiction in accordance with the policies, procedures and technologies set forth in the Code of Federal Regulations (43 CFR 6300), BLM Manual 8560 (*Management of Designated Wilderness Areas*) (BLM, 1983), BLM Handbook H-8560-1 (*Management of Designated Wilderness Areas*) (BLM, 1986), and BLM's Principles for Wilderness Management in the California Desert (BLM, 1995). More specifically, camping, hiking, rockhounding, hunting, fishing, non-commercial trapping, backpacking, climbing, and horseback riding are permissible (BLM, 1988; BLM, 1983). By contrast, physical endurance contests (such as races, competitive trail rides and survival contests), commercial recreational activities, and the use of motorized or mechanized vehicles (including OHVs, aircraft and motor boats) generally are prohibited (16 USC §1133(c); BLM, 1995; BLM, 1988; BLM, 1983).

The six wilderness areas in the vicinity of the Project have no developed trails, parking/trailheads, or other visitor use facilities. These areas are generally steep, rugged mountains, with no permanent natural water sources, thus limiting extensive hiking or backpacking opportunities. Visitor use within the wilderness areas is very light, though BLM has no visitor use counts. Observations by staff and Law Enforcement Rangers indicate only 100 to 200 hikers per year within each of the wilderness areas (BLM, 2011i). More popular is vehicle camping along roads that are adjacent to the wilderness areas. RV camping near wilderness areas, with associated hiking, OHV use, photography, sightseeing, etc. accounts for up to 2,000 visitors per year (BLM, 2011i).

Long Term Visitor Areas

The BLM manages seven LTVAs: five in California and two in Arizona. LTVAs accommodate visitors who wish to camp for as long as seven consecutive months. Winter visitors who wish to stay in an LTVA must purchase either a long-term permit for $180 that is valid for the entire season or any part of the season (which runs from September 15 through April 15), or a short visit permit for $40 that is valid for 14 consecutive days. Permit holders may move from one LTVA to another within the permitted timeframe without incurring additional fees. Activities in and use of LTVAs are regulated by the rules of conduct set forth in 43 CFR subpart 8365 and the more than 30 supplemental rules that the BLM has determined are necessary to provide for public safety and health and to reduce the potential damage to natural and cultural resources of the public lands.

As indicated in Table 3.14-1, two LTVAs are located in the vicinity of the Project site: Midland LTVA and Mule Mountains LTVA. Both provide long-term camping opportunities. In addition to long-term camping, recreational opportunities at LTVAs include hiking; OHV use; rockhounding;

viewing cultural sites, wildlife, and unique desert scenery; and solitude (BLM, 2011d; BLM, 2012; Wildernet, 2011). By contrast, the landing or take-off of aircraft, including ultra-lights and hot air balloons, is prohibited in LTVAs (BLM, 2012).

Two campgrounds are located within the boundaries of the Mule Mountains LTVA: Wiley's Well and Coon Hollow Campgrounds. Both are year-round facilities with campsites, picnic tables, grills, shade armadas, and handicapped-accessible vault toilets (BLM, 2011d). See Table 3.14-2 for use information from 2007 to 2009. According to the BLM, visitor use data for the period after 2009 is inaccurate and is currently being reanalyzed (BLM, 2011i). The BLM's Recreation Management Information System (RMIS) totals for Fiscal Year 2011 are 581,601 visits and 2,614,920 visitor days for the Eastern Riverside County Area, which extends from Palm Springs to the Colorado River and includes the Project site (BLM, 2011i).

Areas of Critical Environmental Concern

ACECs are shown in Figure 3.14-1 and described in Section 3.16, *Special Designations*. As indicated in Table 3.14-1, four ACECs are located near the site: Mule Mountains ACEC, Chuckwalla Valley Dune Thicket ACEC, Palen Dry Lake ACEC, and Big Marias ACEC.

TABLE 3.14-2
AVERAGE RECREATION USE AT DEVELOPED SITES 2007 TO 2009

Recreation Fee Site	Annual # of Camping Permits	Annual Recreation Visits
Midland LTVA	41	2,826
Mule Mountain LTVA	135	5,545
Total	***362***	***9,555***

SOURCE: BLM, 2010

Recreation activities allowed in ACECs are determined by the resources and values for which the ACECs were established, and by the associated ACEC Management Plan. Most ACECs allow low-intensity recreation use that is compatible with protection of the relevant values.

Mule Mountains and Big Marias ACECs primarily protect cultural resources while Chuckwalla Valley Dune Thicket and Palen Dry Lake ACECs protect both natural and cultural resources. These ACECs do not have recreation use facilities, but have signage to inform visitors of the special values of the areas and associated protection measures. BLM has no visitor counts for these sites, but observations and patrols indicate very low use, in the hundreds per year (BLM, 2011i).

The Bradshaw Trail

The BLM-administered portion of the Bradshaw Trail is a 65-mile Back Country Byway that begins about 35 miles southeast of Indio, California and ends about 15 miles southwest of Blythe (BLM, 2011e). The Riverside County PVVAP Trails and Bikeway map shows a route for the

Bradshaw Trail that continues east of this location through Blythe to the Colorado River (Riverside County, 2011a). The trail was the first road through Riverside County, created by William Bradshaw in 1862 as an overland stage route beginning in San Bernardino, California, and ending at Ehrenberg, Arizona. The trail was used extensively between 1862 and 1877 to transport miners and passengers. The trail is a graded dirt road that traverses mostly public land between the Chuckwalla Mountains and the Chocolate Mountain Aerial Gunnery Range. Recreational opportunities include four-wheel driving, wildlife viewing, plant viewing, birdwatching, scenic drives, rockhounding, and hiking. (BLM, 2011e).

Regional Recreation Resources

The Riverside County Regional Park and Open-Space District (RPOSD) also provides several recreational facilities in the Project vicinity. A regional trail is proposed by the County along an existing railroad line located approximately 2.5 miles northeast of the Project boundary at the closest point (Riverside County, 2010). The RPOSD also owns and operates Mayflower Park, the Blythe Marina, and McIntyre Park, each of which provides long- and short-stay RV and tent camping, showers, picnicking, fishing, and boat launching; and Miller Park and Goose Flats Wildlife Area, which provide boating and fishing opportunities (Riverside County, 2003; DesertUSA, 2012). Table 3.14-3 indicates the distances of these facilities from the Project site.

TABLE 3.14-3
REGIONAL RECREATIONAL AREAS AND OPPORTUNITIES IN THE PROJECT VICINITY

Recreation Area	Size (ac)	Distance from Solar Plant Site Boundary (mi)	Distance from Gen-Tie Line (mi)
Mayflower Park	24	11.5	10.6
Blythe Marina	14	13	12.3
McIntyre Park	87	15.1	12.1
Miller Park	5	17.9	12.5
Goose Flats Wildlife Area	230	13.9	12.2

NOTE: Sizes and distances are approximate.

SOURCES: Riverside County, 2011; DesertUSA, 2012

Other Recreational Areas and Opportunities

The City of Blythe provides year-round sporting activities. The Blythe Parks Department oversees eight parks (approximately 74 acres total), including five neighborhood parks, two community parks, and one regional park. The “Big Foot Skate-board Park” is located at Todd Park. Other recreational opportunities in Blythe include the Blythe Municipal Golf Course; soccer, football, track and volleyball leagues; and indoor racquetball, basketball, aerobic activities, weight room, and summer swimming. Various nearby privately owned RV parks and campgrounds also provide recreational facilities, including a boat dock, launch ramp, fishing, swimming, horseshoe pits, wildlife observation and other active and passive recreation opportunities (City of Blythe, 2007). The Blythe Municipal Golf Course is approximately 5.3 miles from the solar plant site boundary

and 4.4 miles from the gen-tie line. Other recreational facilities within the City of Blythe are approximately 9.4 miles or further from the solar plant site boundary and 7.5 miles or further from the gen-tie line.

The Cibola National Wildlife Refuge, administered by the USFWS, can be reached from the California side of the Colorado River, just south of Blythe, or, from the Arizona side, south of Quartzsite. This refuge was established in 1964 as mitigation for dam construction on the Colorado River, and provides important habitat for migratory birds, wintering waterfowl, and resident species. Recreational opportunities include hunting, fishing, wildlife viewing, and a nature trail (USFWS, 2012). The refuge is approximately 15.5 miles from the gen-tie line and over 20 miles from the solar plant site boundary.

3.14.1.3 Public Access

Recreation and motorized travel opportunities are determined, in part, by the CDCA Plan multiple-use class and by OHV area designations. The multiple-use class is based on the sensitivity of resources and kinds of uses for each geographic area. Each of the four multiple-use classes describes a different type and level or degree of use which is permitted within that particular geographic area. The BLM is also required to designate all public lands as either open, limited, or closed to off-road vehicles under Executive Orders (E.O. 11644 and E.O. 11989: Use of Off-Road Vehicles on the Public Lands), other authorities, such as the FLPMA of 1976 (43 USC 1701 *et seq.)*, BLM planning regulations in 43 CFR 1600, and the BLM Land Use Planning Handbook H-1600-1.

Multiple-Use Class

The proposed site is located in an area designated by the CDCA Plan as Multiple-use Class L. This class is intended to protect sensitive natural, scenic, ecological, and cultural resource values. Class L lands are managed to provide for generally lower-intensity, carefully controlled use of resources, while ensuring that sensitive values are not significantly diminished. For purposes of OHV management, vehicle access in Class L lands is directed toward use of approved ("open" or "limited") routes of travel. Routes of travel include roads, ways, trails, and washes. Routes of travel, including washes, were evaluated and designated through the NECO Plan for the Project area.

OHV Routes

The CDCA Plan and the NECO Plan Amendment state that vehicle access is among the most important recreation issues in the desert. A primary consideration of the recreation program is to ensure that access routes necessary for recreation enjoyment are provided (BLM, 2002).

During the CDCA and NECO planning process, a detailed inventory and designation of routes was developed. This route designation system, along with other land management actions such as setting aside ACECs and the congressional designation of wilderness areas, has resulted in a significant loss of OHV recreation opportunities in the eastern Riverside County. Currently, there are no BLM-designated "open" OHV areas in Riverside County.

Under the CDCA Plan, travel routes are classified as *Open*, *Limited*, or *Closed* with the following definitions:

1. ***Open Route:*** Access by motorized vehicles is allowed.

2. ***Limited Route:*** Access by motorized vehicles is limited to use by number of vehicles, type of vehicle, time or season, permitted or licensed, or speed limits.

3. ***Closed Route:*** Access by motorized vehicles is prohibited except for authorized use.

As required by the CDCA Plan, the NECO Plan Amendment created a detailed inventory of existing routes within the NECO planning area that were officially designated as *Open, Limited*, or *Closed* as part of the NECO Plan Amendment routes of travel system. The BLM's Palm Springs-South Coast Field Office (PSSCFO) is currently completing the GPS documentation of route-specific designations and implementing route signing on the ground. A route has high significance if it provides access to other routes, historical sites, or recreational areas. Recreation uses in the eastern part of Riverside County include back country driving, photography, camping, rockhounding, and hiking.

The Project site is traversed by one major designated open route, No. 661085, which is a north/south link between I-10 and Arlington Mine Road to the north, and provides an important link that forms a looped route around the east and west side of the Palen-McCoy and Rice Valley wilderness areas, respectively. The length of the route within the Project site is approximately 2 miles. Another designated open route, No. 660835, traverses approximately 1.3 miles of the Project site near the eastern boundary. Routes of travel other than washes are shown in Figure 3.14-2. Several additional routes would be crossed by the proposed gen-tie line.

The BLM has no traffic counters or other means to accurately determine use of routes in the vicinity of the Project site. Observations by BLM staff and Law Enforcement Rangers indicate that use is relatively low on routes through or adjacent to the Project site, not exceeding 200 to 300 visits per year (BLM, 2011i). Recreation and vehicle use is generally limited to the cooler months of September through May. Use is nearly non-existent during the summer months. Recreational vehicle use consists of touring in passenger cars, SUVs, motorcycles, and ATVs. Some camping may occur in the vicinity of the site, but most use is of short duration and by local residents. More attractive recreation opportunities occur in areas where BLM has provided facilities such as the Midland LTVA, ACECs, or other scenic, natural, or cultural attractions.

Washes Open Zones

Motorized vehicle access in washes was also addressed by the CDCA Plan and further addressed or redefined in the 1982 Amendment to the CDCA Plan and the NECO Plan Amendment. As part of the land use planning process, MUC designations were assigned to regions throughout the CDCA. Areas designated Class L (limited) and Class M (moderate) were designated as "washes open zones" unless specifically designated as limited or closed to vehicle use. As stated in the NECO Plan Amendment, "all navigable washes not individually inventoried and mapped on public lands would be designated as open as a class except where such washes occur within a

washes closed zone" (BLM, 2002, p. 2-77). Since there are no OHV *Open Area* designations within the PSSCFO service area, motorized travel available to the public in the NECO planning area is restricted to authorized routes of travel with the exception of washes open zones.

The BLM has not inventoried or analyzed specific washes in the Project area as to their navigability, but by the above definition, all or portions of McCoy Wash may be considered navigable; however, the Project site does not transect the McCoy Wash.

3.14.2 Applicable Regulations, Plans, and Standards

3.14.2.1 Federal

The Project would be located partially on BLM-administered lands. The following is a discussion of the federal plans and policies that would be applicable to the BLM-administered lands on the Project site.

Federal Land Policy and Management Act

FLPMA establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. In particular, the FLPMA's relevance to the Project is that Title V, §501, establishes BLM's authority to grant ROWs for generation, transmission, and distribution of electrical energy. Under FLPMA, the BLM is responsible for the development of energy resources on BLM-administered lands in a manner that balances diverse resource uses and that takes into account the long-term needs of future generations for renewable and non-renewable resources. Among those uses, FLPMA recognizes that the public lands should be managed in a manner that will provide for outdoor recreation.

California Desert Conservation Area Plan

The 25 million-acre CDCA contains over 12 million acres of public lands spread within the area known as the California Desert, which includes the following three deserts: the Mojave, the Sonoran, and a small portion of the Great Basin. Approximately 10 million acres of the CDCA public lands are administered by the BLM.

The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development, and protection of the resources and public lands within the CDCA, and it is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The plan's goals and actions for each resource are established in its 12 elements. Each of the plan elements provides both a desert-wide perspective of the planning decisions for one major resource or issue of public concern as well as more specific interpretation of multiple-use class guidelines for a given resource and its associated activities.

The CDCA Plan defines multiple-use classes for BLM-managed lands in the CDCA, which includes the land area encompassing the proposed Project location.

Northern and Eastern Colorado Area Plan Amendment

The NECO Plan Amendment intends to protect natural resources while balancing human uses of the California portion of the Sonoran Desert ecosystem. Lands within the planning area are popular for hiking, hunting, rockhounding, and driving for pleasure. The plan amendment's inventory of officially designated existing routes within the planning area restricts motorized travel to these authorized routes, with the exception of washes open zones, in order to protect off-route resources.

3.14.2.2 State

There are no state regulations that are applicable to recreational resources within the vicinity of the Project site.

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3.15 Social and Economic Setting

This section describes the social and demographic background and existing conditions in areas surrounding the Project site, including the City of Blythe and the broader eastern Riverside County and neighboring La Paz County, AZ. Additionally, this section discusses applicable plans, policies, and regulations that represent the social aspirations, community characteristics, and desired lifestyle, values, and goals of the stakeholders. These plans, policies, and regulations are necessary to understanding social group concerns in the context of renewable energy development. Information in this section is based on data obtained from national and regional sources, including the United States Census Bureau, the U.S. Bureau of Economic Analysis (BEA), and the California Employment Development Department (EDD). No comments and concerns related to socioeconomic conditions were raised during the scoping process (see Appendix B).

3.15.1 Environmental Setting

The Project site is located in eastern Riverside County, approximately 10 miles northwest of the City of Blythe. The site and its immediately adjoining areas are vacant, with no existing population or housing. Areas of potential social and economic effects include Riverside County, the portion of Chuckwalla Census County Division (CCD) (a Census-designated county subdivision) excluding the state prisons (Ironwood and Chuckawalla Valley State Prisons), Blythe CCD (formerly Palo Verde CCD), City of Blythe, and La Paz County, AZ. Chuckwalla CCD and Blythe CCD together correspond generally to "Eastern Riverside County," as defined in Riverside County General Plan (Riverside County, 2003). The selection of these planning areas for analysis is based in part on potential source area for construction workforce and in part on data availability, as discussed below.

The Project includes the construction, operation, maintenance, and ultimately the closure and decommissioning of a solar energy generating facility. The expected source area for the Project's construction workforce is the primary determinant of the affected social and economic environment associated with the Project. As discussed in more detail in Section 4.15, *Social and Economic Impacts*, the origin of Project workers likely would be a central factor determining the magnitude and extent of the Project's potential socioeconomic impacts to the local and regional economy and communities. The direct benefits of employment and higher personal incomes will primarily benefit the communities where workers and their families reside since that would likely be where they spend the majority of their earnings. Workers' spending for goods and services also would have an indirect impact on the communities and economies where that spending occurs.

If there is an insufficient number of suitable workers to staff the proposed action locally or in the region, then the Project could attract individuals to relocate to the area (either temporarily or permanently), which consequently could result in increased demand for housing and local services.

There is little available research and analysis providing guidance for determining the socioeconomic impact area boundaries for power facilities. The widely referenced Electric Power Research Institute (EPRI) analysis (EPRI, 1982) is generally cited as showing that workers may commute as much as two hours each direction from their communities rather than relocate.

However, simple extrapolation of the EPRI study findings may overestimate the likelihood of construction workers commuting *daily* for Project-related employment and appears to misrepresent the cited EPRI report findings. The EPRI distinguishes between "daily commuting," "weekly commuting," and relocation (or in-migration). The EPRI study also acknowledges a prevalence of weekly commuting for power projects and reports 1.42 hours as the average "construction workers maximum daily commuting time" observed in 12 case studies. The study reports that the average maximum daily commute distance was 73 miles.[1] The report also identifies other factors (e.g., quality of life) determining the amount of commuting (daily and weekly) versus relocation.

In addition, from its case studies, the EPRI also determined that "[o]verall, the proportion of in-migrants ranges from 5 to 50 percent for construction workers and 5 to 84 percent for operating staff." Furthermore, the study also observed that: "(1) More in-migration is required in rural, remote areas; (2) The existence of a regional work force experienced in power plant construction reduces in-migration; (3) Weekly commuting is more widely practiced in the West, or in rural areas" (EPRI, 1982, p. V-2).

For purposes of socioeconomic analysis, and as a conservative assumption recognizing the rural nature of eastern Riverside County, a 2-hour travel radius is used to define the outer limits of the study area. It is likely that most construction workers would come from western Riverside County, which has the largest concentration of construction workers close to the Project site (see Section 3.15.2, below), and some of those workers may commute up to 2 hours each way. However, as described in the EPRI report, many workers are also likely to engage in weekly commuting or otherwise temporarily relocate to the Blythe area while working at the Project site.

Figure 3.15-1 depicts a map of areas within 60, 90, and 120 minutes of travel time from the Project site. As shown in this figure, areas of up to 2-hour travel time include eastern Coachella Valley (Palm Springs and communities to the east), Desert Center, and the City of Blythe in Riverside County and Ehrenberg and Quartzsite in La Paz County, AZ.

Economic and employment data are generally available only for counties or metropolitan statistical areas (MSAs) consisting of whole counties. For this analysis, therefore, the socioeconomics regional study area consists of Riverside County, California, and La Paz County, Arizona. Where important additional data are available for Riverside-San Bernardino-Ontario MSA, consisting of Riverside and San Bernardino Counties, they are used for reference. With respect to housing

[1] This estimate was strongly influenced by one project (Laramie River) that reported a maximum daily commute distance of 115 miles.

analysis, data for counties are supplemented with those for cities and communities of Blythe, California, and Ehrenberg and Quartzsite, Arizona.

The 2-hour travel area also extends into parts of Maricopa County in Arizona and San Diego, Imperial, and San Bernardino Counties in California. However, given that there are no major urban centers in these counties that would be located in the 2-hour travel area, they are not included in this analysis.

Per guidelines shown in BLM Land Use Planning Handbook, Appendix D, the analysis of a proposed action of this type needs to consider existing socioeconomic conditions and impacts on several geographic scales. As noted above, at the regional scale, this analysis examines data for Riverside and La Paz Counties, as well as Riverside-San Bernardino-Ontario MSA, where appropriate.

At the local scale, the analysis examines the three nearest communities of Blythe, California (approximately 13 miles southeast of the site), Ehrenburg, Arizona (approximately 14 miles east of the site), and Quartzsite, Arizona (approximately 30 miles east of the site). These represent the major communities located within an hour's travel of the site.

3.15.1.1 Population

Population data for Riverside County, the portion of Chuckwalla CCD excluding state prisons, Blythe CCD, the City of Blythe, La Paz County, and Colorado River Indian Reservation are shown in Table 3.6-1 in Section 3.6, *Environmental Justice*. Additional population estimates and recent growth trends for both the regional and local study areas are summarized in Table 3.15-1. Historical data (1990, 2000, and 2010 census data) are shown for the two counties and the three major communities. Projections for future growth are prepared for counties by the respective states (California Department of Finance and Arizona Department of Administration), but not for cities.

As shown in Table 3.15-1, the population of Riverside County grew rapidly between 1990 and 2000 and also between 2000 and 2010, with the majority of the growth taking place in western Riverside County. The City of Blythe grew rapidly from 1990 to 2000, due in part to the annexation of the two state prisons (Ironwood and Chuckawalla Valley State Prisons). However, the city's household population (non-institutionalized population) also grew rapidly in the 1990s. This growth slowed markedly between 2000 and 2010.

The population of La Paz County, Arizona, grew rapidly between 1990 and 2000 and then slowed in 2000s. The community of Ehrenberg, located across the Colorado River from Blythe, grew moderately during the 1990s and 2000s. The town of Quartzsite, however, grew nearly 80 percent from 1990 to 2000, then its growth slowed in the 2000s.

The forecasted population trends for Riverside and La Paz counties are also shown in Table 3.15-1. Population growth in Riverside County is expected to remain high over the next few decades, though slower than in the 2000s. The growth rate is projected to be about 33 percent between

TABLE 3.15-1
HISTORICAL AND PROJECTED POPULATION OF THE STUDY AREA

	Census			State Projections		
	1990	2000	2010	2020	2030	2040
Riverside County, CA	1,170,413	1,545,387	2,189,641	2,904,848	3,507,498	4,103,182
10-year Growth	---[b]	*32.0%*	*41.7%*	*32.7%*	*20.7%*	*17.0%*
Blythe City, CA[a]	8,428	20,465	21,516	---	---	---
Household Pop.	8,269	11,954	12,972	---	---	---
10-year Growth	---	*44.6%*	*8.5%*	---	---	---
La Paz County, AZ	13,844	19,715	20,489	25,487	28,074	29,715
10-year Growth	---	*42.4%*	*3.9%*	*24.4%*	*10.2%*	*5.8%*
Ehrenberg CDP[c], AZ	1,226	1,357	1,470	1,486	1,543	1,580
Household Pop.	1,196	1,357	1,470	---	---	---
10-year Growth	---	*13.5%*	*8.3%*	*1.1%*	*3.8%*	*2.4%*
Quartzsite, AZ	1,876	3,354	3,677	4,317	4,748	5,022
Household Pop.	1,866	3,354	3,595	---	---	---
10-year Growth	---	*79.7%*	*7.2%*	*17.4%*	*10.0%*	*5.8%*

NOTES:

[a] Total population of Blythe City includes two state prisons, Ironwood State Prison and Chuckawalla Valley State Prison.
[b] Household population excludes population in group quarters, such as prisons
[c] Census-designated place

2010 and 2020, and then fall to 21 percent between 2020 and 2030. La Paz County is forecast to grow by over 24 percent from 2010 to 2020 and by 10 percent from 2020 to 2030.

3.15.1.2 Housing

Current (2010) housing conditions for the regional and local study areas are summarized in Table 3.15-2. The three major communities located within a 1-hour commute of the site are shown, as well as data for both Riverside and La Paz Counties.

In 2010, Riverside County had 800,707 housing units, with a vacancy rate of 14.3 percent. CT 469, the rural area of Chuckwalla CCD, had 1,161 units, with a vacancy rate of 37.0 percent. Blythe CCD, which includes the City of Blythe and other areas of Palo Verde Valley, had 6,140 units (of which 5,473 units were in the city), with a vacancy rate of 16.6 percent (17.5 percent in the city). The higher vacancy rates in eastern Riverside County result from many units maintained for seasonal or recreational use and from slower population growth, as discussed in the previous section.

La Paz County (including the portion of Colorado River Indian Reservation in Arizona) had 16,049 housing units and vacancy rate of 42.7 percent. The two communities near Blythe, Ehrenberg and Quartzsite, have 948 and 3,378 units, respectively, and vacancy rates of 32.0 percent and 40.0 percent.

TABLE 3.15-2
HOUSING PROFILE OF THE REGIONAL STUDY AREA (2010)

(Housing units, except as noted)	Riverside County, CA	Census Tract (CT) 469 (Part of Chuckwalla Valley CCD)[a]	Blythe CCD, CA[b]	Blythe City, CA[c]	La Paz County, AZ[d]	Ehrenberg Census-Designated Place (CDP), AZ	Quartzsite Town, AZ
Total Housing	800,707	1,161	6,140	5,473	16,049	948	3,378
Occupied Housing	686,260	732	5,123	4,513	9,198	645	2,027
Percent Owner Occupied	67.4%	66.3%	52.0%	52.2%	76.9%	62.8%	84.4%
Percent Renter Occupied	32.6%	33.7%	48.0%	47.8%	23.1%	37.2%	15.6%
Vacant Housing	114,447	429	1,017	960	6,851	303	1,351
Percent Vacant	14.3%	37.0%	16.6%	17.5%	42.7%	32.0%	40.0%
Vacant for Seasonal, Recreational, or Occasional Use	50,538	249	342	448	5,318	215	1,087
Vacant for Sale	18,417	68	108	100	370	22	106
Vacant for Rent	23,547	57	329	248	586	47	78

NOTES:

[a] Rural areas of Chuckwalla Valley CCD; excludes state prisons and Colorado River Indian Reservation.
[b] Formerly Palo Verde CCD; excludes state prisons.
[c] Incorporated Blythe city; housing data exclude group quarters.
[d] Includes the part of Colorado River Indian Reservation that is located in Arizona.

SOURCE: U.S. Census Bureau, 2011.

Temporary Housing Resources

Rental Homes

As shown above in Table 3.15-2, vacancy rates are high in the study area. The 2010 Census reports that, on April 1, 2010, 17.5 percent or 960 units in the City of Blythe were vacant. Of these, 448 units were vacant for seasonal or recreational use, 100 units were for sale, and 248 units were for rent (other vacant units included sold or rented units, but not yet occupied, and vacant for unspecified reason). An additional 81 units in the surrounding Blythe CCD (Palo Verde Valley and Mesa) were vacant for rent. Ehrenberg and Quartzsite also had large numbers of vacant units (303 and 1,351 units, respectively), but most of these were for seasonal or recreational use, with 22 and 106 units for sale and 47 and 78 units for rent. Vacant units for rent in 2010 in the four communities totaled 454 units.

Hotel and Motel Accommodations

In addition to existing residential units, construction workers and operational workers could use other local lodging facilities as temporary housing. Temporary housing in the form of hotel/motel rooms are typically concentrated in urban areas or near major transportation nodes. For the purposes of this analysis, only those hotels in the communities closest to the proposed action were tabulated under the assumption that construction and operations workers would congregate in this area for ease of commuting.

Data compiled by Smith Travel Research for hotels and motels with 15 or more rooms identified 19 hotels in Blythe with a total of 878 rooms in 2008, which represents the most current available data (Smith Travel Research, 2008, as cited in Genesis Solar, LLC, 2009). Blythe is the only community in California with hotels or motels with 15 or more rooms within 1 hour's driving distance. Other hotels and motels are located in Ehrenberg (84 rooms) and Quartzsite, Arizona (totaling 52 rooms), for a total of 1014 rooms in the three communities (Best Western, 2012; CalHotels.us, 2012).

The extent that the local motel and hotels within the local study area could provide temporary housing for MSEP construction workers would depend both on current room rates and occupancy rates. Typical room rates for most of the hotel/motels are currently relatively inexpensive during the off-season with quoted rates of $60 to $95 per night (not including tax). Provided operators maintain comparable rates, these local hotel and motel rooms would provide an option for temporary housing, particularly for workers that might be willing to share accommodations.

The average annual occupancy rate for hotels in Riverside and San Bernardino Counties in 2007 was 70.8 percent (PK Consulting, 2008 as cited in Genesis Solar, LLC, 2009). Applying this rate to the total number of hotel rooms identified within the local study area suggests that, on average, in 2008 a total of 296 unoccupied rooms were available for rent in the local study area. However, given the seasonality of local tourism to the area, it is considered likely that higher occupancy and room rates would apply during the winter season (December to March), while higher vacancy rates and lower room rates would apply during the off-season (summer and early fall) when very hot temperatures persist in the area.

Considerable additional hotel and motel facilities are available in the other communities located within 1 to 2 hours' drive of the MSEP site, including Indio, Palm Desert, Indian Wells, Rancho Mirage, Desert Hot Springs, Palm Springs, and several other small communities. Another 165 hotels with a total of 14,842 rooms were identified in these communities (Smith Travel Research, 2008 as cited in Genesis Solar, LLC, 2009). Applying the 2007 average occupancy rate (70.8 percent) suggests that, on average, 4,334 unoccupied rooms are available for rent within 1 to 2 hours' drive of the MSEP site.

Although eastern Coachella Valley (Palm Desert, Indio, and points east) has a substantial number of hotel and motel accommodations, the attractiveness of these resources for construction workers is low, due to the great distance of nearly 2 hours of travel time from the Project site. Furthermore, given their location near business and recreation centers, it is likely that these hotels and motels would have higher room rates and, therefore, would not be suitable temporary housing for MSEP workers.

Campgrounds and RV Parks

In addition, other housing opportunities are available in the form of RV facilities, mobile home sites, and campgrounds. Under some circumstances, these types of facilities could be usable by MSEP construction workers as temporary housing. Generally their lower costs for overnight use could make them attractive as a potential temporary housing resource. Particularly for

construction workers who may own their own RV or trailers, RV parks with utility hook-ups and other amenities would be more suitable for use during the summer and could serve as a longer-term rental for workers who prefer a weekly commute.

There are at least 5 RV parks located in the vicinity of Blythe, with a combined total of about 840 spaces (RV Park Reviews, 2012). RV parks in Blythe tend to be located along the Colorado River and receive higher levels of use during the summer. Research on small sample of these RV parks suggests that, while they have a large number of spaces, many are occupied by year-round residents or are privately owned and, therefore, would not be available for use by construction workers (Genesis Solar, LLC, 2009). Additional RV parks are located in Ehrenberg and Quartzsite, Arizona, approximately 4 miles and 20 miles east of Blythe, respectively. The Quartzsite Chamber of Commerce states there are more than 70 campgrounds in the vicinity of the community that are typically occupied between October and March, with visitors attracted to the gem, mineral, and swap meet shows which are popular tourist attractions in the area (Quartzsite Business Chamber of Commerce, 2010).

BLM operates two campgrounds in the general vicinity of the local study area: Wiley's Well Campground and Coon Hollow Campground, both located south of I-10 on Wiley's Well Road within the Mule Mountain LTVA. Except for "special areas" with specific camping regulations, vehicle camping is allowed anywhere on BLM-administered land within 300 feet of any posted Open Route. However, there are no facilities in these locations, and there is a 14-day limit for camping in any one location. After 14 days, campers wishing to stay in the area longer are required to move 25 miles from their original camp site. Long-term camping is available by permit in LTVAs on BLM lands between September 15 and April 15 (from April 16 to September 14, there is a 14-day limit within any 28-day period). There are two LTVAs located in the vicinity of Blythe and the Project site: Mule Mountain, within which camping is only allowed at designated sites within the Wiley's Well and Coon Hollow campgrounds, and Midland, located north of the City of Blythe. BLM also operates another LTVA within the local study area at La Posa, south of I-10 near Quartzsite, Arizona (BLM, 2007). Although LTVAs are generally intended for recreation use only, BLM may allow temporary LTVAs to be established at the site for Project employees for the duration of Project construction.

3.15.2 Economic Conditions

3.15.2.1 Employment

Regional employment statistics by industry sector for 2010 are summarized in Table 3.15-3. In the Riverside-San Bernardino-Ontario MSA, which consists of Riverside and San Bernardino Counties, and in Riverside and La Paz Counties, the government sector (federal, state, and local) employs the most workers among the two-digit NAICS (North American Industry Classification System) codes, accounting for around 20 percent in the MSA and Riverside County and over 31 percent in La Paz County. Other important industries in the region include retail trade, leisure and hospitality services, educational and health services, and professional and business services. Although some data for La Paz County have been suppressed to preserve confidentiality, the leisure and hospitality industry clearly accounts for most of the 1,220 workers not included in

TABLE 3.15-3
EMPLOYMENT BY INDUSTRY GROUP – 2010

NAICS Code	Industry	Riverside-San Bernardino-Ontario, CA MSA (2010)	Portion of Total (%)	Riverside County, CA (2010)	Portion of Total (%)	La Paz County, AZ (2009)	Portion of Total (%)
11-000000	Total Farm	14,800	1.3	12,800	2.4	309	4.2
10-000000	Mining and Logging	1,000	0.1	400	0.1	---[a]	---
20-000000	Construction	59,500	5.3	35,600	6.6	242	3.3
30-000000	Manufacturing	84,600	7.5	38,000	7.1	155	2.1
41-000000	Wholesale Trade	48,800	4.3	19,100	3.6	97	1.3
42-000000	Retail Trade	154,600	13.7	78,200	14.6	1,314	17.7
43-000000	Transportation, Warehousing & Utilities	66,500	5.9	19,500	3.6	131	1.8
50-000000	Information	15,900	1.4	10,200	1.9	---	---
55-000000	Financial Activities	41,100	3.7	19,300	3.6	503	6.8
60-000000	Professional & Business Services	121,500	10.8	50,600	9.4	443	6.0
65-000000	Educational & Health Services	133,800	11.9	58,600	10.9	330	4.4
70-000000	Leisure & Hospitality	122,100	10.8	68,500	12.8	---	---
80-000000	Other Services	37,500	3.3	18,100	3.4	340	4.6
90-000000	Government	224,300	19.9	107,800	20.1	2,337	31.5
	Total--All Industries	1,126,000	100.0	536,600	100.0	7,421	100.0

NOTE. Data for Riverside-San Bernardino-Ontario MSA and Riverside County are for wage and salary employment only; data for La Paz County, AZ, include the self-employed and proprietors, as well as wage and salary employment. Total wage and salary employment in La Paz County in 2009 was 5,741.

[a] Data not reported to avoid disclosure of confidential information or due to small sample size (less than 10).

SOURCE: EDD, 2011; U.S. Bureau of Economic Analysis (BEA), 2009

the industries with disclosed data. Educational, health, and business services account for a lower proportion of workers in La Paz County than in Riverside County.

3.15.2.2 Gross Domestic Product and Personal Income

A region's gross domestic product (GDP) is the total value of all goods and services produced annually in that region. A region's total personal income is the sum of all income received by its residents, including wages, supplements to wages, dividends, interest, rental income, transfer payments, and proprietors' income. The two values differ depending on the amount of business investment in the region and on imports from and exports to other regions. The BEA publishes GDP data for the nation, states, and MSAs and personal income data for these areas and for counties.

In 2010, the gross domestic product of Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino Counties) was $109.8 billion, representing about 6 percent of the GDP of California (BEA, 2011). Per capita personal income (PCPI), the total personal income divided by population, in this MSA was $29,680, or about 70 percent of the PCPI for California (see Table 3.15-4). PCPIs of Riverside County alone and of La Paz County were comparable, at $29,748 and $26,317, respectively.

TABLE 3.15-4
GROSS DOMESTIC PRODUCT AND PERSONAL INCOME IN 2010

	California	Riverside-San Bernardino-Ontario, CA MSA	Riverside County, CA	La Paz County, AZ
Gross Domestic Product (GDP) (in millions)	$1,901,088	$109,818	---[a]	---
Personal Income (in millions)[b]	$1,590,279	$122,969	$63,228	$527
Per Capita Personal Income[b]	$42,578	$29,680	$29,748	$26,317

NOTES:
[a] BEA does not report gross domestic product for counties.
[b] 2010 data for California; 2009 data for other regions.

SOURCE: BEA, 2011

3.15.2.3 Labor Force and Unemployment

Labor force and employment in the study area are presented in Table 3.15-5. From January to October of 2011, the Riverside-San Bernardino-Ontario MSA had a labor force of about 1.75 million workers, of whom 1.5 million were employed, resulting in an unemployment rate of 13.8 percent (EDD, 2011). As shown in this table, the MSA's labor force grew from 2005 to 2008, before the recent recession began, and has declined since then. The relatively high unemployment rate since 2009 reflects the recession's impact, and the rate is likely to improve (decline) in future years as the regional economy recovers. Figures for Riverside County are similar to those of the MSA, since the county represents approximately half of the MSA.

In Arizona, La Paz County had a labor force of about 7,400 workers over the first 10 months of 2011, with an unemployment rate of 10.5 percent (Arizona Department of Administration, 2011; U.S. Bureau of Labor Statistics, 2011). Labor force and employment in La Paz County also reflect current economic conditions, and the unemployment rate is likely to reduce as the economy recovers.

Growth Projections

Table 3.15-6 presents labor force estimates and projections for workers in occupations that are likely to be required for the construction and operation of the Project. As most workers are expected to come from Riverside County, which has the largest concentration of workers in

TABLE 3.15-5
LABOR FORCE AND UNEMPLOYMENT IN THE STUDY AREA

	2005	2006	2007	2008	2009	2010	2011 Jan-Oct
Riverside-San Bernardino-Ontario, CA MSA							
Labor force	1,707,400	1,745,600	1,767,600	1,774,800	1,774,900	1,769,500	1,749,000
Employed	1,616,600	1,659,700	1,665,000	1,628,900	1,540,700	1,513,300	1,507,200
Unemployed	90,800	85,900	102,600	145,900	234,200	256,200	241,800
Unemployment rate	5.3%	4.9%	5.8%	8.2%	13.2%	14.5%	13.8%
Riverside County, CA							
Labor force	854,300	883,400	903,800	912,100	916,600	913,800	913,600
Employed	808,200	839,000	849,500	834,700	793,600	779,500	786,400
Unemployed	46,100	44,400	54,300	77,400	123,000	134,300	127,200
Unemployment rate	5.4%	5.0%	6.0%	8.5%	13.4%	14.7%	13.9%
La Paz County, AZ							
Labor force	7,637	7,670	7,612	7,576	7,773	7,774	7,394
Employed	7,120	7,240	7,229	7,016	7,024	7,001	6,615
Unemployed	517	430	383	560	749	773	779
Unemployment rate	6.8%	5.6%	5.0%	7.4%	9.6%	9.9%	10.5%

SOURCE: EDD, 2011; U.S. Bureau of Labor Statistics, 2011, Arizona Department of Administration, 2011

TABLE 3.15-6
WORKERS BY OCCUPATION – RIVERSIDE-SAN BERNARDINO-ONTARIO MSA

SOC (Occupation) Code	Occupational Title	2008 (Annual Average)	2018 (Projected)
17-1022	Surveyors	530	530
17-2000	Engineers	7,430	7,880
47-1011	First-Line Supervisors / Managers of Construction Trades and Extraction Workers	7,150	7,490
47-2031	Carpenters	18,380	18,910
47-2051	Cement Masons and Concrete Finishers	3,780	3,910
47-2061	Construction Laborers	17,950	19,500
47-2071	Paving, Surfacing, and Tamping Equipment Operators	410	410
47-2073	Operating Engineers and Other Construction Equipment Operators	4,460	4,640
47-2111	Electricians	5,020	4,850
47-2221	Structural Iron and Steel Workers	710	710
47-3000	Helpers--Construction Trades	3,100	3,210
49-2000	Electrical and Electronic Equipment Mechanics, Installers, and Repairers	4,720	5,010
49-9051	Electrical Power-Line Installers and Repairers	1,540	1,720
49-9052	Telecommunications Line Installers and Repairers	3,500	3,580
51-4041	Machinists	3,400	3,340
51-4121	Welders, Cutters, Solderers, and Brazers	3,230	3,080
53-3032	Truck Drivers, Heavy and Tractor-Trailer	24,030	26,300
	Total	**109,340**	**115,070**

SOURCE: EDD, 2009; U.S. Bureau of Labor Statistics, 2010.

relevant occupations closest to the Project site, data compiled by the EDD are used. EDD reports workers by Standard Occupational Classification System (SOC), defined by the U.S. Department of Labor, as well as projections of future employment, for metropolitan areas.

For construction of the Project, occupations with the largest need for workers are likely to be construction laborers, followed by equipment operators, electricians, and concrete finishers. According to EDD, there were 17,950 construction laborers in the MSA in 2008, and this number is expected to increase to 19,500 by 2018. There were also large numbers of equipment operators, electricians, and concrete finishers in the MSA, as shown in Table 3.15-6. With the exception of electricians, whose numbers are projected to decline, employment in the other occupations is expected to increase by 2018.

No county-level employment projections for La Paz County are available. Given the small percentage of construction employment in the county (see Table 3.15-3) and given the large supply of construction workers in Riverside County, it is not likely that Project construction would place a significant demand on labor in La Paz County.

3.15.2.4 Government Tax Revenues

A summary of Riverside County's revenues and expenditures for fiscal years (FY) 2009-10 and 2010-11 is provided in Table 3.15-7. As the Project would be constructed in unincorporated Riverside County, it would be the local agency receiving most of the direct fiscal impacts from the MSEP in the form of additional expenses or revenues.

For FY 2010-11, new revenues for governmental funds (General Fund and other funds for general governmental functions, excluding proprietary and special district funds) of Riverside County totaled approximately $3.05 billion, and expenditures totaled $3.23 billion (Table 3.15-7; Riverside County, 2010). The excess of expenditures over revenues was funded through the use of reserves and designations from the previous fiscal year. The largest sources of revenue are intergovernmental revenues (state and federal; $1.59 billion), charges for current services ($0.75 billion), and taxes (property, sales, and other taxes; $0.31 billion). The largest expenditure categories are public protection (sheriff, corrections, courts, and fire protection; $1.13 billion) and public assistance ($0.89 billion). The table also includes for comparison actual revenues and expenditures for FY 2009-10 (Riverside County, 2009, 2010).

A key issue of concern to local governments regarding solar energy generation projects is the exemption from property taxation on newly constructed projects. California Revenue and Taxation Code, §73 (described below in Section 3.15.3.2) excludes an "active solar energy system" from calculation of cash value subject to property taxation. Off-site electric transmission lines (gen-tie lines) are generally subject to property taxation.

Without access to property taxation on most components of a new solar energy project, the County must rely principally on sales tax revenues on construction materials and supplies to fund expenditures for public services related to the Project. Riverside County's key expenditures were

TABLE 3.15-7
RIVERSIDE COUNTY ADOPTED BUDGET, FY 2010-11
GOVERNMENTAL FUNDS REVENUES AND EXPENDITURES

	Actual FY 2009-10		Board of Supervisors Adopted Budget FY 2010-11	
Revenues				
Financing Sources		% of total		% of total
Taxes	$296,481,866	10.4	$307,488,615	10.1
Licenses, Permits & Franchises	19,195,879	0.7	21,551,522	0.7
Fines, Forfeitures & Penalties	113,254,133	4.0	104,463,368	3.4
Revenue From Use of Money & Property	33,743,557	1.2	33,959,507	1.1
Intergovernmental Revenues	1,475,368,355	51.6	1,587,487,340	52.0
Charges For Current Services	649,032,606	22.7	745,861,392	24.5
Other In-Lieu And Other Governments	12,326,753	0.4	10,183,065	0.3
Special And Extraordinary Item	59,660	0.0	59,000	0.0
Other Revenue	258,546,368	9.0	239,118,425	7.8
Sub-total	$2,858,009,177	100.0	$3,050,172,234	100.0
Fund Balance Unreserved/Undesignated	--[a]		52,497,292	
Decreases to Reserves/Designations	--		172,134,982	
Net Change in Fund Balances[b]	276,342,750		-	
Total	$3,134,351,927		$3,274,804,508	
Expenditures				
Financing Uses				
General Government	$643,606,184	20.5	$492,161,018	15.2
Public Protection	1,098,560,030	35.0	1,128,874,139	34.9
Public Ways and Facilities	146,586,605	4.7	196,998,793	6.1
Health and Sanitation	346,402,520	11.1	402,834,664	12.5
Public Assistance	834,801,710	26.6	893,441,799	27.6
Education	21,076,112	0.7	48,820,384	1.5
Recreation and Cultural Services	355,798	0.0	333,991	0.0
Debt Service	42,962,968	1.4	47,960,270	1.5
Contingency	--	0.0	20,000,000	0.6
Sub-total	$3,134,351,927	100.0	$3,231,425,058	100.0
Increases to Reserves/Designations	--		43,379,450	
Total	$3,134,351,927		$3,274,804,508	

NOTES:
[a] Not applicable
[b] Net change in both unreserved/undesignated and reserves/designations funds. The budget does not provide details of this change.

SOURCE: Riverside County, 2009, 2010.

on public assistance, public safety, and health. The county acknowledges that the economic slowdown may result in revenues lower than past projections which may lead to cutbacks in services.

3.15.2.5 Stakeholders

Affected Groups and Attitudes

This section discusses some groups of individuals who could be affected by the Project, based on BLM's previous experience during the environmental review processes for other utility-scale solar projects in eastern Riverside County. Social effects to these groups and other stakeholders are discussed under Section 4.15, *Social and Economic Impacts*.

Identification of these groups does not imply that other stakeholders may not be affected by the Project or are outside of the social and environmental review process. Discussion of the affected groups is a means of highlighting and facilitating review of issues of potential significance for those stakeholders who have a particular local or regional relationship to the Project site or Proposed Action.

Blythe Area Chamber of Commerce

The Blythe Area Chamber of Commerce provides a forum for local businesses and residents on important community issues. The Chamber of Commerce maintains a directory of all the businesses in Blythe and promotes the city's business economy. The purpose of the Blythe Area Chamber of Commerce is to encourage and facilitate activities that improve the economic viability of this community, provide a forum for guidance and support, provide opportunities to inform, and seek funds necessary for implementing compatible activities that would improve this agricultural community. The Chamber of Commerce has supported other utility-scale solar projects in the Blythe area and would likely support the Project.

Blythe/Palo Verde Valley Economic Development Partnership

Desert Regional Consortium, a consortium of community colleges in Riverside County to support workforce and economic development efforts in the county, has received funding from the California Community Colleges to undertake a pilot program in the Blythe area, called Blythe/Palo Verde Valley Economic Development Partnership. The partnership consists of representatives from the City of Blythe, Palo Verde College, Blythe Area Chamber of Commerce, Riverside County, Palo Verde Unified School District, Palo Verde Irrigation District (PVID), and other community and regional organizations (Desert Regional Consortium, 2011). Members of the partnership generally have supportive attitudes towards renewable energy projects, and believe that these types of projects will help the local area's economy.

Environmental Groups

Several national and local groups, including the Sierra Club, Wilderness Society, Natural Resources Defense Council, Defenders of Wildlife, Center for Biological Diversity, and Western Watersheds Project, have expressed concerns about the siting criteria used for renewable energy projects proposed for development in sensitive biological resource areas. Environmental groups also have concerns regarding impacts on wildlife movement corridors, impacts on special status species associated with the implementation of solar panels (e.g., shading effects on species), GHG emission impacts on plants and wildlife, and impacts on desert hydrology and landscapes.

Recreational Users

Recreational users include OHV users, hikers, campers, and wildlife viewing enthusiasts. The recreational user group has a deep appreciation for the natural high desert landscape, and their social attitudes are participatory and protective of this resource. This group is concerned with the indirect impacts associated with the displacement of recreational lands by solar energy facilities, including the cumulative loss of land available for OHV recreational uses.

Local Private Land Owners and Residents

Although the Project would be developed mostly on BLM land, a portion of the solar plant, as well as a portion of gen-tie line, would be located on private land located immediately east of BLM land. There are other private lands north and east of the Project site. However, these lands are currently vacant, and no comments in opposition to the Project have been received from land owners during the scoping process for this Project.

Project Workers and Suppliers to the Renewable Energy Industry

The MSEP has the potential to affect both local and non-local labor force from surrounding areas in Riverside and La Paz counties. Construction and operation of the Project would require both temporary and permanent workers, which would increase demand for labor, and would present an opportunity for the sale of materials and supplies by firms in the renewable energy industry.

3.15.3 Applicable Regulations, Plans, and Standards

3.15.3.1 Federal

NEPA

Under NEPA (42 USC §4321 et seq.), an EIS must include an analysis of the proposed action's economic, social, and demographic effects related to effects on the natural or physical environment in the affected area, but does not allow for economic, social, and demographic effects to be analyzed in isolation from the physical environment.

3.15.3.2 State

California Revenue and Taxation Code §73

Assembly Bill 15, signed by the California governor in June 2011, modified and extended existing state law excluding an “active solar energy system” from calculation of cash value subject to property taxation. An active solar energy system includes PV panels, inverters, and other improvements necessary to deliver electric power for transmission or final use. The exclusion applies to new systems constructed prior to January 1, 2017, and remains in effect until a change in ownership occurs.

3.16 Special Designations and Lands with Wilderness Characteristics

This section describes special designations in the vicinity of the proposed Project (Figure 3.14-1) as well as lands with wilderness characteristics (Figure 3.16-1). Most special areas are either designated by an Act of Congress or by Presidential Proclamation, or are created under BLM administrative procedures.

BLM's National Landscape Conservation System (NLCS) designations include: National Monuments, National Conservation Areas, National Recreation Areas, National Wilderness Areas, Wilderness Study Areas, National Scenic and Historic Trails, Wild and Scenic Rivers, Outstanding Natural Areas, Forest Reserves, or any other special designations lands described in the Omnibus Public Lands Management Act of 2009 (PL 111-11 §2002(b)).

In addition, other BLM special designations include ACECs, Cooperative Management and Protection Areas, Scenic and Back Country Byways, watchable wildlife viewing sites, wild horse and burro ranges, and other special designations identified in BLM Handbook H-1601 – Land Use Planning Handbook, Chapter III (BLM, 2005).

Specifically, the land use plan and management direction for such designations must comply with the purposes and objectives of the proclamation or act of Congress regardless of any conflicts with the FLPMA's multiple-use mandate (BLM, 2009).

The following discussion explains the relationship between the Project and the existing special designations within the vicinity of the Project, which include six National Wilderness Areas, four ACECs, one Back Country Byway, and an area found to have wilderness characteristics. It further identifies the existing laws and regulations relevant to those special designations.

3.16.1 Environmental Setting

3.16.1.1 Regional Setting

The Project would be located within the Palo Verde Mesa of the Sonoran Desert region of southeastern California, an alluvial-filled basin that is bounded by the Mojave Desert to the north and by the McCoy Mountains, Little Maria Mountains, and Big Maria Mountains to the west, northwest, and northeast, respectively, extending southwest to the Palo Verde Mountains. The Palo Verde Mesa is bounded by the Palo Verde Valley to the east, which is generally formed by the flood plain deposits of the Colorado River.

Special designations within this regional setting, as shown in Figure 3.14-1, include six components of the National Wilderness System: Palen-McCoy Wilderness (approximately 2 miles west), Rice Valley Wilderness (approximately 11 miles north), Riverside Wilderness (approximately 19 miles northeast), Big Maria Mountains Wilderness (approximately 8 miles

northeast), Palo Verde Mountains Wilderness (approximately 18 miles south), and Little Chuckwalla Mountains Wilderness (approximately 15 miles southwest).

Four ACECs have been administratively designated within the vicinity of MSEP: Mule Mountains ACEC (approximately 9 miles south), Chuckwalla Valley Dune Thicket ACEC (approximately 9 miles southwest), Palen Dry Lake ACEC (approximately 17 miles west), and Big Marias ACEC, located in Arizona (approximately 12 miles east).

The eastern terminus of the Bradshaw Trail National Back Country Byway is located approximately 13 miles south of MSEP, and traverses the Palo Verde Mesa westerly for approximately 65 miles.

An area approximately 30,200 acres in size within McCoy Wash has recently been inventoried and it has been determined that wilderness characteristics exist in the northern portion of this area. The southern limits of these lands with wilderness characteristics extend approximately one mile into the northwest quadrant of Unit 2 of the Project. Figure 3.16-1 displays the relationship between the Project and this area.

There are no other special designations within the vicinity of the Project.

3.16.1.2 Project Setting

No Congressional or Administrative special designations exist at or are immediately adjacent to the MSEP. The area that is encompassed by the MSEP has undergone recent wilderness characteristic reviews, and those findings are discussed further in Section 3.16.1.3.

3.16.1.3 Wilderness Characteristics Review

The BLM will evaluate lands with wilderness characteristics through the land use planning process and when analyzing new land use authorizations. When such lands are present, the BLM will examine options for managing these lands and determine the most appropriate land use allocations for them. Considering wilderness characteristics in the land use planning process may result in several outcomes, including, but not limited to: 1) emphasizing other multiple uses as a priority over protecting wilderness characteristics; 2) emphasizing other multiple uses while applying management restrictions (conditions of use, mitigation measures) to reduce impacts to wilderness characteristics; 3) the protection of wilderness characteristics as a priority over other multiple uses. Pursuant to §201(a) of the FLPMA, all Public Lands within the California Desert District were analyzed in the 1979 wilderness inventory process to determine whether they possessed appropriate wilderness characteristics of size, naturalness, outstanding opportunities for solitude or primitive and unconfined type of recreation and other supplemental values. The Project site is contained within the CDCA Wilderness Inventory Units (WIU) #CDCA 325 and #CDCA 325B (hereafter referred to as WIU #325 and WIU #325B, respectively) (BLM, 1979).

Figure 3.16-1 displays the relationship between the MSEP and the wilderness inventory units and lands with wilderness characteristics.

WIU #325

In 1979, WIU #325 was estimated to be 500,000 acres, and is generally bounded on the south by I-10, on the west by Highway 177, on the north by State Highway 62 and the Colorado River Aqueduct, and on the east by Midlands Road, the Arizona and California Railroad line, and a gas pipeline right-of-way to I-10.

The 1979 decision established 284,730 acres of WIU #325 as having wilderness characteristics. This block of land was called the Palen-McCoy Wilderness Study Area. The California Desert Protection Act of 1994 (CDPA designated the Palen-McCoy Wilderness. The boundary for the wilderness was similar to the boundary of the wilderness study area. The remainder of WIU #325 was determined not to have wilderness characteristics. The Project site and immediately adjacent lands were included in this category of lands without wilderness characteristics.

In April 2011, the wilderness characteristics inventory of WIU #325 was updated and was used to determine whether public lands within the proposed Riverside East Solar Energy Zone (SEZ) have wilderness characteristics. The area in the vicinity of the Project, identified as the East McCoy sub-unit (#325-1) is approximately 30,200 acres in size, of which about 27,640 acres are on public lands, and about 2,199 encompassed by the Project. It is generally bounded on the south by I-10, on the west by the foot of the McCoy Mountains, on the north by St. John's Mine Road/Arlington Mine Road, on the east by Gas Line Road to I-10. (BLM, 2011a)

In October 2011, based on this inventory, 11,925 acres (48.3 km^2) of WIU #325-1 on the eastern side of the SEZ (in the area of McCoy Wash) was found to have wilderness characteristics. These lands are shown in Figure 3.16-1 (BLM, 2011b).

These lands with wilderness characteristics include 1,256 acres (5.1 km2) of Unit 2. The southern limit of the lands with wilderness characteristics follows the vehicle route that goes west from Gas Line Road in Section 27, T5S, R21E, SBM.

WIU #325B

WIU #325B is located adjacent and east of WIU #325-1, as described above. The boundary between these two units in the vicinity of the Project site is Gas Line Road. In the 1979 inventory, the entire unit was found to not meet the criteria for wilderness characteristics, primarily due the lack of outstanding opportunities for solitude or a primitive and unconfined type of recreation.

In July 2010, BLM conducted a maintenance update of the wilderness characteristics of WIU #325B. Although a series of changes in conditions since 1979 were noted, the conclusion was that no changes in conditions have occurred that would warrant a finding that is different from the 1979 decision that wilderness characteristics were not present in the area (BLM, 2010a).

WIU #325B contains 2,561 acres of Unit 1 and 42 acres of Unit 2.

3.16.1.4 Designated Wilderness Areas

Designated Wilderness Areas in the vicinity of the Project are shown on Figure 3.14-1. Wilderness areas are congressionally designated and are managed pursuant to the Wilderness Act of 1964 (PL 88-577; 16 USC 1131-1136), and/or the specific legislation designating the wilderness area. In addition to the Wilderness Act of 1964, wilderness areas in the CDCA were designated and are managed through the CDPA of 1994 (PL 103-433) and the Omnibus Public Lands Management Act of 2009 (PL 111-11). A designated wilderness area is defined as having four primary characteristics, including the following:

1. Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;

2. Has outstanding opportunities for solitude or a primitive and unconfined type of recreation;

3. Has at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition; and

4. May also contain ecological, geological or other features of scientific, educational, scenic, or historical value.

Six wilderness areas are located in the vicinity of the site and were established by the CDPA (16 USC §§ 410aaa et seq.). The Palen-McCoy Wilderness is approximately 2 miles northwest of the site, the Big Maria Mountains Wilderness is approximately 8 miles northeast, the Rice Valley Wilderness is approximately 11 miles north, the Little Chuckwalla Mountains Wilderness is approximately 15 miles southwest, the Palo Verde Mountains Wilderness is approximately 18 miles south, and the Riverside Mountains Wilderness is approximately 19 miles northeast. These six wilderness areas were designated by Congress through enactment of the CDPA and formally incorporated in the CDCA Plan through the NECO Plan (BLM, 2002).

According to the CDPA §103(d), "The Congress does not intend for the designation of wilderness areas in §102 of this title to lead to the creation of protective perimeters or buffer zones around any such wilderness area. The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness area shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area."

The Palen-McCoy Wilderness Area encompasses approximately 236,488 acres. Within it are the Granite, McCoy, Palen, Little Maria, and Arica Mountains, which are five distinct mountain ranges separated by broad sloping bajadas. Because this large area incorporates so many major geological features, the diversity of vegetation and landforms is exceptional. The desert wash woodland found here provides food and cover for burro deer, coyote, bobcat, gray fox and mountain lion. Desert pavement, bajadas, interior valleys, canyons, dense ironwood forests, canyons, and rugged peaks form a constantly changing landscape pattern. State Highway 62 near the Riverside County line provides access from the north, and I-10 via the Midland Road near Blythe provides access from the south (BLM 2011c).

The Big Maria Mountains Wilderness is 45,384 acres. The terrain varies from gently sloping bajadas to numerous rough, craggy peaks disjointed by steep canyons. The northern boundary lies south of a major drainage known as Big Wash, and the eastern edge parallels State Highway 95 and the Colorado River. The west and south boundaries follow power lines and contours along the base of the mountains. Foxtail cactus and California barrel cactus dot the landscape, and a burro deer herd relies on the river's habitat for survival. State Highway 95 provides access from the east and north via Big Wash, and by I-10 from the southwest via Midland Road and power line roads (BLM, 2011d).

The Rice Valley Wilderness is 41,777 acres and is approximately 26 miles northwest of Blythe. The broad, flat plains of Rice Valley and the northwestern tip of the steep and rugged Big Maria Mountains lie within the borders of this wilderness. A system of small dunes rising 30 to 40 feet above the surface form a long, narrow band running through the middle of the valley floor. The valley is part of a massive sand sheet which extends from Cadiz Valley through Ward Valley, representing a part of one of the largest dune systems in the California Desert. The Big Maria Mountains rise above the valley to an elevation of 2,000 feet. State Highway 62 provides access to the wilderness from the north and I-10 via the Midland Road, from the south (BLM, 2011e).

The Little Chuckwalla Mountains Wilderness is 28,034 acres and also lies south of I-10. It includes rugged mountains surrounded by a large, gently sloping bajada laced with a network of washes. To the north, a bajada gently rises to 400 feet, while the rugged mountains crest at 2,100 feet. Habitat for bighorn sheep and desert tortoise can be found in portions of this region, and the southern bajada has been identified as crucial desert tortoise habitat. Several sensitive plant species grow here, including the California snakeweed, Alverson's foxtail cactus, and the barrel cactus. I-10 provides northern access to the Little Chuckwalla's via the Ford Dry Lake exit; Graham Pass Road from the west; and Teague Well four-wheel drive route from the east. Both routes access the Bradshaw Trail to the south, which connects to Wiley's Well Road (BLM, 2011f).

The Palo Verde Mountains Wilderness is 30,605 acres, lies south of I-10 in Imperial County, and is approximately 18 miles south of MSEP. It is located 18 miles southwest of Blythe, and 5 miles west of an unincorporated town of Palo Verde. Distinguishing this wilderness are twin buttes known as Flat Tops, which stand out as a landmark against a range of jagged peaks. Palo Verde Peak is the highest point of the range rising 1,800 feet. Dry washes cut across the mountain slopes, supporting such vegetation as palo verde, mesquite, and ironwood. Clapp Spring and its palm oasis are unique to this area offering the only permanent water source to such wildlife species as desert bighorn, sheep desert tortoise and wild burros. Rather than hide among canyon walls as most springs in the desert, Clapp Spring lies in an open landscape. Saguaro cactus dot the southern part of the wilderness, a rare plant species in California (BLM 2011g).

The Riverside Mountains Wilderness is 24,004 acres and is approximately 10 miles north of Blythe. The Colorado River parallels this wilderness on its eastern edge. The landscape varies from gently sloping bajadas to steep, rugged interiors. Washes emerging from canyons divide the bajadas below. Numerous peaks in the Riverside Mountains give this small range a rough, craggy appearance. The foxtail cactus and California barrel cactus, two sensitive plant species, decorate

this wilderness. A small herd of burro deer live among the Riverside range. State Highway 95 provides access to the wilderness from the east (BLM, 2011h).

Users of these wilderness areas are seeking opportunities to experience naturalness, solitude, and unconfined recreation. The areas have no developments other than sparse trails and any routes that have not been reclaimed since the wilderness designation. Little data exist on the amounts, types, and trends of visitor use experiences such as camping, hiking, or sightseeing. Recreation uses are discussed in Section 3.14, *Recreation and Public Access (Off-Highway Vehicles)*, and include hunting, fishing, and non-commercial trapping. Pets are allowed, and the use of horses is permitted. Camping is permitted, but is limited to a period of 14 days. After 14 days, campers must relocate at least 25 miles from the previous site.

Motorized-vehicle access is prohibited in wilderness except as specifically provided for in the Wilderness Act and by reference in subsequent wilderness legislation (i.e., where access is required to private property, and where necessary to meet minimum requirements for the administration of the area for the purpose of the Act, including measures required in emergencies involving the health and safety of persons within the area).

3.16.1.5 Areas of Critical Environmental Concern

ACECs in the vicinity of the site are shown on Figure 3.14-1. ACECs are BLM-specific, administratively designated areas within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes; or to protect life and safety from natural hazards (FLPMA, 43 USC 1702(a); 43 CFR 1601.0-5(a)). By itself, the designation does not automatically prohibit or restrict uses in the area; instead, it provides a record of significant values that must be accommodated when BLM considers future management actions and land use proposals.

There are four ACECs located in the vicinity of the site. The 4,092-acre Mule Mountains ACEC is located approximately 9 miles south of the site. This ACEC bears dual MUC designations, M and L, and was established to manage prehistoric resources. The 2,273-acre Chuckwalla Valley Dune Thicket ACEC is located approximately 9 miles southwest of the site. This ACEC is managed as Multiple Use Class M, for wildlife habitat, specifically that of the desert tortoise. Similarly, the Palen Dry Lake ACEC is located approximately 17 miles west of the site and was established to protect cultural resources. The Big Marias ACEC, located in Arizona, is approximately 12 miles east of the site and was established to protect prehistoric archaeological features, including a high concentration of nationally significant intaglio features, and sensitive plant species (BLM, 2010b). Recreation uses allowed in ACECs are discussed in Section 3.14, *Recreation and Public Access (Off-Highway Vehicles)*.

3.16.1.6 Back-Country Byways

The Bradshaw Trail is a 70-mile BLM Back Country Byway which begins about 12 miles east of the community of North Shore near the Salton Sea State Recreation Area. The trail's eastern end

is about 14 miles southwest of Blythe.[1] It was the first road through Riverside County, created by William Bradshaw in 1862 as an overland stage route beginning in San Bernardino, California, and ending at Ehrenberg, Arizona. The trail was used extensively between 1862 and 1877 to transport miners and passengers. The trail is a graded dirt road that traverses mostly public land between the Chuckwalla Mountains and the Chocolate Mountain Aerial Gunnery Range. Recreational opportunities include four-wheel driving, wildlife viewing, plant viewing, birdwatching, scenic drives, rockhounding, and hiking (BLM, 2011i; DOT, 2004).

3.16.2 Applicable Regulations, Plans, and Standards

3.16.2.1 Federal

The following summarizes the federal regulations, plans and standards that would be applicable to the special designations on BLM-administered lands on and in the vicinity of the MSEP site.

Federal Land Policy Management Act of 1976

FLPMA (Public Law 94-579, October 21, 1976), is called the BLM Organic Act because it consolidates and articulates BLM's management responsibilities. Many land and resource management authorities were established, amended, or repealed by FLPMA, and it proclaimed multiple use, sustained yield, and environmental protection as the guiding principles for public land management (BLM, 2011j).

Several sections of FLPMA provide guidance regarding the establishment, management, and inventory of resource values which are considered for special designations.

Lands in the vicinity of MSEP were recently reviewed for wilderness characteristics based on §201(a) requiring the BLM to:

> *prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values. The preparation and maintenance of such inventory or the identification of such areas shall not, of itself, change or prevent change of the management or use of public lands.*

Section 202(c)(3) requires the BLM, through the land use planning system, to "give priority to the designation and protection of areas of critical environmental concern." In §103(a), an ACEC is defined as the following:

> *An area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and*

[1] This section deals specifically with special federal designations; the portions of the Bradshaw Trail recognized by Riverside County are described in Section 3.14.

> *wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.*

Section 603(a) of FLPMA required BLM to conduct the original inventory of wilderness characteristics, which was completed in 1979, while §603(c) stated that "once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act (16 USC 1131 et seq.) which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area"

Wilderness Act of 1964

The "Wilderness Act" (Public Law 88-577; September 3, 1964) is the legislation authorizing the establishment and management of the six wilderness areas in the vicinity of Project Area. Section 4(a) states:

> *…….each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use*.

California Desert Protection Act of 1994

The CDPA (Public Law 103-433, October 31, 1994) designated 69 areas as components of the National Wilderness Preservation System on BLM-managed public lands in the California Desert. Section 103(d) states that "wilderness is a distinguishing characteristic of the public lands in the California desert" and "the wilderness values of desert lands are increasing threatened by …development." The CDPA further states that there are no buffer zones designated along with the wilderness areas: "The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness area shall not, in itself, preclude such activities or uses up to the boundary of a wilderness area."

Omnibus Public Lands Management Act of 2009

The Omnibus Public Lands Management Act (Public Law 111-11, March 30, 2009) §2002(a) established the NLCS in order "to conserve, protect, and restore nationally significant lands that have outstanding cultural, ecological and scientific values for the benefit of current and future generations" to be managed by the BLM. Section 2002(c) directed the BLM "to manage the system in accordance with any applicable law (including regulations) relating to any of component of the system in a manner that protects the values for which the components of the system were designated." The Public Lands within the CDCA and components of the National Wilderness Preservation System are areas included under this authorization.

California Desert Conservation Area Plan

The CDCA is a 25-million acre expanse of land designated by Congress in 1976 through §601 of FLPMA. The BLM administers about 10 million of those acres. When Congress created the

CDCA, it recognized its special values, and the need for a comprehensive plan for managing the area.

The CDCA Plan recognized the need to maintain and perpetuate wilderness resources, including plants and animals indigenous to the area, and to the extent consistent provide the above for opportunities for public use, enjoyment, and understanding, and the unique experiences dependent upon a wilderness setting, including maintaining access to these areas. The plan also directed managers to consider valid nonconforming uses and activities in the management of the wilderness so as to have the least possible adverse effect and/or wherever possible a positive effect (BLM, 1980; pg 50).

In addition, the plan established ACECs as a value management tool for the protection of special values, including cultural resources, prehistoric archaeological features, wildlife habitat, and sensitive plant species. Prior to its designation, management prescriptions are developed for each proposed ACEC. These prescriptions are site specific and include actions that the BLM has the authority to carry out, as well as recommendations for actions that the BLM does not have direct authority to implement, such as cooperative agreements with other agencies and mineral withdrawals (BLM, 1980).

Additional discussion regarding management prescriptions of specific ACECs are found in the relevant sections: 3.3, *Biological Resources – Vegetation*; 3.4, *Biological Resources – Wildlife*; and 3.5, *Cultural Resources.*

Northern and Eastern Colorado Area Plan Amendment

The NECO Plan Amendment is a landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over five million acres and hosts 60 sensitive plant and animal species. Lands within the planning area are also popular for hiking, hunting, rockhounding, and driving for pleasure. Several commercial mining operations, livestock grazing, and utility transmission lines exist in the area as well (BLM, 2002a).

The record of decision for the NECO Plan, signed December 12, 2002, amended the 1980 CDCA Plan by formally incorporating the 23 wilderness areas (including the six in the vicinity) established by the 1994 CDPA in the CDCA (BLM, 2002b).

BLM Manual 8560, Management of Designated Wilderness Areas

This manual section identifies BLM's role in administering wilderness areas on public lands, provides policy guidance for BLM personnel, and sets the framework for wilderness management program development. It states the goals of wilderness management, as well as administrative functions and specific activities related to wilderness management.

BLM Handbook 1601-1 Land Use Planning Handbook

This handbook provides general guidance for the establishment of BLM administrative designations including those in the vicinity of the MSEP: ACECs and Back Country Byways. It specifically states that designated ACECs must be managed to protect the area and prevent irreparable damage or natural systems (BLM, 2005).

BLM Handbook 8357-1, 1993 BLM Byways Handbook

This handbook provides specific direction for BLM's Back Country Byways program, including information of Byways nomination and designation, planning criteria, visitor safety, and specifications for entrance kiosks (BLM, 2011k).

BLM Instruction Memorandum No. 2011-154

This Instruction Memorandum directs offices to continue to conduct and maintain inventories regarding the presence or absence of wilderness characteristics, and to consider lands with wilderness characteristics in land use plans and when analyzing projects under NEPA (BLM, 2011).

3.16.2.2 State

Special designations refer specifically to the BLM and are not relevant to the state government.

3.17 Transportation and Traffic

This section describes existing conditions related to transportation and traffic, including applicable plans, policies, and regulations. Because the MSEP site is located in a remote area, all materials would have to be brought to the site from long distances and/or personnel would have to travel from surrounding communities within Riverside County, such as Blythe and Indio, as well as regions of Los Angeles County and towns in Arizona, such as Quartzite, Ehrenberg, and Cibola. Consequently, all MSEP-related traffic would utilize I-10 for regional travel, and Mesa Drive and Black Rock Road for site access. Therefore, the study area for this analysis of transportation and traffic includes these local roads and the I-10 in the vicinity of the MSEP.

3.17.1 Environmental Setting

3.17.1.1 Regional and Local Roadway Facilities

In the MSEP area, I-10 is classified as a freeway with two lanes in each direction. Access to the site from I-10 is through the Airport/Mesa Drive interchange. Local access to the MSEP site is from Black Rock Road, via Mesa Drive. Black Rock Road also serves as an access for the BSPP site, which is located adjacent to the MSEP site.

3.17.1.2 Existing Traffic Volumes and Levels of Service

The level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS indicators for the highway and roadway system are based on specific characteristics of traffic flow on designated sections of roadway during a typical day. For mainline freeway and roadway segments, these include overall traffic volume, speed, and density.

Several physical and operational characteristics of the roadway, such as lane configuration and flow speed (i.e., the typical speed along a roadway segment) are used to determine the vehicular capacity of the roadway segment. When these two sets of data are compared, a volume-to-capacity ratio is calculated. These factors then are converted to a letter grade identifying operating conditions and expressed as LOS A through F. The *Highway Capacity Manual 2000*[1], published by the Transportation Research Board, includes six levels of service for roadways or intersections ranging from LOS A (best operating conditions characterized by free-flow traffic, low volumes, and little or no restrictions on maneuverability) to LOS F (worst operating conditions characterized by forced traffic flow with high traffic densities, slow travel speeds, and often stop-and-go conditions) (Transportation Research Board, 2000).

[1] This manual is a common guide used for computing the capacity and quality of service of various highway facilities, including freeways, arterial roads, signalized and unsignalized intersections and the effects of mass transit, pedestrians, and bicycles on the performance of these systems.

Table 3.17-1 provides existing peak-hour traffic volumes and LOS for I-10 that would be used for indirect access to the MSEP site. As indicated below, traffic conditions along I-10, east and west of the Mesa Drive Interchange are operating at LOS A during the a.m. and p.m. peak hours.

TABLE 3.17-1
EXISTING PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

	Existing Conditions			
Roadway/Segment	**Travel Lanes**	**Volume[a]**	**Capacity[b]**	**LOS**
I-10 West of Mesa Drive	4	2,700	8,000	A
I-10 East of Mesa Drive	4	2,600	8,000	A

NOTES:
[a] Caltrans volumes, published 2011.
[b] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).

SOURCES: Caltrans, 2011; ESA, 2011.

3.17.1.3 MSEP Access

Regional Access

Interstate 10 (I-10) is a four-lane freeway that runs in an east-west alignment. I-10 provides access to multiple communities throughout Riverside County, including Blythe and Indio as well as communities in Los Angeles County and to points farther west, and communities in Arizona and to points farther east. The most recent data published by Caltrans indicates the Annual Average Daily Traffic (AADT) on the roadway in the MSEP area is about 22,000 vehicles (Caltrans, 2011). The roadway is included in the Riverside County Congestion Management Program (CMP) Roadway Network (Riverside County Transportation Commission [RCTC], 2010).

Local Access

Black Rock Road is a two-lane, two-way roadway that extends westerly from Mesa Drive parallel to, and on the north side of, I-10. Its paved width is approximately 24 feet; the road has graded shoulders on both sides. Black Rock Road intersects Mesa Drive opposite Hobson Way approximately 300 feet north of the intersection of the westbound I-10 ramps with Mesa Drive. The intersection of Black Rock Road, Hobson Way, and Mesa Drive is controlled with stop signs on the Hobson Way and Black Rock Road approaches.

Black Rock Road continues as Hobson Way east of Mesa Drive. Hobson Way continues east for approximately 11 miles then turns southwest as Riviera Drive. Riviera Drive continues for approximately 2 miles before terminating at U.S. Route 95. According to the *City of Blythe General Plan*, Chapter 4, Circulation Element, Hobson Way is considered the City of Blythe's "Main Street" (City of Blythe, 2007).

Mesa Drive is a two-lane, two-way roadway that extends north and south from I-10 at the easterly edge of the Blythe Airport. Mesa Drive between I-10 and Hobson Way is a paved road approximately 30 feet wide. From Hobson Way, Mesa Drive is a paved road approximately 70 feet wide, and extends approximately 1,000 feet north before ending in a cul-de-sac adjacent to the Blythe Airport.

Site Access

Access to the site would be from Black Rock Road via a driveway leading to the site. The driveway to the MSEP site is undeveloped and unpaved; however, the driveway would be constructed to provide a 30-foot-wide access road (two paved travel lanes occupying a 24-foot width, and 3-foot unpaved shoulders on each side) and would serve as an all-weather access for access of general and emergency vehicles, such as fire trucks and ambulances. The driveway would be located approximately 1.5 miles west of Mesa Drive along Black Rock Road, immediately south of the southern edge of the MSEP site boundary (as shown in Figure 2-2).

3.17.1.4 Public Transportation within the Vicinity of the MSEP

Public transportation within the vicinity of the MSEP consists of an airport, rail services, bicycle and pedestrian facilities. Information about those forms of public transportation follows.

Blythe Airport

The nearest airport facility to the MSEP site is the Blythe Airport. Blythe Airport is a public facility located approximately 6 miles west of the City of Blythe and approximately 1 mile south and east of the site. The airfield has been open since 1940, when it was known as Bishop Army Airfield. The airport later became a part of Muroc Army Air Field, now known as Edwards Air Force Base.

Blythe Airport has two operating runways, Runway 8-26 (oriented east-west), the primary runway, is 6,562 feet long and 150 feet wide. Runway 17-35 (oriented north-south) is 5,820 feet long and 100 feet wide. Today, Blythe Airport is primarily used for general aviation (i.e., flights other than military and regularly-scheduled airline service and regular cargo flights).

Current Operations

Current operations at Blythe Airport are limited. For the 12-month period ending in May 2010, aircraft operations averaged 69 takeoffs or landings per day or more than 25,000 operations per year. Of these, approximately 50 percent were characterized as transient general aviation; approximately 50 percent local general aviation and less than 1 percent military (Airnav, 2011).

According to the *Palo Verde Valley Area Plan*, which supplements the Riverside County General Plan, the Blythe Airport also is used as a base for crop spraying operations, airplane rentals, and flight instruction (Riverside County, 2008).

Future Operations

To carry out its responsibilities, in 2004 the Riverside County ALUC published an airport compatibility plan. This compatibility plan is based on the Airport Master Plan adopted by the Riverside County Board of Supervisors in 2001. The plan is based on an assumption of long-range future activity of 58,100 annual aircraft operations, including up to 2,200 airline aircraft operations. The theoretical ultimate airport activity as envisioned in the plan includes a number of large jet transport aircraft operations. Accordingly, the Airport Master Plan includes a proposal for extending Runway 8-16 to 3,450 feet westward for a total length of 10,012 feet (Riverside County ALUC, 2004).

Rail and Bus Service

There is no regional passenger railroad transportation in proximity of the MSEP area, or in Blythe; however, local bus transportation is provided by the Palo Verde Valley Transit Agency (PVVTA). PVVTA Bus Route 3 provides weekday express service from Blythe to the prison facilities on Wiley's Well Road south of I-10, and provides a bus stop at Hobson Way and Mesa Drive. Weekday bus service to this bus stop is Monday through Friday, from 5:40 a.m. to 7:40 a.m., with bus frequencies every 25 to 60 minutes. Afternoon and evening transit trips to the Mesa Drive exit are by request only, between approximately 2:30 p.m. and 5:00 p.m. (PVVTA, 2011).

Bicycle and Pedestrian Facilities

Bicycle facilities are generally classified as Class I (bicycle paths separated from roads), Class II (striped bicycle lanes within the paved areas of roadways), or Class III (signed bike routes that allow cyclists to share streets with vehicles). There are no bicycle facilities adjacent to the MSEP site; however, bicycles are allowed on I-10 from Dillon Road in Coachella to Mesa Drive in Blythe. Hobson Way from Mesa Drive east toward the City of Blythe is designated as a Class II Bikeway in the Circulation Element of the Blythe General Plan (City of Blythe, 2007). Mesa Drive and Black Rock Road are not designated bikeways.

Pedestrian facilities include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape amenities. The local roadways described above do not include any pedestrian facilities.

3.17.2 Applicable Regulations, Plans, and Standards

Construction, operation, maintenance, and decommissioning of the MSEP could affect access and traffic flow patterns on public streets and highways. Therefore, it would be necessary for the Applicant and/or the construction contractor(s) to obtain encroachment permits or similar legal agreements from the public agencies responsible for the affected roadways and other applicable ROWs. Such permits are needed for ROWs that would be affected by access road construction. For the Project, encroachment permits would be issued by Caltrans, Riverside County, and other affected agencies and companies.

3.17.2.1 Federal

49 CFR Subtitle B, Parts 171-173, 177-178, 350-359, 397.9 and Appendices A through G address safety considerations for the transport of goods, materials, and substances and governs the transportation of hazardous materials, including types of materials and marking of the transportation vehicles.

3.17.2.2 State

The use of state highways for other than transportation purposes requires an encroachment permit, which an applicant can obtain through submission of Caltrans form TR-0100. This permit is required for utilities, developers, and non-profit organizations for use of the state highway system to conduct activities other than transportation (e.g., landscape work, utility installation, film production) within the ROW. The application would be forwarded to Caltrans District 8, whose jurisdiction includes the MSEP site. Part 5 of the Caltrans Traffic Manual provides Traffic Controls for Construction and Maintenance Work Zones (Caltrans, 2010). Additionally, the transport of oversize or overweight loads would require approval from Caltrans.

Congestion Management Program

The California CMP was created in 1990 by voter-approved Proposition 111. The RCTC serves as the Congestion Management Agency (CMA) of Riverside County (RCTC, 2010). As the County's CMA, the RCTC is responsible for managing the County's blueprint to reduce congestion and improve air quality. RCTC is authorized to set state and federal funding priorities for transportation improvements affecting the Riverside County CMP transportation system. Roadways in proximity to the MSEP site that are designated in the CMP roadway system include I-10.

The CMP specifies a system of highways and roadways for which traffic level of service standards are established. The CMP system includes all freeways, state highways, and principal arterials in the County. The program sets level of service standards for all CMP roadway segments and intersections. The LOS standard for all CMP roadways is LOS E; therefore the above-mentioned CMP roadways near the MSEP site have a level of service standard of LOS E. RCTC requires local jurisdictions to analyze impacts of new developments or land use policy changes on CMP facilities. RCTC periodically monitors the CMP Roadway System and records levels of service along CMP facilities; the last level of service assessment of its facilities was completed in 2009 (RCTC, 2010).

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3.18 Utilities and Service Systems

This section describes the existing utilities and associated service systems relevant to the Project. Limited utilities are available on-site. However, this section provides an overview of available infrastructure in the vicinity of the Project, as relevant to its construction, operation and maintenance, and decommissioning. Because no connection to a wastewater treatment provider exists or is proposed for the Project site, wastewater treatment is not discussed. The information used for this analysis came from agency websites and author reviews of maps and satellite imagery of the Project area.

3.18.1 Environmental Setting

3.18.1.1 Water Supply

Water Suppliers

The PVID provides water primarily to agricultural users in the vicinity of the Project site, and PVID is the nearest water supplier to the site. PVID's canals extend across agricultural areas to the north and west of Blythe. However, the nearest canal to the Project is located about 5 miles to the southeast, at a maximum elevation of about 275 amsl. This is at least 190 feet lower than elevations at the Project site. Thus, groundwater is the sole water supply source available at the Project site.

Groundwater Availability

The availability of groundwater in support of the Project is evaluated through a water supply assessment, as well as a numerical groundwater model. Groundwater is pumped in the basin in support of private residential use and agriculture, although most agricultural supplies are based on surface water from the Colorado River. For a discussion of the water supply assessment completed in support of the Project, please refer to Section 4.18, *Utilities and Service Systems*. For a discussion of the numerical groundwater model completed in support of the Project, please refer to Section 4.20, *Water Resources*.

3.18.1.2 Solid Waste Management

The Riverside County Waste Management Department operates six landfills, has a contract agreement for waste disposal with an additional private landfill, and administers several transfer station leases (RCWMD, 2011). Among the six landfills, the Blythe Landfill is closest, located approximately 6.4 miles from the site. The next closest landfills are the Desert Center Landfill (about 48 miles from the site), Mecca II Landfill (about 82 miles from the site) and Oasis Landfill (about 87 miles from the site). Riverside County has a minimum of 15 years of capacity for future landfill disposal, and expects to maintain at least 15 years of capacity into the future (RCWMD 2011). Blythe Landfill has a total estimated permitted capacity of approximately 6 million cubic yards, with a remaining capacity of over 4 million cubic yards, and an anticipated closure date of June, 2047 (CalRecycle, 2011).

3.18.1.3 Electricity

Electricity within the vicinity of the Project site is provided by SCE. In support of the numerous renewable power projects being installed in the vicinity of the Project (and including the Project), SCE is in the process of pursuing construction of a new 157-mile-long transmission line. A ROD for the transmission line project, DPV2, was completed in July, 2011, between the BLM and the USFS (BLM and USFS, 2011). The selected alternative includes a new 500 kV transmission line that will connect the CRS west to the Cactus City Rest Area. From that point, the alignment will extend to the Devers Substation in Palm Springs, then to the Valley Substation, located in Romoland, CA. Additional equipment will be installed at the Devers Substation in order to accommodate the new transmission line.

The primary reason for installation of the DPV2 transmission line is to provide an interconnect between the various solar energy power projects proposed for the I-10 corridor and nearby areas. Accordingly, the DPV2 project includes various refinements to support transmission interconnection needs for solar projects (BLM and USFS, 2011). The DPV2 project was approved by the CPUC in November, 2009, and the CPUC issued a Mitigation Consistency Determination for the DPV2 in May, 2011, which also considered various refinements since the CPUC's initial approval.

3.18.1.4 Stormwater

At present there are no stormwater facilities located on-site or in the immediate vicinity of the Project site. Various stormwater facilities are anticipated to be installed in support of the BSPP, which is located immediately south of the Project site. Pending final engineering design and installation, these may include facilities to channel runoff around the BSPP site, between the array fields for the BSPP and the Project. No other stormwater facilities are currently located on-site. The McCoy Wash, which is located immediately east of the Project site, fans out onto the alluvial plain before it reaches farmland to the northwest of Blythe. Here, stormwater is channeled into existing drainages that are maintained by the PVID, and eventually to the Colorado River.

3.18.2 Applicable Regulations, Plans, and Standards

3.18.2.1 Federal

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) (Public Law 93-523), passed in 1974, the USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by USEPA primary and secondary Maximum Contaminant Levels (MCLs) that are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting MCLs for drinking water. USEPA has delegated to the CDHCS

the responsibility for administering California's drinking-water program. CDPH is accountable to USEPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by USEPA. The applicable state primary and secondary MCLs are set forth in 22 CCR §64431 et seq.

3.18.2.2 State

California Government Code §4216.2 Notification of Underground Work

California Government Code §4216.2 requires excavators to contact a regional notification center at least two working days before, but not more than 14 calendar days prior to beginning excavation work. Notification is required to be completed for all areas that are known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator. If practical, the excavator is required to delineate, with white paint or other acceptable markings, the area to be excavated. Additional restrictions are provided for locations within 10 feet of a high priority subsurface installation. Additional provisions are applicable to emergency situations.

14 CCR Division 7.3

Title 14 of the CCR provides minimum requirements for solid waste handling and disposal within the state. The regulations implement standards for the disposal and storage of solid waste, for nonhazardous wastes, and including solid wastes from industrial sources. Specific requirements are included for the handling and disposal of construction and demolition wastes, nonhazardous contaminated soil, waste tires, nonhazardous ash, and inert debris. Additional requirements are provided for transfer and processing facilities, siting and design standards, operation, and record keeping and reporting.

22 CCR Division 4.5

Title 22 of the CCR discusses an array of requirements with respect to the disposal and recycling of hazardous and universal wastes. Specific standards and requirements are included for the identification, collection, transport, disposal, and recycling of hazardous wastes. Additional standards are included for the collection, transport, disposal and recycling of universal wastes, where universal wastes are defined as those wastes identified in 22 CCR §66273.9, including batteries, electronic devices, mercury containing equipment, lamps, cathode ray tubes, and aerosol cans. Requirements include recycling, recovery, returning spent items to the manufacturer, or disposal at an appropriately permitted facility. 22 CCR Division 4.5 also provides restrictions and standards relevant to waste destination facilities, and provides authorization requirements for various waste handlers. Note that Title 22 includes California's Universal Waste Rule, as well as other additional waste handling and disposal requirements.

27 CCR Division 2

Title 27 of the CCR implements regulations of CalRecycle and the SWRCB, with respect to disposal of wastes on land. The regulations implement a waste classification and management

system, which determines whether or not wastes are compatible with containment features of specific disposal facilities, and whether or not wastes are considered hazardous. Additional requirements are included for the waste disposal sites, including construction standards, liner requirements, siting criteria, and operational management requirements. Water quality monitoring requirements are also included, along with associated contamination response programs. Finally, disposal facility closure and post closure requirements, compliance with reporting programs, and financial assurance requirements are also included.

Integrated Waste Management Act

The Integrated Waste Management Act was enacted in 1989, as AB 939. The Act required each of the cities and unincorporated portions of counties throughout the state of California to divert a minimum of 25 percent of solid waste from landfills by 1995 and 50 percent by 2000. To attain these goals for reductions in disposal, the Act established a planning hierarchy utilizing integrated solid waste management practices. The Act resulted in the creation of the California Integrated Waste Management Board, which is now known as CalRecycle. Under the Act, jurisdictions also have to submit solid waste planning documentation to CalRecycle. The Act also set into place a comprehensive statewide system of permitting, inspections, and maintenance for solid waste facilities, and authorized local jurisdictions to impose fees based on the types and amounts of waste generated.

3.19 Visual Resources

This section introduces the study area in terms of its existing value as a visual resource, and describes the applicable regulatory framework that seeks to manage and preserve scenic landscapes. Following a description of the characteristics and extent of the study area, this section focuses on determining the extent and quality of visual resources in the study area by reporting on the results of two existing visual resource inventories that have been completed in the study area. In addition, this section relies on the results of a site reconnaissance carried out in support of this PA/EIS. On September 7th and 8th, 2011, ESA performed a site reconnaissance in order to (1) document the visual character of the study area, (2) verify the degree and extent to which the Project site is visible from publicly accessible locations, (3) evaluate the use and accessibility of BLM facilities and wilderness areas, and (4) gather information on nighttime lighting conditions.

3.19.1 Environmental Setting

3.19.1.1 Regional Setting

The Project site is located in the Mojave Desert geomorphic province of California, also referred to as the Sonoran Desert section of the Basin and Range physiographic region of the United States.[1] The Project site is within a broad interior region of isolated mountain ranges separated by expanses of internally drained desert plains. Located on the Palo Verde Mesa, the Project site is bounded on all sides by a number of mountain ranges, except for the mesa's southeastern edge, which is elevated relative to Palo Verde Valley. Numerous desert arroyos emanating out of the surrounding mountains dissect the gently sloped, coalescing alluvial fans, eventually meeting in the center of the basin to form the southeast-draining McCoy Wash. While most of the plains in the region are internally drained, McCoy Wash drains the surrounding mountains southwest towards the Palo Verde Valley, forming a local break in the mesa as viewed from the valley. The vicinity of the Project site is visually dominated on the west by the steeply rising, barren-sloped McCoy Mountains, and on the north to northeast by the Little Maria and Big Maria Mountains. The Palo Verde Mesa is mantled by desert scrub and desert dry wash woodland, comprised largely of Sonoran creosote bush and species typical of the riparian shrub woodland community.

3.19.1.2 Visual Character

The visual character of the landscape within the region has substantial variability based on the location of the viewer and other visual variables, such as seasonal climate, atmospheric and lighting conditions, cultural modifications, and the visibility, presence, and extent of character-defining visual features. The visual quality of the landscape, visual variables, and the manner in which a viewer experiences the landscape setting (i.e., the cumulative impression felt by different types of users traveling through an area) are all factors that combine produce visual experiences

[1] California's geomorphic provinces and the physiographic regions of the U.S. are naturally defined geologic regions that display a distinct landscape or landform. These divisions are based on unique, defining features such as geology, topographic relief, climate, and vegetation. The distinction between California's geomorphic provinces and the physiographic regions of the U.S. is in the scale at which they are defined.

that are unique and difficult to quantify. However, the visual character of the region can be broadly generalized within two primary contexts: the natural landscape and the built environment (i.e., areas where cultural modifications dominate, or nearly dominate the visual character of an area).

Natural Landscape

Context photographs of the natural landscape of the Palo Verde Mesa are shown in Figure 3.19-1a from several different vantage points. Generally, the landscape can be characterized as panoramic in nature, due to the wide expanse of the landscape that is unencumbered by intervening features. From low angles of view, foreground and middleground views are greatly shortened/diminished, forming a continuous horizon line that distinctly separates the valley floor from background views of the mountains, although the prominence of the line can be blurred by distance, atmospheric haze, and/or broken up by intervening desert scrub. In this visual context, viewers are drawn to background views of the mountains, which stand in sharp contrast to the landscape character elements of form, color, and texture of the valley floor. Landscapes such as these are unencumbered and wide in scale, and accurate perceptions of distance are difficult to make. Vertical features that cut through middleground and background views—which in heavily vegetated landscape contexts could be easily overlooked—are more likely to attract the attention of an observer. The primary public roadways on the Palo Verde Mesa (Midland Road and Hobson Way) provide low-angle views of the mesa, and viewer attention is most typically drawn to prominent visual features in the foreground, or in the absence of foreground features, to the closest mountain range (such as easterly views of the Big Maria Mountains).

As viewers in the landscape gain elevation, the shape, texture and colors of the valley floor begin to attract greater attention as it occupies a greater portion of the view. Vegetation growing along the desert washes stand in contrast to the sparsely vegetated desert pavements, and in places can form bold lines in the valley floor. In elevated locations with close-range views of adjacent mountains, the landscape begins to take on a focal character, as the jagged, pyramidal outlines of the mountains and the converging desert washes draws viewer attention toward the middle of the scene. In views toward the Palo Verde Mesa, the distance and scale of the valley floor become increasingly apparent, and distant mountain ranges lose some degree of dominance in the scene, especially in circumstances of haze or cloudiness. Within the Palo Verde Mesa and surrounding mountain ranges, high-angle views are only accessible on foot, and are not available from paved public roadways within the viewshed. Intermediate-angle views are available from several OHV routes that access the mountain ranges on either side of the mesa, but such routes generally remain between mountain peaks, and avoid drastic elevation gains.

Built Environment

Context photographs of the built environment of the Palo Verde Mesa are shown in Figure 3.19-1b from several different vantage points. The built environment's effect on the visual character of the landscape is to introduce numerous foreground and middleground elements that stand in visual contrast to the natural character of the surrounding environment. The greatest degree of development on the mesa is probably along Hobson Way, which contains the Blythe Airport, the

Blythe Energy Center, a sewage disposal plant, and a substation. Long-range, northerly views from Hobson Way are obstructed by several buildings, structures, and numerous power poles. These features tend to break up the continuity of the landscape and distract the viewer from the natural landscape elements. In some circumstances, however, such as views of agricultural fields that are not interrupted or degraded by electrical utilities or industrial-appearing structures, the built environment can have a positive influence on the aesthetic quality of views by adding pattern, color and harmony into views that would otherwise be muted in color and lacking in texture. Further, housing development designed with aesthetic considerations in mind can also add visual variety and have a locally positive influence on the visual character of an area. Built features that generally have the greatest negative influence on the visual character of the region are associated with industrial, mining, and utility-related land uses, as well as improperly sited and designed roadways.

3.19.1.3 Project Viewshed and Visibility

The study area is defined as all land areas from which any element of the Project would be visible, i.e., the Project's viewshed. The Project viewshed is shown in Figure 3.19-2, and was generated via computer-generated viewshed tools, based on numerous points that model the location and height of the proposed solar plant site and gen-tie line, and a 10-meter resolution (horizontal) USGS digital elevation model. Bolder colors in Figure 3.19-2 represent areas where the Project would be visible from a greater angle (as opposed to being viewed side-on at a similar elevation). In addition to estimating the extent and angle of visibility, the viewshed calculation is useful in determining which existing roadways and other publicly accessible vantage points are located within the viewshed of the Project site.

Because viewshed calculations do not consider the presence of intervening vegetation, structures, atmospheric haze and diminished visibility caused by distance, the visibility of the Project site was verified during a site reconnaissance. The site reconnaissance found that views of the solar plant site are not available from the City of Blythe and adjacent agricultural lands within the Palo Verde Valley. Even in locations where northwesterly views are not blocked by intervening vegetation or buildings, the location of the Project site above and behind the crest of the Palo Verde Mesa eliminates all potential views of the Project site. Further, only the gen-tie line would be visible from I-10. In northerly views from the highway, views of the solar plant site are generally blocked by foreground elements such as vegetation, structures, and signage. Even in locations along the highway where foreground elements are not present, the Project solar plant site is screened by topography. Similar viewing conditions exist along Hobson Way, which is located parallel to and just north of I-10, although northerly views may provide brief glimpses of the solar plant site which would be low-angle, distant, and partially screened. The primary public roadway along which views of the Project site would be most prominent and long-lasting would be Midland Road, which extends in a northwesterly direction from the north end of the City of Blythe.

Based on the study area, the location of public roadways, BLM facilities, and other public vantage points, seven key observation points (KOPs) were chosen in consultation with the BLM. The purpose of the KOPs was to capture representative views of the Project site, to be used in visual

simulations of the Project, and as an aid in preparing visual contrast ratings of the Project. The location of the KOPs are shown in Figure 3.19-2; however, the visual characteristics of each viewpoint and the Project-related visual contrast are fully detailed in Section 4.19.

3.19.1.4 Nighttime Lighting Conditions

With the exception of southerly views towards Blythe, I-10 and Hobson Way, night skies in the vicinity of the Project on the Palo Verde Mesa are very dark and absent of any significant or substantial light sources. A nighttime reconnaissance was performed the night of September 7, 2010, at the Midland LTVA, when conditions were clear and cloudless. Stargazing conditions were excellent and skyglow from light sources to the south affected only the very lowest southerly horizon line with no noticeable adverse effect on the visibility of the nighttime sky. The most intense/bright light sources in southerly views were associated with the Blythe Airport, the Blythe Energy Center, and Palo Verde College. Other developments along Hobson Way, further south along Midland Road, and further in the distance toward the City of Blythe were less intense but greater in number. In westerly and northwesterly views, two minor unshielded light sources of unknown origin were present in the vicinity of the McCoy Wash. In all other view directions, no other light sources were visible, and none of the light sources present in the viewshed were sufficiently intense to be distracting or to noticeably reduce the visibility of the night sky and stars.

3.19.1.5 Approach to Baseline Analysis

BLM's Visual Resource Management (VRM) Policy is the agency's implementation of requirements from FLPMA and other sources for managing scenic resources. Pursuant to FLPMA, BLM has developed and applied a standard visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. BLM Manual M-8400-Visual Resource Management (BLM, 1984), Handbook H-8410-Visual Resource Inventory (BLM, 1986a), and Handbook H-8431-Visual Resource Contrast Rating (BLM, 1986b) set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating Proposed Actions for conformance to the established objectives for BLM-administered public lands. The following describes the three primary elements of the BLM's VRM Policy.

Determining Visual Resource Values

The primary means to establish visual resource values are to conduct a Visual Resource Inventory (VRI), as described in BLM handbook H-8410. There are four VRI Classes (I to IV) assigned as a representation of the relative visual value. VRI Class I has the highest value and VRI Class IV has the lowest. VRI Class I is reserved for special congressional designations or administrative decisions such as Wilderness Areas, visually sensitive ACECs, or Wild and Scenic Rivers, etc. Visual resource values are determined through a systematic process that documents the landscape's scenic quality, public sensitivity, and visibility. Rating units for each of these factors are mapped individually, evaluated, and then combined through an over-layering analysis. The three considerations are briefly described below.

Scenic Quality: Scenic Quality Rating Units (SQRUs) are delineated based on common characteristics of the landscape. There are seven criteria used for inventorying the landscape's scenic quality within each SQRU: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and degree of cultural modification. Each factor is scored for its respective contribution to the scenic quality, the scores are summed, and the unit is given a rating of A (highest), B, or C (lowest) based on the final score.

Sensitivity Level: Sensitivity Level Rating Units (SLRU) are delineated and evaluated for public sensitivity to landscape change. Criteria used for determining level of sensitivity within each unit includes types of use, amount of use, public interest, adjacent land uses, special areas, and other factors. Each criterion is ranked high, medium, or low and an overall sensitivity level rating then is assigned to the unit.

Distance Zones (visibility): The third factor is visibility of the landscape evaluated from where people commonly view the landscape. The distance zones are divided into foreground/middleground (3 to 5 miles); background (5 to 15 miles); and seldom seen (beyond 15 miles or topographically concealed areas within the closer range distance zones).

The relationships between the rated values of scenic quality, sensitivity level, and visibility are cross-referenced with the VRI Matrix to determine the VRI Class, as shown in Table 3.19-1. VRI classes are informational in nature and provide the basis for considering visual values in the RMP process. They do not establish management direction and should not be used as a basis for constraining or encouraging surface disturbing activities. They are considered the baseline data for existing conditions.

TABLE 3.19-1
DETERMINING VISUAL RESOURCE INVENTORY CLASSES

		Sensitivity Level								
		High			**Medium**			**Low**		
Special Areas		I	I	I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II	II	II
	B	II	III	III/IV[a]	III	IV	IV	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV	IV	IV
		Fg/mg	Bg	Ss	Fg/mg	Bg	Ss	Fg/mg	Bg	Ss
		Distance Zones								

NOTES:

[a] If adjacent area is Class III or lower assign Class III, if higher assign Class IV

Fg/mg=Foreground/Middleground
Bg=Background
Ss=Seldom seen

SOURCE: BLM, 1986a

Establishing Management Objectives

VRM Classes (defined in Table 3.19-2) are determined by considering both VRI Class designations (visual values) along with resource allocations or special management decisions made in the applicable RMP. Management objectives for each VRM Class set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape. Thus, the allowable levels of visual change for VRM Classes I through IV are decreasingly restrictive.

TABLE 3.19-2
VISUAL RESOURCE MANAGEMENT CLASSES

VRM Class	Objective
Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape
Class IV	The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

VRI Classes are not intended to automatically become VRM class designations. VRM classes are determined through careful analyses of other land uses and demands. The VRM classes are considered a land use plan decision that guides future land management actions and subsequent site-specific implementation decisions. The VRM class designations are to be assigned to all BLM public land. The VRM class designations may be different than the VRI classes assigned in the inventory and should reflect a balance between protection of visual values while meeting energy and other land use or commodity needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction, or its designation as a utility corridor.

While the applicable RMP for the study area is the CDCA Plan, it does not contain a visual resource element, and has not established VRM Classes. For a description of the Project's applicable land use plan (CDCA), as it related to visual resources, refer to Section 3.19.2.1. When a project is proposed and there are no RMP-approved VRM objectives, Interim VRM Classes must be established in order to establish a baseline for analysis only. These classes are developed using the process just described, but may be restricted in geographic scope to areas affected by the Proposed Action. If the area is also without a VRI, then one must be conducted in order to

provide a baseline of data by which to analyze impacts and to inform appropriate designation of Interim VRM Classes.

Evaluating Proposed Actions

Proposed plans of development are evaluated for conformance to the VRM Class objectives through the use of the Visual Resource Contrast Rating process set forth within BLM Handbook H-8431-1. Because this concerns the environmental consequences of the Proposed Action, this process is further described and applied in Section 4.19.

3.19.1.6 Visual Resource Inventory of the Project Area

Sources of Visual Resource Inventory Data

Lands along the gen-tie line have already been assigned VRI Classes in connection with SCE's DPV2 500 kV Transmission Line Project EIR/EIS (CPUC, 2006). The existing Devers-Palo Verde No. 1 500kV transmission line is approximately 1 mile south of and parallel to I-10 in this location. However, the Interim VRM classes for the DPV2 Project do not cover the majority of the areas affected by the Project, including the solar plant site, the portion of the gen-tie line and access road adjacent to the east side of the BSPP, and the distribution line. For these areas, a recently-conducted, large-scale visual resource inventory of BLM-managed lands extending east from Palm Springs to the Arizona border (herein referred to as the BLM Palm Springs Field Office VRI) shall be used as a source of baseline data (Otak Inc., 2011). It represents the best available information on visual resources for land not covered by Interim VRM Classes developed for the DPV2 Project. Hence, the BLM Palm Springs Field Office VRI will be used to describe the visual values of the affected area.

Scenic Quality Ratings

Scenic quality ratings are summarized below, divided based on Project component and associated source of VRI data.

Gen-Tie Line South of BSPP

The baseline inventory for the DPV2 Project included two scenic quality rating units that encompass the gen-tie line portion of the Project: SQRU No. 12 encompassing the Chuckwalla Valley, and SQRU No. 14 which included McCoy Mountains and the valley area at the base of its southern end. Documentation of the scenic quality rating, including photographs and evaluation of scenic quality factors, is provided in Appendix F. A description of each is given below.

Scenic Quality Rating Unit No. 12 – Chuckwalla Valley. SQRU 12 encompasses the central-eastern portion of Chuckwalla Valley in the vicinity of the exiting gen-tie lines south of I-10. The landform of the valley floor is flat and non-descript with grass and low-growing shrubs of subdued color. Though distant mountain ranges (McCoy Mountains to the north and Chuckwalla Mountains to the south) provide distant backdrops of visual interest (not part of this unit), SQRU 12 is primarily influenced by the dominant presence of existing utility infrastructure and I-10.

This landscape unit was given a scenic quality rating of C, based on the combination of scores for landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The most influential factor in this unit's low rating for scenic quality was the abundance of cultural modification along I-10 (roads, transmission lines, 4-wheel drive tracks, etc.) and the flatness and lack of visual variety in landform (though relatively high marks were given for adjacent scenery).

Scenic Quality Rating Unit No. 14 – McCoy Mountains. SQRU No. 14 encompasses McCoy Peak and the southern end of the McCoy Mountains. The proposed Project gen-tie line north of I-10 and south of the southern edge of the BSPP solar plant site is within this landscape unit. The Chuckwalla Valley floor that abuts the McCoy Mountains is flat and relatively non-descript with low growing grasses and shrubs. Colors are dominated by the light tan-to-pale yellow grasses and green shrubs. The McCoy Mountains provide some variety in color with hues ranging from blue to magenta to brown. Unlike the surrounding Units (10, 12, and 15), the Unit 14 landscape is dominated by rugged mountainous terrain with little influence from built structures (though 4WD access tracks are visible as linear features when viewed in-line).

This landscape unit was assigned as scenic quality rating of B, based on the combination of scores for landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The most influential factors in the B-quality rating were the unit's relatively undisturbed state and the dramatic and rugged peaks in the foreground.

Project Solar Plant Site, Gen-Tie Line on the perimeter of the BSPP, and Distribution Line

The BLM Palm Springs Field Office VRI encompassed the affected area for the majority of the Proposed Action including the Project solar plant site, the gen-tie line and access road on the eastern perimeter of the BSPP, and distribution line. The scenic quality rating unit identified for the Project area is identified as SQRU No. 19 – Chuckwalla Valley. Documentation of the scenic quality rating, including photographs and evaluation of scenic quality factors is provided in Appendix F.

The SQRU is described in the inventory as a broad, enclosed landscape surrounded on most sides by dramatic mountain ranges. The landscape unit is described as vast and natural-appearing with vegetation that is somewhat visually dominant. The scores and description for this rating were consistent with the description for SQRU No. 14 in the DPV2 Project. Accordingly, this landscape unit was given a scenic quality rating of B, based on the combination of scores for landform, vegetation, water, color, adjacent scenery, scarcity and cultural modifications. The most influential factor in the B-quality rating was the adjacent scenery created by the surrounding dramatic and rugged peaks.

Visual Sensitivity

Sensitivity level ratings are summarized below, divided based on Project component and associated source of VRI data.

Gen-Tie Line South of BSPP

In determining the sensitivity level of the affected area, the VRI for the DPV2 Project assigned a high visual sensitivity level, based on the rationale that the CDCA was designated by Congress in large part for its visual values and uniqueness in terms of being a fairly undisturbed portion of the California Desert close to large population centers.

Project Solar Plant Site, Gen-Tie Line and Access Road on the perimeter of the BSPP, and Distribution Line

The BLM PSSCFO VRI assigned a sensitivity level of medium to the area affected by the Project solar plant site, the gen-tie line and access road on the eastern perimeter of the BSPP, and distribution line (the sensitivity level rating unit was identical to the SQRU). This rating was based on relatively low levels of recreation use, a history of low-level development of private lands in the area, and use as a transportation and utility corridor. The sensitivity level was determined as medium (and not low) in recognition of the area as belonging to the CDCA, and being surrounded by BLM wilderness areas. Documentation of the sensitivity level rating is provided in Appendix F.

Distance Zones

According to both VRIs, all portions of the Project are within the foreground/middleground zone because I-10 and other public roads are located within a distance of 5 miles.

Visual Resource Inventory Classes

Based on the visual resource inventory classification matrix in Table 3.19-3, all areas of the Project are rated as VRI Class III except for the gen-tie line north of I-10 and south of the southern edge of the BSPP solar plant site, which is assigned a VRI Class II. Scenic quality, visual sensitivity, distance zones, and VRI Classes for the Project are summarized in Table 3.19-3, and illustrated in Figure 3.19-3. This indicates the lands affected by the Project have a moderate visual value.

3.19.1.7 Interim Visual Resource Management Class Recommendations

As discussed above, there are currently no VRM Classes established for lands under BLM jurisdiction within the CDCA Plan area, and VRM classes differ from VRI Classes in that they represent decisions about how the land will be managed in conjunction with resource allocations and management priorities outlined in the applicable RMP. The designation and adoption of Interim VRM classes conducted in support of a specific project is a BLM Field Office Manager decision. As required under BLM guidance, Interim VRM Classes have been adopted by the BLM in connection of with the DPV2 Project. In the case of the DPV2 Project, the Interim VRM Classes mirrored the VRI Classes established in the baseline inventory and will be carried forward into this analysis. Accordingly, areas adjacent to and south of I-10 along the gen-tie line would be managed in accordance with Interim VRM Class III objectives, and the transmission ROW between the southern boundary of the BSPP solar plant site and approximately400 feet north of I-10 would be managed in accordance with Interim VRM Class II objectives.

TABLE 3.19-3
SUMMARY OF VISUAL VALUES AND MANAGEMENT OBJECTIVES

Project Component/Source	Scenic Quality Rating	Sensitivity Level	Distance Zone	Visual Resource Inventory Class[a]
Gen-tie line north of I-10 and south of the southern edge of the BSPP solar plant site * DPV2 Inventory	B	High	Foreground/Middleground	Class II
Gen-tie line south of I-10 * DPV2 Inventory	C	High	Foreground/Middleground	Class III
Project solar plant site, the gen-tie line and access road on the eastern perimeter of the BSPP, and distribution line * BLM Palm Springs Field Office Draft VRI	B	Medium	Foreground/Middleground	Class III

NOTE:
[a] As determined using the VRI classification matrix presented in Table 3.19-1

SOURCE: Otak Inc., 2011; CPUC, 2006

For the Project solar plant site, the gen-tie line and access road on the eastern perimeter of the BSPP, and distribution line, the process of developing Interim VRM classes has not been completed (only the baseline inventory has been developed). However, it is recommended that the area be managed according to an Interim VRM Class III designation based on the following: (1) the proposed Project area was assessed as VRI Class III, (2) the Multiple Use Class of the Project area is "L" (limited), which allows for consideration of wind or solar electrical generation facilities after NEPA requirements are met. It is the field manager's determination upon approval of this recommendation that the area be designated as Interim VRM Class III. The Field Manager for the BLM Palm Springs/South Coast Field Office has agreed with this recommendation, as documented in Appendix F.

As a result of the above determinations, the VRM Class objectives for which the Project would be managed reflect the VRI Classes presented in Figure 3.19-3.

3.19.2 Applicable Regulations, Plans, and Standards

3.19.2.1 Federal

CDCA Plan

Under FLPMA §601, the BLM has developed the CDCA Plan to "provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality." Central to the CDCA Plan is the establishment of Multiple Use Classes that govern the management of the public lands based on the sensitivity of the resources and types of uses for each geographic area. As discussed in greater detail in Section 3.10, *Lands and Realty*, multiple use

classes are divided into four categories, each of which have specific guidelines for the management of specific resource or activity areas contained and discussed in each of the CDCA Plan Elements.

The proposed Project site is located within lands designated "Class L," or limited use. There is no stand-alone visual resource plan element within the CDCA; however, the visual values are addressed within the recreation element of the CDCA Plan. According to the recreation element, the BLM will take the following actions to effectively manage for activities involving the alteration of the natural character of the landscape (BLM, 1980):

1. The appropriate levels of management, protection, and rehabilitation on all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple use class guidelines.

2. Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using the BLM's contrast rating process.

The contrast rating process is a tool used to determine the extent of visual impact that proposed resource management activities would create in a landscape. It serves as a guide for reducing visual impacts to acceptable levels as defined by the visual management objectives and multiple use class guidelines. Applicable visual resource management objectives are identified above in Section 3.19.8.1, and defined in Table 3.19-2. The visual contrast rating process is further discussed in Section 4.19.

3.19.2.2 State

No applicable state regulations, plans, or standards related to visual resources were found.

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3.20 Water Resources

This section describes the existing hydrology/drainage including the extent of jurisdictional waters, water quality, groundwater, and flooding, in the Project area, including key issues relevant to the impact analysis provided in subsequent chapters. This section also identifies regulations, plans, and policies including federal, state, and local laws related to water resources that are relevant to the MSEP.

3.20.1 Environmental Setting

The MSEP site is located in the northwestern Colorado Desert, which is part of the greater Colorado Desert Geomorphic Province. This Province is characterized by isolated mountain ranges separated by broad alluvial-filled basins of Cenozoic-age sedimentary and volcanic materials overlying older rocks. Much of the Colorado Desert lies at low elevations, with some areas below sea level.

Specifically, the Project site is located in the alluvial-filled basin of the Palo Verde Mesa in eastern Riverside County. Beneath the Palo Verde Mesa lies the PVMGB, which is bounded by non-water-bearing rocks of the Big Maria and Little Maria mountains to the north, by the McCoy and Mule mountains to the west, and by the Palo Verde Mountains to the south. See Figure 3.20-1.

To the east are the Palo Verde Valley and the Colorado River. The Big Maria Mountains and the McCoy Mountains are the contributing watersheds to the Palo Verde Mesa. McCoy Wash, a tributary of the Colorado River, flows southeast approximately 2,000 feet north of the northeastern corner of the site. Surface water drains from the surrounding mountains toward the Colorado River. There are no perennial streams on the Palo Verde Mesa. The PVMGB encompasses an area of about 353 square miles or 226,000 acres, is tributary to the lower Colorado River, and is part of the Colorado River aquifer (DWR, 2004).

The Palo Verde Mesa has a generally low relief until near the surrounding mountains. There are two distinct river-cut terraces that form a topographic break westward from the Colorado River. The MSEP site is located on the uppermost of the two terraces that comprise the mesa. Approximately 3 miles east of the eastern site boundary, a sharp break in the slope forms the boundary between the Palo Verde Mesa and the Palo Verde Valley, which is 80 to 130 feet below the mesa. In this region, the Palo Verde Valley is roughly equivalent to the recent historic floodplain of the Colorado River.

The ground surface slopes gently downward in a southeast direction away from the McCoy Mountains at a gradient of less than 1 percent. MSEP site elevation ranges from about 720 feet along the western edge of the site, to approximately 580 feet along the southeastern corner of the site. Grades on site are generally gently sloping, at or less than 1.5 percent. However, steeper grades do occur on site in some areas.

3.20.1.1 Climate and Precipitation

The climate on the Palo Verde Mesa, which is classified as a "low desert," is characterized by high aridity and low precipitation. The region experiences a wide variation in temperature, with very hot summer months with an average maximum temperature of 108 ºF in July and cold, dry winters with an average minimum temperature of 66.7 ºF in December. The Blythe area receives approximately 3.5 inches of rainfall per year. The majority of the rainfall occurs during the winter months, but rainfall during the late summer is not uncommon. The summer rainfall events tend to be a result of tropical storms that have a short duration and a higher intensity than the winter rains. Annual precipitation ranges from 0.02 to 0.47 inches per month for a total annual precipitation of just under 4 inches. Table 3.20-1 and Table 3.20-2 display the average monthly and annual minimum and maximum temperatures and precipitation (rainfall) from 1948 to 2011, as collected from the Blythe Airport, located approximately 5 miles southeast of the MSEP site.

Average annual precipitation in the MSEP area, based on the gauging station at Blythe Airport, is 3.55 inches, with August recording the highest monthly average of 0.61 inches and June recording the lowest monthly average of 0.02 inches. Evapotranspiration rates in the vicinity of the MSEP are high, characteristic of the surrounding desert environment and dry, hot climate. Table 3.20-3 presents average monthly evapotranspiration rates for various stations located in the region.

TABLE 3.20-1
CLIMATE TEMPERATURE DATA RECORDED AT BLYTHE AIRPORT, CALIFORNIA

	Temperatures °F					Mean Number of Days			
	Monthly Averages			Record Extremes		Max. Temp.		Min. Temp.	
Month	Daily Max.	Daily Min.	Monthly	Record High	Record Low	90°F & Above	32°F & Below	32°F & Below	0°F & Below
Jan	66.8	41.6	54.2	89	20	0	0	2.6	0
Feb	71.9	45.4	58.6	93	22	0.2	0	0.8	0
Mar	78.	50.2	64.4	100	30	3.0	0	0.1	0
Apr	86.4	56.5	71.4	107	38	11.5	0	0	0
May	95.2	64.4	79.8	114	43	23.7	0	0	0
Jun	104.5	72.7	88.6	123	46	29	0	0	0
Jul	108.4	81.1	94.8	123	62	30.9	0	0	0
Aug	106.7	80.2	93.5	120	62	30.7	0	0	0
Sep	101.4	73.1	87.3	121	53	28.5	0	0	0
Oct	89.8	60.8	75.3	111	27	17.5	0	0	0
Nov	75.9	48.6	62.3	95	26	0.8	0	0.1	0
Dec	66.6	41.3	54.0	87	24	0	0	1.8	0
Year	87.7	59.7	73.7	123	20	175.7	0	5.4	0

SOURCE: WRCC, 2011a.

TABLE 3.20-2
PRECIPITATION DATA RECORDED AT BLYTHE AIRPORT, CALIFORNIA

Month	Rainfall (inches) [1913-2008]			
	Mean	Highest	Lowest	Highest Daily
Jan	0.48	2.48	0	1.64
Feb	0.45	3.03	0	1.66
Mar	0.35	2.15	0	1.52
Apr	0.15	3.00	0	2.67
May	0.02	0.22	0	0.22
Jun	0.02	0.91	0	0.91
Jul	0.26	2.44	0	1.4
Aug	0.61	5.92	0	3.0
Sep	0.35	2.14	0	1.9
Oct	0.26	1.89	0	1.61
Nov	0.19	1.84	0	1.04
Dec	0.41	3.33	0	1.42
Year	3.55	9.16	0.59	3.0

NOTES: (a) Totals may not match the data in specific columns due to rounding errors.

SOURCE: WRCC, 2011b

TABLE 3.20-3
MONTHLY AVERAGE EVAPOTRANSPIRATION RATES FOR THE MSEP VICINITY

Month	CIMIS Station #135	CIMIS Station #151	CIMIS Station #162	CIMIS Station #175	Regional
	Station: Blythe NE	Station: Ripley	Station: Indio	Station: Palo Verde II	
Jan (in/mo)	2.32	2.44	2.44	2.41	2.48
Feb (in/mo)	3.09	3.31	3.31	3.22	3.36
Mar (in/mo)	5.00	5.25	5.25	5.59	5.27
Apr (in/mo)	6.61	6.85	6.85	7.22	6.90
May (in/mo)	8.54	8.67	8.67	8.78	8.68
Jun (in/mo)	9.69	9.57	9.57	9.42	9.60
Jul (in/mo)	10.13	9.64	9.64	9.58	9.61
Aug (in/mo)	8.91	8.67	8.67	8.61	8.68
Sep (in/mo)	6.85	6.85	6.85	6.58	6.90
Oct (in/mo)	4.64	5.00	5.00	4.74	4.96
Nov (in/mo)	2.95	2.95	2.95	2.94	3.00
Dec (in/mo)	2.07	2.20	2.20	2.25	2.17
Year (in/yr)	70.8	71.4	71.4	71.35	71.6

NOTES: CIMIS monitoring station closest to the site are listed.
Regional evapotranspiration values correspond to CIMS Reference ETo Zone 18, which includes Imperial Valley, Death Valley, and Palo Verde.

SOURCE: CIMIS, 2012.

3.20.1.2 Groundwater

Groundwater in the area of the MSEP is contained within the Colorado River Hydrologic Region, which covers about 19,962 square miles of southeastern California, and overlaps portions of San Bernardino, Riverside, San Diego, and Imperial counties (DWR, 2003). The Colorado River Hydrologic Region is bound to the west by the San Bernardino, San Jacinto and Launa Mountain ranges; to the north by the New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord mountain ranges and the State of Nevada; to the east by the Colorado River and the State of Arizona; and to the south by the border of the United States and Mexico. The Colorado River Hydrologic Region also includes the Salton Sea and the Coachella and Imperial valleys, and has an average annual precipitation of 5.7 inches.

The Colorado River Hydrologic Region is subdivided into 28 groundwater basins. The MSEP overlies the PVMGB, which lies directly west of the Palo Verde Valley Groundwater Basin (PVVGB). The PVVGB underlies the Colorado River and surrounding areas, and functions as the river's historic flood plain. The PVVGB is tributary to the lower Colorado River, and is part of the Colorado River aquifer. The PVMGB contains somewhat higher ground surface levels that are outside of the Colorado River's historic flood plain. The location of the boundary between the PVMGB and the PVVGB does not include a barrier to groundwater flow; groundwater readily flows from one to the other. The discussion provided below acknowledges these groundwater flow characteristics.

There are no significant subsurface structural features that restrict horizontal groundwater flow within the PVMGB according to the DWR (1979, 2003). The PVMGB is not listed on the DWR list of adjudicated groundwater basins (DWR, 2012), but is likely subject to the Colorado River Compact, 1922, the Boulder Canyon Project Act, and the Consolidated Decree 547 U.S. 150 (2006) (U.S. Supreme Court).

In the PVMGB, groundwater provides a source of water for domestic, industrial, and agricultural water supply. Surface water from the Colorado River, through the Palo Verde Irrigation District (PVID), is the primary source of water for agriculture in the area. In 2010 the PVID supplied about 270,000 AF of water for agricultural use (United States Bureau of Reclamation, 2011), wherein PVID's service area includes a portion of the PVMGB.

Natural groundwater recharge to the PVMGB includes recharge from precipitation and subsurface inflow from the Chuckwalla Valley Groundwater Basin (CVGB) to the west (DWR, 2004), as well as water derived from the Colorado River to the east (see also "Subsurface Inflow" section, below). Other sources of recharge to the basin include agricultural return flow. The estimated inflow and outflow rates discussed in the subsections below are summarized in Table 3.20-4, which provides estimates of recharge from precipitation, underflow into the basin, and irrigation return flow, as well as groundwater outflow associated with groundwater extraction.

TABLE 3.20-4
ESTIMATED ANNUAL GROUNDWATER BUDGET, PVMGB

Budget Components	Budget (AFY)
Recharge from Precipitation	3,086
Underflow from Chuckwalla Valley Groundwater Basin	400
Underflow from Colorado River	1,200
Underflow from Palo Verde Valley Groundwater Basin	1,244
Irrigation Return Flow	770
Total Inflow	***6,700***
Groundwater Extraction	6,700
Total Outflow	***6,700***
Budget Balance (Inflow-Outflow)	**0**

SOURCE: CEC, 2010

Recharge from Precipitation

In this area of the Colorado Desert, almost all moisture from rain is lost through evaporation or evapotranspiration and runoff occurs principally during intense thunderstorms (Colorado River RWQCB, 2006). Most recharge from precipitation occurs when runoff from the surrounding mountains exits bedrock canyons and flows across the coarse sediments deposited along the western edge of the PVMGB.

Methods to estimate runoff proposed by Hely and Peck (1964) were used by AECOM (2010a) to estimate mean annual runoff in the PVMGB. Hely and Peck estimated runoff based on precipitation data, the rainfall-runoff relationship, and observed characteristics of the terrain. AECOM (2010a) reviewed topographic and geological data to divide the PVMGB into localities that approximated those described by Hely and Peck (i.e., mountains, hills, alluvium-steep slope, or alluvium-shallow slope). AECOM calculated the area for each locality. Information from Hely and Peck was used to select an average runoff curve number for each locality assuming an average of all soil types. For example, an average runoff number of 74 was selected for alluvium-steep slope. Hely and Peck developed a relationship between the runoff curve number and the runoff as a percentage of the precipitation. The annual volume of runoff from each locality was calculated by multiplying the area times the mean annual precipitation times the percentage of runoff estimated for the runoff curve number.

From the estimated total runoff for the PVMGB, simple percentages of 3 to 5 percent were applied to the estimated total volume of rainwater from mean annual precipitation to generate an estimate of total annual infiltration volume (AF) for the basins. Table 3.20-5 presents the estimate of total annual infiltration for the PVMGB.

TABLE 3.20-5
ESTIMATES OF RUNOFF AND INFILTRATION IN PALO VERDE MESA GROUNDWATER BASIN

Layer[a]	Area (acres)	Mean Annual Precipitation (inches)[b]	Total Volume of Rainwater from Mean Annual Precipitation (AF)	Runoff Curve Classification[b]	Runoff Curve Number[b]	Runoff (percent of Precipitation)	Total Annual Volume of Infiltration – Hely & Peck (AF)	Total Annual Volume of Infiltration (AF) based on 3 percent[c]	Total Annual Volume of Infiltration (AF) based on 5 percent[c]
unit1-pvm	23,695	4	7,898	Alluvium, Steep Slope	74	3.50%	276	8	14
bedrockpvm	5,624	4	1,875	Mountains	93	29.10%	546	16	27
bedrockpvm	16,819	6	8,409	Mountains	93	29.10%	2,447	73	122
bedrockpvm	13,571	4	4,524	Mountains	93	29.10%	1,316	39	66
bedrockpvm	18,298	4	6,099	Hills	83	10%	610	18	30
unit1-pvm	79,574	5	33,156	Alluvium, Steep Slope	74	3.50%	1,160	35	58
unit2-pvm	382	4	127	Hills	83	10%	13	0	1
unit2-pvm	122,370	4	40,790	Alluvium, Flat Slope	69	2%	816	24	41
Totals	***280,332***	***---***	***102,878***	***---***	***---***	***---***	***7,184***	***216***	***359***

NOTES:
[a] See Figure DR-S&W-179 in AECOM 2010b.
[b] From Hely & Peck, 1964.
[c] Based on a percent of Total Volume of Rainwater from Mean Annual Precipitation (Column 4).

SOURCE: AECOM, 2010b, Table DR-S&W-179-1.

Subsurface Inflow

Subsurface inflow into the PVMGB occurs from the Colorado River via the PVVGB, and from the CVGB. Groundwater migrating from the Colorado River through the PVMGB represents most of the subsurface inflow to the basin, while the CVGB is a lesser source. Subsurface inflow from the CVGB is estimated to be 400 AFY (Metzger et al., 1973).

Geochemical and water level data supplied by AECOM (2009, as cited in CEC, 2010) previously suggested that groundwater from the Colorado River could potentially flow through the PVVGB to the PVMGB. However, available data do not substantiate or support this hypothesis, and groundwater connection between the Colorado River and the PVMGB is not anticipated.

AECOM (2011a) indicated relatively stable groundwater levels over time, suggesting very little change of groundwater in storage. In addition, they suggested that groundwater withdrawal from the underlying aquifer has not significantly changed the water balance within the PVMGB due to recharge of water from the Colorado River. As shown in Table 3.20-4, an additional 1,244 AFY of groundwater inflow also occurs from the PVVGB into the PVMGB.

Groundwater Irrigation Demand/Surface Outflow

PVID reports that in 2010, 461 acres within its service area and an estimated 370 acres outside its service area irrigated with groundwater on the mesa (Henning, 2012). Therefore, the total groundwater irrigation demand can be estimated as follows: assuming water usage based on an average annual evapotranspiration rate of 71 inches and an irrigation efficiency of 75 percent yields a water use of 7.9 AF/acre/yr, which equates to approximately 6,600 AFY of groundwater demand in the PVID in 2010.

Irrigation Return Flow

As previously indicated, approximately 6,600 AFY of groundwater is used for irrigation in the PVMGB. In addition, the PVID supplies water (surface water from its irrigation canal system in the Palo Verde Valley that is pumped uphill) to the Palo Verde Mesa area. However, based on reviews of aerial photographs, the area supplied is very small. Assuming 1,000 AFY is supplied by PVID (based on AECOM, 2011a) and the 6,600 AFY is pumped, this equates to approximately 7,600 AFY of irrigation water supplied in the Palo Verde Mesa area. Assuming 10 percent of the applied water infiltrates and recharges the groundwater basin, an estimated 760 AFY recharges the area from irrigation return flow, using 2010 data.

Subsurface Outflow

As previously stated, the PVMGB is in direct connection with the PVVGB. It is possible that at the southern end of the PVMGB, outflow could occur to the adjacent PVVGB. However, at the northern end of the PVMGB, in the vicinity of the MSEP, subsurface outflow from the PVMGB is not expected to occur. Any outflow occurring along the southern end is expected to be minor in comparison to subsurface inflow at the northern end. Therefore, subsurface outflow from the PVMGB is considered insignificant.

Groundwater Budget

Table 3.20-4 summarizes the groundwater budget for the Palo Verde Mesa. The Colorado River underflow is the primary mechanism for recharge to the basin along with infiltration of precipitation (mountain front recharge). The CVGB and irrigation return water also provide inputs to overall basin recharge.

Water Bearing Units

The following water-bearing formations have been identified in the PVMGB.

Quaternary Alluvium

The youngest major units in the Palo Verde region, the Older Alluvium and Younger Alluvium, were deposited by the Colorado River and are the primary water-bearing units of the local aquifer system (referred to as the groundwater system in this report). The Older and Younger Alluvium were deposited as a series of floodplain deposits. The Older Alluvium is composed of ancestral floodplain deposits and results from all but the most recent cycle of erosion and deposition by the Colorado River. The Older Alluvium comprises all of the known groundwater system deposits of the Palo Verde Mesa and extends beneath the Palo Verde Valley, underlying the Younger Alluvium. The Older Alluvium is much thicker than the Younger Alluvium, reaching thickness of 600 feet beneath the central portion of the valley and the mesa and pinching out along the bordering bedrock mountains. The Older Alluvium is composed of sand, silt, and clay with minor amounts of gravel. The USGS also described the composition and productivity of the Older Alluvium in the mesa. The Older Alluvium includes a narrow zone of highly productive gravel lenses, which occur within a mile of the boundary between the PVVGB and the PVMGB.

The most recent erosional episode carved the lowest terrace of the present-day Palo Verde Mesa, as well as a trench in the central portion of these older floodplain deposits. The Younger Alluvium fills this trench with about 100 feet of sediments and comprises the present-day floodplain deposits of the Colorado River within the Palo Verde Valley. The Younger Alluvium is predominately sand and gravel with minor amounts of silt and clay.

Pliocene Bouse Formation

The Pliocene Bouse Formation underlies the Quaternary sediments. The Bouse Formation includes a marine to brackish-water estuarine sequence deposited in an arm of the proto-Gulf of California (Wilson and Owen-Joyce, 1994; Metzger, 1968). This formation has alternatively been interpreted as, or may include, lacustrine sediments deposited in a closed, brackish basin (Stone, 2006). The Bouse Formation is widely reported in the Colorado River valley and tributary basins in southeastern California and descriptions of this formation come from occurrences outside of Chuckwalla Valley. It is reported to be composed of a basal limestone (marl) overlain by interbedded clay, silt, sand, and tufa. The top of the Bouse Formation is relatively flat lying with a reported dip of approximately 2 degrees, south of Cibola (Metzger et al., 1973). These unconsolidated to semi-consolidated sediments are reported to yield several hundred gpm in wells perforated within coarse-grained units (Wilson and Owen-Joyce, 1994).

Miocene Fanglomerate

The following information is from Metzger et al. (1973). The Bouse Formation is unconformably underlain by a fanglomerate composed chiefly of angular to subrounded and poorly sorted, partially to fully cemented pebbles with a sandy matrix. The fanglomerate is likely of Miocene age; however, it may in part be of Pliocene age. The fanglomerate represents composite alluvial fans built from the mountains towards the valley, and the debris of the fanglomerate likely represents a stage in the wearing down of the mountains following the pronounced structural activity that produced the basin and range topography in the area. Bedding surfaces generally dip from the mountains towards the basin. The fanglomerate reportedly dips between 2 and 17 degrees near the mountains due to structural warping. The amount of tilting indicates a general decrease in structural movements since its deposition. The presence, depth and thickness of the fanglomerate beneath the MSEP site is unknown but has been reported in the Parker-Blythe-Cibola area by Metzger et al. (1973).

Bedrock

Bedrock beneath the site consists of metamorphic and igneous intrusive rocks of pre-Tertiary age that form the basement complex (Metzger et al. 1973). The bedrock topography in the study area has not been determined but appears to lie at depths exceeding 1,000 feet bgs in Parker Valley approximately 3 miles to the northeast, and is not indicated to be a significant source of water (Metzger et al., 1973).

Groundwater Occurrence and Movement

The groundwater below the Project site in the central part of the mesa occurs under apparently semiconfined conditions in the older alluvium at a depth of about 200 feet bgs (AECOM, 2011a). In their estimate of groundwater storage, the DWR (1979) used an assumed average saturated thickness of 300 feet and a specific yield of 10 percent for the PVMGB to derive a usable storage of about 5 million AF, with about half of the usable storage estimated to be in the McCoy Wash part of the basin. In subsequent reports, the DWR (2003) listed the groundwater in storage for the basin as “unknown” although they listed the total storage capacity in the basin as approximately 6,840,000 AF.

As described in Section 3.7, *Geology and Soils Resources*, the Project site is not crossed by any known active faults or designated Earthquake Fault Zones. No known barriers or faults inhibit the flow of groundwater in the PVMGB (DWR, 1978, 2003).

Water level elevation contours for the PVMGB and PVVGB drawn from year 2000 water level data gathered from the USGS database and the water level measured south of the MSEP site in October 2009 show that, north of the MSEP site, the groundwater flows to the southeast towards the Colorado River, following the general axial trend of McCoy Wash (AECOM, 2011a). Beneath the MSEP site and in areas south of the MSEP site, groundwater flow “turns” (in response to influence from the Colorado River) towards the south-southeast following the general flow path of the Colorado River (AECOM, 2011a). Based on the 2000 water level data in the

USGS and DWR databases (USGS, 2009; as cited in BLM, 2010; DWR, 2009) for wells located approximately 2 to 3 miles east of the MSEP site, the hydraulic gradient is about 0.007 ft/ft.

Aquifer Characteristics

In their development of a two-dimensional superposition model for the Parker-Palo Verde-Cibola area, which includes the PVMGB, Leake et al. (2008) evaluated published aquifer testing data and through statistical analysis derived a range of transmissivity values from a low value of 6,300 ft^2/day to an average value of 26,200 ft^2/day. They selected a storage coefficient of 0.20 to approximate aquifer conditions throughout their model domain, which includes the CVGB and the PVMGB.

Metzger et al. (1973) provided historical data from pumping tests that were conducted in the 1960s on wells in the PVMGB. They reported transmissivity values ranging from 64,000 to 1,900,000 gallons per day per foot (gpd/ft) of aquifer thickness (or 8,756 to 254,600 ft^2/day), specific yields from 100 to 2,180 gallons per minute per foot of drawdown, and hydraulic conductivities ranging from 210 to 12,300 gallons per day per square foot (gpd/ft^2). The data are summarized in Table 3.20-6. Groundwater production, from wells completed in the PVMGB, averages 1,650 gpm (DWR, 1979). The maximum yield reported was 2,750 gpm from well 6S/22E-16A1, which is approximately 4 miles southeast of the MSEP site. The DWR (1979) indicated that large well yields are common for properly designed and developed wells near the edge of the Palo Verde Valley floodplain, which is east of and adjacent to the PVMGB.

Well yields in the rest of the PVMGB, where sand is the dominant lithology, are lower. Yields greater than 1,000 gpm are reported in wells in the McCoy Wash area. The depth of these wells range from 250 to 600 feet and the wells are 12 to 16 inches in diameter (DWR, 1979).

Historic Groundwater Levels and Flow

AECOM (2009, as cited in CEC, 2010) reported that the water level data from 1971 show local variations in water level contours in the area east of the MSEP site, which suggests localized pumping in support of agriculture. Water level data from 2000 show that the water levels had recovered in the area due east of the site and show a southerly flow of groundwater coincident with the flow in the Colorado River. Groundwater flow in the PVMGB is from the north, southeast through McCoy Wash at a gradient of 0.001 ft/ft, then south-southwest at gradients of between about 0.0003 and 0.0008 ft/ft in a direction coincident with the flow of the Colorado River (AECOM, 2009).

AECOM (2009, as cited in CEC, 2010) reported that hydrographs indicate that the water level in the PVMGB has generally remained stable over the past few decades. In well Township 4 Range 21 Section 9B1 at the north end of the PVMGB, groundwater elevation remained unchanged from 1971 to 2000. In wells closer to the MSEP site, groundwater elevations have decreased about 5 feet in well Township 5 Range 22 Section 31E1 from 1966 to 2000 and in well Township 6 Range 22 Section 32R1 from 1947 to 2006. The relatively stable groundwater levels that have been measured over this period suggest that groundwater withdrawal from the underlying aquifer has not

TABLE 3.20-6
HISTORICAL PUMPING TEST DATA – PALO VERDE MESA

Well ID	Distance from MSEP Site	Well Owner or Name	Date of Pump Test	Yield/ Drawdown (gpm/ft)	Depth Interval Tested (ft, bgs)	Trans-missivity (gpd/ft)	Trans-missivity (ft^2/day)	Indicated Avg Field Hydraulic Conductivity (gpd/ft^2)	Geologic Source Unit
5S/22E-28C2	3 mi. NE	U.S. Citrus Corp.	10/25/1962	1,450/?	270-358 382-600	64,000	8,576	210	Older Alluvium of Colorado R.
6S/22E-11H1	5 mi. E	H.M. Neighbour	6/18/1964	665/9	165-235	700,000	93,800	10,000	Older Alluvium of Colorado R.
6S/22E-15M1	4 mi. E	E. Weeks	6/12/1963	475/21	168-315	500,000	67,000	3,400	Older Alluvium of Colorado R.
6S/22E-32R1	6.5 mi. S-SE	W. Passey	6/11/1963	650/66	120-123 402-408 479-488	420,000	56,280	NL	Older Alluvium of Colorado R.
6S/22E-35R2	7.5 mi. S-SE	Southern Counties Gas Co.	10/23/1962	520/15	302-326	150,000	20,100	6,200	Older Alluvium of Colorado R.
6S/23E-24J1	12.5 mi. E	Clayton Ranch	7/8/1964	2,180/50	NL	1,900,000	254,600	NL	Older Alluvium of Colorado R.
6S/23E-29R1	9.5 mi. E	City of Blythe 8	10/23/1962	360/33	264-276 354-368	320,000	42,880	12,300	Older Alluvium of Colorado R.
6S/23E-32D1	9.5 mi. E	City of Blythe 9	10/23/1962	520/31	122-132 168-286	430,000	57,620	3,400	Younger Alluvium – basal gravel
6S/23E-32P1	9.5 mi. E	City of Blythe 1	10/23/1962	470/12	245-270 290-296	496,000	66,464	10,000	Older Alluvium of Colorado R.
6S/22E-4P1	3.5 mi. E	J.E. Mason	10/23/1962	100/1.6	NL	1,700,000	227,800	NL	Older Alluvium of Colorado R.

NOTES: NL = Not listed.

SOURCE: Metzger et al., 1973.

significantly changed the water balance within the PVMGB. This is probably in large part due to recharge of water from the Colorado River (AECOM, 2009).

Groundwater Quality

In general, water quality in the PVMGB is generally higher near the edge of the Palo Verde Mesa adjacent to the Colorado River floodplain. The amount of dissolved solids becomes progressively higher away from the Colorado River floodplain and with depth (AECOM, 2011c). The groundwater in the area beneath the MSEP site and its vicinity is generally sodium sulfate-chloride in character (DWR, 2003). According to AECOM (2011c), the Total Dissolved Solids (TDS) content of shallow groundwater in the basin ranges from 730 to 3,100 milligrams per liter (mg/L), while the TDS of deeper groundwater is higher at 4,500 mg/L.

Table 3.20-7 presents the analytical results for a select number of wells that were sampled between October 1962 and April 1966 located near the MSEP site. Given the long screen interval for these wells, and the uncertain methodology of sampling the wells, these data likely represent an average water quality of the more permeable sediments over the screen interval. A review of the water quality data for the PVMGB and PVVGB in Table 3.20-7 indicate the following:

1. TDS concentrations (466 to 5,640 mg/L) generally exceeded the recommended standard of 500 mg/L for a drinking water resource in California. TDS concentrations above 1,000 mg/L were reported in water samples from wells located east of the MSEP site.

2. Fluoride concentrations (0.2 to 6.3 mg/L) in some cases exceed the State of California Maximum Contaminant Levels (MCLs) for drinking water (2.0 mg/L). Fluoride concentrations above the MCL are present in water samples from wells on the Mesa located east of the MSEP site. Concentrations are significantly lower and below the MCL in water samples from wells located in the floodplain.

3. Chloride concentrations range from 77.7 to 3,220 mg/L, and in some cases exceed the State of California Secondary MCL for drinking water (250 mg/L). Higher concentrations are found in wells on the Mesa in the area of McCoy Wash.

4. Boron concentrations range from 40 micrograms per liter [µg/L] to 2,000 µg/L. Based on data collected in 2009, most of the water samples collected underlying that site exceeded the State of California Action Level for drinking water (1,000 µg/L).

5. Sulfate concentrations range from 90 to 1,850 mg/L, and in some cases exceed the State of California Secondary MCLs for drinking water (250 mg/L). The highest concentrations mirror those found for chloride and are located in the area east of the site and in the area of McCoy Wash.

In general, based on available water quality data from the immediate vicinity of the MSEP site, groundwater below the MSEP site would not meet drinking water quality primary or secondary standards for domestic supply without treatment given the elevated levels of TDS and high concentrations of fluoride, chloride, boron, and sulfate. The data show that generally, TDS and sulfate concentrations were higher with increasing distance from the Colorado River, with the highest concentrations occurring in the area of McCoy Wash and the gap between the PVMGB

TABLE 3.20-7
SUMMARY OF GROUNDWATER QUALITY DATA[a,b]
(all values reported in mg/L[c] unless otherwise indicated)

Analyte	Test Well (October 2009)[a]	Well 5/22-28C1 (Oct-1962)	Well 5/22-33J1 (Oct-1962)	Well 6/21-36R1 (May 1964)	Well 6/22-17L1 (April 1966)	All Palo Verde Mesa Groundwater Basin Wells[a]
Arsenic	ND<0.01	--[d]	--	--	--	0.0011
Bicarbonates as HCO3	--	--	--	--	--	20 – 736
Boron	1.41	--	--	1.07	1.4	0.04 – 2.0
Calcium	287	--	--	--	--	9.21 – 844
Carbonates as CO3	--	--	--	--	--	0 – 12
Fluoride	1.3	--	1.7	3	--	0.02 – 6.30
Chloride	370	440	400	420	380	77.7 – 3,220
Iron	0.123	--	--	--	--	0 – 0.4
Magnesium	29.6	--	--	--	--	0.1 – 351
Manganese	ND<0.005	--	--	--	--	0 – 3.9
Nitrate	(N)	ND<0.01	--	--	--	--
Selenium	ND<0.015	--	--	--	--	--
Sodium	457	--	--	--	--	0 – 2,000
Sulfate	970	970	380	440	400	90 – 1,850
Total Alkalinity as CaCO3	34	--	--	--	--	28 – 3,600
TDS	2,170	2,160	--	1,470	1,250	466 – 5,640
pH (units)	--	--	--	--	--	7 – 8.6

NOTES:

[a] Metals data reported from the unfiltered ("total") sample (turbidity at the time of sampling <10NTU).
[b] Water quality data for all wells in the Project vicinity are from available information in online databases and historic reports, a summary of which is provided in Appendix J of the AFC. Source: USGS, 2009; as cited in BLM, 2010.
[c] mg/L – milligrams per liter
[d] no data reported in available online databases or historic documents

SOURCE: AECOM, 2010a.

and CVGB. Fluoride, chloride, and boron concentrations were generally lower in the eastern portions of the PVMGB (closer to the Colorado River) and increased westward towards the MSEP site. The much higher TDS concentrations below the Palo Verde Mesa reflect recharge of high TDS water to the PVMGB from percolation along the mountain front and underflow from Rice and Chuckwalla valleys.

Groundwater Wells in Proximity to the MSEP Site

Over 580 water supply wells were identified in online databases in the PVMGB (see AECOM, 2011a, included as Appendix G of this PA/EIS). A field survey of wells in the Project vicinity conducted by AECOM (2009) encountered no active water supply wells. Nine out of 13 wells

within 1 mile of the site were found to be accessible. All of these wells had been used for irrigation supply, but because no sources of electrical power for pumps (i.e., power lines and generators) were observed at any of these wells, it was presumed that these nine wells were inactive. The remaining four wells were reported to be not accessible, and therefore their status could not be determined (AECOM, 2009). Available information for water supply wells located near the MSEP site is summarized in Table 3.20-8. Water level data were updated by AECOM (2011a; Appendix G) to include 2010 data. Only two wells indicated new data available during this period.

TABLE 3.20-8
CHARACTERISTICS OF NEARBY WELLS

State Well Number	Surface Elevation (ft amsl)	Total Depth (ft bgs)	Distance from Proposed Production Well (feet)	Specific Capacity (gpm/ft)
6/21E-25L01	400.2	--	25,000	--
6/22E-08J01	408	302	135,000	35.56-64.80
6/22E-17B01	399.64	302	135,000	25.00-30.60
6/22E-17L01	400	445	15,000	37.88-54.90
6/22E-17L02	397	323	15,500	42.73-56.90
6/22E-18A01	406.88	298	13,000	30.19-35.14
6/22E-18J01	408	302	14,000	32.43-34.62
6/22E-19N02	397	300	20,000	--
6/22E-19N03	397.2	394	20,000	--
6/22E-19R01	395.6	300	21,000	--

SOURCE: Derived from AECOM, 2009; as cited in CEC, 2010; AECOM, 2010a; AECOM, 2011a.

3.20.1.3 Surface Water Hydrology, Drainage, and Flooding

There are no permanent bodies of water located on the MSEP site. Surface water in Palo Verde Mesa drains to the southeast into the Colorado River. In the vicinity of the MSEP, the general surface water flow pattern trends from higher elevations in the McCoy Mountains into shallow moderately defined channels at the base of the mountains. The major watercourse near the MSEP site is McCoy Wash (east of the site) which drains approximately 210 square miles of the Palo Verde Mesa, McCoy Mountains, Little Maria Mountains, and Big Maria Mountains, and exits the mesa to the southeast of the MSEP site. Measured flows in McCoy Wash have reached as high as 4,000 cubic feet per second (cfs), as measured in 1976 during flooding in the watershed (CH2MHill, 2008 as cited in CEC, 2010).

Dry Washes on Site

There are no perennial streams on the MSEP site or the Palo Verde Mesa that impact the MSEP site. The vast majority of the time, the area is dry and devoid of any surface flow. Water runoff occurs only in response to infrequent intense rain storms. Stormwater runoff from higher elevations in the McCoy Mountains flows into moderately defined channels located near the base of these mountains. From that point, stormwater flows across alluvial fan systems that radiate

from the base of the McCoy Mountains and mesa. These alluvial fans compose a broad, flat expanse of desert terrain that slopes in a generally southeasterly direction across the MSEP site.

Field observations on site indicate that numerous moderately defined washes which traverse the site. These features are discernable on aerial photography. To the west side of the MSEP site they are deeper, containing poorly sorted sediment and angular cobbles and boulders. To the east, they are typically shallow, and tend to be defined by well sorted sand and vegetation. Well developed desert pavement exists between the washes. The conveyance capacity of the washes is limited, and runoff during moderate to large events would break out of these features and be conveyed across the alluvial fan as shallow sheet flow. In general, the drainages appear to be stable and not experiencing significant downcutting or lateral migration. When sufficient flow is present, west-to-east trending washes located on site eventually merge with McCoy Wash, which is located east of proposed MSEP facilities, as described above.

Stormwater Flows

Off-site storm water flows impacting the MSEP site are from five tributary sub-basins that originate in the McCoy Mountains, approximately 3 miles west of the site (AECOM, 2011b). The extent of and approximate sub-basin boundaries of the overall watersheds impacting the MSEP were delineated utilizing a combination of USGS 7.5-minute quadrangle sheets and site-specific aerial topography, including 2-foot LIDAR data specific to the MSEP site. Peak discharges for each sub-basin were calculated using the HEC-HMS model[1] and generally followed the guidelines presented in the *Riverside County Flood Control and Water Conservation District Hydrology Manual.* Stormwater dynamics on site were modeled using the FLO-2D model[2] using output from the HEC-HMS model, as well as available precipitation, LIDAR topography, and ground surface attributes (roughness) as inputs. The FLO-2D model accounts for stormwater input from upstream areas in the McCoy Mountains (based on output from HEC-HMS), as well as stormwater flows generated on site due to precipitation. The overall watershed boundaries, sub-basin delineations, and HEC-HMS/FLO-2D model domains are shown on Figure 3.20-2. Modeled existing stormwater flow rates are summarized in Table 3.20-9 in cfs.

Flooding

The Federal Emergency Management Agency (FEMA) flood insurance rate maps have not been prepared for the MSEP site or surrounding lands. Therefore, while the MSEP site does not lie within a federally mapped floodplain, flooding could still occur on site.

Springs, Seeps and Playa Lakes

No springs are listed in the area of the PVMGB where the MSEP site is located, according to the National Water Information System (NWIS) database of Water Resources of the United States that is maintained by the USGS. One spring (McCoy Spring) is shown on a geologic map of the

1 USACE HEC-HMS software, version 3.5.
2 FLO-2D Version 2009.06

TABLE 3.20-9
MODELED EXISTING STORMWATER FLOWS FOR 10-YEAR AND 100-YEAR STORM EVENTS AT THE MSEP SITE (CFS)

Location (see Figure 3.20-2)	10-Year Storm Event	100-Year Storm Event
XS-1	118	718
XS-2	103	594
XS-3	124	782
XS-4	292	1918
XS-5	35	348
XS-6	121	1083

SOURCE: AECOM, 2011b

area (California Division of Mines and Geology (CDMG), 1967, as cited in CEC, 2010). McCoy Spring is approximately 6 miles northwest of the MSEP site and is located in Pleistocene non-marine sediments just west of the McCoy Mountains. Discharge from McCoy Spring flows west-southwest into Chuckwalla Valley.

Solid bedrock associated with the McCoy Mountains separates the MSEP site from McCoy Spring. Permeability of the bedrock is very low to nil, such that groundwater extraction from the MSEP site is not expected to affect flow from McCoy Spring. In a report on water wells and springs in Palo Verde Valley (DWR, 1978) including the Palo Verde Mesa area, no springs are shown in the McCoy Mountains or the Palo Verde Mesa (AECOM, 2010a).

According to the NWIS database, where seeps and surface discharges/outfalls (along with streams, lakes, wetlands, and diversions) are categorized as “surface water sites,” three sites are located on the southern edge of the Palo Verde Mesa approximately 14 miles south of the MSEP site. These sites (site numbers 5, 6, and 7) are listed in Table 3.20-10. The northern segment of the Mule Mountains separates these three sites and associated groundwater gradients/flow directions from the MSEP site. Therefore, groundwater extraction from the MSEP site is not expected to affect these locations.

Numerous other “surface water sites” (including seeps and surface discharges) are identified in the NWIS database in the PVVGB east of the PVMGB. As many as 50 “surface water sites” are listed in the NWIS database for the Palo Verde Valley, which includes the floodplain area from the Colorado River westward to the base of the terrace (see AECOM, 2010a). Fifteen of the 50 sites are within 10 miles of the MSEP site. The remaining 35 of the 50 sites are 11 or more miles east of the MSEP site, and many of these are within 0.5 mile of the Colorado River. The 15 sites that are closest to the MSEP site are listed in Table 3.20-10. According to the NWIS database, these sites are streams or canals that likely collect irrigation runoff from the abundant farmland in the Palo Verde Valley.

TABLE 3.20-10
SURFACE WATER DISCHARGES IN PALO VERDE MESA AND PALO VERDE VALLEY WITHIN 10 MILES OF MSEP SITE

Site No.	Location Number	Location Name	Latitude	Longitude	Type	Approx. Distance from MSEP (miles)
1	USGS 334431144121	Rannells Dr at Keim Drive Near Blythe CA	33°34'43	114°41'26	Stream	8
2	USGS 333755114372301	W Side Drain a 10th and Defrain Ave Blythe CA	33°37'55	114°37'23	Stream	7
3	USGS 333940114370801	Up W DSie Drain A 6th Ave near Blythe	33°39'40	114°37'08	Stream	7
4	USGS 332928114443101	Hodges Dr at 30th near Palo Verde CA	33°29'28	114°44'31	Stream	14
5	USGS 09533300	Wellton Mohawk Bypass Dr a AZ Son Bdry AZ	33°29'38	114°48'41	Stream	14
6	USGS 09534550	Two Forty Two Lateral Near San Luis	33°29'13	114°47'14	Stream	14
7	USGS 09534500	E Main Canal Wasteway at AZ Son Bdry	33°29'13	114°47'01	Stream	14
8	USGS 332909114440601	CRDC Near Well 6 CA	33°29'09	114°44'06	Stream	14
9	USGS 332935114433701	Palo Verde Drain A 30th Ave Palo Verde CA	33°29'35	114°43'37	Stream	14
10	USGS 333025114421401	Rannells Dr A 28th Ave Nr Ripley	33°30'25	114°42'14	Stream	13
11	USGS 333123114402300	Westside Dr Palo Verde Outfall, CA	33°31'23	114°40'23	Stream	12
12	USGS 333241114381901	Central CA Dr a 22nd Ave Nr Ripley CA	33°32'41	114°38'19	Stream	11
13	USGS 333426114355801	Lovekin Dr A 18th Nr Blythe CA	33°34'26	114°35'58	Stream	11
14	USGS 333849114354901	W Side Drain A 8th Ave Nr Blythe	33°38'49	114°35'49	Stream	8
15	USGS 333942114353601	W Side Drain A 6th Ave Nr Blythe	33°39'42	114°35'36	Stream	8

SOURCE: AECOM, 2010a.

3.20.2 Applicable Regulations, Plans, and Standards

3.20.2.1 Federal

Clean Water Act

The CWA established the basic structure for regulating discharges of pollutants into "waters of the United States." The act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.

1. Sections 303 and 304, which provide for water quality standards, criteria, and guidelines.

2. Section 401 requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain a water quality certification that the proposed activity will comply with applicable water quality standards.

3. Section 402 regulates point- and nonpoint-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the SWRCB oversees the NPDES program, which is administered by the Regional Water Quality Control Boards (RWQCBs). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. Anti-backsliding requirements provided for under CWA §§402(o)(2) and 303(d)(4) prohibit slackening of discharge requirements and regulations under revised NPDES permits. With isolated/limited exceptions, these regulations require effluent limitations in a reissued permit to be at least as stringent as those contained in the previous permit.

4. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including some wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry.

Executive Order 11988 and the Federal Emergency Management Agency

Under Executive Order 11988, FEMA is responsible for management of floodplain areas. FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e., the 100-year flood event).

Safe Drinking Water Act

Under the Safe Drinking Water Act (Public Law 93-523), passed in 1974, the USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by USEPA primary and secondary Maximum Contaminant Levels (MCLs) that are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting MCLs for drinking water. USEPA has delegated to the CDPH the responsibility for administering California's drinking-water program. DHS is accountable to USEPA for program implementation and for adopting standards and regulations that are at least as stringent as those developed by USEPA. The applicable state primary and secondary MCLs are set forth in Title 22, Division 4, Chapter 15, Article 4 of the California Code of Regulations.

3.20.2.2 State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act provides for protection of the quality of all waters of the State of California for use and enjoyment by the people of California. It further provides that all activities that may affect the quality of waters of the state shall be regulated to obtain the highest water quality that is reasonable, considering all demands being made and to be made on those waters. The Act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered most effectively on a local level, with statewide oversight. Within this framework, the Act authorizes the SWRCB and regional boards to oversee responsibility for the coordination and control of water quality within California, including those responsibilities under the federal CWA that have been delegated to the state.

State Water Resources Control Board

Created by the California State Legislature in 1967, the SWRCB holds authority over water resources allocation and water quality protection within the state. The five-member SWRCB allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine RWQCBs. The mission of SWRCB is to, "preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations."

Colorado River Regional Water Quality Control Board

The Colorado River RWQCB's Water Quality Control Plan (Basin Plan) establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses of surface and ground waters in the region. The Basin Plan describes implementation activities and other control measures designed to ensure compliance with statewide plans and policies, and to provide comprehensive water quality planning.

Beneficial water uses are of two types: consumptive and non-consumptive. Consumptive uses are those normally associated with human activities, primarily municipal, industrial and irrigation uses that consume water and cause corresponding reduction and/or depletion of water supply. Non-consumptive uses include swimming, boating, waterskiing, fishing, hydropower generation, and other uses that do not significantly deplete water supplies. Historical beneficial uses of water within the Colorado River Basin Region have largely been associated with irrigated agriculture and mining. Industrial use of water has become increasingly important in the region, particularly in the agricultural areas.

With respect to present beneficial uses, agricultural use is the predominant beneficial use of water in the Colorado River Region, with the major irrigated acreage being located in the Coachella,

Imperial, and Palo Verde valleys. The next largest use of water is for municipal and industrial purposes. The third major category of beneficial use, recreational use of surface waters, represents another important segment of the region's economy. The Colorado River Basin Region functions as a portion of the larger Colorado River watershed, which supplies water for agricultural and urban uses, fisheries, hydroelectric power production, recreation, and international treaty obligations.

According to the Basin Plan, all surface and ground waters are considered to be suitable, or potentially suitable, for municipal or domestic water supply with the exception of:

1. Surface and ground waters where the TDS exceed 3,000 mg/L, and the source is not reasonably expected by the RWQCB to supply a public water system, or

2. There is contamination, either by natural process or human activity, that cannot be treated for domestic use using either best management practices or best economically achievable treatment practices, or

3. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

California Fish and Game Code §1602

Section 1602 of the FGC protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by the CDFG in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state, or local governmental agency, or public utility to notify the CDFG before beginning any activity that will:

1. Substantially divert or obstruct the natural flow of any river, stream or lake;

2. Substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or

3. Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Preliminary jurisdictional evaluations for waters of the state have been completed in support of the MSEP. These evaluations will be made permanent during final engineering and design of the MSEP. Acquisition of a Streambed Alteration Agreement, if required, would occur prior to construction of the MSEP, thus maintaining compliance with §1602. A Streambed Alteration Agreement is required in the event that the CDFG determines the activity could substantially adversely affect an existing fish and wildlife resource.

22 CCR §§64400.80-64445

These CCR sections require monitoring for potable water wells, defined as non-transient, non-community water systems (serving 25 people or more for more than 6 months). The number of workers employed by the MSEP would exceed this amount during operations. Regulated wells must be sampled for bacteriological quality once a month and the results submitted to the CDPH

for review and comment. The wells must also be monitored for inorganic chemicals once and organic chemicals quarterly during the year designated with the year designation based on historical monitoring frequency and laboratory capacity. The MSEP would be required to comply with this regulation.

27 CCR §20200

27 CCR §20200 et seq provides a waste classification system that applies to wastes that cannot be discharged to waters of the state. Applicable facilities include evaporation ponds, as well as various other types of disposal. The evaporation ponds identified for installation in support of the MSEP would be designated as Class II Surface Impoundments Waste management Units (WMU). Therefore, the evaporation ponds must meet the requirements of 27 CCR §20200 et seq, which would require permitted approval from the Colorado River RWQCB and/or the CDPH.

California Water Code §13751

California Water Code §13751 requires a Report of Well Completion to be filed with the DWR within 60 days of well completion. New wells must comply with DWR Well Standards as described in Water Resources Bulletins 74-81 and 74-90.

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3.21 Wildland Fire Ecology

This section was developed using Section 3.3, *Biological Resources – Vegetation* and the NECO Plan (BLM, 2002).The study area for Wildland Fire Ecology constitutes an area approximately 1 mile larger than the periphery of the Project site boundary, capturing the greatest extent of any likely wildfires near the Project. Fire risk in the study area is moderate with most fires in the NECO Plan area caused by lightning or vehicles.

3.21.1 Environmental Setting

The behavior and characteristics of wildfires are dependent on a number of biophysical and anthropogenic (human-caused) factors. The biophysical variables are fuels (including composition, cover, and moisture content), weather conditions (particularly wind velocity and humidity), topography (slope and aspect), and ignition sources (e.g., lightning). The anthropogenic variables are ignitions (e.g., arson, smoking, and power lines) and management (wildfire prevention and suppression efforts).

Vegetation with low moisture content is more susceptible to ignitions and burns more readily than vegetation with higher moisture content. Grasses tend to ignite more easily and burn faster, but tend to burn for a shorter duration than woody vegetation such as shrubs and trees. Continuity of fuels helps sustain wildland fires. Dense vegetation tends to carry a fire farther than patchy vegetation. The presence of invasive annual grasses, however, can provide fuel connectivity in patchy desert shrublands that would otherwise provide inconsistent fuel for a wildland fire. High winds provide oxygen to wildfires and can also blow glowing embers off burning vegetation to areas far ahead of the front of a fire, allowing fires to jump fuelbreaks in some cases. Conditions of low relative humidity will dry out fuels, increasing the likelihood of ignition. Finally, steep slopes and slopes with exposure to wind will carry fires rapidly uphill, and fires that are extinguished in mountainous areas are often contained along ridgelines.

The natural vegetation-fuel types in the study area, Sonoran creosote bush scrub, desert dry wash woodland, and stabilized and partially stabilized desert dunes, are not fire-adapted. Fire, particularly repeated wildfire, is deleterious to these plant communities and tends to deplete the native woody shrubs that characterize and dominate these communities in favor of exotic weedy annuals. See Figure 3.3-1. Compared to other parts of the state, there are relatively few fires in the NECO Plan area and most are small. Between 1980 and 1995, a handful of fires burned a total of about 6,000 acres, all outside the study area.

Sonoran Desert Scrub is the dominant community type within the NECO Planning Area, covering 3.8 million acres, or 69 percent of the total area. The large majority of its distribution (86 percent) is on public lands. Major threats to this community type include fire, grazing, OHV use, and invasions of alien species. Sonoran creosote bush scrub occupies approximately 95 percent of the study area. The remaining 5 percent of the land cover includes stabilized and partially stabilized desert dunes, agricultural, and developed lands, and Ephemeral “Riparian” drainages of Desert

Dry Wash Woodland, Mesquite Bosque (Tetra Tech, 2012), Vegetated and unvegetated Ephemeral channels. None of the lands in the study area appear to have burned in recent history.

BLM and NPS have collaborated in the development of the *Fire Management Activity Plan (FMAP) for the California Desert* (1996) which brings together fire management goals for biological resources, wilderness, and other sources. The FMAP establishes fire management standards and prevention and protection programs as well as limitations on fire suppression methods in critical habitat and other tortoise habitat designed to limit habitat disturbance while keeping fires small. (BLM, 2001)

Wildfire suppression occurs with minimum surface disturbance practical in all habitats. Wildfires are suppressed using a mix of only the following methods in order to minimize habitat disturbance:

1. Aerial attack;
2. Crews using hand tools to create fire breaks;
3. Mobile attack engines limited to public roads, designated open routes, and routes authorized for limited-use;
4. Use of foam and/or fire retardant;
5. Use of earth-moving equipment or tracked vehicles (such as bulldozers) in critical situations to protect life, property, or high-value resource; and/or
6. Post fire-suppression mitigation includes rehabilitation of firebreaks and other ground disturbances and obliteration of vehicle tracts sufficient to discourage future casual use. Hand tools are used for rehabilitation activities whenever feasible.

Exotic and invasive weedy annual plants such as Mediterranean splitgrass and red brome form a complete ground cover in some places, where disturbances such as livestock grazing, OHV use, development and fire have contributed to the spread of exotic annuals by displacing native annual and perennial grasses and forbs (Brooks, 1998; Malo and Suarez, 1995 as cited in BLM, 2002). The Project site is crossed by an unpaved OHV route occupying approximately 5 acres within the study area.[1] The gen-tie line would cross or be within 1 mile of active and fallow agriculture and developed areas. These are the areas most likely to support or carry wildfires in the study area.

Fire Hazard Severity Zones (FHSZs) are areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors that have been mapped by the California Department of Forestry and Fire Protection (CAL FIRE). FHSZs are ranked from moderate to very high and are categorized for fire protection as within a federal responsibility area (FRA) under the jurisdiction of a federal agency, within a state responsibility area (SRA) under the jurisdiction of CAL FIRE, or within a local responsibility area (LRA) under the jurisdiction of a local agency. The Project is located in a FRA under the jurisdiction of BLM with the exception of 477 acres in the southeast

[1] This number is based on an approximate road width of 10 feet and length of 4 miles (2 miles within the Project site and 1 mile to the north and south of the Project site).

corner in an LRA, under the jurisdiction of the RCFD. The BLM would be first responder for wildland fires and the County for structures. The Project is wholly within a moderate FHSZ (CAL FIRE, 2007).

There are no residences or other sensitive receptors located within the Project boundary or in the immediate vicinity of the Project site. The nearest sensitive receptors to the Project site are residences located approximately 2.6 miles southeast and 2.7 miles south of the southern site boundary, respectively (Tetra Tech, 2011). In addition, there are several residences that would be within a mile of the proposed gen-tie line, the closest of which is south of I-10 at a distance of approximately 0.6 mile.

In summary, fire risk in the study area as well as the potential for a major fire in the surrounding area is moderate.

3.21.2 Applicable Regulations, Plans, and Standards

3.21.2.1 Federal

Federal Energy Regulatory Commission

FERC requires utilities to adopt and maintain minimum clearance standards between vegetation and transmission voltage power lines. These clearances vary depending on voltage. In most cases, however, the minimum clearances required in state regulations are greater than the federal requirement. In California for example, the state has adopted General Order 95 rather than the NERC Standards as the electric safety standard for the state. Since the state regulations meet or exceed the FERC standards, the FERC requirements are not discussed further in this section, as compliance with the state requirements will ensure that the federal requirements are met.

Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995 and updated in 2001 by the National Wildfire Coordinating Group, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgement of the essential role of fire in maintaining natural ecosystems. The Federal Wildland Fire Management Policy and its implementation are founding on the following guiding principles:

1. Firefighter and public safety is the first priority in every fire management activity.
2. The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.
3. Fire management plans, programs, and activities support land and resource management plans and their implementation.
4. Sound risk management is a foundation for all fire management activities.

5. Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.

6. Fire management plans and activities are based upon the best available science.

7. Fire management plans and activities incorporate public health and environmental quality considerations.

8. Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.

9. Standardization of policies and procedures among federal agencies is an ongoing objective.

International Fire Code

Created by the International Code Council, the International Fire Code addresses a wide array of conditions hazardous to life and property including fire, explosions, and hazardous materials handling or usage. The International Fire Code places an emphasis on prescriptive and performance-based approaches to fire prevention and fire protection systems. Updated every 3 years, the International Fire Code uses a hazards classification system to determine the appropriate measures to be incorporated in order to protect life and property (often, these measures include construction standards and specialized equipment). The International Fire Code uses a permit system based on hazard classification to ensure that required measures are instituted.

North American Electric Reliability Corporation Standards

The NERC is a nonprofit corporation comprising 10 regional reliability councils. The overarching goal of NERC is to ensure the reliability of the bulk power system in North America. To achieve its goal, the NERC develops and enforces reliability standards, monitors the bulk power systems, and educates, trains, and certifies industry personnel (NERC, 2011). In order to improve the reliability of regional electric transmission systems and in response to the massive widespread power outage that occurred on the Eastern Seaboard, NERC developed a transmission vegetation management program that is applicable to all transmission lines operated at 200 kV and above to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the electric system in the region. The plan, which became effective on April 7, 2006, establishes requirements of the formal transmission vegetation management program, which include identifying and documenting clearances between vegetation and any overhead, ungrounded supply conductors, while taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, fire risk, line terrain and elevation, and the effects of wind velocities on conductor sway (NERC, 2006). The clearances identified must be no less than those set forth in the IEEE Standard 516-2003 (*Guide for Maintenance Methods on Energized Power Lines*) (NERC, 2006).

Institute of Electrical and Electronics Engineers Standard 516-2003

The IEEE is a leading authority in setting standards for the electric power industry. Standard 516-2003, *Guide for Maintenance Methods on Energized Power Lines*, establishes minimum

vegetation-to-conductor clearances in order to maintain electrical integrity of the electrical system.

3.21.2.2 State

California Fire Code

The California Fire Code is contained within Title 24, Chapter 9 of the CCR. Based on the International Fire Code, the California Fire Code is created by the California Buildings Standards Commission and regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. Similar to the International Fire Code, the California Fire Code and the CBC use a hazards classification system to determine the appropriate measures to incorporate to protect life and property.

Title 14 CCR §§1250-1258, Fire Prevention Standards for Electric Utilities, provides specific exemptions from electric pole and tower firebreak and electric conductor clearance standards, and specifies when and where standards apply.

California Health and Safety Code

State fire regulations are established in §13000 of the California Health and Safety Code. The section establishes building standards, fire protection device equipment standards, high-rise building and childcare facility standards, interagency support protocols, and emergency procedures. Also, §13027 states that the state fire marshal shall notify industrial establishments and property owners having equipment for fire protective purposes of the changes necessary to bring their equipment into conformity with, and shall render them such assistance as may be available in converting their equipment to, standard requirements.

California Public Resources Code

The PRC includes fire safety regulations that apply to SRAs during the time of year designated as having hazardous fire conditions. During the fire hazard season, these regulations restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors[2] on equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire-suppression equipment that must be provided on-site for various types of work in fire-prone areas.

PRC §4291 provides that a person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material, shall at all times maintain defensible space of 100 feet from each side and from the front and rear of the structure, but not beyond the property line.

[2] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap commonly is used to retain carbon particles from the exhaust.

PRC §§4292 and 4293 require that any person who owns, controls, operates, or maintains any electrical transmission or distribution line shall maintain a firebreak clearing around and adjacent to any pole, tower, and conductor that carries electric current as specified in the section.

California Strategic Fire Plan

The 2010 Strategic Fire Plan for California is the statewide plan for adaptive management of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the CAL FIRE. The central goals that are critical to reducing and preventing the impacts of fire revolve around both suppression efforts and fire prevention efforts. The key goals of the plan are:

1. Improved availability and use of information on hazard and risk assessment;
2. Land use planning: including general plans, new development, and existing developments;
3. Shared vision among communities and the multiple fire protection jurisdictions, including county-based plans and community-based plans such as Community Wildfire Protection Plans;
4. Establishing fire resistance in assets at risk, such as homes and neighborhoods;
5. Shared vision among multiple fire protection jurisdictions and agencies;
6. Levels of fire suppression and related services; and
7. Post-fire recovery.

The plan puts emphases on pre-fire adaptive management of risk, including measures such as fuelbreaks, defensible space, and other fuel reduction strategies. The Fire Plan does not contain any specific requirements or regulations. Rather, it acts as an assessment of current fire management practices and standards and makes recommendations on how best to improve the practices and standards in place (CAL FIRE, 2010).

Fire Hazard Severity Zones

CAL FIRE mapped FHSZs in Riverside County based on fuel loading, slope, fire weather, and other relevant factors under the direction of PRC §§4201-4204 and Government Code §§51175-89. FHSZs are ranked from moderate to very high and are categorized for fire protection as within a FRA under the jurisdiction of a federal agency, within a SRA under the jurisdiction of CAL FIRE, or within a LRA under the jurisdiction of a local agency.

CPUC General Order 95: Rules for Overhead Electric Line Construction

GO 95 is the key standard governing the design, construction, operation, and maintenance of overhead electric lines in the state. It was adopted in 1941 and updated most recently in 2006. GO 95 includes safety standards for overhead electric lines, including minimum distances for conductor spacing and minimum conductor ground clearance, standards for calculating maximum sag, electric line inspection requirements, and vegetation clearance requirements.

Rule 31.2, *Inspection of Lines*, requires that lines be inspected frequently and thoroughly for the purpose of ensuring that they are in good condition, and that lines temporarily out of service be inspected and maintained in such condition as not to create a hazard.

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3.22 Additional NEPA Considerations

This section addresses several additional areas of concern under NEPA that are relevant to the Proposed Action and Project area: transmission line safety and nuisance and unexploded ordnance.

3.22.1 Transmission Line Safety and Nuisance

3.22.1.1 Introduction

This discussion focuses on the following issues, taking into account both the physical presence of the gen-tie and distribution lines and the physical interactions of their electric and magnetic fields:

1. interference with radio-frequency communication;
2. hazardous and nuisance shocks; and
3. EMF exposure.

3.22.1.2 Environmental Setting

The site is in an uninhabited open desert land with no existing homes or other structures. The available land for gen-tie and distribution corridors would traverse some BLM-administered land and some privately-owned and local government-owned lands in a largely uninhabited desert area, which has only a few residences within 1 mile of the solar plant site and gen-tie line and distribution line routes. The closest residence is approximately 0.6 mile from the proposed gen-tie line, south of I-10. The closest residence to the MSEP plant site is approximately 2.6 miles away.

3.22.1.3 Interference with Radio-Frequency Communication

Overhead transmission lines do not, as a general rule, interfere with normal radio or television reception. However, potential transmission line-related radio frequency interference could be produced by the physical interactions of line electric fields. This would be an indirect effect of transmission line operation. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings.

When generated, corona noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication when the signal is amplitude modulated (AM). The resulting radio interference causes the buzzing or crackling noise one might hear from the speaker of an AM broadcast receiver when near a transmission line. The potential for corona-related interference generally becomes a concern for lines of 345 kV and above. Frequency modulated (FM) signals normally are unaffected as are modern digital signals such as those involved in cellular telephone communication or modern airport and other types of radio communication.

Because of the power loss from corona and gap discharges, it is in the interest of each line proponent to employ design, construction and maintenance plans that minimize them. Since the level of the interference in any given case would depend on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The potential for such impacts therefore would be minimized by reducing the line electric fields and locating the line away from inhabited areas. The Federal Communications Commission requires a line's owner to mitigate such interference in specific cases.

3.22.1.4 Hazardous and Nuisance Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and an energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines. No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. However, safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. See also Section 3.9, *Hazards and Hazardous Materials*.

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from an energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields. The potential for nuisance shocks around transmission lines would be minimized through standard industry grounding practices specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute and the IEEE.

3.22.1.5 Electric and Magnetic Field Exposure

EMFs occur whenever electricity flows. They are associated with the production, transmission, and use of electric power including by high-voltage transmission lines, secondary power lines, home wiring and lighting, and the motors and heating coils found in electronic equipment and appliances (National Institute of Environmental Health Sciences, 2010). The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Questions also have been raised about EMF interference with computer monitors.

Data and other information as evaluated by the CPUC, CEC, and other regulatory agencies indicates a lack of scientific evidence that either confirms or denies a causal link between EMFs and a significant health hazard to humans exposed to such fields (see, e.g., OSHA, 2011; Neutra et al., 2002). Most regulatory agencies believe that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

While there is considerable uncertainty about EMF health effects, the following facts have been established from the available information and have been used to establish existing policies:

1. Any exposure-related health risk to the exposed individual would likely be small.

2. The most biologically significant types of exposures have not been established.

3. Most health concerns are about the magnetic field.

4. Measures can be employed for field reduction, but they can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

Although there is considerable uncertainty about EMF health effects, it appears that EMFs associated with some transmission lines can affect the operation of older model pacemakers by causing them to revert to asynchronous pacing. Cardiovascular specialists do not consider prolonged asynchronous pacing to be a problem: periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. With dual-chamber pacemakers, inappropriate pacing has been documented before unit reversion to asynchronous mode (EPRI, 1997). Depending on the manufacturer and design, the magnetic field threshold for pacemaker interference, including the possibility of inappropriate pacing, is in the range of to 12 Gauss (G), and the electric field threshold is about 1.5 kilovolts/meter (kV/m) for some of the more sensitive dual-chamber units, and above 2.0 kV/m for older ventricular units (EPRI, 1997).

Magnetic fields can interfere with personal computer monitors that use cathode ray tubes (CRTs). Resulting disturbances affect the image displayed on the monitor, causing it shake or distort. The extent of interference depends on several factors, including the monitor's orientation, design, and vertical image refresh rate as well as the 60 Hz magnetic field intensity.

3.22.1.6 Regulatory Setting

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the Western Electricity Coordinating Council (WECC), a regional entity responsible for promoting and coordinating bulk electric system reliability in the western United States, has adopted a policy to separate parallel transmission lines within a common corridor by the greater of 500 feet or the length of the longest span (distance between adjacent transmission structures), which for the proposed Project is anticipated at 800 to 1,000 feet (BLM, 2010).

3.22.2 Unexploded Ordnance

3.22.2.1 Introduction

More than 5 million acres of BLM-managed land that is open to public access may contain UXO. The BLM is collaborating with the Department of Defense (DOD) and the USACE to address UXO-contaminated lands currently under BLM management and the possible transfer of additional military lands to BLM management.

3.22.2.2 Environmental Setting

According to information in the Phase I Environmental Site Assessment performed for the Project site (TetraTech, 2011), the site is within General Patton's World War II Desert Training Center opened by the Army Ground Forces in 1942. In 1943 it was renamed California-Arizona Maneuver Area (CAMA). The CAMA was the largest military training center ever established, stretching from west of Pomona, California, to Yuma, Arizona, and north to Nevada, encompassing approximately 12 million acres. Seven camps were set up in the CAMA for divisional use and for combat and supply units. The camps were widely spaced to prevent groups from interfering with each other during training exercises, but all were interconnected with a network of railroad lines and roads. After the camps closed in 1944, efforts began to salvage material and dismantle the sites. The land was returned to private and government holdings.

Because of the area's former use for military training, there is potential for discarded military munitions, other explosives, and unexploded ordnance (collectively, UXO) to be encountered. The BLM has conducted investigations at several of the known camps, but has not completed a UXO survey of the entire training ground. As with most current or former military installations, there is a possibility of UXO. Reportedly, several UXO discoveries have been made in the immediate vicinity of the site. Information obtained from cultural resource studies in the area and construction efforts at the BSPP indicate that UXOs have been identified in the area with increasing frequency near the McCoy Wash (Tetra Tech, 2011).

The former Blythe Army Airfield is located adjacent to the south of the BSPP site, approximately 6 miles due west of Blythe on West Hobson Way, adjacent to I-10. The airfield has been open since 1940, when it was known as Bishop Army Airfield. The airport later became a part of Muroc Army Air Field, now known as Edwards Air Force Base. The airfield was a second Army Air Forces heavy bombardment crew training base during World War II. Multiple bombardment groups were active at the airfield in 1942 and 1943, and up to 75 B-17 bombers were flown and maintained at this site. Historical records and drawings indicate that bombs and explosive materials, and possibly incendiary and pyrotechnic materials, were stored on airfield grounds in up to five magazines or bunkers. A gunnery range, skeet range, and jeep type target range, all with ammunition storage, were constructed and used by Army personnel (California State Military Museum, 2008).

3.22.2.3 Regulatory Setting

The CERCLA requires that, before transferring lands from the military, the military service must search for and remove munitions and UXO to accommodate reasonably anticipated future land uses.