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RECORD OF DECISION

Soda Mountain Solar Project
and
Amendment to the California Desert Conservation Area Plan

United States Department of the Interior
Bureau of Land Management

Case File Number: CACA-049584

Soda Mountain Solar Project
Decision to Grant Right-of-Way and Amend California Desert Conservation Area Plan

United States Department of the Interior, Bureau of Land Management
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Abbreviations

ACEC	Area of Critical Environmental Concern
AO	Authorized Officer
APM	Applicant-proposed measure
BBCS	Bird and Bat Conservation Strategy
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BO	Biological Opinion
CDCA	California Desert Conservation Area
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
DOI	United States Department of the Interior
DRECP	Desert Renewable Energy Conservation Plan
DWMA	Desert Wildlife Management Area
ECCMP	Environmental Construction and Compliance Monitoring Program
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FESA	Federal Endangered Species Act
FLPMA	Federal Land Policy and Management Act of 1976
GCP	General Conservation Plan
I-15	Interstate 15
IM	Instructional Memorandum
kV	kilovolt
MBTA	Migratory Bird Treaty Act
MUC	Multiple-Use Class
MW	megawatt
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent
NPS	National Park Service
NTP	Notice to Proceed
OHV	off-highway vehicle
PA	Plan Amendment
POD	Plan of Development
PV	photovoltaic
REAT	Renewable Energy Action Team
ROD	Record of Decision
ROW	right-of-way
SRMA	Special Recreation Management Area
TMA	Travel Management Area
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WSA	Wilderness Study Area

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Executive Summary

This document constitutes the Record of Decision (ROD) of the United States Department of the Interior (DOI) and the Bureau of Land Management (BLM) to approve a revised configuration of Soda Mountain Solar, LLC's (Applicant) application for a Right-of-Way (ROW) grant for the Soda Mountain Solar Project (Project) and associated amendment to the California Desert Conservation Area (CDCA) Plan of 1980, as amended. The decisions in this ROD were analyzed in a joint Proposed Plan Amendment (PA) and Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) that was published on June 12, 2015.

This ROD makes two decisions:

- First, it approves the issuance of a Federal Land Policy and Management Act (FLPMA) Title V ROW grant to the Applicant to construct, operate, maintain, and decommission a solar facility with a facility footprint smaller than that originally proposed by the Applicant, but substantially similar to that analyzed under Alternative B in the Proposed PA and Final EIS/EIR (i.e., the South and East Arrays and ancillary facilities, and no North Array; see Figure 2-5 in Proposed PA and Final EIS/EIR Appendix A) with the exception that no realignment of Rasor Road would occur. Additionally, the proposed brine ponds associated with reverse osmosis treatment of groundwater are not included.
- Second, it amends the CDCA Plan to identify 2,813 acres of public land within the solar facility footprint as suitable for solar energy development (see Figure 2 in Appendix 1 of the ROD).

The Proposed PA and Final EIS/EIR analyzed the Applicant's Proposed Action, three alternative configurations of the proposed facility, a No Action/No Project Alternative, a No County Permit alternative, and related BLM planning decisions regarding resources in the vicinity of the Project site. It was prepared jointly by the BLM and San Bernardino County, CA (County) pursuant to the applicable requirements under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively. The County is separately considering a decision whether to approve groundwater well permits in connection with the Project.

The decisions in this ROD reflect careful consideration and resolution of the issues identified in the Project's Proposed PA and Final EIS/EIR, which were thoroughly analyzed during the environmental review process. These decisions best fulfill the BLM's and DOI's statutory mission and responsibilities. Granting the ROW for the Selected Alternative will contribute to the public interest by providing a reliable electricity supply that allows for the development of renewable power to satisfy Federal renewable energy goals. Similarly, the mitigation measures incorporated as part of the ROW grant and the related planning decisions made here will ensure that the authorization of the Selected Alternative will protect environmental resources and comply with applicable environmental standards. In total, these decisions reflect the careful balancing of the many competing public interests in managing the public lands and are based on a comprehensive environmental analysis and full public involvement. The BLM and DOI have determined that approval of the Selected Alternative is in the public interest.

1.0 Introduction

1.1 Background

The Applicant, Soda Mountain Solar, LLC, is a wholly owned subsidiary of Bechtel Development Company, Inc. The Applicant filed a ROW grant application with the BLM to construct, operate, maintain, and decommission the Project (Case File Number CACA-049584) on December 14, 2007. As part of the ROW grant application process, the Applicant submitted a Plan of Development (POD) for the Project to the BLM on March 15, 2011, followed by several revisions of the POD in March 2013 and November 2014 to supplement information provided in the original submittal.

1.2 Purpose and Need

The BLM's purpose and need for the action are to respond to the Applicant's application under Title V of the FLPMA (43 USC § 1761(a)(4)) for a ROW grant to construct, operate, maintain, and decommission a solar photovoltaic (PV) facility on public lands in compliance with FLPMA, BLM ROW regulations, and other applicable Federal laws. In accordance with Sections 103(c) and 302(a) of the FLPMA (43 USC §§ 1702(c) and 1732(a)), public lands are to be managed under the principles of multiple use and sustained yield, taking into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant ROWs on public lands for systems for generation, transmission, and distribution of electric energy (43 USC § 1761(a)(4)). Taking into account the BLM's multiple use and sustained yield mandate, the BLM is deciding whether to approve, approve with modifications, or deny issuance of a ROW grant to the Applicant for the Project. The BLM may include any terms, conditions, and stipulations it determines to be in the public interest, and may include modifying the proposed use or changing the location of the proposed facilities (43 CFR 2805.10(a)(1)).

In conjuction with FLPMA, the BLM's applicable authorities and policies include the following:

1. Executive Order 13212 (May 18, 2001) mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."

2. Secretarial Order 3285A1 (March 11, 2009, as amended February 22, 2010), which "establishes the development of renewable energy as a priority for the Department of the Interior."

3. The President's Climate Action Plan, released on June 25, 2013, which sets forth a new goal for the DOI to approve 20,000 MW of renewable energy projects on the public lands by 2020, in order to ensure America's continued leadership in clean energy.

In connection with its decision on the Project, the BLM's action also includes consideration of a concurrent amendment of the CDCA Plan. The CDCA Plan, while recognizing the potential

compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission that are not identified in the CDCA Plan be identified through the land use plan amendment process. CDCA boundaries are shown on Figure 1 in Appendix 1 of the ROD.

The BLM is deciding to amend the CDCA plan to identify the Project site as suitable for solar energy development.

2.0 Overview of Alternatives

2.1 Alternatives Fully Analyzed

In the Proposed PA and Final EIS/EIR, BLM evaluated seven alternatives.

Alternative A (Proposed Action) would approve a grant for the Applicant's proposed of right-of-way (ROW) authorization for a 358 MW solar energy plant and related facilities, including rerouting of Rasor Road, on approximately 2,222 acres within an approximately 4,179-acre area of BLM administered public land in San Bernardino County, California, and the County's approval of a groundwater well permit. Alternative A consists of a North Array (571 acres), East Array (397 acres, comprising two sub-arrays, East 1 and East 2) and South Array (1,197 acres, consisting of three sub-arrays, South 1, South 2, and South 3). The BLM would amend the CDCA Plan to identify the site as suitable for solar development.

Alternative B consists of the East Array (comprising two sub-arrays, East 1 and East 2) and the South Array (consisting of three sub-arrays, South 1, South 2, and South 3) as described for the Proposed Action; no North Array would be constructed. The substation and switchyard would be constructed in the same location as the Proposed Action, except that no collector lines would feed into the substation from the north. Only the collector lines from the East and South arrays, combined into a single route before crossing I-15, would feed into the substation. The operation and maintenance area buildings and brine ponds would be located and constructed as described for the Proposed Action. The groundwater wells would be located and constructed as described for the Proposed Action. Primary site access to Alternative B would be via an alternative realignment of Rasor Road. The maximum solar energy generating capacity of Alternative B is estimated to be approximately 264 MW. The BLM would amend the CDCA Plan to identify the site as suitable for solar development.

Alternative C consists of the North Array and South Array (consisting of three sub-arrays, South 1, South 2, and South 3), as described for the Proposed Action; the East Array would not be constructed. The substation and switchyard would be constructed in the same location as the Proposed Action; however, no collector line would be constructed from the East Array. The operation and maintenance area buildings and brine ponds would be located and constructed as described for the Proposed Action. The groundwater wells would be located and constructed as described for the Proposed Action. Access to the South Array could be provided either via the Proposed Action realignment of Rasor Road or the Alternative B realignment of Rasor Road. The

maximum solar energy generating capacity of this alternative would be 298 MW. The BLM would amend the CDCA Plan to identify the site as suitable for solar development.

Alternative D consists of the North Array, East Array 2, and South Array 1 as described for the Proposed Action, and a reduced-acreage East Array 1 and South Array 2. South Array 3 would not be constructed under Alternative D. The substation and switchyard would be constructed in the same location as the Proposed Action; however, no collector line would be constructed from South Array 3. The operation and maintenance area buildings and brine ponds would be constructed within the footprint of the reduced South Array, located at the intersection of Rasor Road and Arrowhead Highway. The groundwater wells would be located and constructed as described under the Proposed Action. Under Alternative D, no realignment of Rasor Road would occur, and the existing BLM informational kiosk would not be relocated. Instead, the existing Rasor Road would be used for site access on the southeast side of I-15 including any necessary road maintenance. Access to the north side of I-15 would be provided as under the Proposed Action. The maximum solar energy generating capacity of this alternative would be 250 MW. The BLM would amend the CDCA Plan to identify the site as suitable for solar development.

Alternative E (No Action/No Project) would result in the BLM not authorizing a ROW grant for the Project or amending the CDCA Plan to identify the site as suitable for the proposed use; and the County would not approve the groundwater well permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. The BLM would not amend the CDCA Plan, and would continue to manage the land consistent with the site's multiple use classification. The CDCA Plan amendments made in the Western Solar Plan would apply to any future applications at the site.

Alternative F (CEQA No Project) describes the scenario that would result if the BLM were to authorize the requested ROW grant under the Proposed Action (Alternative A) or Alternative B, C, or D and amend the CDCA Plan to identify the Project site as suitable for the proposed use, and the County were to deny the requested groundwater well permit application (i.e., select Alternative E). In this event, a PV solar energy facility and related infrastructure would be developed on the site as described in Alternative A, B, C, or D, except that it would require an off-site source of water during construction, operation and maintenance, and decommissioning for potable use, dust control, panel washing, and fire protection.

Alternative G (Site Unsuitable for Solar, No BLM ROW, and No County Permit) would not authorize a ROW grant for the Project and would amend the CDCA Plan to identify the site as unsuitable for a utility-scale solar development; and the County would not approve the groundwater well permit application. No solar arrays, substation, switchyard, collector routes, operation and maintenance facilities, or other Project components would be constructed. No realignment and no upgrade of Rasor Road would occur. No groundwater wells would be developed on the site, and no other sources of water would be procured. Because the Project would not be approved, no new structures or facilities would be constructed, operated, maintained, or decommissioned on the site, and no related ground disturbance or other Project

impacts would occur. The BLM would continue to manage the land consistent with the site's multiple use classifications as described in the CDCA Plan with the exception that solar development would be precluded on the site.

2.2 Alternatives Considered but Eliminated from Detailed Analysis

According to the Council on Environmental Quality's (CEQ) NEPA Regulations (40 CFR 1502.14), the alternatives section in an EIS shall rigorously explore and objectively evaluate all reasonable alternatives; however, for alternatives which were eliminated from detailed study, the EIS shall briefly discuss the reasons for their having been eliminated.

In accordance with 43 CFR 2804.10, the BLM worked closely with the Applicant during the pre-application phase to identify appropriate locations and configurations for the Project. The BLM discouraged the Applicant from including in its application alternate BLM locations with significant environmental concerns, such as critical habitat, Areas of Critical Environmental Concern (ACECs), Desert Wildlife Management Areas (DWMAs), designated Off-Highway Vehicle (OHV) areas, wilderness study areas, and designated wilderness areas. The BLM encouraged the Applicant to locate its Project on public lands with few potential conflicts. In addition, the Applicant's objectives and pre-application site-evaluation and public comments helped guide the BLM's development of alternatives.

The BLM considered, but did not fully analyze the following alternatives:

- Site alternatives, including additional Public Land Alternatives, Private Land Alternatives, and Brownfields/Degraded Lands Alternatives on both private and federally owned land;
- Other types of renewable energy projects; and
- Conservation and demand-side management.

A detailed explanation for eliminating these alternatives from detailed analysis is contained in Section 2.9 of the Proposed PA and Final EIS/EIR. In summary, these alternatives were not fully considered for one or more of the following reasons:

- The alternative did not meet the BLM's purpose and need;
- The alternative would be technically or economically infeasible (as informed by the Applicant's interests and objectives);
- The alternative was inconsistent with the basic policy objectives for the management of the area;
- Implementation of the alternative would be remote or speculative;

- The alternative would be substantially similar in design to an alternative that is analyzed in detail; or

- The alternative would have substantially similar effects to an alternative that is analyzed in detail.

2.3 Environmentally Preferred Alternative

In accordance with 40 CFR 1505.2(b), the BLM has identified Alternative E, the No Action/No Project Alternative, as the environmentally preferred alternative because it would cause the least damage to the biological and physical environment in the Project area. Out of the action alternatives, the environmentally preferred alternative would be Alternative B, which would result in less ground disturbance than any of the other action alternatives.

2.4 Information Developed since the Proposed PA and Final EIS/EIR

Since the preparation and publication of the Proposed PA Final EIS/EIR, the Applicant has submitted an Amended Plan of Development (POD) providing new information consisting of clarifications on the design of Alternative B. This new information, described below, did not result in significant modifications to the Selected Alternative or require additional NEPA analysis.

In the Amended POD, the Applicant indicates that in constructing, operating, maintaining, and decommissioning the Alternative B solar plant, it would retain the existing location and uses of Rasor Road (no realignment), eliminate the proposed reverse osmosis technology and brine ponds, eliminate pipelines from wells, revise the number of megawatts that would be produced, and revise disturbed acreage. Water would be stored in tanks at the wells and at the Operations and Maintenance area, and trucked to the construction areas as necessary. These aspects of the Project all were considered in the Proposed PA and Final EIS/EIR. The changes are summarized as follows:

- The Proposed PA and Final EIS/EIR described an East Array that would be divided into two sub-arrays, East 1 and East 2. The Amended POD reconfigures the East Array as a single, larger array block. In the reconfigured design, solar panels would cover an area that was avoided for anticipated drainage needs in previous designs but that, based on more detailed design plans and analysis of flood flows indicating minimal flows in this location, does not require avoidance.

- The Amended POD reconfigures the proposed South Array, including the array fence line, to avoid encroachment on 52 acres of the Rasor OHV Area and avoid construction of solar arrays within the existing alignment of Rasor Road. The Amended POD proposes to maintain the existing location and uses of Rasor Road, and to construct a portion of the proposed realignment to provide access to the Project buildings and arrays.

- The Amended POD relocates the proposed flood control berms between the southernmost array blocks to an area just outside of the array fence line to coincide with the revised boundaries of the East and South Arrays.

- The reconfigured East Array and South Array described in the Amended POD provide greater acreage (1,726 acres) for solar arrays than described in the Proposed PA and Final EIS/EIR (1,594 acres). As a result, the configuration described in the Amended POD would have a capacity of 287 MW, compared to the 264 MW described in the Proposed PA and Final EIS/EIR.

- The Proposed PA and Final EIS/EIR described collector corridors 150 feet in width. The Amended POD proposes a 200-foot-wide corridor to install the collector circuits and allow for sufficient spacing between the collector lines.

- The Proposed PA and Final EIS/EIR described a proposed reverse osmosis facility and evaporation ponds for treatment of groundwater. Based on water quality tests performed by the Applicant in 2014, the quality of groundwater in the Project area is suitable for panel washing without reverse osmosis treatment. Accordingly, the Amended POD removes these groundwater treatment features, including the brine ponds from the Project.

- The Proposed PA and Final EIS/EIR described a construction schedule of up to 30 months. The Amended POD indicates that the Project would be constructed over an 18-month to 5-year period depending on Project phasing. The arrays and array blocks could be installed in phases where the substation/switchyard, buildings, and groundwater wells would be installed with the first phase. Portions or all of an array area could be constructed within a given phase depending on the terms of a Power Purchase Agreement.

- The Proposed PA and Final EIS/EIR described the estimated temporary and permanent disturbance for the initial Proposed Action (Alternative A) and Alternative B. The Amended POD provides revised estimates of temporary and permanent disturbance as shown in the following table. The estimates for the Project described in the Amended POD are slightly greater than the Alternative B estimates, but less than the Alternative A estimates evaluated in the Proposed PA and Final EIS/EIR. The total permanent disturbance of the Project in the Amended POD would be 1,767 acres. The total disturbance, including temporarily disturbed areas, would be 2,059 acres.

	Proposed Action (Alternative A) (acres)		Alternative B (acres)		Amended POD (acres)	
Project Component	**Permanent**	**Total**	**Permanent**	**Total**	**Permanent**	**Total**
Solar Arrays	2,165	2,227	1,594	1,646	1,726	1,785
Substation, Switchyard, and Interconnection	15	40	15	40	15	40
Rasor Road Realignment	13	68	16	82	0	0
Access Roads	9	106	5	57	16[1]	77[1]
Berms	20	33	17	28	10[2]	59[2]
Collector Routes	0	24	0	24	0	33[3]
Laydown Area	0	30	0	30	0	30
Temporary Desert Tortoise Exclusion Fence	0	29	0	16	0	35
Total	**2,222**	**2,557**	**1,647**	**1,923**	**1,767**	**2,059**

NOTES:
Totals include permanent and temporary disturbance acreage.
1 The increase in permanent access roads accounts for an access road from Blue Bell Mine Road to the substation that was previously part of the North Array impact area and an access road from Rasor Road to the operation and maintenance facilities that was previously part of the Rasor Road realignment.
2 The increase in disturbance for berms was a result of more specific engineering design and reconfiguration of the arrays.
3 The increase in disturbance for collector routes was a result of more specific engineering design indicating a need for a 200-foot-wide corridor.

2.5 Agency Preferred Alternative/Selected Alternative

In accordance with NEPA (40 CFR 1502.14(e)), the BLM identified the Alternative B solar plant site with the Applicant-proposed Rasor Road realignment route as the agency preferred alternative in the Proposed PA and Final EIS/EIR, with the exception that the proposed brine ponds associated with reverse osmosis treatment of groundwater are not included, as contemplated under Alternative F. The clarifications to this alternative provided by the Applicant are described above in Section 2.4. Alternative B, with these clarifications including maintaining the existing Rasor Road in place, is the Selected Alternative in this ROD. The maximum solar energy generating capacity of the Selected Alternative is estimated to be approximately 287 MW. The Selected Alternative will reduce the Project's total ground disturbance by nearly 500 acres compared to Proposed Action (Alternative A), reducing the Project's impacts on visual resources, the designated utility corridor running through the Project area, and future efforts to restore bighorn sheep connectivity.

3.0 Decision

The decision is hereby made to approve the Selected Alternative, described in Sections 2.4 and 2.5, to amend the CDCA Plan to allow solar energy related use of specified property and to approve a ROW grant to lease land managed by the BLM in San Bernardino County, California. This decision fulfills BLM's legal requirements for managing public lands and contributes to the public interest in developing renewable power to meet Federal and State renewable energy goals. Specifically, this ROD approves the construction, operation and maintenance, and decommissioning of the 287 MW solar PV Project on BLM administered public lands in San Bernardino County, California for the Selected Alternative and associated CDCA Plan Amendment. While this specific alternative was not analyzed in the Proposed PA and Final EIS/EIR, the impacts are nevertheless within the spectrum of impacts analyzed in the Proposed PA and Final EIS/EIR, which was noticed in the June 12, 2015 Federal Register (80 FR 33519).

The approval will be implemented through a FLPMA ROW grant, issued in conformance with Title V of FLPMA (42 USC § 1761 et seq.) and its implementing regulations (43 CFR § 2801 et seq.). In order to approve the site location for the Selected Alternative, this decision also amends the CDCA Plan to find the site suitable for solar development. The Project site is located in the Mojave Desert, approximately 6 miles southwest of Baker, California, on both sides of Interstate 15 (I-15) in San Bernardino County, California, located in portions of sections 1, 11, 12, 13 and 14, township 12 north, range 7 east; sections 25 and 36, township 13 north, range 7 east; sections 6, 7, 8 and 18, township 12 north, range 8 east; and sections 17, 18, 19, 20, 21, 29, 30, 31, and 32, township 13 north, range 8 east, San Bernardino Meridian, California. Figure 1 in Appendix 1 of the ROD shows the location of the approved Project site within the California Desert District.

The ROW grant authorization will allow the Applicant to use, occupy, and develop the described public lands; and to construct, operate and maintain, and decommission a solar PV electric generating facility with a capacity of up to 287 MW. Within the ROW area, construction and operation would permanently disturb approximately 1,767 acres for the solar plant site and required linear facilities outside the solar plant site (including a connection to an existing high-voltage power line and access road).

Construction of the Selected Alternative is expected to be phased over a period of approximately 18 months to up to 5 years. The ROW grant will be issued to the Applicant for a term of 30 years with a right of renewal so long as the lands are being used for the purposes specified in the grant. In addition, the initiation of construction will be conditioned on the BLM's issuance of Notice to Proceed (NTP) for each phase or partial phase of construction. If the approved Project does not progress to construction or operation or is proposed to be changed to the extent that it appears to BLM to be a new project proposal on the approved site, that proposal may be subject to additional review under NEPA and may require additional approval from the BLM.

The ROW is conditioned on compliance with: (i) the terms and conditions in the grant; (ii) the Biological Opinion (BO) issued by the United States Fish and Wildlife Service (USFWS)

provided in Appendix 2 of this ROD; (iii) implementation of the approved mitigation measures and monitoring programs provided in Appendix 4 of this ROD; and (iv) the issuance of all other necessary local, State, and Federal approvals, authorizations, and permits.

Additionally, through this ROD, the CDCA Plan is amended to identify the Project area of the Selected Alternative as suitable for solar electricity generation.

This ROD applies only to BLM administered lands and to BLM's decisions on the Selected Alternative. Other agencies, including but not limited to San Bernardino County and the California Department of Fish and Wildlife, are responsible for issuing and enforcing their own decisions and applicable authorizations for the Selected Alternative.

4.0 Management Considerations in Determining the Selected Alternative

The BLM determined that Alternative B in the Proposed PA and Final EIS/EIR with the Applicant-proposed Rasor Road realignment and no brine ponds was the Agency's preferred alternative. This alternative, with clarifications as described in Section 2.4 including maintaining the existing Rasor Road in place, is the Selected Alternative approved in this ROD. The selection of this alternative reflects careful balancing of many competing public interests in managing public lands in accordance with the multiple use and sustained yield mandate and other obligations in FLPMA. In particular, the Selected Alternative eliminates the north array of the Project, thereby reducing the Project's impacts. Through comprehensive environmental analysis and full public involvement in accordance with NEPA, the BLM has determined that the footprint of the Selected Alternative will preserve room for future efforts to re-establish bighorn sheep connectivity across the Interstate highway and will minimize visual impacts to the nearby Mojave National Preserve.[1] Further, the groundwater use required in the Selected Alternative will not adversely affect the endangered Mohave tui chub. The BLM has developed measures to avoid, minimize, and mitigate impacts to resources such as visual resources, groundwater, air quality, recreation access, and wildlife. The Selected Alternative and mitigation measures were developed with cooperating agencies, including the National Park Service (NPS), as discussed further below in Section 5.1.

[1] The Selected Alternative complies with the BLM's Special Status Species policy, MS-6840 (Dec. 12, 2008), with respect to bighorn sheep and other focal species. The Proposed PA and Final EIS/EIR addressed the effects of the Project and PA on special status species and identified appropriate siting/design features and mitigation measures that would reduce impacts to those species and are consistent with policy objectives for species and habitat management. With respect to bighorn sheep in particular, the Proposed PA and Final EIS/EIR Section 3.4.2.3 described the resident population demography and distribution within the Project area, relying on surveys conducted using CDFW protocols, consultation with bighorn sheep biologists, and current scientific literature. The Project area is not located within a desert bighorn sheep Wildlife Habitat Management Area and would not result in loss of habitat or extirpation of the species in any such area. While the Selected Alternative may impact future use of the Project area as a potential dispersal corridor, there are numerous other locations that provide for the necessary movement of bighorn sheep within this region of the desert. The restoration opportunities and mitigation for desert bighorn sheep within the Project area are identified in the Proposed PA and Final EIS/EIR as Mitigation Measures 3.4-3a through 3.4-e and APM 75. These measures, which have been incorporated into the Selected Alternative, address identified threats to bighorn sheep at the project level, including distribution and dispersal, by requiring improvements to bighorn sheep connectivity across I-15, access to additional water sources, and an adaptive management approach with near-term and long-term goals for desert bighorn sheep in this portion of the desert.

4.1 Federal Land Policy and Management Act of 1976

The FLPMA establishes policies and procedures for the management of public lands. In Section 1701(a)(8), Congress declared that it is the policy of the United States that:

> . . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

Title V of FLPMA (43 USC §§ 1761–71) and BLM's ROW regulations (43 CFR Part 2800) authorizes BLM, acting on behalf of the Secretary of the Interior, to authorize a ROW grant on, over, under, and through the public lands for systems for generation, transmission, and distribution of electric energy. The BLM Authorized Officer (AO) administers the ROW authorization and ensures compliance with the terms and conditions of the ROW lease. This authority is derived from the authority of the Secretary of the Interior, and may be revoked at any time. With respect to this ROW grant, this authority belongs to the Field Manager of the Barstow Field Office, who will be responsible for managing the ROW grant for the Selected Alternative. The grant will be subject to specified terms and conditions, including compliance with the BO; mitigation measures adopted by the BLM; and compliance with other applicable Federal rules and regulations that are designed to protect public health and safety, prevent unnecessary damage to the environment, and ensure that the Project will not result in unnecessary or undue degradation of public lands.

4.2 National Environmental Policy Act and Public Involvement

Section 102(c) of NEPA (42 USC § 4321) and CEQ and DOI implementing regulations (40 CFR Parts 1500–1508 and 43 CFR Part 46, respectively) provide for the integration of NEPA directives into agency planning to ensure appropriate consideration of NEPA's policies and to eliminate delay. When taking actions such as approving CDCA Plan Amendments and ROW grants, the BLM complies with the applicable requirements of NEPA, the CEQ's and DOI's NEPA regulations, and the agency's own policies for the implementation of NEPA. Compliance with the NEPA process is intended to assist Federal officials in making decisions about a project that are based on an understanding of the environmental consequences of the decision, and identifying actions that protect, restore, and enhance the environment. The Draft PA/EIS/EIR, Proposed PA and Final EIS/EIR, and this ROD document BLM's compliance with the requirements of NEPA for the Project.

The BLM engaged highly qualified technical experts to analyze the environmental effects of the Proposed Action and alternatives. During the scoping process and following the publication of the Draft PA/EIS/EIR, members of the public submitted comments that enhanced BLM's consideration of many environmental issues relevant to the Proposed Action and alternatives. The BLM, and the County, along with other cooperating and consulting agencies including the

NPS, USFWS, the California Department of Fish and Wildlife (CDFW), and consulted tribes used their expertise and best available information to address important resource issues associated with the Proposed Action and Alternatives. Chapter 4 and Appendix K of the Proposed PA and Final EIS/EIR include responses to all of the comments submitted on the Draft PA/EIS/EIR.

Chapter 3 of the Proposed PA and Final EIS/EIR presents an analysis of the environmental consequences that would result from each of the alternatives described above, including their effectiveness in meeting BLM's purpose and need for action, which includes consistency with the requirements of the FLPMA, the policy and legal directives encouraging renewable energy development on BLM administered public lands, and basic policy objectives for the management of lands within the CDCA. The BLM's purpose and need is described in Section 1.2 of this ROD.

The MW capacity associated with the Selected Alternative will best assist BLM in addressing these several management and policy objectives. The Selected Alternative would generate up to 287 MW of electricity and is expected to provide climate, employment, and energy security benefits to California and the Nation. The Selected Alternative will provide clean electricity for homes and businesses, and bring much needed jobs to the area. The Selected Alternative is expected to create up to 290 jobs during the construction period and 25 to 40 permanent, full-time jobs during its operation (Proposed PA and Final EIS/EIR Table 2-5, p. 2-28).

5.0 Consultation and Coordination

5.1 Cooperating Agencies

As described in detail in Section 4.1.3 of the Proposed PA and Final EIS/EIR, and discussed briefly above in Section 4.0, the NPS acted as a cooperating agency in the preparation of the Proposed PA, consistent with the BLM's land use planning regulations (43 CFR Part 1600), and in the preparation of the EIS, consistent with NEPA and CEQ regulations for implementing NEPA. Additionally, the BLM is coordinating with the NPS per the terms of the Memorandum of Understanding between the BLM California State Office and the NPS Pacific West Region on Coordination and Collaboration on Renewable Energy Projects in California.

The NPS provided comments to the BLM on the administrative and public Draft PA/EIS/EIR, expressing concerns about the Project due to its proximity to the nearby Mojave National Preserve. Concerns included the Project's potential impacts to groundwater, bighorn sheep, visual resources, and air quality. The agencies held regular meetings between April and December 2014 to facilitate coordination on revisions to the Proposed PA Final and EIS/EIR. Specifically, the BLM took the following steps to address NPS's concerns:

- Identified a preferred alternative that would eliminate the north array of the Project, thereby minimizing the Project's visual impacts on the Preserve and preserving room for future efforts to re-establish bighorn sheep connectivity across I-15;

- Required additional groundwater testing to confirm the Project will not adversely impact the endangered Mohave tui chub. Groundwater modeling and testing results were independently verified by the U.S. Geological Survey;
- Developed a bighorn sheep adaptive management strategy to maintain existing foraging, movement and feeding opportunities, improve opportunities to restore sheep movement and connectivity, and provide funding to ensure gene flow between populations for the life of the Project. This funding would be used, at the CDFW's discretion, to conduct regional translocation of bighorn sheep;
- Conducted additional visual resources analysis, which demonstrated that the Project would not block the Preserve's views from any highway or designated route of travel, nor be seen from the Preserve, with very limited exception in low visitor use areas.
- Required additional mitigation to reduce impacts to visual resources, groundwater, air quality, and other resources. For example, to minimize impacts to night skies, Mitigation Measure 3.18-1a requires the Applicant to minimize and shield exterior nighttime lighting except as required to meet safety and security requirements to eliminate unnecessary night lighting that might be seen in the Preserve or from the Mojave Road. Mitigation requirements have also been added to reduce glint and glare, and require use of appropriate paint to reduce visual contrast with the landscape. Additional mitigation measures are listed in Appendix 4 of this ROD.

5.2 NHPA Section 106 Consultation

As described in detail in Section 4.2.2.1 of the Proposed PA Final and EIS/EIR, Federal agencies must demonstrate compliance with the National Historic Preservation Act (NHPA) (54 USC § 300101 et seq.). NHPA Section 106 requires a Federal agency with jurisdiction over a project to take into account the effect of the proposed project on historic properties included on, or eligible for inclusion on, the National Register of Historic Places (54 USC § 306108). Federal agencies also must provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Under NHPA Section 106, the BLM consults with Indian tribes as part of its responsibilities to identify, evaluate, and resolve adverse effects to historic properties affected by BLM undertakings. This consultation is described below in Section 5.3, Government-to-Government Consultation with Tribes.

The BLM has determined that none of the 5 archaeological resources or 52 isolates located within the Area of Potential Effect is eligible for listing in the National Register, and has made a finding of no effect to historic properties as a result of the Selected Alternative. In a letter dated November 4, 2014, the State Historic Preservation Officer concurred with these findings.

5.3 Government-to-Government Consultation with Tribes

As described in detail in Section 4.2.2.2 of the Proposed PA and Final EIS/EIR, the BLM formally invited the following eight federally recognized tribes to consult on a government-to-government basis for the Project: Chemehuevi Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Las Vegas Tribe of Paiute Indians, Moapa Band of Paiute Indians, San

Manuel Band of Mission Indians, Timbisha Shoshone Tribe, and the Twenty-Nine Palms Band of Mission Indians. Consultation was initiated in accordance with several authorities including, but not limited to, NEPA, NHPA, the American Indian Religious Freedom Act, Executive Order 13175, Executive Order 13007, Secretarial Order 3317, and DOI's Tribal Consultation Policy (Dec. 1, 2011). All of the federally recognized tribes were invited to be consulting parties as provided in 36 CFR Part 800, the implementing regulations for Section 106 of NHPA.

Consistent with policy, the BLM notified and formally requested consultation with the above-listed Indian tribes by letter on August 21, 2012. The BLM Field Manager and staff have actively responded to all requests to meet with tribal leaders and staff throughout Project review. A summary of the major consultation milestones includes:

1. August 21, 2012: the BLM notified and formally requested consultation with Indian tribes at the earliest stages of Project planning and review;
2. January 23, 2013: Tribes attended a meeting and visit to the Project site;
3. November 17, 2014: a site visit with representatives from the Fort Mojave Indian Tribe; and
4. November 19, 2014: a meeting with representatives from the Chemehuevi Indian Tribe.

Currently, a Cultural Resources Discovery and Monitoring Plan is being drafted as described in Mitigation Measure 3.6-2 to address the potential for inadvertent discovery, and will be submitted to the tribes for comment prior to issuance of the Notice to Proceed. Copies of the Proposed PA and Final EIS/EIR were provided to the tribes listed above at the time of publication.

On July 9, 2015, the Colorado River Indian Tribes filed a protest pursuant to the BLM's land use planning regulations in 43 CFR 1610.5-2. The protest raised issues related to cumulative impacts of multiple solar project approvals, adequacy of the environmental analysis of impacts to biological, cultural, and visual resources, and adequacy of government-to-government consultation. The BLM attempted to contact the CRIT with a letter on October 27, 2015 and subsequent emails and voicemails in November and early January, with no response. Protest resolution is summarized in Section 8.5 of this ROD.

5.4 Endangered Species Act—Section 7 Consultation

As described in Section 3.4.3.1 and 4.2.1 of the Proposed PA and Final EIS/EIR, the USFWS has jurisdiction over threatened and endangered species listed under the Federal Endangered Species Act (FESA) (16 USC § 1531 et seq.). In general terms, consultation with the USFWS under FESA Section 7 is required for any Federal action that may affect a federally listed species (50 CFR 402.14). The BLM initiated consultation with the USFWS on December 13, 2013. The BLM submitted a Biological Assessment (BA) describing the Proposed Action to the USFWS. See generally 50 CFR 402.12. Following review of the BA, the USFWS provided the BLM with a draft Biological Opinion (BO) on October 23, 2015, and issued a final BO on January 13, 2016. The USFWS concurred with the BLM's determination that the Selected Alternative may affect, but is not likely to adversely affect, the Mohave tui chub. The BO indicates that the Selected Alternative would not jeopardize the continued existence of the desert tortoise. The BO identified reasonable

and prudent measures that would reduce adverse impacts to the species. Implementation of these measures is mandatory and is a requirement of this ROD and the ROW. A copy of the BO is included in Appendix 2 of this ROD.

5.5 Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act (MBTA) (16 USC §§ 703-712) 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.

The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of either bald eagles or golden eagles. "Take" 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." The Proposed PA and Final EIS/EIR included evaluation of Project impacts associated with both migratory birds and golden eagles. Pursuant to BLM Instructional Memorandum (IM) 2010-156 and California IM 2013-030, the BLM must incorporate consideration of golden eagles and their habitat into the NEPA analysis for all renewable energy projects. IM 2010-156 requires the following condition of approval for all renewable energy authorizations/actions occurring within the range of bald and golden eagles:

> ***Bald and Golden Eagle Protection Act (Eagle Act) Compliance Stipulation.*** *Bald and/or golden eagles may now or hereafter be found to utilize the Project area. The BLM will not issue a notice to proceed for any project that is likely to result in take of bald eagles and/or golden eagles until the applicant completes its obligation under applicable requirements of the Eagle Act, including completion of any required procedure for coordination with the U.S. Fish and Wildlife Service (Service) or any required permit. The BLM hereby notifies the applicant that compliance with the Eagle Act is a dynamic and adaptable process which may require the applicant to conduct further analysis and mitigation following assessment of operational impacts. Any additional analysis or mitigation required to comply with the Eagle Act will be developed with the Service and coordinated with the BLM.*

In accordance with BLM Instruction Memorandum 2010-156, the BLM made a determination that the Selected Alternative is not likely to result in the take of golden eagles and would not disrupt essential breeding behavior. Further, Applicant-proposed measure (APM) 58 includes annual golden eagle clearance surveys within a 4-mile radius during construction, and coordination with the BLM and wildlife agencies to ensure construction does not result in disturbance of golden eagles if any active nests are found.

Proposed PA and Final EIS/EIR Section 3.4 also evaluates the potential impacts of the Project on migratory and nesting birds. The Proposed PA and Final EIS/EIR summarizes the APMs to address these impacts, including APMs 45, 46, 47, 49, 52, 55, 57, 59, and 61. A Bird and Bat Conservation Strategy (BBCS) is required under Mitigation Measure 3.4-1g, and a draft BBCS

developed by the Applicant in coordination with the USFWS was provided in Appendix L of the Proposed PA and Final EIS/EIR. It includes a number of different conservation measures designed to minimize the Selected Alternative's impacts on migratory birds and golden eagles, including specific measures to be implemented during construction and post-construction monitoring and reporting. Additionally, Mitigation Measures 3.4-1e, 3.4-1f, and 3.4-1h include additional measures aimed at further reducing risks to birds and bats.

Mitigation Measure 3.4-1h requires implementation of an Avian Mitigation and Monitoring Program that includes avian mortality and injury monitoring that will provide additional data for the BLM, USFWS, and CDFW to evaluate. The BLM will continue to monitor this Project and if it becomes necessary, the BLM may amend the terms and conditions of the grant per 43 CFR 2805.15.

5.6 Federal Agency Coordination

5.6.1 U.S. Environmental Protection Agency

The BLM coordinated with the U.S. Environmental Protection Agency (USEPA) during the scoping process and comment periods for the Proposed PA and Final EIS/EIR. The USEPA submitted comments in response to the October 26, 2012 NOI to prepare the Draft EIS regarding impacts to air, biological, cultural, and water resources and consistency with regional planning efforts. The USEPA also submitted comments on the Draft PA/EIS/EIR (Letter 65 in Appendix J of the Proposed PA and Final EIS/EIR). The USEPA's comments are addressed in Proposed PA and Final EIS/EIR Section 4.5.3.4 and Sections 3.2, *Air Resources*; 3.6, *Cultural Resources;* 3.7, *Geology and Soil Resources*; 3.8, *Hazards and Hazardous Materials*; and 3.19, *Water Resources*.

5.6.2 U.S. Department of Defense

As explained in Section 4.1.1 of the Proposed PA and Final EIS/EIR, the BLM coordinates with the Department of Defense prior to approval of ROWs for renewable energy, utility, and communication facilities to ensure that these facilities would not interfere with military activities. Fort Irwin is located approximately 20 miles northwest of the Project site, and the Twentynine Palms Marine Corps Air Ground Combat Center is located approximately 30 miles southwest of the Project site. The Department of Defense reviewed Project development documents provided by the Applicant and determined that the Project would not interfere with military activities, including testing or training.

5.6.3 U.S. Army Corps of Engineers

As explained in Section 4.1.2 of the Proposed PA and Final EIS/EIR, the U.S. Army Corps of Engineers (USACE) has jurisdiction to protect the aquatic ecosystem, including water quality and wetland resources, under Clean Water Act Section 404. Under that authority, USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, through the Section 404 permit program. The USACE issued a determination on August 21, 2013, that there

are no waters of the United States on the Project site. As a result, the USACE does not have permitting authority over the Soda Mountain Solar Project.

5.7 San Bernardino County CEQA Review

The Applicant has submitted well construction permits to the County for up to five groundwater production wells and three groundwater monitoring wells. The wells would be used to produce groundwater for dust suppression, fire response during construction, and for fire response and sanitary purposes during operation and maintenance. Under Memorandum of Understanding (MOU) Agreement No. 03-1211 between BLM and the County, facilities requiring groundwater wells fall under the County's jurisdiction, and would therefore be required to comply with County Ordinance No. 3872 regarding permitting and monitoring of groundwater extraction wells. Because the Selected Alternative would include installation of groundwater extraction wells, implementation of the proposed facility would require discretionary approval from the County with respect to issuance of well permits from the Environmental Health Services Department. Because the County must take a discretionary action, the Project warranted environmental review under CEQA. The County will be responsible for certifying the Proposed PA and Final EIS/EIR after reviewing the document for consistency with CEQA requirements (CEQA Guidelines § 15090). Because the Proposed PA and Final EIS/EIR demonstrates that the Selected Alternative would have significant and unavoidable (not mitigable) impacts, if the County decides to approve the well permits, then the County will need to adopt a "Statement of Overriding Considerations" explaining the reasons for approving the well permits despite these significant impacts (CEQA Guidelines § 15093).

5.8 Governor's Consistency Review

FLPMA requires the Secretary of the Interior to "coordinate the land use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located" (43 USC § 1712(c)(9)). It further directs the Secretary to "assure that consideration is given to those State, local and tribal plans that are germane in the development of land use plans for public lands" and "assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal Government plans." Regulations implementing FLPMA, 43 CFR § 1610.3-2(e), generally require a 60-day period for Governor's consistency review; however, by agreement with the California Governor's office, this review period has been expedited. The purpose of the review is to identify inconsistencies of the proposed PA with State and local plans, programs, and policies. On June 12, 2015, the BLM initiated the period of Governor's Consistency Review for the Proposed PA in accordance with FLPMA. The Governor's Office of Planning and Research did not provide a formal response within 60 days; therefore, the BLM presumes that the review did not identify any inconsistencies between the Proposed PA and any State or local plans, programs, and policies. *See* 43 C.F.R. § 1610.3-2(e).

6.0 Mitigation Measures

Consistent with BLM NEPA Handbook H-1790-1 and 40 CFR 1505.2(c), all practicable means to mitigate environmental harm from the Selected Alternative have been adopted by this ROD. The ROW grant authorization is subject to the following measures, terms, and conditions:

- Terms and Conditions in the USFWS BO, provided in Appendix 2 of this ROD, as may be amended by the USFWS;
- Avoidance, Minimization, and Compensation Measures identified in Proposed PA and Final EIS/EIR Chapter 3, *Environmental Analysis*, provided in their final form in Appendix 4 of this ROD; and
- The Environmental Construction and Compliance Monitoring Program (ECCMP) provided in Appendix 5 of this ROD.

These measures, terms, and conditions are determined to be in the public interest pursuant to 43 CFR § 2805.10(a)(1). These measures, terms, and conditions will avoid, minimize, and compensate for project impacts consistent with the requirements of Secretarial Order 3330, *Improving Mitigation Policies and Practices of the Department of the Interior*, and other applicable DOI and BLM policy. Additional mitigation may be imposed pursuant to State laws (including CEQA), rules, policies, or regulations.

7.0 Monitoring and Adaptive Management

A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation (40 CFR 1505.2(c)). Agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases. Mitigation and other conditions established in the Final EIS or otherwise during BLM's review of the Modified Project, and made a condition of the decision in this ROD, shall be monitored for implementation by BLM and DOI or other appropriate consenting agency, as applicable.

For purpose of the monitoring and enforcement of those measures, the ECCMP for the Selected Alternative is provided in Appendix 5 of this ROD. As the Federal lead agency under NEPA, the BLM is responsible for ensuring compliance with all adopted mitigation measures set forth in Appendix 4. The BLM will incorporate these mitigation measures into the ROW grant as terms and conditions. Failure on the part of Soda Mountain Solar, LLC, as the applicant, to adhere to these terms and conditions could result in various administrative actions up to and including a termination of the ROW grant and requirement to remove the facilities and rehabilitate disturbances.

Adaptive management has been incorporated into several of the mitigation measures adopted for the Selected Alternative. Adaptive management is a system of management practices based on clearly identifying outcomes, monitoring to determine if management actions are meeting those outcomes, and, if not, facilitating management changes that will best ensure that outcomes are met or reevaluating the outcomes.

8.0 Public Involvement

8.1 Scoping

As described in Section 4.4 of the Proposed PA and Final EIS/EIR, a Notice of Intent to prepare the joint Draft PA/EIS/EIR was published in the Federal Register (77 FR 64824) on October 23, 2012, and Notice of Preparation was filed with the California State Clearinghouse on October 26, 2012. The BLM and the County jointly held publicly noticed scoping meetings on November 14, 2012, at the Hampton Inn in Barstow, California. The Final Scoping Report describes the comments received and is included as Appendix B of the Proposed PA and Final EIS/EIR.

The BLM also established a website that describes the Project, the process, and various methods for providing public input, including the phone number where the BLM's Project Manager may be reached, locations where Project documents may be obtained and reviewed, and an e-mail address where comments may be sent electronically: http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html.

8.2 Public Comments on the Draft PA/EIR/EIS

The BLM issued a Notice of Availability of the Draft PA/EIS/EIR and distributed it for public and agency review and comment on November 29, 2013 (78 FR 71607). The comment period ended March 3, 2014. Ninety-five comment letters and one comment via telephone were received and are reproduced in Appendix J of the Proposed PA and Final EIS/EIR. Responses to all letters also are provided in Appendix K of the Proposed PA and Final EIS/EIR. All comments received from agencies, members of the public, and internal BLM and cooperating agency review were considered and modifications incorporated as appropriate into the Proposed PA and Final EIS/EIR. Input received resulted in the addition of clarifying text in the analysis and further explanations provided in responses to comments.

8.3 Public Comments on the Proposed PA and Final EIS/EIR

BLM received three letters regarding the Proposed PA and Final EIS/EIR following the USEPA's publication of the Notice of Availability in the Federal Register for the Proposed PA and Final EIS/EIR (80 FR 33519):

- Albert Cutillo, dated June 18, 2015;
- Ralph Guidero, dated June 18, 2015; and
- CDFW, dated July 7, 2015

Even though there was no comment period on the Proposed PA and Final EIS/EIR, the BLM considered these letters to the extent practicable. The BLM's consideration of these letters did not result in changes in the design, location, or timing of the Project in a way that would cause

significant effects to the human environment outside of the range of effects analyzed in the Proposed PA and Final EIS/EIR. Similarly, none of the letters identified new significant circumstances or information relevant to environmental concerns that bear on the Selected Alternative and its effects.

8.4 Notice of Clarifications of the Proposed PA and Final EIS/EIR

Minor corrections to and clarifications of the Proposed PA and Final EIS/EIR are provided in Appendix 3. These minor revisions have been made as a result of and in response to additional input received on the document (see Section 8.3 of this ROD) and internal BLM review. None of the minor corrections and clarifying statements affects the adequacy of the underlying FLPMA or NEPA analysis in the Proposed PA and Final EIS/EIR, nor do they affect the location, features, components, or activities associated with the Selected Alternative.

8.5 Protests on the Proposed CDCA Plan Amendment

Pursuant to the BLM's land use planning regulations in 43 CFR 1610.5-2, any person who participated in the land use planning process for the Project and who has an interest that is or may be adversely affected by the planning decision may protest approval of the proposed PA within 30 days from the date the USEPA publishes the Notice of Availability (NOA) in the Federal Register. Detailed information on protests may be found on the BLM Washington Office website: http://www.blm.gov/pgdata/content/wo/en/prog/planning/planning_overview/protest_resolution.html.

The USEPA published a NOA of the Proposed PA and Final EIS/EIR in Volume 80, page 33519 of the Federal Register on June 12, 2015. Publication of this NOA initiated a 30-day protest period, which closed on July 13, 2015. The BLM timely received four protests:

- Colorado River Indian Tribes;
- Tom Budlong;
- Basin and Range Watch; and
- National Parks Conservation Association, Defenders of Wildlife, Sierra Club, and Center for Biological Diversity.

The Director has resolved all protests. In general, protesters did not support the proposed plan amendments identified above and raised the following issues, among others: the BLM's purpose and need for the Project; the range of alternatives analyzed in the EIS; potential impacts to cultural resources, air quality, and wildlife including bighorn sheep, Mojave tui chub, water birds, and all migratory birds; adequacy of mitigation; adequacy of tribal consultation; compliance with FLPMA's prohibition on unnecessary or undue degradation; consistency with the CDCA Plan; consistency with San Bernardino County Ordinances and management of the Mojave National

Preserve; consultation under the NHPA; compliance with Secretarial Order 3330; compliance with BLM ACEC policy; compliance with BLM visual resource management policy; and compliance with BLM wildlife policy.

All protesting parties received response letters from the BLM Director conveying the Director's decision on the concerns raised in their protests. The responses concluded that BLM followed the applicable laws, regulations, and policies and considered all relevant resource information and public input in developing the Draft PA/EIS/EIR and Proposed PA and Final EIS/EIR. Therefore, all protests were denied, and no changes were made to the decision as a result of the protests. Detailed information on protests can be found on BLM Washington Office's website: http://www.blm.gov/wo/stlen/prog/planning/protestresolution.html.

8.6 Availability of the Record of Decision

Electronic copies of this ROD are available on the Internet at http://www.blm.gov/ca/st/en/fo/barstow/renewableenergy/soda_mountain.html. Paper and electronic copies may be viewed at the following locations:

Bureau of Land Management
Barstow Field Office
2601 Barstow Road
Barstow, CA 92311

Bureau of Land Management
California Desert District
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

9.0 Consideration of Other BLM Plans and Policies

9.1 Relationship of the Selected Alternative to the Solar Energy Development in Six Southwestern States (Western Solar Plan)

The Western Solar Plan, adopted through the October 2012 Record of Decision, included amendments to 89 BLM land use plans, including the CDCA Plan, not only to support solar energy development on public lands, but also to minimize potential environmental, cultural, and socioeconomic impacts. As part of the Western Solar Plan, the BLM identified priority areas (solar energy zones) that are well suited for utility-scale production of solar energy, variance areas outside of solar energy zones where solar development would be open to applications, and areas to be excluded from utility-scale solar energy development.

The Project is considered a "pending" application for the purposes of the Western Solar Plan. The BLM defines "pending" applications as any applications (regardless of place in line) filed within proposed variance and/or exclusion areas before publication of the Supplement to the Draft Solar PEIS (October 28, 2011) and any applications filed within proposed solar energy zones before June 30, 2009.[2] Pending applications, including the application being approved in this ROD, are not subject to any decisions adopted by the Western Solar Plan (at page 5). Amendments to pending applications are also not subject to the decisions adopted by the Western Solar Plan, provided they meet the criteria identified in Appendix B, B.1.2 of the Western Solar Plan. The BLM processes pending solar applications consistent with existing land use plan decisions in place prior to amendment by the Western Solar Plan. As a pending application, the Applicant's CACA-049584 application has been processed under the CDCA land use plan decisions in place prior to the adoption of the Western Solar Plan.

9.2 Conformance with the CDCA Plan

In furtherance of its authority under FLPMA, the BLM manages public lands in the California Desert Conservation Area, including the Project site, pursuant to the CDCA Plan, as amended. The CDCA Plan is a comprehensive, long-range plan that was adopted in 1980 and has since been amended many times. The CDCA is a 25-million acre area that contains more than 12 million acres of BLM administered public lands in the California Desert, which includes the Mojave Desert, the Sonoran Desert, and a small part of the Great Basin Desert. The Selected Alternative was identified as Alternative B with modifications and includes a maximum solar energy generating capacity of 287 MW within a ROW area of 2,813 acres. As described in Section 2 of the Proposed PA and Final EIS/EIR, Alternative B consists of the East Array (comprising two sub-arrays, East 1 and East 2) and the South Array (consisting of three sub-arrays, South 1, South 2, and South 3) as described for the Proposed Action; no North Array would be constructed.

The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not specifically identified in the CDCA Plan be considered through the Plan Amendment process. As discussed in Section 3.9 of the Proposed PA and Final EIS/EIR, the Project's proposed connection to the existing Marketplace-Adelanto 500 kV transmission line would consist of a high-voltage substation, switchyard, and transmission interconnect that would be located within an existing designated Federal Section 368 Energy Corridor (Corridor number 27-225). The CDCA Plan identifies designated corridors as suitable for transmission of electricity, including this one. Therefore, no CDCA Plan Amendment would be needed to allow the proposed connection to the 500 kV line. As described in Section 3 of this ROD, the CDCA Plan is being amended to identify the Project site as a site specifically associated with solar power generation and transmission.

[2] The CDCA Plan amendments made in the Western Solar ROD identify the Project site primarily as a variance area open to future applications for solar development, subject to the procedures identified in the Solar PEIS, and a portion in the southeast part of the site as an exclusion area that would be closed to such applications.

The Project site is classified as Multiple-Use Classes (MUC) L (Limited Use), M (Moderate), and I (Intensive) in the CDCA Plan. Class L (Limited Use) lands are managed for generally lower intensity uses for the purpose of protecting sensitive natural, scenic, ecological, and cultural resource vales. MUC M (Moderate Use) provides for a wide variety of present and future uses including mining, livestock grazing, recreation, and energy and utility development. MUC I (Intensive Use) provides for concentrated use of lands and resources to meet human needs, where reasonable protection is provided for sensitive natural and cultural resources. Based on CDCA Plan Table 1, Multiple Use Class Guidelines, and CDCA Plan Chapter 3, Energy Production and Utility Corridors Element, solar generating uses are conditionally allowed in the MUC L, M, and I designations contingent on the CDCA Plan amendment process and NEPA requirements being met. Because the Project site is not identified in the CDCA Plan for such use, a CDCA Plan Amendment is required in connection with the approval for the Selected Alternative. The Proposed PA and Final EIS/EIR acts as the mechanism for satisfying NEPA requirements for the CDCA Plan amendment process, and provides the analysis required to support a CDCA Plan amendment to identify the proposed site as suitable or unsuitable for solar development within the Plan.

The CDCA Plan Amendment to identify the site of the Selected Alternative for solar energy generation is provided in the ROD through the following Land Use Plan amendment analysis.

9.2.1 Required CDCA Plan Determinations

As discussed in Chapter 7 of the CDCA Plan, the BLM must make certain determinations in amending the CDCA Plan. The required determinations and how they were made for the CDCA Plan Amendment for the Selected Alternative are provided below.

> **Required Determination:** Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.

The Applicant's request for a ROW grant was properly submitted; the Proposed PA and Final EIS/EIR was the mechanism for evaluating and disclosing environmental impacts associated with that application. No law or regulation prohibits granting the CDCA Plan Amendment.

> **Required Determination:** Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element.

The Selected Alternative does not require a change in the MUC classification for any area within the CDCA.

> **Required Determination:** Determine the environmental effects of granting and/or implementing the applicant's request.

The Proposed PA and Final EIS/EIR evaluated the environmental effects of approving the CDCA Plan Amendment and the ROW grant application for the Selected Alternative.

> **Required Determination:** Consider the economic and social impacts of granting and/or implementing the applicant's request.

The Proposed PA and Final EIS/EIR evaluated the economic and social impacts of the Plan Amendment and the ROW grant.

> **Required Determination:** Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from Federal, state, and local government agencies.

Opportunities for and consideration of public comment on the proposed amendment, including input from the public and from Federal, state, and local government agencies that were provided are described in Section 8 of this ROD.

> **Required Determination:** Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.

The balance between resource use and resource protection is evaluated in the Proposed PA and Final EIS/EIR. FLPMA Title VI, as addressed in the CDCA Plan, provides 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 maintenance of environmental quality. Multiple use includes the use of renewable energy resources, and, through Title V of FLPMA, the BLM is authorized to grant ROWs for the generation and transmission of electric energy. The acceptability of use of public lands within the CDCA for this purpose is recognized through the CDCA Plan's approval of solar generating facilities within MUCs L, M, and I. The Proposed PA and Final EIS/EIR identifies resources that may be adversely affected by approval of the Selected Alternative, evaluates alternative actions that may accomplish the purpose and need with a lesser degree of resource impacts, and identifies mitigation measures that, when implemented, would reduce the extent and magnitude of the impacts and provide a greater degree of resource protection.

9.2.2 Conformance with CDCA Plan MUC Guidelines

The proposed Land Use Plan Amendment to be made by the BLM is a site identification decision only. Because the proposed solar Project and its alternatives are located within MUCs L, M, and I, the classification designations govern the type and degree of land use action allowed within the classified area. All land use actions and resource management activities on public lands within a MUC designation must meet the guidelines for that class. MUCs L, M, and I allow electric generation plants for solar facilities after NEPA requirements are met. These guidelines are listed in Table 1, *Multiple Use Class Guidelines*, in the CDCA Plan. The specific application of the MUC designations and resource management guidelines for a specific resource or activity are further discussed in the plan elements section of the CDCA Plan. In the MUC L designation, the BLM Authorized Officer (AO) is directed to use his/her judgment in allowing for consumptive uses by taking into consideration the sensitive natural and cultural values that might be degraded. In the MUC M designation, the CDCA Plan acknowledges the tradeoffs between acceptable uses. It also notes that even MUC I is still open to negotiate between those uses.

The Selected Alternative meets the MUC Guidelines, consistent with the explanation provided in Proposed PA and Final EIS/EIR Section 3.9.11 (p. 3.9-14 et seq.).

9.2.3 CDCA Plan Decision Criteria

The CDCA Plan defines specific Decision Criteria to be used by BLM in evaluating applications in the Energy Production and Utility Corridors Element of Chapter 3. The consideration of these Decision Criteria for the Selected Alternative is described below.

> **Decision Criterion:** Minimize the number of separate rights-of-way by utilizing existing rights-of-way as a basis for planning corridors.

This decision criterion is not applicable to the Selected Alternative because it is not a corridor planning exercise. However, much of the right-of-way for the Selected Alternative would be within a designated utility corridor.

> **Decision Criterion:** Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables.

The Selected Alternative would utilize existing transmission lines within an existing corridor. It would not increase the number of transmission lines or cables within the LADWP Marketplace-Adelanto 500kV corridor. The solar plant site would partially overlap the Section 368 and the CDCA Plan-designated West-wide Energy Corridor 27-225. The analysis in Section 3.9.6.2 of the Proposed PA and Final EIS/EIR describes that while the Selected Alternative would occupy the entire width of the portion of this corridor on the southeastern side of I-15, it would leave an approximately 1.5-mile to 1.75-mile-wide area of the 2-mile-wide corridor on the northwestern side of I-15 that could accommodate several major utility lines in the future. The proposed substation would occupy a small area adjacent to the 500 kV line ROW and the collector lines would be located underground, such that overhead lines could be located over them within the corridor.

> **Decision Criterion:** Provide alternative corridors to be considered during processing of applications.

The BLM considered alternative footprints in evaluating the Project; however, each would require use of the same corridors for connector line access to the substation and switchyard that would connect the Project to the existing 500kV transmission line. The collector lines would be located underground.

> **Decision Criterion:** Avoid sensitive resources wherever possible.

The extent to which the Selected Alternative has been located and designed to avoid sensitive resources is addressed throughout the Proposed PA and Final EIS/EIR. The BLM's regulations and policies and other Federal regulations and policies were considered in the original siting process used by the Applicant to identify potential sites for the Project locations. The alternatives analysis considered whether the purpose and need for the Project could be achieved with a different build alternative, but with a lesser effect on sensitive resources. That analysis indicated that the Selected Alternative would have the lowest impacts to sensitive resources of any of the action alternatives.

Decision Criterion: Conform to local plans whenever possible.

As explained in Section 5.8 above, BLM initiated the period of Governor's Consistency Review for the Proposed PA and Final EIS/EIR in accordance with FLPMA (43 USC § 1712(c)(9)) on June 12, 2015. The purpose of the review is to identify inconsistencies of the proposed PA with state and local plans, programs, and policies. No inconsistencies were identified. Further, Appendix I in the Proposed PA and Final EIS/EIR evaluates consistency with the San Bernardino County General Plan. The entire Selected Alternative site is on BLM administered lands and conforms to applicable BLM land use plans, policies and regulations.

Decision Criterion: Consider wilderness values and be consistent with final wilderness recommendations.

There are no wilderness areas or lands with wilderness characteristics within or adjacent to the Project site. As described in Section 3.15.2 of the Proposed PA and Final EIS/EIR, there is one designated Federal Wilderness Area in the general vicinity of the Project site. In 1994, the Federal California Desert Protection Act designated 695,200 acres of Mojave National Preserve as wilderness. The Zzyzx and Soda Dry Lake area is the closest portion of the Mojave National Wilderness to the site and is approximately 2 miles from the nearest portion of the Selected Alternative (East Array). Additionally, the Soda Mountains Wilderness Study Area (WSA) is approximately 1 mile from the nearest portion of the Selected Alternative (South Array and operation and maintenance area). Potential impacts on these areas, including mitigated effects on night sky views, are discussed in Proposed PA and Final EIS/EIR Sections 3.15, Special Designations, and 3.18, Visual Resources. As described therein, the Selected Alternative would have some visual impacts on the Soda Mountain WSA, which have been mitigated to the extent practicable. Due to distance and intervening topography, the visibility of the Selected Alternative from the Mojave National Wilderness would be negligible.

Decision Criterion: Complete the delivery systems network.

This decision criterion is not applicable to the Selected Alternative.

Decision Criterion: Consider ongoing projects for which decisions have been made.

The BLM approved the XpressWest High Speed Rail Project parallel to I-15 in 2011. The project is not yet under construction, and a potential construction schedule is not known. The XpressWest corridor is located on the north side of I-15 in the Project area and would intersect the Selected Alternative's collector lines connecting to the substation and switchyard. Impacts associated with the XpressWest project were considered in the cumulative analysis in the Proposed PA and Final EIS/EIR. No other approved projects are located in close proximity to the Selected Alternative; however, other approved and pending projects also are considered in the cumulative analysis.

Decision Criterion: Consider corridor networks which take into account power needs and alternative fuel resources.

This decision criterion is not applicable to the Selected Alternative. The Project does not involve the consideration of an addition to or modification of the corridor network.

9.2.4 Revisions to Open Routes

The WEMO Plan Amendment, adopted in March 2006, was prepared specifically to develop a comprehensive strategy for the protection of sensitive plants and animals and resulted in the establishment of eight Travel Management Plans to establish new route designations for vehicles in the Western Mojave Desert. The Project site is located in two separate Subregion Travel Management Areas (TMAs): Afton Canyon (TMA1) and Cronese (TMA5). The new route designations for these TMAs have been completed. Currently, there is open route traversing the Project site: Route AC8828 (Rasor Road). The Selected Alternative would maintain this road in its existing location, and no revisions to open routes would be needed. Upon decommissioning of the Project, BLM will revisit the travel needs of the area, and determine whether changes are needed at that time.

9.3 Relationship of the Selected Alternative to the Draft Desert Renewable Energy Conservation Plan

On November 13, 2015, the BLM published the Proposed Plan Amendment and Final EIS for the Desert Renewable Energy Conservation Plan (DRECP). The DRECP is a landscape-scale planning effort undertaken to achieve two sets of overarching goals:

- Renewable Energy: The proposed plan identifies specific development focus areas with high-quality renewable energy potential and access to transmission in areas where environmental impacts can be managed and mitigated.
- Conservation: The plan specifies species, ecosystems and climate adaptation requirements for desert wildlife, as well as the protection of recreation, cultural, and other desert resources.

The DRECP covers 22.5 million acres and is a collaborative effort between the BLM, USFWS, the California Energy Commission, and the CDFW. The Draft DRECP, released in September 2014 for public review and comment, included five alternatives for achieving the overall renewable energy and conservation goals of the DRECP.

In March 2015, the DRECP agencies announced that completion of the plan would follow a phased approach with the first phase consisting of 10 million acres of lands managed by the BLM. The Proposed BLM Plan was developed in partnership with other agencies along with input from local and tribal governments and public comments received on the Draft DRECP.

The Proposed DRECP Land Use Plan amendment has not yet been approved by the BLM. Existing land use plan decisions remain in effect during an amendment or revision until the amendment or revision is completed and approved. Therefore, the BLM has processed this application under the CDCA Plan, as amended. However, the BLM considered the Proposed DRECP when selecting an alternative.

The Project site is within the Mojave and Silurian Valley subregion of the DRECP. The Proposed DRECP would expand the Soda Mountain ACEC north of I-15, however no conservation areas are proposed south of I-15 within the Project site. Therefore, while some of the Soda Mountain Proposed PA and Final EIS/EIR alternatives would overlap with conservation designations in the DRECP, the BLM has selected an alternative that avoids those areas.

The BLM's determination in the Proposed DRECP that areas north of the highway contained the relevant and important criteria for ACEC designation, but areas to the south did not, is consistent with the site-specific evaluation the BLM conducted in response to an ACEC nomination received as a comment on the Soda Mountain Project. A detailed, site-specific evaluation of the ACEC nomination is in Appendix M of the Soda Mountain Proposed PA and Final EIS/EIR.

The proposed DRECP identifies most of the Selected Alternative site as "unallocated." Under the DRECP, unallocated lands are not designated for renewable energy or conservation. These areas would be available for renewable energy on a case-by-case basis following a Plan Amendment and environmental review. Therefore the Soda Mountain Proposed PA and Final EIS/EIR is consistent with the Proposed DRECP Land Use Plan Amendment.

10.0 Final Agency Action

10.1 Land Use Plan Amendment

It is the decision of the BLM to approve the Proposed Plan Amendment to the California Desert Conservation Area Land Use Management Plan (CDCA Plan, 1980, as amended), to identify the Project site as suitable for solar energy development. I have resolved all protests on the Proposed Plan Amendment and, in accordance with BLM regulations, 43 CFR 1610.5-2, my decision on the protests is the final decision of the Department of the Interior.

Based on the recommendation of the State Director, California, I hereby approve the Proposed Plan Amendment. This approval is effective on the date this Record of Decision is signed.

Approved by:

Neil Kornze
Director
Bureau of Land Management
U.S. Department of the Interior

3/25/16
Date

10.2 Right-of-Way Authorization

It is my decision to approve a solar energy right-of-way grant to Soda Mountain Solar, LLC, subject to the terms, conditions, stipulations, Plan of Development, and environmental protection measures developed by the Department of the Interior and reflected in this Record of Decision. This decision is effective on the date this Record of Decision is signed.

Approved by:

Neil Kornze
Director
Bureau of Land Management
U.S. Department of the Interior

3/25/16
Date

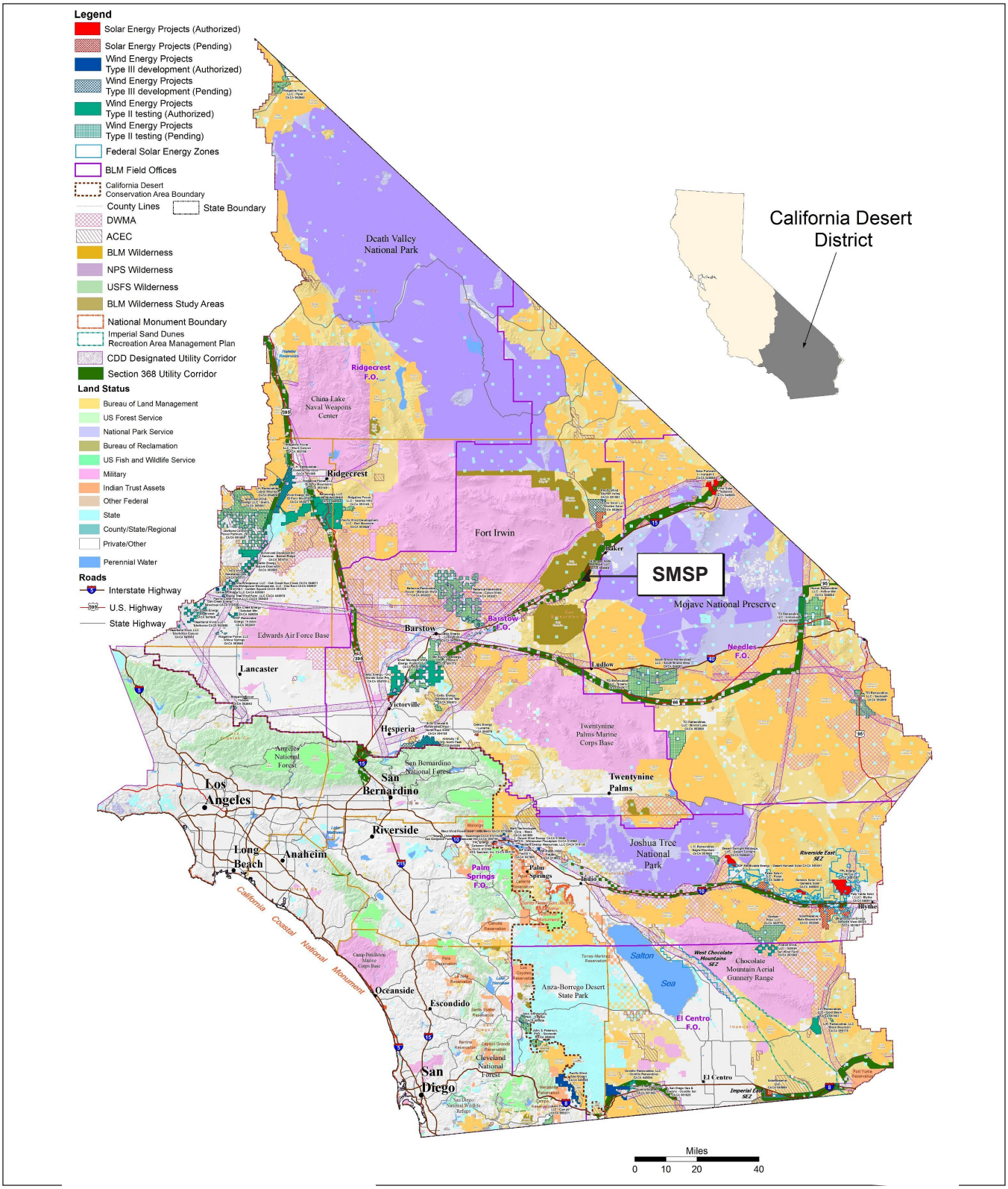
10.3 Secretarial Approval

I hereby approve these decisions. My approval of these decisions constitutes the final decision of the Department of the Interior and, in accordance with the regulations at 43 CFR 4.410(a)(3), is not subject to appeal under Departmental regulations at 43 CFR Subpart 4.400. Any challenge to these decisions, including the BLM Authorized Officer's issuance of the right-of-way as approved by this decision, must be brought in the Federal District Court.

Approved by:

Janice M. Schneider
Assistant Secretary
Land and Minerals Management
U.S. Department of the Interior

3-28-16
Date



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Soda Mountain Solar Project : 120592

SOURCE: Bureau of Land Management 2014

Figure 1
Regional Context

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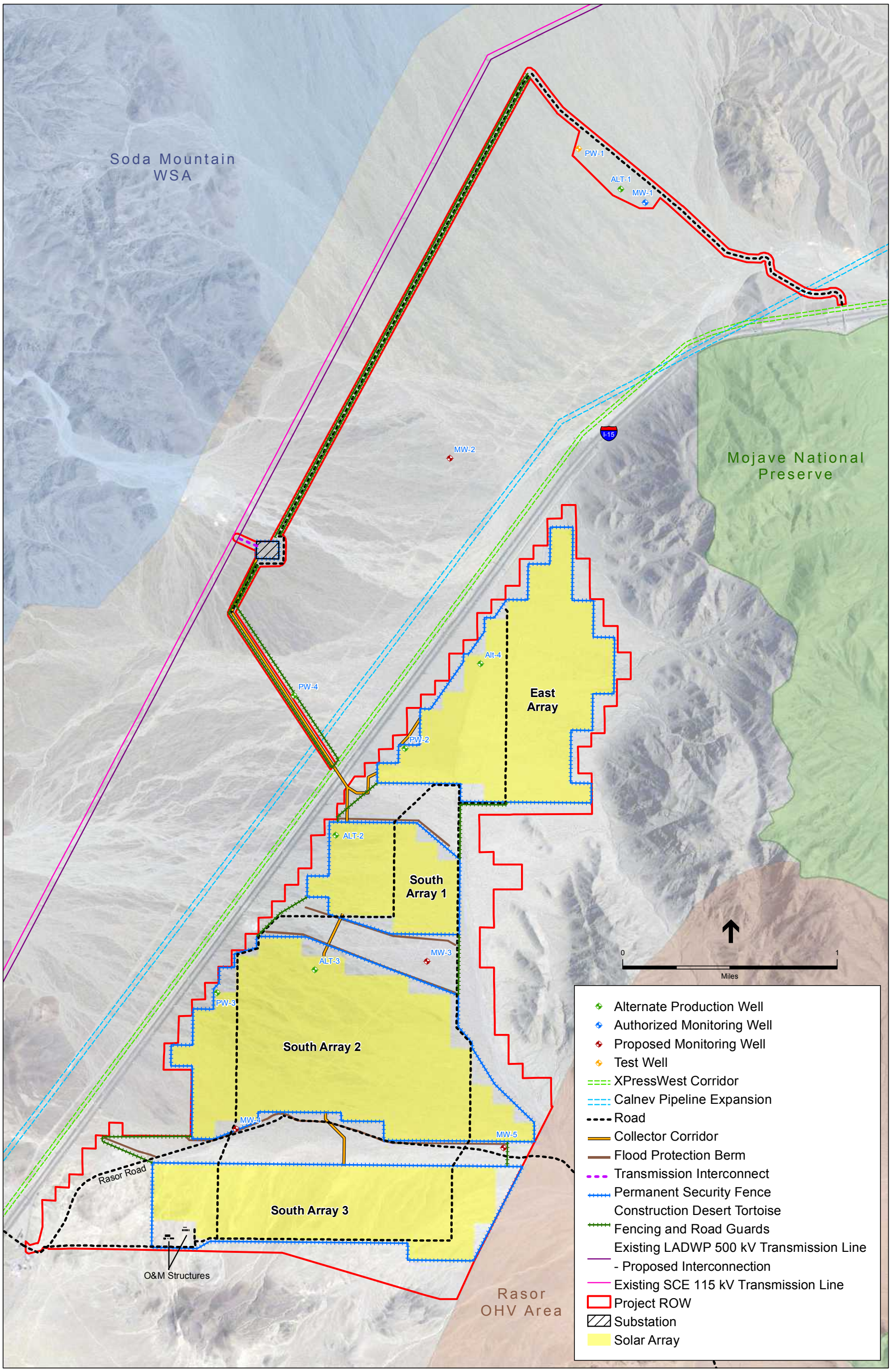

ESA, 2015; Soda Mountain Solar, LLC, 2015

Soda Mountain Solar Project . 120592

Figure 2

Selected Alternative

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-SB-15B0081-14F0616

JAN 13 2016

Memorandum

To: District Manager, Bureau of Land Management
California Desert District, Moreno Valley, California

From: Field Supervisor, Carlsbad Fish and Wildlife Office
Carlsbad, California

Subject: Biological Opinion for the Soda Mountain Solar Project, San Bernardino County, California [2831.03(CP), CACA-49584, CADOOO.06/CAD080]

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Bureau of Land Management's (Bureau) proposed issuance of a right-of-way grant for the Soda Mountain Solar Project and its effects on the federally threatened desert tortoise (*Gopherus agassizii*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The proposed Soda Mountain Solar Project involves the construction, operation, maintenance, and decommissioning of a 287-megawatt photovoltaic solar power plant and associated infrastructure and facilities. We received your request for formal consultation on December 13, 2013.

This biological opinion is based on information that accompanied your request for consultation, including the biological assessment (Bureau 2013a) and draft environmental impact statement (Bureau 2013b), information that the Bureau and Soda Mountain Solar, LLC, (applicant or Soda Mountain Solar) provided during consultation, correspondence with National Park Service and Bureau staff, and information contained in our files. The Service can make a complete record of this consultation available at the Palm Springs Fish and Wildlife Office.

CONSULTATION HISTORY

On December 10, 2013, the Bureau (2013c) requested initiation of formal consultation for the issuance of a right-of-way grant for the construction, operation, maintenance, and decommissioning of the Soda Mountain Solar Project. In the request for initiation, the Bureau concluded that the proposed project may affect, but is unlikely to adversely affect, the federally endangered Mohave tui chub (*Gila bicolor mohavensis*). The Mohave tui chub occurs in Lake Tuendae and MC Springs, which are located approximately 4 miles east of the project site at

Zzyzx. The applicant provided a hydrogeological conditions and groundwater modeling report (Appendix C in Bureau 2013a) that served as a basis for the Bureau's determination.

By memorandum dated April 16, 2014, the Service (2014a) notified the Bureau that given the uncertainties surrounding the behavior of groundwater in the area, the lack of clarity and precision in the groundwater monitoring plan, and the importance of surrounding areas to the continued existence of the Mohave tui chub, we could not agree with the Bureau's conclusion that the proposed project may affect, but is not likely to adversely affect, the Mohave tui chub. Consequently, the Bureau and the county of San Bernardino requested that Soda Mountain Solar install and test a groundwater well to assess potential effects of pumping groundwater from the Soda Mountain basin on Mohave tui chub occurring in the surrounding areas. Panorama Environmental (Panorama), Burns and McDonnell conducted a groundwater well test to characterize the groundwater resources within the Soda Mountain Solar project area.

On October 20, 2014, the Bureau provided the Service with the results of Panorama's (2014a) groundwater well test. Staff of the U.S. Geological Survey (2014) used the results to assess the potential effects of pumping groundwater from the Soda Mountain basin and found that the proposed pumping for the Soda Mountain Solar Project is unlikely to measurably affect discharge from nearby areas that support Mohave tui chub. The Bureau revised the groundwater monitoring and mitigation plan to reflect the results of the groundwater well test and identified thresholds that would trigger corrective measures to avoid effects to Mohave tui chub (Panorama 2014a).

Based on the revisions to the groundwater monitoring and mitigation plan (Panorama 2014a), we concur with the Bureau's determination that the proposed Soda Mountain Solar Project may affect, but is not likely to adversely affect, the Mohave tui chub. If the proposed action changes in any manner that could result in adverse effects that were not anticipated, the Bureau must contact us immediately to ensure the appropriate level of consultation is completed.

We provided a draft biological opinion to the Bureau on December 19, 2014 (Service 2014c). The Bureau shared the draft biological opinion with the applicant and the National Park Service and provided comments to the Service on January 20, 2015 (Bureau 2015a). We have incorporated those comments where appropriate.

We also received a memo from the Bureau on October 2, 2015. (Bureau 2015b). The Bureau detailed a change in the proposed action that reduced the solar energy capacity, project foot print acres, and water use. We have incorporated these changes in the project description and throughout our biological opinion as necessary.

We provided another draft biological opinion to the Bureau on October 23, 2015 (Service 2015). The Bureau shared the draft biological opinion with the applicant. We received additional comments and clarification on the project description on December 2, 2015 (Bureau 2015b). We have revised the biological opinion to include those comments.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Introduction

The Bureau proposes to issue a right-of-way grant to Soda Mountain Solar to construct, operate, maintain, and decommission a 287-megawatt photovoltaic solar power plant and associated infrastructure and facilities near Baker, California. The proposed project is located approximately 6 miles southwest of the unincorporated community of Baker and approximately 50 miles northeast of Barstow. The project is situated on both the northwest and southeast sides of Interstate 15 (I-15) near the western boundary of the Mojave National Preserve. The proposed facility would occupy 1,726 acres (Bureau 2015) within a 2,942-acre right-of-way.

Construction

Prior to commencement of construction, the applicant would install construction fencing, security perimeter fencing, and desert tortoise exclusion fencing (Figure 1). The construction fence would be a temporary fence, coupled with a desert tortoise exclusion fence, erected around the disturbance areas within the right-of-way, areas used for access to the site, and project well locations northwest of I-15. The perimeter fence would be a combination of permanent security fencing, desert tortoise exclusion fencing, and desert tortoise guards, around each individual block of the South Arrays, the entire East Array, and the substation and switchyard. The applicant would also install temporary desert tortoise exclusion fencing around all areas of temporary disturbance (e.g. underground collector lines, temporary construction roads). Installation of desert tortoise guards would occur where desert tortoise exclusion fencing intersects with roads on the project site.

Construction would occur over an 18-month to 5-year period. It would commence with site clearing and grading of laydown areas and the substation location, followed by survey, clearance, and grading of road corridors to provide site access. During construction of solar arrays and associated facilities, the applicant would maintain existing vegetation to the extent possible. Project construction would require grading and clearing of vegetation for the staging areas, roads, operations and maintenance facilities, and project substation. Within the solar array blocks, construction contractors would cut back vegetation but leave the plant root structure and about 6 inches of aboveground vegetation to be trimmed during operation as necessary.

In the following paragraphs, we provide a description of the key components of the project. Table 1 provides approximate disturbance acreages for the project components. Figure 1 shows the Soda Mountain Solar Project footprint and components.

Solar Panel Arrays

The project would consist of four solar arrays blocks. The East Array would be located on the southeast side of Interstate 15 on approximately 428 acres. South Array 1, 2, and 3 would be located immediately south of the East Array, on approximately 1,128 acres. The project would utilize approximately 1.3 million flat-plate polycrystalline silicon solar panels. The panels would mount on 6-foot to 12-foot-tall linear trackers that would rotate throughout the day to increase total solar exposure.

Temporary Construction Areas

The construction laydown area would consist of one 30-acre area within the right-of-way. The applicant would install construction fencing around portions of the laydown area not otherwise located within the project's perimeter fence. The applicant would remove the construction fences around the laydown area and restore the area to pre-project conditions following construction.

Access Road

The applicant would construct a 2,600-foot primary access route to the southwest corner of solar site. This construction would not modify Rasor Road and would not restrict public use of the road. The applicant would also construct an approximately 1,000-foot-long access road from the Los Angeles Department of Water and Power transmission line access road to the substation and switchyard and an access road from the Blue Bell Mine Road to the substation and switchyard. The applicant would use an existing California Department of Transportation access road to the Opah Ditch pit mine for construction of the collection line. Within the project footprint, the applicant would construct approximately 14.5 miles of internal roads for panel access during site operation and maintenance. Access road construction activities would also include improvements to existing roads; areas damaged by erosion or requiring widening for turns may require reinforcement with rip-rap or crushed aggregate during construction and operation.

Collection Lines

Within the project site, underground collection cables would connect the solar panel arrays to the substation. Collection lines would originate from the arrays southeast of I-15, cross under the interstate at a single location through a directional boring, and continue along Opah Ditch Mine Road to the substation location.

Substation, Switchyard, and Interconnection

The project would have a 15-acre substation and switchyard for central collection and transfer of solar-generated power to the regional electrical grid. These facilities would be constructed west of the project site and deliver power to the adjacent Los Angeles Department of Water and Power's Marketplace-Adelanto 500-kilovolt transmission line through an interconnection. A

permanent gated, chain-link fence combined with desert tortoise exclusion fencing would be constructed around the substation and switchyard.

Operation and Maintenance Facility

The operations and maintenance facilities would be located at the southwestern corner of the site, adjacent to the southernmost array. The operation and maintenance facilities would consist of an operation and maintenance building, a maintenance facility, and a warehouse facility.

Fencing and Security

As described above, the applicant would install permanent security fencing, integrated with desert tortoise exclusion around various portions of the project. Fencing would be approximately 6-feet high with 1 foot of barbed wire at the top and integrated with desert tortoise exclusion fencing. The applicant would not install permanent security fencing in major drainage washes to minimize adverse effects on wildlife corridors and storm water flow. However, the applicant may install breakaway fencing along larger drainages. Breakaway fencing would consist of a driven post with detachable connections just above ground level, which would allow the fencing to yield to the force of a storm event; the fence would be reattached to the post following such events. Desert tortoise guards would be installed as appropriate where desert tortoise exclusion fencing intersects with roads on the project site and cleaned after major flood events.

Lighting

During construction, the applicant would strategically locate lighting in the construction staging area, parking area, and around site security facilities. Lighting would serve safety and security purposes, incorporate shielding, and focus downward and toward the interior of the site to minimize light exposure to areas outside the construction area. The purpose of the lighting is not to facilitate construction at night; however, lighting is needed for construction activities at night, the applicant would limit it to the locations and amounts needed to ensure safety.

During operation and maintenance, the project would incorporate lighting at the site entrance, operation and maintenance building, substation, and switchyard. These lights would provide for safe access to project facilities and visual surveillance; lighting would be the minimum required for safety and security. All lights would incorporate shields and focus downward and toward the interior of the site to minimize the effects of lighting on neighboring areas.

Water Supply, Use, and Storage

The applicant would install up to five groundwater production wells, a water pipeline between the wells and the maintenance building, and five monitoring wells within the project perimeter fence to provide non-potable water for project construction. The applicant would also install three permanent water storage tanks - one 5,000-gallon potable water supply tank, one 22,500-gallon tank for fire suppression near the operation and maintenance building, and one 42,000-

gallon tank located near the southern entrance to the project for use during panel washing. The applicant estimates that construction would require approximately 192 acre-feet of water per year (approximately 283 to 354 acre-feet over the construction period). The applicant would truck 4 to 5, 20,000-gallon, temporary water tanks to the site in anticipation of construction water needs. The applicant would truck potable water to the site due to the expected high boron and fluoride content in groundwater pumped from the water supply wells.

Drainage and Erosion Control

Design of the four individual array blocks would preserve existing site runoff patterns to the extent feasible. The solar facility would not detain runoff or substantially interfere with existing drainage patterns on or off the project site and would preserve existing sediment transport throughout the site. The project's design would allow runoff from the alluvial fan on the north side of I-15 to flow through the project area through the existing channels. The applicant would construct berms along the edges of flow corridors through the south arrays to prevent side channel flows from affecting the solar arrays. Berms would be outside perimeter fences, but during construction would be located within the temporary construction fence.

The applicant would avoid placing solar panels of the south arrays within the flow corridors downstream of the three existing culverts under I-15 to allow flows from the culverts to follow existing braided flow channels. Development within existing washes would only consist of access road crossings and potential subsurface collector lines.

Table 1. Surface Disturbance of Project Components.

Project Component	**Temporary Area of Disturbance (acres)[1]**	**Permanent Area of Disturbance (acres)**	**Total Area of Disturbance (acres)**
Solar Arrays[2,3]	59	1,726	1,785
Substation, Switchyard, and Interconnection	25	15	40
Access Roads	61	16	77
Berms	49	10	59
Collector Routes	33	0	33
Laydown Area	30	0	30
Construction Fence	35	0	35
Total	**292**	**1,767**	**2,059**

[1] The applicant would restore areas of temporary disturbance to pre-project conditions following construction.

[2] Permanent disturbance is calculated as all areas within the perimeter fence. Temporary disturbance associated with the solar array includes areas within the construction fence and a work area 30 feet from the construction fence, excluding other project components.

[3] This disturbance area includes disturbances for operation and maintenance buildings, warehouses, water tank, project wells.

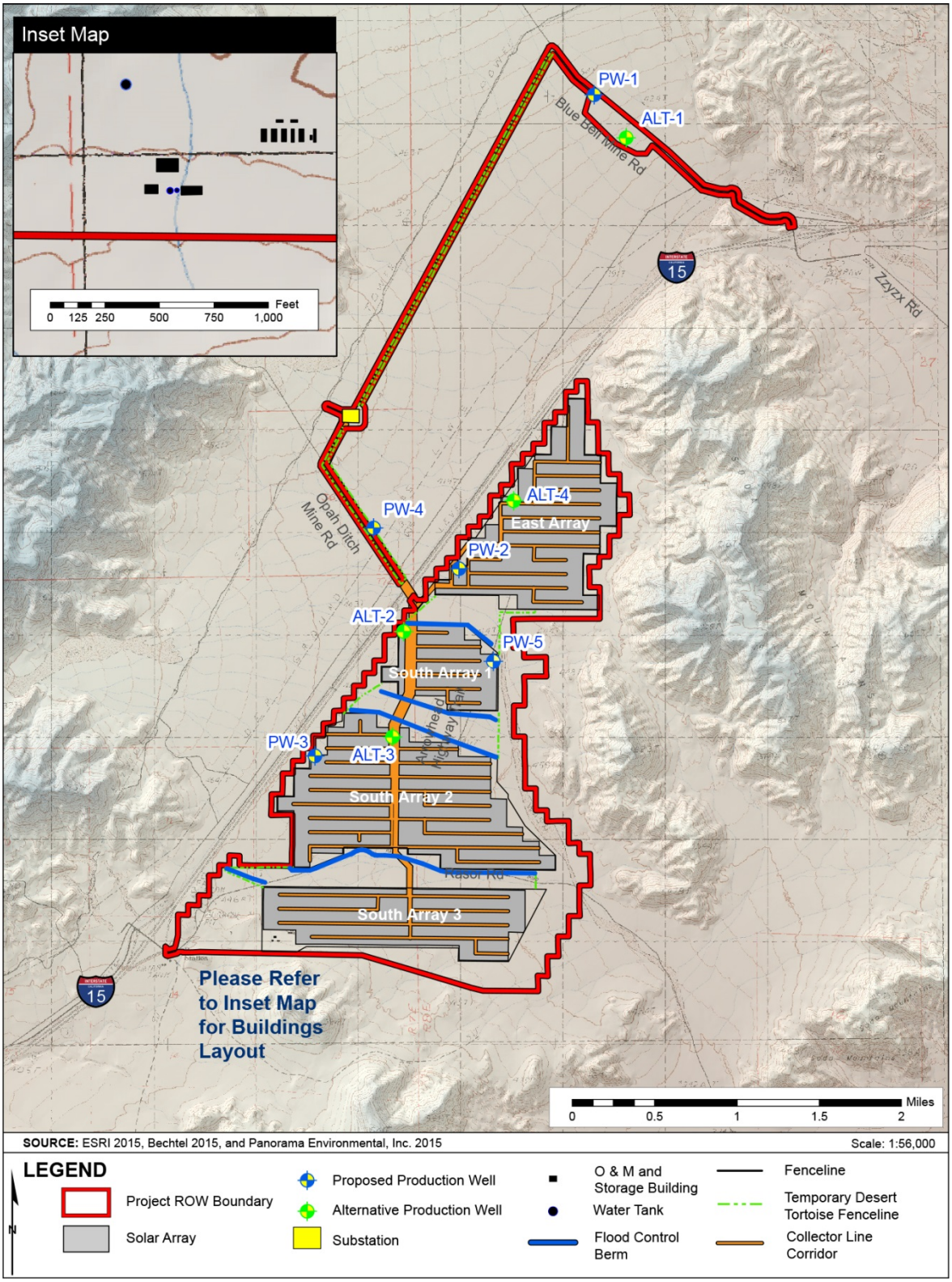

Figure 1. Soda Mountain Solar Project footprint and components.

Operation and Maintenance

Operational activities would include monitoring power generated by the solar arrays, monitoring interconnection to the Los Angeles Department of Water and Power transmission lines, operating the solar array tracking system, and conducting panel washing activities periodically throughout the year.

Maintenance activities would include inspecting, repairing, and maintaining the arrays, tracking systems, and the centralized monitoring and control system; maintaining and repairing the collector lines, which may require trenching. Administrative buildings, fencing and signage, roadways, and other ancillary facilities at the site would also require maintenance.

With the exception of linear facilities, operation and maintenance activities associated with the solar facility would occur within the fenced perimeter of the project site. Activities that would occur outside the perimeter fence could include road maintenance and servicing the gen-tie interconnection. The biological assessment (Bureau 2013a) for the Soda Mountain Solar Project provides additional details on these activities.

Operation and maintenance of the proposed project would require water for potable use, dust control, panel washing, and fire protection. The applicant anticipates requiring approximately 24 acre-feet of water per year for general operation and maintenance.

Decommissioning and Site Reclamation

The project would have an anticipated economic lifespan of 30 to 40 years. Because site conditions and agency requirements may change over the course of the project lifespan, the draft decommissioning plan would be finalized prior to termination of the right-of-way authorization and be approved by the Bureau, dependent on the future use of the site. The project is planned to be operated over the full term of the right-of-way grant and beyond, pending renewal. At the end of the project's economic lifespan, structures and equipment would be removed and the land surface would be reclaimed. The draft decommissioning and closure plan (Bureau 2013b) describes the activities that would occur during decommissioning and site reclamation.

In this biological opinion, we are consulting on the issuance of the Bureau's right-of-way grant for the project, which the environmental impact statement describes as 30 years for the solar facility. We based our analysis on this assumption. If the Bureau determines that it is appropriate to extend the right-of-way grant beyond this time frame, this extension would constitute a modification of the agency action that may affect the listed species in a manner that we did not consider in this biological opinion and may necessitate re-initiation of consultation with the Service, pursuant to section 7(a)(2) of the Act (50 Code of Federal Regulations 402.16).

As previously stated, the decommissioning plan would not be finalized until closer to the time of facility closure. As proposed in the draft decommissioning and closure plan, decommissioning and site reclamation would occur in phases, allowing for minimal amounts of disturbance and

requiring minimal dust control and water usage. The applicant anticipates approximately 192 acre-feet of water per year for decommissioning and site reclamation; decommissioning and site reclamation activities would take place over a 2-year period.

Minimization Measures

General Protective Measures

To minimize adverse effects to the desert tortoise, the Bureau will ensure the applicant implements the following protective measures during construction, operation, maintenance, and decommissioning activities. These measures differ to some degree from those described in the original biological assessment (Bureau 2013a) because of discussions among the Bureau, Service, and Soda Mountain Solar that occurred during the consultation process. The biological assessment (Bureau 2013a) contains more detailed descriptions of the proposed protective measures.

1. The applicant will employ authorized biologists, approved by the Service, and desert tortoise monitors to ensure compliance with protective measures for the desert tortoise. Use of authorized biologists and desert tortoise monitors will be in accordance with the most up-to-date Service guidance (currently Service 2010a) and will be required for monitoring of any construction, operation, maintenance, or decommissioning activities that may injure or kill desert tortoises. The phrases "authorized biologist" and "desert tortoise monitor," as used in this section are taken from the Service's (2010a) guidance and are defined as follows:

    a. Authorized biologists must have thorough and current knowledge of desert tortoise behavior, natural history, ecology, and physiology, and demonstrate substantial field experience and training to safely and successfully conduct their required duties. Authorized biologists are approved to monitor project activities within desert tortoise habitat and are responsible for locating desert tortoises and their sign (i.e., conduct clearance surveys). Authorized biologists must ensure proper implementation of protective measures, and make certain that the effects of the project on the desert tortoise and its habitat are minimized in accordance with the biological opinion. All incidents of noncompliance in accordance with the biological opinion must be recorded and reported.

    b. Desert tortoise monitors will be approved by the authorized biologist to monitor project activities within desert tortoise habitat, ensure proper implementation of protective measures, and record and report desert tortoises and sign observations in accordance with approved protocol. They will report incidents of noncompliance in accordance with the biological opinion, move desert tortoises from harm's way when they enter project sites and place these animals in "safe areas" pre-selected by authorized biologists or maintain the desert tortoises in their immediate possession until an authorized biologist assumes care of the animal. Desert tortoise monitors

assist authorized biologists during surveys to acquire experience. Monitors should not conduct clearance surveys or other specialized duties of the authorized biologist unless the authorized biologist has determined that the monitor has demonstrated that he or she is completely capable of performing that task independently.

c. None of the proposed measures will prohibit any individual from handling a desert tortoise when necessary to ensure the safety of the animal.

2. The applicant will provide the credentials of all individuals seeking approval as authorized biologists to the Bureau. The Bureau will review these and provide the credentials of appropriate individuals to the Service for approval at least 30 days prior to the time they must be in the field.

3. The applicant will designate a field contact representative who will oversee compliance with protective measures during construction, operation, maintenance, and decommissioning activities that may result in injury or mortality of desert tortoises. If the field contact representative, authorized biologist, or desert tortoise monitor identifies a violation of the desert tortoise protective measures, they will halt work in the immediate area until the violation is corrected.

4. Authorized biologists and desert tortoise monitors will capture and handle desert tortoises in compliance with the most up-to-date Desert Tortoise Field Manual (currently Service 2009a).

5. The applicant will develop and implement an environmental awareness program for all workers (construction, operation, maintenance, and decommissioning) that will address the following: a) types of construction activities that may affect the desert tortoise, b) the required desert tortoise protective measures, c) life history of and threats to the desert tortoise, d) legal protections and penalties, and e) reporting requirements.

6. The applicant will install fencing to exclude desert tortoises from the construction right-of-way as described by the Bureau in its record of decision (the construction fence) and clear this area of all desert tortoises prior to the onset of construction. The site may be partitioned with temporary construction fencing to conduct clearance surveys in an efficient manner. Any work outside fenced areas will have clearance surveys conducted by authorized biologists.

7. Following installation of fencing, the applicant will inspect the fence line and all desert tortoise guards on a weekly basis and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing will be temporarily repaired within 24 hours to keep desert tortoises out of the site. During operation of the facility, fencing and desert tortoise guards will be inspected bi-weekly and following all major rainfall events. Any damage to

the fencing will be repaired within 24 hours. The applicant will keep all desert tortoise guards free of sediment and in appropriate working order (e.g., suitable escape ramps).

8. The applicant will install shade structures at regular intervals (no greater than 100 meters apart) on the outside of the outer most fence line, whether permanent or temporary. The precise fence locations will be determined during final design and will enclose areas of project activity. Design of the shade structures will be approved by the Bureau. All permanent shade structures will be installed prior to energizing of any of the solar arrays.

9. The applicant will employ an appropriate number of authorized biologists and desert tortoise monitors to provide full coverage monitoring of construction, operation, maintenance, and decommissioning activities that occur in any unfenced work areas. Authorized biologists or desert tortoise monitors will flag all desert tortoise burrows for avoidance in areas adjacent to construction work areas.

10. The applicant will confine all construction activities, project vehicles, and equipment within the delineated boundaries of construction areas that authorized biologists or desert tortoise monitors have identified as cleared of desert tortoises. The applicant will confine all work areas to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. The applicant will use previously disturbed areas to the extent feasible.

11. Any non-emergency expansion of activities into areas outside of the areas considered in this biological opinion will require the Bureau's approval and desert tortoise clearance surveys. These expanded activities may require re-initiation of consultation with the Service.

12. The applicant will prohibit project personnel from driving off road or performing ground-disturbing activities outside of designated areas during construction, operation, maintenance, or decommissioning.

13. During operation and maintenance activities at the completed project site, the applicant will confine all vehicle parking, material stockpiles, and construction-related materials to the permanently fenced project sites and construction logistics area.

14. The applicant will confine project access to two roads for construction. Following construction, one of the roads will be revegetated and the other road will be maintained for use during operation, maintenance, and decommissioning of the facilities. The applicant will temporarily fence these roads with construction fencing prior to the onset of construction; following construction, the fencing will be removed. To reduce the potential for vehicle strikes of desert tortoises on unfenced access roads, the applicant will enforce a 15-mile-per-hour speed limit for project related travel (i.e., construction, operation, maintenance, and decommissioning) in these areas. The applicant will post speed limit signs along all access routes.

15. Project personnel who are working outside fenced areas will be required to check under vehicles or equipment before moving them. If project personnel encounter a desert tortoise, they will contact an authorized biologist. The desert tortoise will be allowed to move a safe distance away prior to moving the vehicle. Alternatively, an authorized biologist or desert tortoise monitor may move the desert tortoise to a safe location to allow for movement of the vehicle.

16. An authorized biologist or desert tortoise monitor will inspect all ground-disturbing activities (i.e., excavations and grading) that are not within construction fencing on a regular basis (several times per day) and immediately prior to filling of the excavation. If project personnel discover a desert tortoise in an open trench, an authorized biologist or desert tortoise monitor will move it to a safe location. The applicant will cover or erect construction fence around the excavations that are outside of the perimeter fence at the end of each day to prevent entrapment of desert tortoises during non-work hours.

17. Project personnel working outside the fenced areas will not move construction pipes greater than 3 inches in diameter if they are stored less than 8 inches above the ground until they have inspected the pipes to determine the presence of desert tortoises. As an alternative, the applicant may cap all such pipes before storing them outside of fenced area.

18. No pets will be allowed on site prior to or during construction, except working dogs, if used for surveys. All working dogs will remain under the control of their handlers at all times.

Management of Common Ravens

1. The applicant will contain all trash associated with the project that could serve as an attractant to predators in secure, self-closing receptacles to prevent the introduction of anthropogenic food resources for common ravens.

2. The applicant will promptly remove and dispose of (bury or disposal at a landfill) all road-killed animals on the project site or its access roads. Migratory bird carcasses will be removed from the site in accordance with the bird and bat conservation strategy (Panorama 2014c).

3. The applicant will use water for construction, operation, maintenance, and decommissioning (e.g., truck washing, dust suppression, panel washing, landscaping, etc.) in a manner that does not result in puddling or ponding of standing water for more than 4 hours.

4. The applicant will use closed tanks to store water for all project site water needs to eliminate an open water source for common ravens.

5. The applicant will monitor all potential structures on which common ravens may nest

within the right-of-way and remove nests that it identifies following authorization by the Bureau and the Service. The applicant will implement adaptive management if the proposed measures are unsuccessful.

6. The applicant will monitor facility structures to identify frequently used perching locations for common ravens. If it identifies such locations, the applicant will install bird barrier spikes or other functional equivalent following specific discussion with the Bureau and, if necessary, with the Service.

7. The applicant will provide $105 per acre of the project right-of-way area (2,942 acre BLM right-of-way) to the regional common raven management program.

8. The applicant will monitor the effectiveness of these measures during all phases of construction and for 2 years following completion of construction activities. Monitoring will include: 1) an initial raven count for the project area, 2) a quarterly inventory of ravens, during construction and biannually after construction, found on the site with an analysis of the increase, decrease or level of the population, and 3) a final report at the end of construction with a review of the raven inventory. The applicant will continue to implement the measures to reduce the attractiveness of the project to common ravens described herein throughout the life of the project; the applicant will implement adaptive management measures if management of the project is not effective in controlling common raven use of the project site. The applicant will consult with the Bureau and the Service prior to implementing adaptive management changes.

Weed Management

1. The applicant will designate an environmental compliance manager to provide oversight of construction practices and ensure compliance with weed management provisions.

2. The applicant will provide training to all personnel charged with environmental management responsibilities that will include the following: a) weed plant identification; b) effect of noxious and invasive weeds on native vegetation, wildlife, and fire activity; and c) required measures to prevent the spread of noxious and invasive weeds on the site.

3. The applicant will implement an integrated weed management plan (Bureau 2013d) to control weed infestations and the spread of noxious and invasive weeds on the project site. We have summarized the integrated weed management plan herein.

4. During construction, the applicant will perform weekly inspections during the growing season of all construction areas, access routes, and equipment cleaning facilities for the presence of noxious and invasive weeds and weed seed. Following the completion of construction activities, the applicant will continue monitoring according to the following schedule: 1) once a month during the first 2 years of the re-vegetation, 2) quarterly for the third and fourth years, 3) semi-annually for year 5 through 10, and 4) every other year and

following major rainfall events (as defined in General Protective Measure #7) for years 11 through 30, and 5) once a month for 3 years following decommissioning.

5. During operation of completed facilities, the applicant will monitor the site according to the schedule described above in Weed Management measure #4. If noxious and invasive species are found during any of the monitoring periods, the affected areas will be treated by performing weed control at least every other week during the growing season and once a month during the remainder of that year. Weed control will consist of physical or mechanical control methods (e.g., hand pulling, hoeing, etc.) or herbicide application as specified in the integrated weed management plan (Bureau 2013d). If they do not detect noxious or invasive species, the monitoring will continue per Weed Management measure #4 above.

6. The applicant will apply all herbicides used in weed treatments according to a plan approved by the Bureau, which will only be used within the permanent perimeter fence, and in accordance with the herbicide labels. The applicant will only use qualified individuals for herbicide application and will suspend herbicide use when any of the following conditions are met: a) wind velocity has the potential to carry granular or liquid herbicides off-site, b) snow or ice covers the foliage of weeds, c) precipitation is occurring or is imminent, or d) air temperatures exceed 90 degrees Fahrenheit.

7. The applicant will monitor all locations of weed treatment to ensure that treatments are effective.

8. The applicant will limit disturbance areas during construction to the minimal required to perform work and will only use defined routes when accessing work areas.

9. The applicant will use vehicle wash and inspection stations (one on each side of I-15) to wash off-road construction vehicles and delivery vehicles reaching the active construction area and will closely monitor all material brought onto the site to minimize the potential for weed introductions.

10. The applicant will identify and flag all areas of noxious and invasive weed infestation and minimize use of these areas by project personnel until weed treatment of the area has occurred.

11. After project construction, the applicant will restore areas of temporary disturbance as described in the vegetation resource management plan.

12. The applicant will preferentially perform native seed collection for restoration work from areas adjacent to the project site. When it is necessary (i.e., native seed from the surrounding area is not available for collection) to use native seeds from commercial vendors, the applicant will only accept seed that is free of non-native weed seeds.

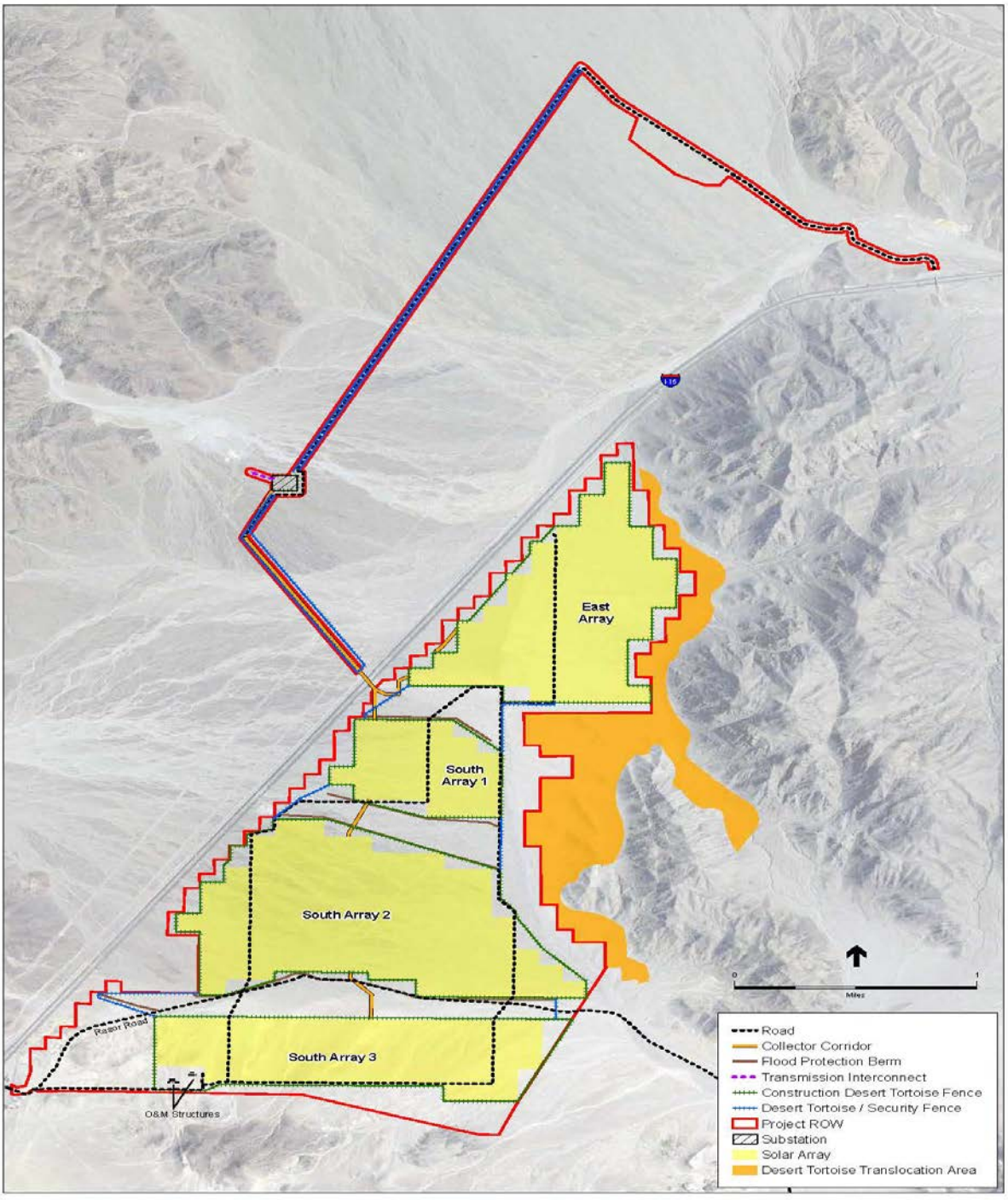

Figure 2. Translocation areas for desert tortoises.

Translocation Strategy

To minimize adverse effects associated with the project, the applicant has proposed to translocate desert tortoises from within the proposed solar facility and any other fenced areas. The Bureau would move desert tortoises to recipient sites east of the project site, as shown in Figure 2. The desert tortoise translocation plan follows the Service's (2011a) guidance. We have summarized the following description of the translocation strategy for the project from the translocation plan (Appendix D in Bureau 2013a), the Service's (2011a) translocation guidance, and modifications made to address changes in the project (i.e., removal of the North Array from the project description and elimination of the need for translocation areas north of Interstate 15). These documents contain additional details of the procedures described below.

Translocation Methods

The applicant will implement a final desert tortoise translocation plan or other documentation related to translocation that may be based on the draft plan (Appendix D in Bureau 2013a) that is consistent with Service's (2011a) guidance, or disposition plans as requested by the Service. The final plan will include all revisions deemed necessary by the Bureau and the Service that result from this consultation.

The applicant will follow the Service's (2009a) procedures to conduct clearance surveys and translocate desert tortoises; clearance surveys will occur during the desert tortoise active season. The biological assessment (Bureau 2013a) describes the data that the authorized biologist will collect during clearance surveys. Desert tortoises that appear healthy will have blood drawn to determine disease status, and will remain on site (i.e., within the fenced project site, pending results of the disease test). The applicant will regularly confirm the desert tortoise's location using radio transmitters or by visually locating them until they are removed from the project site. The applicant will monitor desert tortoises on the project site at least once per month until translocation; desert tortoises will not be held on site for longer than 18 months. If a desert tortoise is too small to carry a transmitter, the applicant will place it in an interim holding pen. At a minimum, the authorized biologist(s) will mark all desert tortoises they handle animals with unique identification numbers and collect data on the same parameters collected during the clearance surveys.

The applicant will quarantine desert tortoises showing signs of illness or injury to prevent interactions with other desert tortoises and transport them to a suitable care facility to undergo assessment, treatment, and/or necropsy; rehabilitated desert tortoises would be potentially eligible for subsequent release. Coordination with the approved care facility will occur when clearance surveys commence to facilitate prompt transport of unhealthy desert tortoises. Quarantine areas will be away from work areas and protected by exclusion fencing so desert tortoises.

Following preconstruction surveys and health evaluations, the authorized biologist will determine the number of desert tortoises to be translocated from the site and will prepare a

disposition plan for each desert tortoise. Desert tortoises will be moved to the recipient area and hydrated in accordance with the most recent agency guidelines (Service 2011a). The applicant does not propose long-term monitoring of desert tortoises following translocation, but will monitor translocated individuals until the moved animals have settled and are not moving into harm's way. Authorized biologist(s) will excavate all desert tortoise burrows within the cleared area to find viable nests. If the applicant locates a viable nest, they will move it as described in the Desert Tortoise Field Manual (Service 2009a).

The applicant will conduct clearance surveys for the linear facilities at any time throughout the year. Linear facilities for this project will include the buried collector lines between arrays, and connection to the substation. The applicant will not move desert tortoises located during these surveys unless necessary to reduce the potential for injury or mortality of the individual; in most cases project personnel will allow desert tortoises to clear the site without assistance or interference. If desert tortoises are moved, they will be moved to the closest adjacent habitat.

The applicant will survey fence lines and a 30-foot-wide buffer to locate desert tortoises prior to construction of the fence according to the Service's (2009a) protocol. Desert tortoises found in the fence line survey area or spotted within 50 meters of the fence line survey area will be given a unique identifier, a visual health assessment, and be fitted with a transmitter. Desert tortoises will be moved into habitat adjacent to and outside the fence line if the individual is inside the fence line or the authorized biologist determines the individual is within harm's way. The desert tortoise will be moved into an empty burrow if clearance of the fence area takes place during winter months, outside the active season (i.e., from November to March and from June to August); desert tortoises will not be blocked in empty burrows. During the remainder of the year, the applicant will follow temperature guidelines according to the Service's (2011a) translocation guidance. Desert tortoises that are too small to accept a transmitter (i.e., if no transmitter is available that is 10 percent or less of the desert tortoise's body weight) will be marked and translocated into habitat adjacent to and outside the fence line. Unhealthy desert tortoises will be transported to a suitable care facility as described above.

If a desert tortoise that was moved out of the fence alignment moves back into the project site prior to the completion of the fence, the individual will be translocated as identified in the translocation plan and considered a translocatee. If the individual remains outside of the fence, it will be considered a resident of the area, the transmitter will be removed, and no further action will be taken.

Measures to Offset Adverse Effects to the Desert Tortoise

The Bureau will require the applicant to offset the loss of desert tortoise habitat resulting from construction, operation, and maintenance of the proposed project in accordance with the West Mojave Plan (Bureau *et al*. 2005). Compensation will include acquisition of private lands containing desert tortoise habitat and their transfer to the Bureau, implementation of habitat enhancement and rehabilitation projects on public land, or some combination of these actions. The Bureau estimates that 2,059 acres of suitable desert tortoise habitat would be required to

offset the loss of desert tortoise habitat caused by the project (Childers 2015). The compensation lands will be located within the Western or Eastern Mojave recovery units, as defined in the recovery plan for the desert tortoise (Service 2011b); however, the specific locations of these lands are currently unknown.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 Code of Federal Regulations 402.02).

The jeopardy analysis in this biological opinion relies on four components: 1) the Status of the Species, which describes the range-wide condition of the desert tortoise, the factors responsible for that condition, and its survival and recovery needs; 2) the Environmental Baseline, which analyzes the condition of the desert tortoise in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the desert tortoise; 3) the Effects of the Action, which determine the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the desert tortoise; and 4) the Cumulative Effects, which evaluate the effects of future, non-federal activities in the action area on the desert tortoise.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of the desert tortoise, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the desert tortoise in the wild.

STATUS OF THE DESERT TORTOISE

Section 4(c)(2) of the Endangered Species Act requires the Service to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether the species' status has changed since it was listed or since the most recent 5-year review; these reviews, at the time of their completion, provide the most up-to-date information on the range-wide status of the species (Service 2010a). We are incorporating the 5-year review by reference to provide most of the information for this section of the biological opinion. The 5-year review is available at
http://ecos.fws.gov/docs/five_year_review/doc3572.DT%205Year%20Review_FINAL.pdf

The following paragraphs provide a summary of the relevant information in the 5-year review and information updated since publication of the 5-year review:

In the 5-year review, the Service discusses the status of the desert tortoise as a single distinct population segment and provides information on the Federal Register notices that resulted in its listing and the designation of critical habitat. The Service also describes the desert tortoise's ecology, life history, spatial distribution, abundance, habitats, and the threats that led to its listing (i.e., the five-factor analysis required by section 4(a)(1) of the Act). In the 5-year review, the Service concluded by recommending that the status of the desert tortoise as a threatened species be maintained.

With regard to the status of the desert tortoise as a distinct population segment, the Service concluded in the 5-year review that the recovery units recognized in the original and revised recovery plans (Service 1994 and 2011b, respectively) do not qualify as distinct population segments under the Service's distinct population segment policy (61 Federal Register 4722; February 7, 1996). We reached this conclusion because individuals of the listed taxon occupy habitat that is relatively continuously distributed, exhibit genetic differentiation that is consistent with isolation-by-distance in a continuous-distribution model of gene flow, and likely vary in behavioral and physiological characteristics across the area they occupy as a result of the transitional nature of, or environmental gradations between, the described subdivisions of the Mojave and Colorado deserts.

In the 5-year review, the Service summarizes information with regard to the desert tortoise's ecology and life history. Of key importance to assessing threats to the species and to developing and implementing a strategy for recovery is that desert tortoises are long lived, require up to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential. The number of eggs 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. Predation seems to play an important role in clutch failure. Predation and environmental factors also affect the survival of hatchlings.

In the 5-year review, the Service also discusses various means by which researchers have attempted to determine the abundance of desert tortoises and the strengths and weaknesses of those methods. Due to differences in area covered and especially to the non-representative nature of earlier sample sites, data gathered by the Service's current rangewide monitoring program cannot be reliably compared to information gathered through other means at this time.

The rangewide monitoring that the Service initiated in 2001 is the first comprehensive attempt to determine the densities of desert tortoises across their range. The Desert Tortoise Recovery Office (Service 2014b) used annual density estimates obtained from this sampling effort to evaluate rangewide trends in the density of desert tortoises over time. This analysis indicates that densities in the Northeastern Mojave Recovery Unit have increased by approximately 13.6 percent per year since 2004, with the rate of increase apparently resulting from increased survival of adults and subadults moving into the adult size class. The analysis also indicates that

the populations in the other 4 recovery units are declining: Upper Virgin River (-5.1 percent), Eastern Mojave (-6.0 percent), Western Mojave (-8.6 percent), and Colorado Desert (-3.4 percent; however, densities in the Joshua Tree and Piute Valley conservation areas within this unit seem to be increasing). Figure 3 shows linear trends in the log-transformed densities in each desert tortoise conservation area by recovery unit. Data for the Upper Virgin River Recovery Unit are from 1999 to the present; data for all other recovery units are from 2004 to the present.

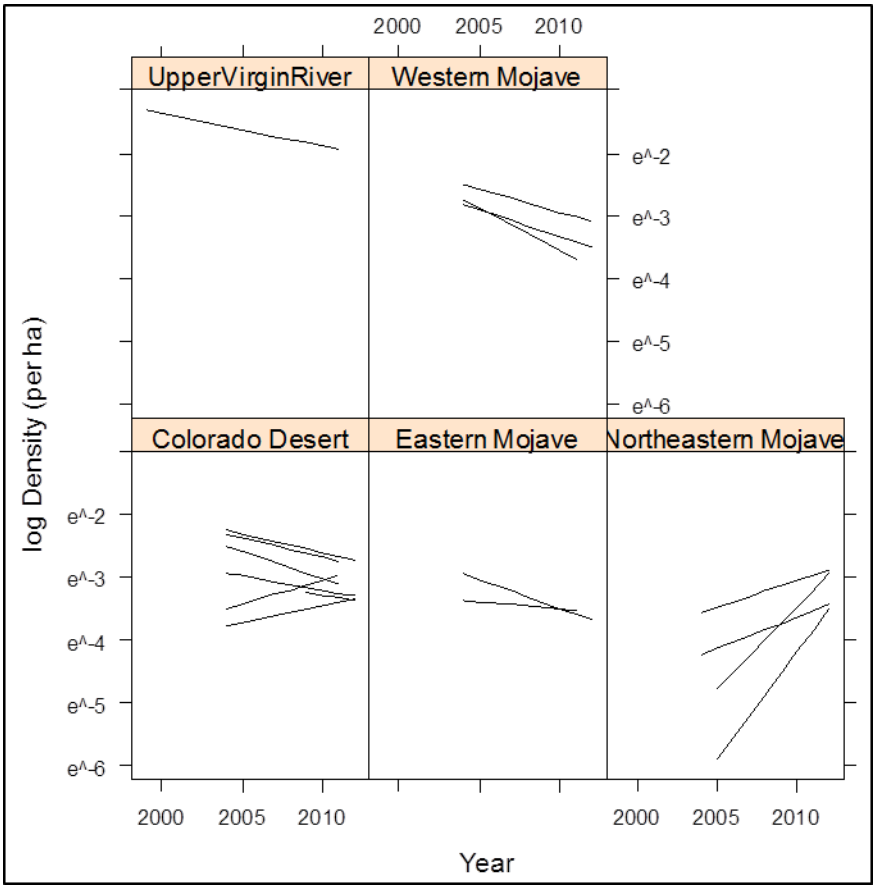

Figure 3. Rangewide trends in the density of desert tortoises.

Allison (2013) also evaluated changes in size distribution of desert tortoises since 2001. In the Western Mojave and Colorado Desert recovery units, the relative number of juveniles to adults indicates that juvenile numbers are declining faster than adults. In the Eastern Mojave, the number of juvenile desert tortoises is also declining, but not as rapidly as the number of adults. In the Upper Virgin River Recovery Unit, trends in juvenile numbers are similar to those of adults; in the Northeastern Mojave Recovery Unit, the number of juveniles is increasing, but not as rapidly as are adult numbers in that recovery unit. Juvenile numbers, like adult densities, are responding in a directional way, with increasing, stable, or decreasing trends, depending on the recovery unit where they area found.

In this context, we consider “juvenile” desert tortoises to be animals smaller than 180 millimeters in length. The Service does not include juveniles detected during rangewide sampling in density estimations because they are more difficult to detect and surveyors frequently do not observe them during sampling. However, this systematic rangewide sampling provides us with an opportunity to compare the proportions of juveniles to adults observed between years.

In the 5-year review, the Service provides a brief summary of habitat use by desert tortoises; the revised recovery plan contains more detailed information (Service 2011b). In the absence of specific and recent information on the location of habitable areas of the Mojave Desert, especially at the outer edges of this area, the 5-year review also describes and relies heavily on a quantitative, spatial habitat model for the desert tortoise north and west of the Colorado River that incorporates environmental variables such as precipitation, geology, vegetation, and slope and is based on occurrence data of desert tortoises from sources spanning more than 80 years, including data from the 2001 to 2005 rangewide monitoring surveys (Nussear *et al.* 2009). The model predicts the probability that desert tortoises will be present in any given location; calculations of the amount of desert tortoise habitat in the 5-year review and in this biological opinion use a threshold of 0.5 or greater predicted value for potential desert tortoise habitat. The model does not account for anthropogenic effects to habitat and represents the potential for occupancy by desert tortoises absent these effects.

To begin integrating anthropogenic activities and the variable risk levels they bring to different parts of the Mojave and Colorado deserts, the Service completed an extensive review of the threats known to affect desert tortoises at the time of their listing and updated that information with more current findings in the 5-year review. The review follows the format of the five-factor analysis required by section 4(a)(1) of the Act. The Service described these threats as part of the process of its listing (55 Federal Register 12178; April 2, 1990), further discussed them in the original recovery plan (Service 1994), and reviewed them again in the revised recovery plan (Service 2011b).

To understand better the relationship of threats to populations of desert tortoises and the most effective manner to implement recovery actions, the Desert Tortoise Recovery Office is developing a spatial decision support system that models the interrelationships of threats to desert tortoises and how those threats affect population change. The spatial decision support system describes the numerous threats that desert tortoises face, explains how these threats interact to affect individual animals and habitat, and how these effects in turn bring about changes in populations. For example, we have long known that the construction of a transmission line can result in the death of desert tortoises and loss of habitat. We have also known that common ravens, known predators of desert tortoises, use the transmission line’s pylons for nesting, roosting, and perching and that the access routes associated with transmission lines provide a vector for the introduction and spread of invasive weeds and facilitate increased human access into an area. Increased human access can accelerate illegal collection and release of desert tortoises and their deliberate maiming and killing, as well as facilitate the spread of other threats associated with human presence, such as vehicle use, garbage and dumping, and invasive plants (Service 2011b). Changes in the abundance of native plants because of invasive weeds can

compromise the physiological health of desert tortoises, making them more vulnerable to drought, disease, and predation. The spatial decision support system allows us to map threats across the range of the desert tortoise and model the intensity of stresses that these multiple and combined threats place on desert tortoise populations.

The threats described in the listing rule and both recovery plans continue to affect the species. Indirect effects to desert tortoise populations and habitat occur in accessible areas that interface with human activity. Most threats to the desert tortoise or its habitat are associated with human land uses; research since 1994 has clarified many mechanisms by which these threats act on desert tortoises. As stated earlier, increases in human access can accelerate illegal collection and release of desert tortoises and deliberate maiming and killing, as well as facilitate the spread of other threats associated with human presence, such as vehicle use, garbage and dumping, and invasive weeds.

Some of the most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects, and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle activity, and habitat invasion by non-native invasive plant species. However, we remain unable to quantify how threats affect desert tortoise populations. The assessment of the original recovery plan emphasized the need for a better understanding of the implications of multiple, simultaneous threats facing desert tortoise populations and of the relative contribution of multiple threats on demographic factors (i.e., birth rate, survivorship, fecundity, and death rate; Tracy *et al.* 2004).

The following map depicts the 12 critical habitat units of the desert tortoise, linkages between conservation areas for the desert tortoise, and the aggregate stress that multiple, synergistic threats place on desert tortoise populations (Figure 4). Conservation areas include designated critical habitat and other lands managed for the long-term conservation of the desert tortoise (e.g., the Desert Tortoise Natural Area, Joshua Tree National Park, and the Desert National Wildlife Refuge). The revised recovery plan (Service 2011b) recommends connecting blocks of desert tortoise habitat, such critical habitat units and other important areas to maintain gene flow between populations. Linkages defined using least-cost path analysis (Averill-Murray *et al.* 2013) illustrate a minimum connection of habitat for desert tortoises between blocks of habitat and represent priority areas for conservation of population connectivity. This map illustrates that, across the range, desert tortoises in areas under the highest level of conservation management remain subject to numerous threats, stresses, and mortality sources.

Since the completion of the 5-year review, the Service has issued several biological opinions that affect large areas of desert tortoise habitat because of numerous proposals to develop renewable energy within its range. These biological opinions concluded that proposed solar plants were not likely to jeopardize the continued existence of the desert tortoise primarily because they were located outside of critical habitat and desert wildlife management areas that contain most of the land base required for the recovery of the species. The proposed actions also included numerous measures intended to protect desert tortoise during the construction of the projects, such as

translocation of affected individuals. In aggregate, these projects would result in an overall loss of approximately 37,503 acres of habitat of the desert tortoise. We also predicted that the project areas supported up to 3,483 desert tortoises; we concluded that most of these individuals were small desert tortoises, that most large individuals would likely be translocated from project sites, and that most mortalities would be small desert tortoises that were not detected during clearance surveys. To date, 560 desert tortoises have been observed during construction of projects; most of these individuals were translocated from work areas, although some desert tortoises have been killed (see Appendix 1). The mitigation required by the Bureau and California Energy Commission, the agencies permitting these facilities, will result in the acquisition of private land and funding for the implementation of various actions that are intended to promote the recovery of the desert tortoise. Although most of these mitigation measures are consistent with recommendations in the recovery plans for the desert tortoise and the Service continues to support their implementation, we cannot assess how desert tortoise populations will respond because of the long generation time of the species.

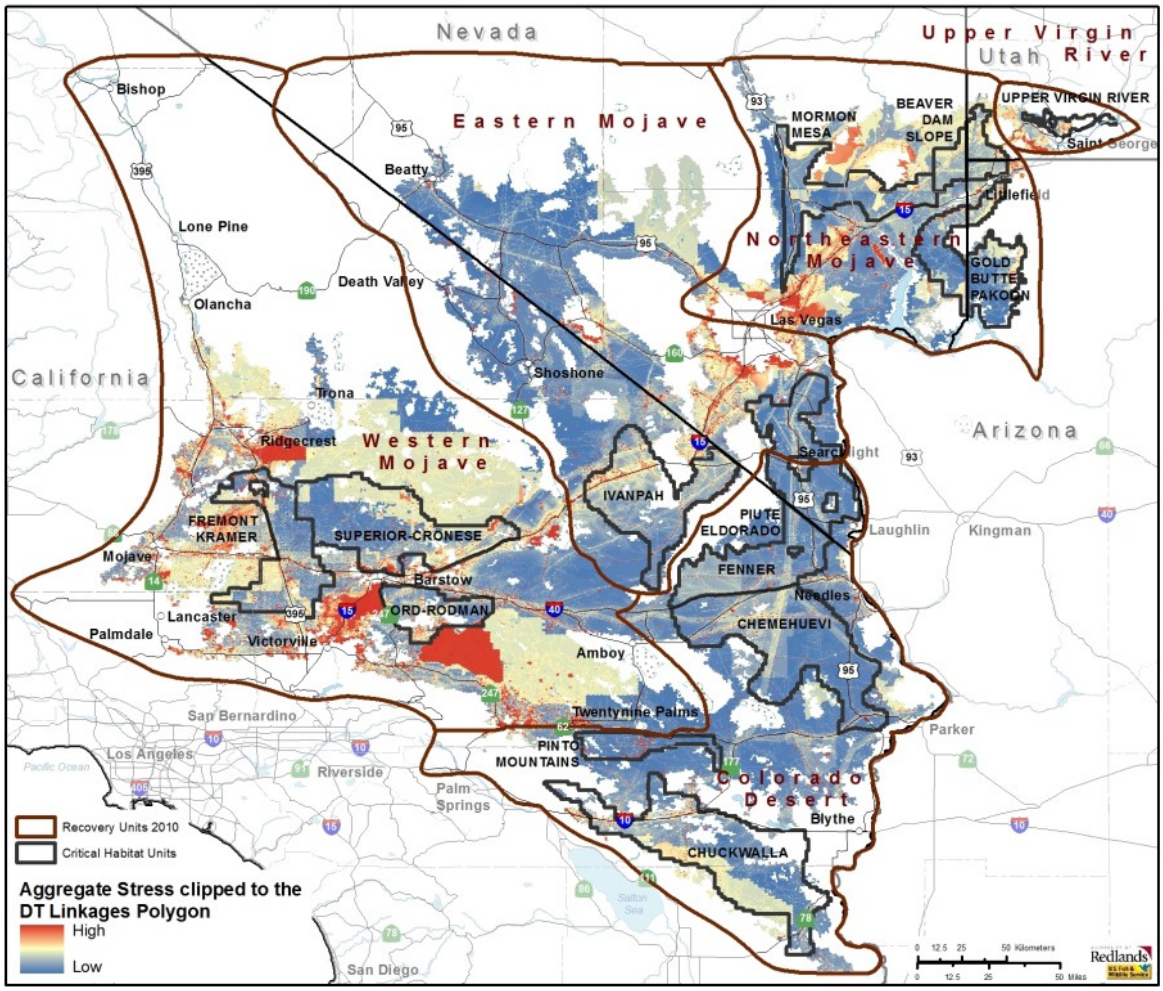

Figure 4. Critical habitat units of the desert tortoise, linkages between conservation areas for the desert tortoise, and the aggregate stress that multiple, synergistic threats place on desert tortoise populations.

In addition to the biological opinions issued for solar development within the range of the desert tortoise, the Service (2012a) also issued a biological opinion to the Department of the Army for the use of additional training lands at Fort Irwin. As part of this proposed action, the Department of the Army removed approximately 650 desert tortoises from 18,197 acres of the southern area of Fort Irwin, which had been off-limits to training. The Department of the Army would also use an additional 48,629 acres that lie east of the former boundaries of Fort Irwin; much of this parcel is either too mountainous or too rocky and low in elevation to support numerous desert tortoises.

The Service also issued a biological opinion to the U.S Marine Corps that considered the effects of the expansion of the Marine Corps Air Ground Combat Center at Twentynine Palms (Service 2012b). We concluded that the Marine Corps' proposed action, the use of approximately 167,971 acres for training, was not likely to jeopardize the continued existence of the desert tortoise. Most of the expansion area lies within the Johnson Valley Off-highway Vehicle Management Area.

The incremental effect of the larger actions (i.e., solar development, the expansions of Fort Irwin, and the Marine Corps Air Ground Combat Center) on the desert tortoise is unlikely to be positive, despite the numerous conservation measures that have been (or will be) implemented as part of the actions. The acquisition of private lands as mitigation for most of these actions increases the level of protection afforded these lands; however, these acquisitions do not create new habitat and Federal, State, and privately managed lands remain subject to most of the threats and stresses we discussed previously in this section. Although land managers have been implementing measures to manage these threats, we have been unable, to date, to determine whether the measures have been successful, at least in part because of the low reproductive capacity of the desert tortoise. Therefore, the conversion of habitat into areas that are unsuitable for this species continues the trend of constricting the desert tortoise into a smaller portion of its range.

As the Service notes in the 5-year review (Service 2010a), "(t)he threats identified in the original listing rule continue to affect the (desert tortoise) today, with invasive species, wildfire, and renewable energy development coming to the forefront as important factors in habitat loss and conversion. The vast majority of threats to the desert tortoise or its habitat are associated with human land uses." Oftedal's work (2002 in Service 2010a) suggests that invasive weeds may adversely affect the physiological health of desert tortoises. Current information indicates that invasive species likely affect a large portion of the desert tortoise's range (Figure 5). Furthermore, high densities of weedy species increase the likelihood of wildfires; wildfires, in turn, destroy native species and further the spread of invasive weeds.

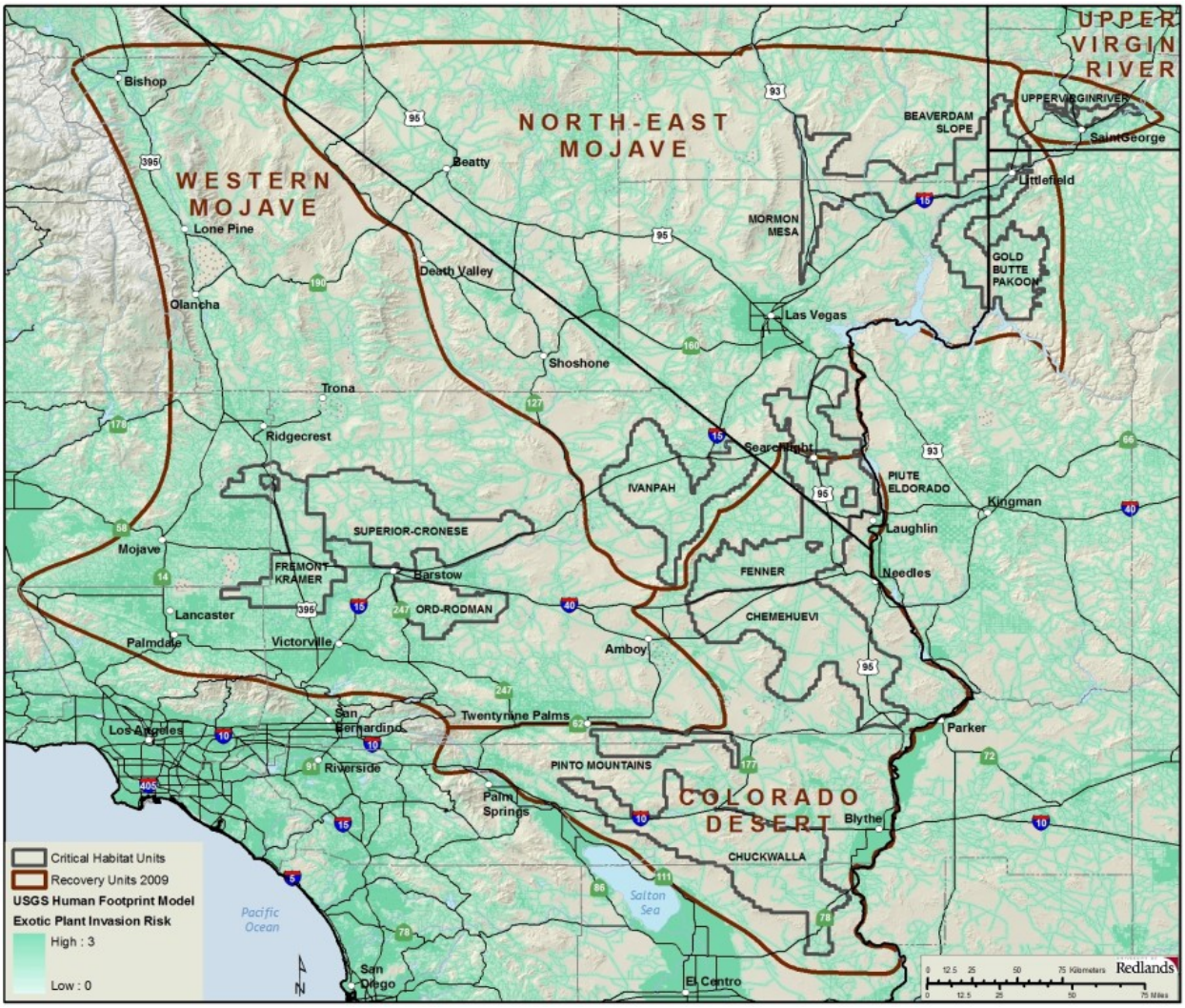

Figure 5. Invasion risk of non-native invasive plant species within the range of the desert tortoise.

Global climate change is likely to affect the prospects for the long-term conservation of the desert tortoise. For example, predictions for climate change within the range of the desert tortoise suggest more frequent and/or prolonged droughts with an increase of the annual mean temperature by 3.5 to 4.0 degrees Celsius. The greatest increases will likely occur in summer (June-July-August mean increase of as much as 5 degrees Celsius [Christensen *et al.* 2007 in Service 2010a]). Precipitation will likely decrease by 5 to 15 percent annually in the region with winter precipitation decreasing by up to 20 percent and summer precipitation increasing by up to 5 percent. Because germination of the desert tortoise's food plants is highly dependent on cool-season rains, the forage base could be reduced due to increasing temperatures and decreasing precipitation in winter. Although drought occurs routinely in the Mojave Desert, extended periods of drought have the potential to affect desert tortoises and their habitats through physiological effects to individuals (i.e., stress) and limited forage availability. To place the consequences of long-term drought in perspective, Longshore *et al.* (2003) demonstrated that

even short-term drought could result in elevated levels of mortality of desert tortoises. Therefore, long-term drought is likely to have even greater effects, particularly given that the current fragmented nature of desert tortoise habitat (e.g., urban and agricultural development, highways, freeways, military training areas, etc.) will make recolonization of extirpated areas difficult, if not impossible.

The Service notes in the 5-year review that the combination of the desert tortoise's late breeding age and a low reproductive rate challenges our ability to achieve recovery. When determining whether a proposed action is likely to jeopardize the continued existence of a species, we are required to consider whether the action would "reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 Code of Federal Regulations 402.02). Although the Service does not explicitly address these metrics in the 5-year review, we have used the information in that document to summarize the status of the desert tortoise with respect to its reproduction, numbers, and distribution.

In the 5-year review, the Service notes that desert tortoises increase their reproduction in high rainfall years; more rain provides desert tortoises with more high quality food (i.e., plants that are higher in water and protein), which, in turn, allows them to lay more eggs. Conversely, the physiological stress associated with foraging on food plants with insufficient water and nitrogen may leave desert tortoises vulnerable to disease (Oftedal 2002 in Service 2010a), and the reproductive rate of diseased desert tortoises is likely lower than that of healthy animals. Young desert tortoises also rely upon high-quality, low-fiber plants (e.g., native annual plants) with nutrient levels not found in the invasive weeds that have increased in abundance across its range (Oftedal *et al.* 2002; Tracy *et al.* 2004). Compromised nutrition of young desert tortoises likely represents an effective reduction in reproduction by reducing the number of animals that reaches adulthood. Consequently, although we do not have quantitative data that show a direct relationship, the abundance of weedy species within the range of the desert tortoise has the potential to affect the reproduction of desert tortoises and recruitment into the adult population in a negative manner.

Data from small-scale study plots (e.g., 1 square mile) established as early as 1976 and surveyed primarily through the mid-1990s indicate that localized population declines occurred at many sites across the desert tortoise's range, especially in the western Mojave Desert; spatial analyses of more widespread surveys also found evidence of relatively high mortality in some parts of the range (Tracy *et al.* 2004). Although population densities from the local study plots cannot be extrapolated to provide an estimate of the number of desert tortoises on a range wide basis, historical densities in some parts of the desert exceeded 100 adults in a square mile (Tracy *et al.* 2004). The Service (2010a) concluded that "appreciable declines at the local level in many areas, which coupled with other survey results, suggest that declines may have occurred more broadly."

The Desert Tortoise Recovery Office (Service 2014b) applied estimated densities within desert tortoise conservation areas surveyed during rangewide monitoring since 2004 to the estimated

acreages of remaining habitat (see Table 3) within each recovery unit to estimate the change in numbers of individuals greater than 180 millimeters in carapace length (Table 2). This calculation assumes that densities inside the surveyed conservation areas are similar to densities in habitat outside these areas, but any bias will be less than would have resulted from applying densities from much smaller study plots to the entire range. Although we presume densities are generally higher within conservation areas, we consider this a reasonable way to describe overall changes in the population given the lack of broad-scale data outside the conservation areas.

Table 2. Estimated number of desert tortoises greater than 180 millimeters in length in each recovery unit.

Recovery Units	**2004**	**2012**	**Change**	**Percentage of Change**
Western Mojave	152,967	76,644	-76,323	-50
Colorado Desert	111,749	85,306	-26,443	-24
Northeastern Mojave	13,709	40,838	+27,129	+198
Eastern Mojave	68,138	42,055	-26,083	-38
Upper Virgin River	12,678	8,399	-4,280	-34
Total	359,242	253,242	-106,000	-30

Table 3. Acreages of habitat (as modeled by Nussear *et al.* 2009, using only areas with a probability of occupancy by desert tortoises greater than 0.5 as potential habitat) within various regions of the desert tortoise's range and of impervious surfaces as of 2006 (Fry *et al.* 2011); calculations are by Darst (2014). All units are in acres.

Recovery Units	**Modeled Habitat**	**Impervious Surfaces* (percentage in parentheses)**	**Remaining Modeled Habitat**
Western Mojave	7,585,312	1,989,843 (26)	5,595,469
Colorado Desert	4,950,225	510,862 (10)	4,439,363
Northeastern Mojave	3,012,293	386,182 (13)	2,626,111
Eastern Mojave	4,763,123	825,274 (17)	3,937,849
Upper Virgin River	231,460	84,404 (36)	147,056
Total	20,542,413	3,796,565 (18)	16,745,848

* Impervious surfaces include paved and developed areas and other disturbed areas that have zero probability of supporting desert tortoises.

The distribution of the desert tortoise has not changed substantially since the publication of the original recovery plan in 1994 (Service 2010a) in terms of the overall extent of its range. Prior to 1994, desert tortoises were extirpated from large areas within their distributional limits by urban and agricultural development (e.g., the cities of Barstow and Lancaster, California; Las Vegas, Nevada; and St. George, Utah; etc.; agricultural areas south of Edwards Air Force Base and east of Barstow), military training (e.g., Fort Irwin, Leach Lake Gunnery Range), and off-road vehicle use (e.g., portions of off-road management areas managed by the Bureau and

unauthorized use in areas such as east of California City, California). Since 1994, urban development around Las Vegas has likely been the largest contributor to habitat loss throughout the range. Desert tortoises have been essentially removed from the 18,197-acre southern expansion area at Fort Irwin (Service 2012a).

In conclusion, we have used the 5-year review (Service 2010a), revised recovery plan (Service 2011b), and additional information that has become available since these publications to review the reproduction, numbers, and distribution of the desert tortoise. The reproductive capacity of the desert tortoise may be compromised to some degree by the abundance and distribution of invasive weeds across its range; the continued increase in human access across the desert likely continues to facilitate the spread of weeds and further affect the reproductive capacity of the species. Prior to its listing, the number of desert tortoises likely declined range wide, although we cannot quantify the extent of the decline; since the time of listing, data suggest that declines continue to occur throughout most of the range, although recent information suggests that densities may have increased in the Northeastern Mojave Recovery Unit. The continued increase in human access across the desert continues to expose more desert tortoises to the potential of being killed by human activities. The distributional limits of the desert tortoise's range have not changed substantially since the issuance of the original recovery plan in 1994; however, desert tortoises have been extirpated from large areas within their range (e.g., Las Vegas, other desert cities). The species' low reproductive rate, the extended time required for young animals to reach breeding age, and the multitude of threats that continue to confront desert tortoises combine to render its recovery a substantial challenge.

ENVIRONMENTAL BASELINE

Action Area

The implementing regulations for section 7(a)(2) of the Act define the "environmental baseline" as the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process (50 CFR 402.02). The action area is the basis of subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take.

For the purposes of this biological opinion, we consider the action area to be the 2,942-acre project right-of-way, the Los Angeles Department of Water and Power switchyard, access routes from I-15, and the recipient sites for translocated desert tortoises. The total size of the action area with all features included is approximately 7,500 acres.

The Bureau (2013a) has determined that the proposed action would have no effect on critical habitat of the desert tortoise.

Habitat Characteristics of the Action Area

The following information provides a summary of the discussion of habitat characteristics from the biological assessment (Bureau 2013a) for the Soda Mountain Solar Project. The proposed solar site is located in a desert valley that is generally bounded in all directions by the Soda Mountains. The proposed project area consists of large, alluvial fans with cobble substrate that extend from upper elevations within the Soda Mountains. Sandy areas with little or no cobble occur within the eastern and southern portions of the area. Desert pavement is also common within the southern portion of the project area. Friable soils are generally present within the eastern portion of the project site, adjacent to the South Soda Mountains. Elevations within the project area range from approximately 1,200 feet above mean sea level to 1,600 feet above mean sea level.

The project site comprises three primary plant communities. Most of the project site shows sparse coverage with creosote bush-white bursage scrub, with creosote bush scrub and cheesebush scrub as other prominent communities. The creosote bush-white bursage scrub community covers approximately 97 percent of the study area. Creosote bush scrub comprises less than 1 percent of the project area. A large wash that runs southwest to northeast through the project area in the South and East arrays supports cheesebush scrub; this habitat is confined to the wash. Areas of development and existing unpaved roads occur in the eastern portion of the project area.

All portions of the action area contain habitat features that the U.S. Geological Survey has mapped as conducive to desert tortoise occupancy (Nussear *et al*. 2009).

Existing Conditions in the Action Area

In this section, we discuss the anthropogenic and natural conditions in the action area as they relate to the desert tortoise and its habitat. Unless we have noted otherwise by citing a biological opinion, the anthropogenic conditions present in the action area were constructed or instituted prior to the listing of the desert tortoise.

Land Use

The project site is located primarily within a Federal utility corridor that consists of public lands managed by the Bureau. The lands in the vicinity of the site are primarily undeveloped with the exception of utility corridors that are described below. Portions of the action area occupy areas designated multiple-use Class L (“Limited”), Class M (“Moderate”), and Class I (“Intensive”) in the California Desert Conservation Area Plan. No wilderness areas, areas of critical environmental concern, desert wildlife management areas, or wildlife habitat management areas occur within or adjacent to the action area.

The Service (2006) issued a biological opinion to the Bureau regarding the effects of its amendment to the California Desert Conservation Area Plan for the western Mojave Desert on

the desert tortoise and its critical habitat. The Bureau's proposed action was a substantial revision of the California Desert Conservation Area Plan, with the fundamental goal of adopting numerous management prescriptions that were intended to promote the recovery of the desert tortoise. The Service concluded that the Bureau's amendment of the plan was not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat because the vast majority of changes addressed in the amendment reduced the intensity of use and were protective of the desert tortoise.

Paved and Unpaved Roads

The action area is south and east of I-15; however, the interstate is not part of the action area. I-15 has likely caused some reduction in the number of desert tortoises in the action area, both as a result of its construction and ongoing traffic. The construction of I-15 resulted in the loss of hundreds of acres of habitat and the likely degradation of additional areas as sheet flow across the valley's alluvial fans was disrupted. We also expect that desert tortoise densities adjacent to the freeway are depressed, as discussed by Hoff and Marlow (2002), but we are not aware of surveys that quantify the effect of interrupted sheet flow.

The action area south of I-15 includes the unpaved Rasor Road and Arrowhead Trail. Rasor Road provides access to the Rasor Off-Highway Vehicle Management Area to the south and east of the proposed project site; access via Rasor Road would still be open to the public. The Arrowhead Trail extends north from Rasor Road in the eastern portion of the action area.

Non-native Species

Within the action area, the overall prevalence of invasive species is low, with the exception of Sahara mustard (*Brassica tournefortii*), which was documented at near-infestation levels on loose sandy soils within the southern portion of the proposed project area. Other invasive plant species identified in the action area include Mediterranean splitgrass (*Schismus* sp.), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*B. tectorum*), redstem filaree (*Erodium cicutarium*), Mediterranean barley (*Hordeum murinum*), crystalline iceplant (*Mesembryanthemum crystallinum*), five-stamen tamarisk (*Tamarix chinensis*), and rattail fescue (*Vulpia myuros*).

Utilities

Several utilities are located within the action area including a fiber optic line, two transmission lines, a distribution line, telephone line, fuel pipeline, and a cellular tower. Portions of the project site are located within a designated utility corridor adjacent to I-15. A distribution line and telephone line run parallel and adjacent to the western edge of I-15. A 115-kilovolt transmission line and a 500 kilovolt-transmission line run parallel to and adjacent to the western perimeter of the action area; these lines are operated by Southern California Edison and the Los Angeles Department of Water and Power, respectively.

The construction of the numerous tower sites for the transmission lines disturbed or destroyed habitat. An unpaved road runs parallel to the power lines and provides access to utility company workers and the public; spur roads extend from this road to each tower. The main and spur roads have likely caused more habitat loss than the tower sites. The use of these roads, by workers and the public, likely results in ongoing injury and death of desert tortoises; the deaths of desert tortoises related to use of access roads within utility corridors have been documented. For example, on April 13, 2013, a desert tortoise that had been struck by a utility vehicle was found along the El Dorado to Ivanpah transmission line route in Nevada. In one case in the western Mojave Desert near Daggett, a desert tortoise bearing a radio transmitter was buried alive by a utility company maintaining the access road. In the spring of 2011, at least two desert tortoises were crushed by vehicles using utility line access roads; based on the use patterns of the utility company at the time, these desert tortoises seem to have been killed by casual users of the access roads. Most of deaths that result from use of the access roads for utility lines are likely not detected; however, these instances demonstrate that access roads within utility corridors pose an ongoing threat to desert tortoises.

As described above, the Los Angeles Department of Water and Power's transmission line traverses the western boundary of the proposed solar facility; the Service issued a biological opinion to the Bureau for this line in 1991 (Service 1991). The Service (1993) amended this biological opinion to eliminate the limit for the number of desert tortoises that could be moved from harm's way during construction, operations, and maintenance of the transmission line. The Service concluded in the 1991 biological opinion and subsequent amendment that the project was not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat.

A substantial ongoing effect of electrical power lines is their use by common ravens for perching and nesting. The presence of this additional nesting substrate, which allows common ravens to nest far above the reach of ground-dwelling predators, likely contributes substantially to the increase in the number of common ravens in the desert. As previously discussed, common ravens prey on desert tortoises and are likely detrimental to their recovery.

The Calnev pipeline corridor supports two existing pipelines that run parallel and adjacent to the eastern perimeter of the proposed north array and land to the southwest within the project site. The installation of the existing pipelines resulted in the disturbance of habitat within the right-of-way. Ongoing maintenance contributes to periodic disturbance in the right-of-way; ongoing use of the access road likely contributes to continuing mortality of desert tortoises, as we discussed previously in this section.

Rail Lines

The Service and Federal Railroad Administration have completed formal consultation on the Desert Xpress High-Speed Train Project from Victorville, California to Las Vegas, Nevada (2011c). The rail line would be located west of and adjacent to Interstate 15. The components of the rail alignment would include a 75-foot-wide permanent right-of-way, concrete barriers,

overhead electrical distribution and transmission lines, fencing, and access and maintenance areas. This rail line would cross washes in the action area with bridges; the design plan includes numerous culverts and overcrossing structures to allow washes to pass under the rail line. The Service concluded that the DesertXpress project is not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat.

Status of the Desert Tortoise in the Action Area

The Service's (2010c) protocol is effective at detecting desert tortoises larger than 180 millimeters in length. We have determined, through work conducted during range-wide sampling, that field workers detect desert tortoises that are 180 millimeters in length or longer more readily than they do small individuals. For the purposes of the analysis in this biological opinion, we will refer to desert tortoises 180 millimeters and greater in length as large animals and desert tortoises less than 180 millimeters in length as small animals.

Desert tortoises reach reproductive age (i.e., become adults) at different sizes in different parts of their range. The likelihood of being detected during surveys is a function of size and not reproductive capacity; therefore, we will not use the terms "adult" and "subadult" in this biological opinion unless we are discussing reproduction.

Estimates for Desert Tortoises Larger than 180 Millimeters

We summarized the following information from the biological assessment (Bureau 2013a). In 2009, URS conducted desert tortoise surveys within the action area based on the Service's (1992, 2009b) field survey protocol. Kiva Biological Consulting conducted subsequent surveys in 2013 using the Service's updated field survey protocol (Service 2010c). The following table summarizes the results of the desert tortoise surveys conducted in 2009 and 2013 (Appendix A and B in Bureau 2013a, respectively).

Table 4. Results of desert tortoise surveys conducted in the action area.

Survey	Live Desert Tortoises	Scat	Burrows	Carcasses
2009	0	0	0	0
2013	1	6	23	5

These results indicate desert tortoises occur at low densities in the action area. Survey results indicate desert tortoises occur intermittently and in low densities in the East Array areas. Desert tortoise sign was moderately widespread in the East Array, particularly at the foot of the mountains to the east. Surveyors found two carcasses south of the desert tortoise recipient area. Desert tortoise sign was not detected within the South Array. No sign has been located near the freeway.

Kiva Biological Consulting used the equation contained in the Service's (2010c) protocol to derive estimates of the number of large desert tortoises within the project site and the lower and upper 95 percent confidence intervals for the Soda Mountain Solar facility. The equation derived an estimate of 2 desert tortoises occurring in the action area with a lower and upper 95 percent confidence interval of 0.39 to 10.28, respectively (Bureau 2013a). Use of the upper 95 percent confidence interval for the number of desert tortoises within the project area provides for a conservative estimate of the number of large individuals predicted within the actual project area. We will use the upper 95 percent confidence interval as a basis upon which to conduct the analysis of effects in this biological opinion because it is the maximum number of desert tortoises likely to be present.

This estimate described above was based on the project design analyzed in our December 19, 2014 (Service 2014c), which included a solar array west of Interstate 15 that is no longer part of the proposed project. We do not anticipate that elimination of this array requires a reassessment of the population estimate for the solar site because no desert tortoises, burrows, or scat were located within the project right-of-way west of Interstate 15 and virtually all live desert tortoises and desert tortoise sign located during surveys were found on or immediately adjacent areas of the East Array that are part of the currently proposed project site. Therefore, we will use the estimates provided in the previous paragraph in the analysis that follows.

Estimates for Desert Tortoises Smaller than 180 Millimeters

Desert tortoises less than 180 millimeters in length (including hatchlings) are difficult to detect because of their small size and their cryptic nature. Hatchlings may also have emerged from a nest on the site since the time of the survey; this scenario could also increase the overall number of individuals on the site. We did not attempt to estimate the numbers of eggs that may be present because viable eggs are not present during a portion of the year and we would need to use several other assumptions to reach such an estimate.

Table 5. Estimated number of desert tortoises in the action area.

Size Class of Desert Tortoise (millimeters)	**Estimated Number of Desert Tortoises (individuals)**	**Rationale for the Number**
>180	10	We used the upper 95 percent confidence limit based on the number of desert tortoises found during protocol surveys.
<180	68	We used a life table to calculate the total number of animals based on the number of larger desert tortoises and then the number smaller than 180 millimeters.
Total	78	

We used the Service's general methodology for estimating the number of small desert tortoises in the project area. Table 5 summarizes the upper 95 percent confidence intervals for the estimates of the number of desert tortoises in the project area. As a basis upon which to conduct the analysis of effects in this biological opinion, we will use the numbers in the following table. The table also contains the reason that we chose the numbers; details of our calculations are in Appendix 2.

The methodology is based on the assumption that the life table developed by Turner *et al*. (1987) is applicable. (Turner *et al*. developed a life table based on work they conducted near Goffs, California, which is located approximately 66 miles southeast of the action area.) We emphasize that, although the estimate of the number of desert tortoises on the project site is based on the best available information, the overall number of animals may be different. The demographic structure of the desert tortoise population on the Goffs study site may have been different in the early 1980s than that currently on the project site because of the declines that have occurred since that time; consequently, use of the Goffs data may overestimate the actual number of smaller desert tortoises within the project area. Furthermore, we recognize that the survey data used for these estimates represent a single point in time and the number of individuals in these areas may change by the onset of project activities, environmental conditions, and other anthropogenic and natural processes.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. In the following analysis, we considered the general manner in which the proposed action may affect desert tortoises and then evaluated the specific components of the proposed action. We conducted the analysis based on the current conditions in the action area as we described in the Environmental Baseline section of this biological opinion. In the Conclusion section of the biological opinion, we considered the overall effects of the proposed action on the reproduction, numbers, and distribution of the desert tortoise.

Effects Associated with Capture and Translocation of Desert Tortoises

The first step in the translocation of desert tortoises involves their capture. In some cases, the authorized biologists may find the animals above ground or near the mouth of their burrow. In such cases, authorized biologists can easily pick up the desert tortoise and transfer it to a container for transport. If desert tortoises are deeper in their burrows, the authorized biologists would excavate the burrow; we expect that excavating desert tortoises from deep in their burrows is likely more stressful for them than being captured on the surface of the ground.

The capture and holding of desert tortoises can subject them to stress; stressed desert tortoises occasionally void their bladders. Desert tortoises store water in their bladders; this water is

important to desert tortoises, particularly during times of low rainfall, in maintaining their life functions. Consequently, desert tortoises that void their bladders are at an increased risk of dying after their release; Averill-Murray (2002) found that desert tortoises that urinated during handling had lower survival rates than those that did not. To offset this effect, the Bureau and the applicant have proposed to hydrate desert tortoises prior to their release according to the Service's protocol. Because the Bureau and the applicant would employ qualified biologist, we expect that the capture and transport of desert tortoises is unlikely to kill or injure any individuals.

We acknowledge that, in every phase of implementation of the proposed action, desert tortoises are at risk of being killed or injured when workers (including authorized biologists and biological monitors) drive outside of areas that have been fenced and cleared of desert tortoises. As in many cases, small desert tortoises are at greater risk than larger animals. We are aware of desert tortoises that have been crushed by the vehicles of biologists working on translocations; both resident and translocated animals are vulnerable.

Boarman (2002), in a review of literature on threats to the desert tortoise, stated that the adverse effects of translocation include increased risk of mortality, spread of disease, and reduced reproductive success. The tendency for translocated desert tortoises to spend more time above ground, moving through their environment, than animals within their home ranges exacerbates at least some of these threats. Recent research, using comparisons among resident desert tortoises (animals within their home ranges with translocated individuals nearby) and control desert tortoises (animals within their home ranges with no translocated individuals nearby), has provided substantial information on this issue. We will evaluate the potential effects of translocation on desert tortoises in the following paragraphs.

Field *et al*. (2007), Nussear (2004), and Nussear *et al*. (2012) have found that translocated animals seem to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations. As time increases from the date of translocation, most desert tortoises change their movement patterns from dispersed, random patterns to more constrained patterns, which indicate an adoption of a new home range (Nussear 2004). Walde *et al*. (2011) found that movement patterns of desert tortoises translocated from Fort Irwin differed from those of animals studied elsewhere but describe their results as "apparent trends" because they have not completed analyses to determine if these trends were statistically significant. Translocated animals moved greater distances than residents and controls through the 4 years of their study. Desert tortoises that were translocated short distances moved much shorter distances than those that were translocated long distances. The movements of resident desert tortoises were similar to those of controls.

After translocation, we expect that translocated animals would spend more time moving, at least during the first year, which means they would be more vulnerable to predators, adverse interactions with other desert tortoises, and weather conditions than resident animals. For example, in spring 2013, biologists translocated 108 large and 49 small desert tortoises from approximately 2,000 acres of the KRoad Moapa Solar Project on the Moapa River Indian Reservation northeast of Las Vegas; they also monitored 18 large desert tortoises as controls or

residents. Extremely high temperatures during the summer may have killed two or more large translocated desert tortoises. Predators likely killed eight small translocated desert tortoises. No resident or control desert tortoises have died during monitoring (Burroughs 2013). During the first year of increased movement, desert tortoises would also be more likely to engage in fence-pacing behavior, which can lead to hyperthermia and death.

As we previously discussed, we expect that translocated desert tortoises would spend more time moving around. Because translocated desert tortoises spend more time moving, individuals that are moved during the summer months outside of their active season (i.e., from June to August) could be overexposed to heat and die from hyperthermia. Cook *et al*. 1978 (in Nussear *et al*. 2012) stated summer releases have previously been reported to be potentially lethal to translocated desert tortoises, often with high mortality within days of release. We expect desert tortoises translocated during the summer months are more likely to die.

Hinderle *et al*. (2015) found that almost half of desert tortoises translocated 2 kilometers returned to their capture site; only one desert tortoise moved 5 kilometers returned to the capture site and no desert tortoises returned home from 8 kilometers away. The propensity for desert tortoises to attempt to return to their capture site would increase the likelihood that they would encounter an exclusion fence and pace it until they are attacked by predators or exposed to extreme weather.

As with other translocations (Nussear 2004, Field *et al*. 2007), we anticipate that predation is likely to be the primary source of post-translocation mortality. The level of winter rainfall may dictate the amount of predation observed in desert tortoises (Drake *et al*. 2010, Esque *et al*. 2010). Drake *et al*. (2010) documented a statistically significant relationship between decreased precipitation and increased predation of translocated desert tortoises at Fort Irwin. We are aware of two instances where monitoring of large numbers of control and resident desert tortoises accompanied the translocation of desert tortoises (Fort Irwin and Ivanpah Solar Electric Generating System). At Fort Irwin, Esque *et al*. (2010) found that "translocation did not affect the probability of predation: translocated, resident, and control tortoises all had similar levels of predation." At the Ivanpah Solar Electric Generating System, the numbers of translocated, resident, and control desert tortoises that have died since the onset of work at the Ivanpah Solar Electric Generating System are roughly equal (Davis 2014), which seems to indicate that translocation is not a factor in these mortalities; among translocated, resident, and control animals, predation by canids is the greatest source of mortality.

Drought conditions seem to affect translocated and resident desert tortoises similarly. Field *et al*. (2007) noted that studies from various sites "suggest that all (desert) tortoises at the (Large-scale Translocation Site) site, regardless of translocated or resident status, likely were adversely affected by drought conditions at the site in 1997. Field *et al*. (2007) noted that most of the translocated desert tortoises "quickly became adept at life in the wild," despite the harsh conditions. Consequently, we have concluded that the amount of rainfall preceding translocation is not likely to decrease the survival rate of desert tortoises that would be moved from within the area of the proposed solar facility.

Nussear *et al*. (2012) investigated the effects of translocation on reproduction in 120 desert tortoises. They found that, in the first year since translocation, the mean reproductive effort for translocated desert tortoises was slightly less than that of residents. Nussear *et al*. (2012) noted that the translocated animals may have benefited from being fed while in the pre-translocation holding facility; the food provided in the facility may have increased their production of eggs in the first year after translocation. In the second and third years after translocation, the mean number of eggs was not different between resident and translocated desert tortoises.

Translocating desert tortoises may also adversely affect resident desert tortoises within the action area due to local increases in density. Increased densities may result in increased incidence of aggressive interactions between individuals, increased competition for available resources, increased incidence of predation that may not have occurred in the absence of translocation, and increased spread of upper respiratory tract disease or other diseases.

We anticipate that density-dependent effects on resident populations are likely to be minor for the following reasons. First, the action area contains few desert tortoises; therefore, few animals are likely to be moved during construction. Second, the applicant will restrict the number of large desert tortoises released in translocation areas to 2.15 individuals per square mile (Bureau 2013a), which is the maximum recipient and translocated density for the Western Mojave Recovery Unit (Service 2011a). Third, the recipient sites are not a confined space, so released individuals would be able to disperse into other areas. Finally, during the translocation work at Fort Irwin, researchers tested over 200 desert tortoises for differences in the levels of corticosterone, which is a hormone commonly associated with stress responses in reptiles; Drake *et al*. (2012) "did not observe a measurable physiological stress response (as measured by [corticosterone]) within the first two years after translocation." The researchers found no difference in stress hormone levels among resident, control, and translocated desert tortoises. For these reasons, we conclude that the addition of translocated desert tortoises to the recipient areas would not result in detrimental effects to translocated or resident animals.

The Service based its guidance for the upper limit of the number of desert tortoises translocated into an area on the density of large animals. We did not develop guidance regarding limiting the density of small desert tortoises during translocation for several reasons. Natural mortality rates of smaller desert tortoises are greater than those of larger tortoises. In general, we expect that healthy populations have a large number of desert tortoises smaller than 180 millimeters (Turner *et al*. 1987), but have limited information on how many that might be. Additionally, small desert tortoises use resources differently than do large ones (Wilson *et al*. 1999) and we expect that juveniles (small animals) and adults (large animals) interact much less frequently than do adults. Due to differences in habitat use, caused by both physical and physiological differences in large and small desert tortoises, we expect overlapping of ranges while the small desert tortoises are growing and dispersing. Consequently, we do not expect translocating small desert tortoises at higher densities than large animals would result in any density-dependent adverse effects.

Upper respiratory tract disease and other pathogens are spread by direct contact between desert tortoises. Consequently, increasing the density of desert tortoises in the recipient areas has the

potential to exacerbate the spread of diseases because, presumably, animals that occur in higher densities would have more opportunity to contact one another. Several circumstances are likely to reduce the magnitude of the threat of disease prevalence being exacerbated by translocation. First, the applicant will use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals; animals are less likely to succumb to disease when they are not stressed. Second, desert tortoises on the project site are currently part of a continuous population with the resident populations of the recipient sites and are likely to share similar pathogens and immunities. Third, Drake *et al*. (2012) indicated that translocation does not seem to increase stress in desert tortoises. Fourth, density-dependent stress is unlikely to occur for the reasons discussed previously in this section. Finally, Service-trained biologists will perform health assessments using Service-approved protocols (Service 2013) and will not translocate any desert tortoise showing severe clinical signs of disease, but rather will transport the animal to an agency-approved quarantine, as described in the project's translocation plan.

Based on this information, we anticipate that post-translocation survival rates will not significantly differ from that of animals that have not been translocated. We expect that translocated desert tortoises would be at greatest risk during the time they are spending more time above ground than resident animals. We cannot precisely predict the level of post-translocation mortality because regional factors that we cannot control or predict (e.g., drought, predation related to a decreased prey base during drought, etc.) would likely exert the strongest influence on the rate of mortality and affect translocated and resident desert tortoises similarly.

Effects Associated with the Construction of the Soda Mountain Solar Project

The applicant will install construction and perimeter fencing, equipped with desert tortoise exclusion fencing and desert tortoise guards, around the project and remove all desert tortoises that it can locate on the proposed project site prior to ground disturbance. During construction of the perimeter fencing and during other ground-disturbing activities that are outside of the fenced facility (i.e., access roads and the interconnection to the Marketplace-Adelanto transmission line), the applicant will perform pre-activity clearance surveys and employ monitors to move desert tortoises out of harm's way if they re-enter work areas. For these reasons, we anticipate that construction is likely to kill few, if any, large individuals. Some potential always exists that surveyors may miss desert tortoises during clearance surveys and construction monitoring. We cannot predict how many of these large desert tortoises that clearance surveys and construction monitoring would miss. However, because the applicant will use qualified biologists, authorized by the Service for clearance surveys, we anticipate the number is likely to be small. Weather conditions can also affect the number of animals detected during surveys; warm weather after average or above-average rainfall would lead to more activity in desert tortoises, which would facilitate their detection.

In some cases, desert tortoises that have been fenced out of their home territories make repeated efforts to return and follow fence lines for long periods. Desert tortoises would die when exposed to harsh conditions (i.e., cold or hot temperatures) while pacing fences. We expect that desert

tortoises whose home territories have been reduced by the project would be the animals most likely to pace fences.

The installation of fencing may also reduce the home range size of some individuals that inhabit areas immediately adjacent to the fence alignments, or that overlap the project footprint. This reduction could result in future injury or mortality of these individuals as they expand their home range into adjacent areas where unknown threats may occur or where adverse social or competitive interactions may occur with neighboring desert tortoises.

The applicant has proposed to survey the perimeter fence line areas to identify any desert tortoises within 50 meters of the area. Desert tortoises located inside the fence line or determined to be in harm's way by the authorized biologist would be fitted with a transmitter and moved into habitat adjacent to and outside the fence line. Desert tortoises can overheat quickly when pacing fences. Even fitting desert tortoises with a transmitter and implementing frequent monitoring of the individuals could be inadequate in preventing mortalities of desert tortoises exhibiting this behavior. Any desert tortoises attempting to return to the project site before completion of fence construction will be held in situ if they appear healthy until blood is drawn, test results are received, and a translocation review package is prepared and approved by the Service as described under Description of the Proposed Action – Translocation Methods section of this biological opinion.

Desert tortoises remaining outside the fence line that do not attempt to return to the project site will be deemed residents and the transmitter will be removed; no further action will be taken for the resident desert tortoise. The Bureau did not specify the duration of monitoring required for these desert tortoises. If the monitoring is for a short period of time, the desert tortoise could attempt to return to a portion of its range inside the fence. If a desert tortoise that has had its transmitter removed begins to pace the fence, it could overheat and die. The applicant has proposed to install shade structures of a design approved by the Bureau and the Service at regular intervals on the outside of the fence line; these structures should reduce the likelihood that desert tortoises would die as a result of hyperthermia.

Desert tortoises often construct their nests at the entrance to their burrows (Ennen *et al*. 2012). Because the applicant will excavate all desert tortoise burrows that are found within the construction footprint prior to the onset of ground disturbance (Bureau 2013a), the biologists may detect at least some of the nests and eggs. Overall, we anticipate that detection of eggs is unlikely because the buried nests are difficult to find. Because hatchlings can take shelter in burrows of all sizes and are difficult to see due to their cryptic nature and their small size, surveyors are less likely to detect them than they are larger desert tortoises. Consequently, we expect that most of the hatchling and eggs are likely to remain in the work areas during construction. The applicant is likely to kill these desert tortoises during construction. Because construction activities would occur year round, we cannot predict whether these activities would affect the hatchling or egg stage. Consequently, we have combined these stages in our estimation of effects.

We cannot predict precisely how many desert tortoises may be injured or killed because of the numerous variables involved. For example, we do not know the precise number of desert tortoises onsite, the size of those individuals, whether eggs will be present at the time of construction, the time of year that construction occurs, and the weather before or during construction. Regardless of these factors, we expect that few large desert tortoises are likely to be killed or injured during construction because the action area does not support many individuals; also, the applicant has proposed to implement measures that have proven effective in the past in reducing mortality and injury.

Effects Associated with the Construction of Linear Facilities

Linear facilities have different effects on desert tortoises relative to construction on large blocks of habitat. Construction of linear facilities (e.g., access roads, collector routes, water pipelines, and installation of the fence along the primary access road) would take place outside of the permanent perimeter fencing. We have analyzed these effects here rather than grouping them with our analysis of the overall effects of construction of the solar arrays.

During construction of linear components, the applicant would move desert tortoises out of harm's way into adjacent habitat. An approved recipient site will not be required for desert tortoises encountered within linear components. Based on the amount of surface disturbance that we expect from the construction of linear facilities, we anticipate that the applicant would move few desert tortoises. Because of the relatively limited amount of activity associated with the construction of linear facilities and numerous protective measures that the applicant has proposed, we expect the number of desert tortoises that would be injured or killed to be small.

Installation of the temporary construction fence along the primary access road would prevent most desert tortoises from being killed or injured on the road during construction. It would also affect desert tortoises in regard to fence pacing behavior during construction of the solar facility. As we discussed previously, desert tortoises that pace fences may become overheated and die. We cannot assess how many animals are likely to engage in this behavior because that number is a function of how many desert tortoises are active and encounter the fence and their behavioral response to it.

The temporary construction fence would be in place for the duration of construction, which the Bureau expects to last between 24 to 30 months. During this time, the temporary fence would fragment habitat in the area because desert tortoises would be unable to cross the road and access the existing culverts under Intestate 15. Results from the desert tortoise surveys (Appendix A and B in Bureau 2013a) indicate that desert tortoises seem to be absent from the areas near the primary access roads; no desert tortoises were found in these areas during surveys. Because desert tortoises seem to be scarce in these areas, we expect that fence pacing behavior would be infrequent. We anticipate that the applicant proposed measures, which we described in the previous section of this biological opinion related to desert tortoises exhibiting this behavior, would be adequate in minimizing mortality.

Construction of the solar facility also includes the installation of collector lines to connect the solar panel arrays to the project substation. These collection lines would be located outside the perimeter fence and be installed underground by way of multiple trenches along Opah Ditch Mine Road. Desert tortoises could be crushed by trenching equipment being used to install the collector lines; workers could also trample desert tortoises. Small desert tortoises would be at greatest risk because they are more difficult to see. If trenches or holes are left uncovered, desert tortoises could become entrapped and die of exposure or be killed by predators. The applicant has proposed several measures to protect desert tortoises during activities that would occur outside the fenced solar facility. These measures include installing temporary fencing around work areas, checking excavations, and assigning monitors to project sites. With these measures, we expect that few desert tortoises are likely to be injured or killed. We cannot quantify the number of desert tortoises the collector lines may affect because we do not know how many animals will cross this linear work area during construction; however, we expect the number to be small because the action area does not support many individuals. Also, we expect that monitors would be able to detect and protect most desert tortoises. The trench for the collector lines would result in the temporary loss of a small amount of habitat and be restored following the completion of construction.

Effects Associated with Operations and Maintenance

We are aware of occasions where desert tortoises have been able to enter fenced facilities, such as a pump station for a gas pipeline and an operating solar plant; they entered through gaps under the fencing or open gates. Floods can damage fences to the point where desert tortoises may be able to enter the facilities. Once inside the fencing, desert tortoises would be at risk of being killed or injured by operations or maintenance. Fencing will be inspected bi-weekly and following all major rainfall events and any damage to the fencing will be repaired within 24 hours. Therefore, we expect that few, if any, desert tortoises will be able to enter the fenced facilities, and, in general, operation and maintenance within the perimeter fence are likely to injure or kill few desert tortoises.

Over the 30-year life of the project, the applicant may conduct some ground-disturbing maintenance activities outside of fenced areas. These activities have the potential to injure or kill desert tortoises primarily by vehicle strikes, as workers travel to and from work sites outside of fenced areas; a limited possibility exists that desert tortoises could be injured or killed by equipment or workers moving around a work site. Because typical maintenance activities would not result in surface disturbance or loss of habitat and the applicant proposes to implement protective measures to reduce the potential effects, maintenance activities would kill or injure few, if any, desert tortoises.

Maintenance activities associated with repair of desert tortoise exclusion fencing would likely kill or injure few, if any, desert tortoises for the following reasons. First, fence repairs are likely to result in minimal ground disturbance in localized areas. Second, at least a portion of the work area would be on disturbed areas within the fenced project site. Third, the permanent perimeter roads, located outside the perimeter fencing, would allow access to most repair locations with

minimal off-road travel. Finally, the applicant would implement numerous protective measures to reduce the potential for injury or mortality of desert tortoises.

Operation and maintenance of the collector lines may affect desert tortoises. As previously mentioned, the collector lines would be installed underground; the collector line corridor would not be permanently fenced. Therefore, desert tortoises may use the habitat and be present during maintenance activities. Vehicles and workers conducting this work could kill or injure desert tortoises in the same manner as during construction. The applicant would implement numerous protective measures to reduce the potential for injury or mortality of desert tortoises during this work.

Use of the unfenced primary access road poses some risk of vehicle strikes to desert tortoises. The applicant's proposal to maintain a 15-mile-per-hour speed limit should be protective of larger animals; small animals would be at greater risk because they are more difficult to see. We expect few desert tortoises to be killed or injured along the primary access road because of the low density of desert tortoises in the area and protective measures proposed by the applicant.

Effects Associated with Decommissioning the Solar Facility

Work associated with decommissioning of the site within the perimeter fence is unlikely to result in injury to or mortality of desert tortoises because desert tortoises would not be present. The effects associated with use of the primary access roads would be similar to those associated with construction and described previously in this biological opinion. If the sites are restored to pre-project conditions, they would likely be available for use by desert tortoises at some point after removal of the facilities. We cannot predict how soon desert tortoises would reoccupy the site after decommissioning because of the many variables involved. These variables would include the amount of degree to which substrates and shrubs have been disturbed, weather conditions, and the restoration methodologies; additionally, different portions of the site may return to functional habitat at different rates. We anticipate that the Bureau will informally consult with the Service as the time for decommissioning approaches, if some aspect of decommissioning and restoration may affect desert tortoises differently than we have anticipated in this biological opinion, the Bureau would need to re-initiate formal consultation, pursuant to section 7(a)(2) of the Act.

The biological assessment notes that some potential exists for continued use of the solar facility (Bureau 2013a). In such a case, re-initiation of consultation, pursuant to section 7(a)(2) of the Act, may be necessary.

Effects of Loss of Habitat

Development of the proposed Soda Mountain Solar Project would result in 292 and 1,767 acres of temporary and permanent disturbance, respectively, as presented in the biological assessment (Bureau 2013a). Construction of the proposed project would result in the direct, long-term loss of 1,767 acres of habitat that will not be available to desert tortoises for foraging, breeding, or

sheltering for the life of the project. Following extensive disturbance and compaction, Mojave Desert substrates can take between 92 and 124 years to recover in the absence of active restoration (Webb 2002). In addition, recovery of plant cover and biomass in the Mojave Desert can require 50 to 300 years in the absence of restoration efforts (Lovich and Bainbridge 1999). Active restoration, including decompaction, seeding, and planting, can reduce the time required to restore desert ecosystems, success is varied and dependent on numerous variables. Based on this information, the 1,767 acres currently characterized as permanent disturbance are likely to remain unsuitable as habitat for several decades following decommissioning of the facility and commencement of restoration work. The potential exists that habitat within the solar arrays may be permanently lost if restoration efforts are not successful.

The Bureau and applicant have proposed to mow vegetation in the solar array field (Bureau 2013a). Areas to be mowed are likely to return to pre-disturbance conditions quicker than graded areas because the roots of most shrubs would be retained for the life of the project and the surface of the ground would be less disturbed. If cryptogamic crust is present, mowing may cause fewer disturbances. (Cryptogamic crusts are a mixture of algae and soil fungi that occur in the upper millimeters of the substrate. They assist in retaining soil moisture and some can incorporate atmospheric nitrogen into substrates; these attributes are beneficial for the establishment and growth of native annual plant species.) Retaining cryptogamic crusts may inhibit the invasion of non-native plant species to some degree and allow for the persistence of native annual plants. We expect mowing will allow these areas to return to a suitable state for desert tortoises more quickly than the areas proposed to be graded.

Up to 1,155 acres may be graded for construction of access roads, installation of collector lines, and to smooth out isolated surface irregularities and to remove oversized rocks; these areas may require the longest time to recover. Some potential exists that the root crowns of shrubs may persist after grading, if the grading removes only a small amount of substrate. Grading of the entire surface area would also remove most of the cryptogamic crusts, which is likely to delay the re-establishment of native annual plants and increase the potential for the establishment of weeds.

Effects Associated with Climate Change

Increases in atmospheric carbon are responsible for changes in climate. As we discussed in the Status of the Desert Tortoise section of this biological opinion, climate change is likely to cause frequent and/or prolonged droughts with an increase of the annual mean temperature. Increased temperatures would likely adversely affect desert tortoises by decreasing the range of temperatures at which desert tortoises would be active; decreased rainfall would likely result in fewer annual plants on which desert tortoises feed.

Plant communities in arid lands sequester carbon by incorporating it into their tissues. Plants also respire carbon into the substrate, where it combines with calcium to form calcium carbonate; calcium carbonate also sequesters carbon (Allen and McHughen 2011). The removal or permanent disturbance of plant life from approximately 1,767 acres within the action area is

likely to reduce the amount of carbon that natural processes can sequester. We acknowledge that a portion of the project would be mowed and that regrowth of shrubs in that area may lessen, to some degree, the loss of carbon-sequestering plants; we do not have the ability to quantify the difference the mowing would cause.

The proposed action is unlikely to affect desert tortoises in a measurable manner with regard to carbon sequestration for several reasons. First, the amount of carbon sequestration that would be lost would be minor because the proposed action would affect a small portion of the desert. Second, some researchers have questioned the amount of carbon sequestration that occurs in arid areas; Schlesinger *et al*. (2009) contend that previous high estimates of carbon sequestration in the Mojave Desert bear re-examination. Finally, the reduction in the use of fossil fuels because of the solar facility would prevent more carbon from entering the atmosphere than would occur by the vegetation that is currently present within the area to be disturbed by construction. For example, Fernandes *et al*. (2010) report that thin film photovoltaic technology reduces overall atmospheric carbon by 4 million grams of carbon per acre per year and that, by contrast, the amount of annual carbon uptake by desert land is approximately 429,000 grams of carbon per acre per year. Additionally, any changes in the level of carbon production or sequestration would be dispersed far beyond the boundaries of the action area of this biological opinion; consequently, we could not link any such changes to any specific effects to desert tortoises within or outside the action area of this consultation.

The proposed action is also unlikely to alter the surface albedo of the action area to the degree that it affects local climatic conditions. (Albedo is the amount of light reflected by an object. An object that reflects more light is heated less. The opposite is also true; an object that reflects less light is heated more.) Millstein and Menon (2011) found that large-scale photovoltaic plants in the desert could lead to significant local temperature increases (0.4˚C) and regional changes in wind patterns because the solar plants are less reflective than many substrates in the desert. As we discussed above, increases in temperatures would likely impair the activity patterns of desert tortoises.

The proposed action is unlikely to affect desert tortoises in a measurable manner with regard to changes in the albedo of the action area because Millstein and Menon's (2011) prediction was based on a model that analyzed the effects of a 1-terawatt solar facility. (A terawatt is 1,000,000,000,000 watts; by comparison, the proposed solar facility would produce a maximum of 287,000,000 watts (i.e., 287 megawatts).) Although Millstein and Menon's model raises an important issue to consider, it is based on numerous assumptions that would affect how a solar plant may actually affect the local environment. Millstein and Menon acknowledge that their assumptions regarding the density of solar panels within the plant and the effectiveness of the panels would influence predictions of the amount of heat generated by the facility. Specifically, they assumed that solar panels would completely cover the ground's surface (they do not, which could alter the reflectivity they predicted) and a specific efficiency of the panels (they acknowledge that more efficient panels are being developed that generate less heat). Additionally, the model assumes specific reflectivity of the desert's surface in two places (near Harper Dry Lake in western Mojave Desert and near Blythe in the Colorado Desert) that may be

substantially different than that of the proposed project area. All of these factors would likely render the model's predictions somewhat different than real-world conditions and outcomes.

Millstein and Menon's model may be inappropriate for the scale of this biological opinion. The two modeled solar plants in Millstein and Menon's model covered 18,750 square kilometers or 4,633,207 acres. We defined the action area of this biological opinion as the 2,942-acre project right-of-way, the Los Angeles Department of Water and Power switchyard, and the recipient sites for translocated desert tortoises; this total area is approximately 7,500 acres. Consequently the modeled solar plants that generated a local temperature increase of 0.4˚C were approximately 618 times larger than the entire action area; considered in another light, the modeled solar plants were approximately 2,600 times larger than the proposed 1,767 acre Soda Mountain Solar Project. Consequently, the proposed action is unlikely to change local temperatures or regional wind patterns.

Miscellaneous Effects

Indirect effects associated with construction, operation, maintenance, and decommissioning of the Soda Mountain Solar Project may injure or kill desert tortoises. These effects include increased predation by common ravens that are attracted to the area because of increased human activity and modification of the habitat and diet of desert tortoises due to the spread of non-native plant species.

Construction and operation of the proposed facility have the potential to attract common ravens and increase desert tortoise predation in the action area. The applicant has proposed numerous measures in the management plan for the project to address predation by common ravens associated with the project site (Bureau 2013a). These measures include control of attractants, monitoring and reporting programs, and implementing adaptive management techniques such as devices to discourage roosting or nesting on project-related structures. To address the indirect and net effects of the proposed project with regard to common ravens, the applicant will participate in the regional management and monitoring program for common ravens. The Service developed this program in coordination with the Desert Managers Group, which is a consortium of land management agencies and other stake holders in California, and the Renewable Energy Action Team, which is composed of the Service, Bureau, California Energy Commission, and California Department of Fish and Wildlife.

We cannot reasonably predict the amount of predation by common ravens that construction and operation of the project is likely to add to baseline levels within the action area, but we anticipate that measures proposed by the applicant are likely to be effective in eliminating some, but not all, common raven use of the project site. Implementation of the management program for common ravens, to which the applicant would contribute, is likely to reduce predation on desert tortoises throughout the desert. Depending on the location of specific control actions, funding of regional management of common ravens may also aid in reducing the amount of common raven predation on desert tortoises within the action area; given the low density of desert tortoises in the action area, any changes to the rate of predation by common ravens locally would likely not be measurable.

Non-native species can occur in densities that can increase the risk of fires, which may result in future habitat loss. Non-native plant species currently occur on the proposed project site and are likely to occur in other portions of the action area at varying densities. Within the local area, numerous features serve as vectors for infestation of the action area by non-native plant species (e.g., highways, unpaved roads, the Rasor Road Off-highway Vehicle Management Area). Construction and operation of the Soda Mountain facility has the potential to increase the distribution and abundance of non-native species within the action area due to ground-disturbing activities that favor the establishment of non-native species. In addition, access to the project site and other project features by construction and operation personnel could increase the volume and distribution of non-native seed carried into the action area.

The applicant has proposed numerous measures to address control of non-native plant species within the project site. We cannot predict the degree to which non-native species would proliferate within or spread beyond the boundaries of the solar facility for several reasons. For example, above-average rainfall immediately after construction may encourage the spread of weeds whereas drought may have the opposite effect. We cannot predict whether project equipment would introduce new species or whether such new species would be able to germinate, grow, and reproduce onsite. Because the objective of the applicant's weed management plan is to ensure that the presence of weed populations on and adjacent to the project does not increase due to the project and because available technology, consistently and persistently applied, can achieve this objective, we predict that the proposed project would not lead to an increase in the number or amount of non-native species within or outside the boundaries of the solar facilities. If the applicant's objective is not met, we would consider this new information regarding the effects of the action that may affect desert tortoise and its habitat in a manner or to an extent not considered in this biological opinion. Consequently, the Bureau would be required to re-initiate formal consultation, pursuant to 50 Code of Federal Regulations 402.16.

Effects of Compensation

The Bureau has required compensation for loss of habitat associated with this project at a ratio of 1:1, per the provisions of the West Mojave Plan amendment to the California Desert Conservation Area Plan (Service 2006). Compensation will include acquisition of private lands containing desert tortoise habitat and their transfer to the Bureau, implementation of habitat enhancement and rehabilitation projects on public land, or some combination of these actions. The compensation lands will be located within the Western or Eastern Mojave recovery units, as defined in the recovery plan for the desert tortoise (Service 2011b). The Bureau estimates that 2,059 acres of suitable habitat would be required to offset the loss of desert tortoise habitat caused by the project (Childers 2015).

Because habitat enhancement actions and land acquisition would occur in desert wildlife management areas or other locations that are important to desert tortoise conservation, the proposed compensation requirements would provide a positive recovery benefit to the desert tortoise and at least partially offset loss of habitat associated with the project. The funding of

management actions is likely to result in restoration and rehabilitation of degraded habitat, protection of existing habitat from future sources of degradation, and a reduction in the direct mortality of desert tortoises. In general, the original and revised recovery plans (Service 1994, 2011b) identify the actions proposed for compensation as being necessary for the recovery of the desert tortoise. We cannot quantify the level of effects that these actions will have because we do not know the specific actions that will be implemented at this time.

Implementation of some of the habitat enhancement actions has the potential to result in adverse effects to the desert tortoise. Because we do not have specific information regarding future habitat enhancement and rehabilitation projects, we cannot perform a detailed analysis of these actions. The Bureau has indicated that these actions would require future project-specific authorizations prior to implementation. Consequently, we would address any adverse effects to the desert tortoise in future project-specific section 7 consultations.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Bureau manages most of the land in the action area; because all future actions on lands managed by the Bureau would require consultation, pursuant to section 7(a)(2) of the Endangered Species Act, we do not anticipate any cumulative effects associated with future activities on public lands. We are not aware of any actions that are reasonably certain to occur on non-federal lands within the action area.

CONCLUSION

As we stated previously in the biological opinion, “jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 Code of Federal Regulations 402.02). This regulatory definition focuses on how the proposed action would affect the reproduction, numbers, or distribution of the species under consideration in the biological opinion. For that reason, we have used those aspects of the desert tortoise’s status as the basis to assess the overall effect of the proposed action on the species.

Additionally, we determine whether a proposed action is likely “to jeopardize the continued existence of the species” through an analysis of how a proposed action affects the listed taxon within the action area in relation to the range of the entire listed taxon. For the desert tortoise, this process involves considering the effects at the level of the action area, then at the level of the recovery unit (in this case, the Western Mojave Recovery Unit), and then finally for the range of the listed taxon. Logically, if a proposed action is unlikely to cause a measurable effect on the listed taxon within the action area, it will not affect the species throughout the recovery unit or

the remainder of its range. Conversely, an action with measurable effects on the listed entity in the action area may degrade the status of the species to the extent that it is affected at the level of the recovery unit or range-wide.

In the following sections, we will synthesize the analyses contained in the Effects of the Action section of this biological opinion to determine how the proposed action affects the reproduction, number, and distribution of the desert tortoise. We will then assess the effects of the proposed action on the recovery of the species and whether they are likely to appreciably reduce the likelihood of both the survival and recovery of the desert tortoise.

Reproduction

Construction of the solar facility would not have a measurable long-term effect on reproduction of individual desert tortoises that live adjacent to the solar facility because intense construction activity would occur over a relatively brief time relative to the reproductive life of female desert tortoises. Furthermore, desert tortoises are well adapted to highly variable and harsh environments and their longevity helps compensate for their variable annual reproductive success (Service 1994).

We expect that translocated desert tortoises may exhibit decreased reproduction in the first year following translocation. However, research conducted by Nussear *et al*. (2012) suggests the reproductive rates of translocated desert tortoises are likely to be the same as those of resident animals in subsequent years. Based on work conducted by Saethre *et al*. (2003), we do not expect the increased density of desert tortoises that would result from translocation to affect the reproduction of resident animals.

For these reasons and also because few desert tortoises would be affected by the proposed action, we expect that the proposed Soda Mountain Solar Project is not likely to affect reproduction of the desert tortoise in the action area.

Numbers

We expect that many of the small desert tortoises and eggs within the boundaries of the solar facility are likely to be killed or injured during construction because of their small size and cryptic nature. We also expect that the applicant would likely find some small animals and translocate them. Small desert tortoises are likely to die during work along linear facilities and in the course of operations and maintenance; however, protective measures are likely to be more effective in preventing mortality or injury during these activities because of the smaller area involved with work along the linear facilities and few desert tortoises are likely to enter the fenced solar facility.

We estimated that the site of the solar facility might support up to 68 small desert tortoises. We did not attempt to compare this estimate with one of the same size classes for the Western Mojave Recovery Unit for two reasons. First, the large number of assumptions involved,

particularly in the context of the entire recovery unit, decreases the value of this analysis; that is, the number of small animals that we might estimate as residing in the Western Mojave Recovery Unit would be based on so many assumptions that our analysis would have little predictive value. Second, the natural high rate of mortality among hatchlings reduces the analytic value of the exercise; in short, many of these smaller animals would die even if the project is not constructed. Although we are not comparing the overall estimate of the numbers of small desert tortoises likely to be killed or injured to the overall numbers within the recovery unit, we can reasonably conclude that the number of small desert tortoises affected by the proposed action is a small percentage of the population in the Western Mojave Recovery Unit.

We expect that the proposed action is likely to result in the injury or mortality of few large desert tortoises because most construction activities (the aspect of the proposed actions that would be most likely to kill or injure desert tortoises) would occur within areas that have been fenced and cleared of desert tortoises. For activities outside of fenced areas, the applicant would implement measures to reduce the level of mortality during all work activities. During operations and maintenance, the same factors that we discussed previously for small desert tortoises would hold true for large animals. Consequently, densities of large desert tortoises serve as the basis for our following analysis.

Few desert tortoises occur within the action area. We expect the majority of large desert tortoises within the solar arrays blocks will be captured and released in the recipient areas. Based on the results of studies conducted at Fort Irwin and the Ivanpah Solar Electric Generating System, we expect that the majority of these animals will survive the translocation. Nussear *et al*. (2012) also found that survivorship is not significantly different between translocated and resident animals. In its report on the desert tortoise population trends, the Desert Tortoise Recovery Office (Service 2014b) estimated that 76,644 large desert tortoises (i.e., those greater than 180 millimeters in length) occupy modeled habitat within the Western Mojave Recovery Unit. The overall number of desert tortoises would increase if we included individuals smaller than 180 millimeters. Consequently, even the loss of all 10 large desert tortoises estimated to occur within the action area would comprise a barely measurable portion (approximately 0.013 percent) of the overall population within the Western Mojave Recovery Unit.

Distribution

The long-term loss of 1,767 acres of desert tortoise habitat that would result from implementation of the solar project would not appreciably reduce the distribution of the desert tortoise. Based on the information in Table 3 of this biological opinion, the Western Mojave Recovery Unit contains approximately 5,595,469 acres of desert tortoise habitat; rangewide, we estimate that approximately 16,745,848 acres of modeled desert tortoise habitat remain. Consequently, the proposed action would result in the loss of approximately 0.03 percent of the remaining habitat in the Western Mojave Recovery Unit and 0.01 percent of the remaining habitat rangewide.

Effects on Recovery

Given the small number of large desert tortoises that we expect the Soda Mountain Solar Project to kill, the proposed action is unlikely to appreciably diminish the ability of the desert tortoise to reach stable or increasing population trends in the future. The project site does not contain high-quality desert tortoise habitat and is not located in an area that is considered crucial to the recovery of the desert tortoise (i.e., critical habitat unit, desert wildlife management area, or other conservation areas for the desert tortoise).

The proposed project site is located between the Superior-Cronese and Ivanpah Critical Habitat Units, which connect through the Newberry Springs area and the Mojave National Preserve to the southwest and east of project site, respectively. Consequently, the project configuration will not affect desert tortoise connectivity because it is not located within a preferred linkage (Averill-Murray *et al*. 2013; see Figure 6).

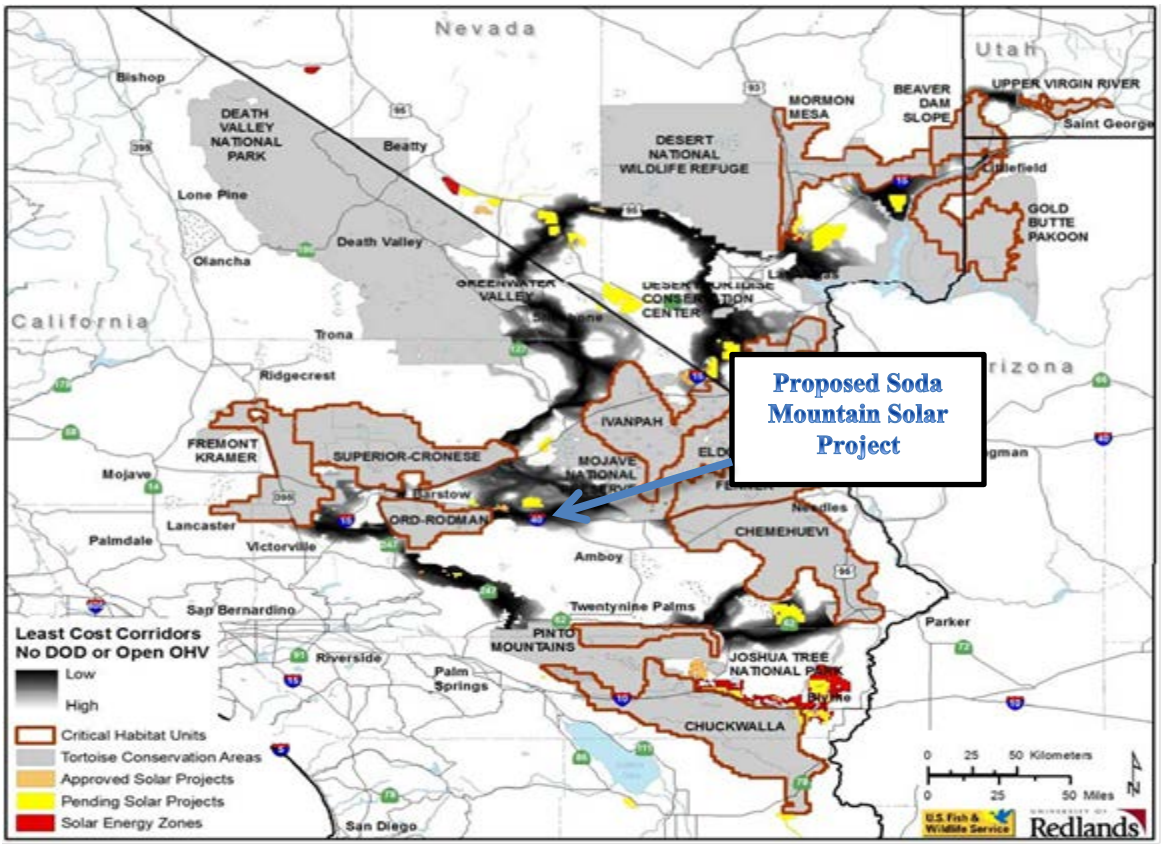

Figure 6. Map of corridors between desert tortoise conservation areas (from Averill-Murray *et al*. 2013).

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Bureau's proposed issuance of a right-of-way grant for the Soda Mountain Solar

Project is not likely to jeopardize the continued existence of the desert tortoise. We reached this conclusion for the project because:

1. The issuance of a right-of-way grant for the Soda Mountain Solar Project would not affect the reproductive capacity of desert tortoises in the action area.

2. The Bureau and applicant have proposed numerous measures, including translocation of desert tortoises from the project site, to minimize their injury and mortality. Information from previous large-scale translocations has demonstrated that it can be an effective tool for reducing mortality at project sites. Consequently, the proposed action is not likely to appreciably reduce the number of desert tortoises in the Western Mojave Recovery Unit.

3. The proposed action will not appreciably reduce the distribution of the desert tortoise because it would result in the loss of approximately 0.03 percent of suitable habitat in the Western Mojave Recovery Unit.

4. The proposed action is not located in an area that the Service considers important for the long-term conservation of the desert tortoise, either as a conservation area itself or as connecting habitat between other conservation areas. Consequently, the proposed action would not adversely affect recovery of the desert tortoise.

As we noted previously in this biological opinion, we conduct our analysis under section 7(a)(2) of the Act in relation to the status of the entire listed taxon. Because we have reached the determination that the proposed action is not likely to appreciably diminish reproduction, numbers, or distribution of the desert tortoise in the Western Mojave Recovery Unit or affect its recovery there, the proposed action is also not likely to reduce appreciably the likelihood of both the survival and recovery of the Mojave population of the desert tortoise throughout its range.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not the purpose of, the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement and the avoidance and minimization measures proposed by the Bureau.

The measures described below are non-discretionary; the Bureau must include these measures as binding conditions of its right-of-way grant to Soda Mountain Solar for the exemption in section 7(o)(2) to apply. The Bureau has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau fails to require Soda Mountain Solar to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the right-of-way grant, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Bureau must report the progress of the actions and its impact on the species to the Service as specified in the incidental take statement (50 Code of Federal Regulations 402.14(i)(3)).

Construction of the Solar Facility

We anticipate that all desert tortoises within the Soda Mountain project site are likely to be taken. We anticipate that most of the large individuals (i.e., those greater than 180 millimeters in length) within the area will be captured and moved from harm's way to adjacent habitat. Desert tortoises that are not detected during clearance surveys prior to construction may be killed or injured; because of the difficulty in finding small desert tortoises, we expect that most of these individuals are likely to be killed or injured during construction.

We estimate that, at most, approximately 10 large desert tortoises and 68 small desert tortoises may be present within the boundaries of the solar facility. We are unable to state precisely how many desert tortoises are present within the area where the proposed solar facility would be built for several reasons. Desert tortoises are cryptic (i.e., individuals spend much of their lives underground or concealed under shrubs), they are inactive in years of low rainfall, and their numbers and distribution within the action area may have changed since the surveys were completed because of hatchlings, deaths, immigration, and emigration. The numbers of hatchlings and eggs are even more difficult to quantify because of their small size, the location of eggs underground, and the fact that their numbers vary depending on the season; that is, at one time of the year, eggs are present but they become hatchlings later in the year.

Determining the amount or extent of the forms in which the take is likely to occur (killed, injured, or captured) is also difficult. As we noted previously, most of the large individuals within this area will likely be captured and moved from harm's way to adjacent habitat. Few larger desert tortoises are likely to be killed or injured because our prior experience is that the proposed avoidance and minimization measures will be effective. However, occasionally even large animals remain undetected during clearance surveys and are likely to be killed or injured during construction. The applicant is also likely to find and translocate some of the small desert tortoises; eggs are unlikely to be detected.

Using the total number of individuals within the site of the solar facility as the anticipated level of incidental take in the form of desert tortoises that are killed or injured as a result of the proposed action would be inappropriate because we fully expect that the applicant will capture and move numerous individuals into adjacent habitat. Therefore, we anticipate that the number of individuals killed or injured resulting from the proposed action will be a subset of the number

of desert tortoises estimated to be within the action area. Because the applicant is not likely to find every dead or injured desert tortoise within the area of the solar facility, the number of dead or injured individuals that are found likely will be a subset of the number that are killed or injured.

To summarize, we do not know the precise number of desert tortoises within the area of the solar facility and cannot predict the numbers of animals that the applicant will capture and move from harm's way prior to and during construction, the number of individuals that are likely to be killed or injured, or the number of dead or injured individuals that will be found. Therefore, we cannot precisely quantify the number of individuals that are likely to be killed or injured during construction of the proposed solar facility. Because the applicant is unlikely to find every individual that is killed or injured and we know that this number will be a fraction of the total number of desert tortoises present, we will consider the amount or extent of take to be exceeded if two large desert tortoises are killed or injured within the construction fence of the solar facility during construction of the proposed project. We used large desert tortoises to establish this amount or extent of take because small desert tortoises are difficult to find and the method by which we calculate their abundance contains more assumptions and therefore more potential for variation than does our method for predicting the number of large desert tortoises. If the amount or extent of take for large desert tortoises is exceeded, the re-initiation of formal consultation would also require re-evaluation of the effects of the action on small desert tortoises.

In the previous paragraphs, we described the difficulties involved with quantifying the numbers of desert tortoises that are likely present in the solar facility and of desert tortoises that are likely to be moved from harm's way. However, we based our overall section 7(a)(2) analysis in this biological opinion on the premise that at most approximately 10 large and 68 small desert tortoises are likely to occur within the boundaries of the proposed solar facility. If the surveys were inaccurate and more desert tortoises actually reside on site, the applicant would exceed the amount or extent of incidental take that we have anticipated; additionally, this increased number of individuals would constitute new information revealing effects of the agency action that may affect the desert tortoise to an extent that the Service did not consider in this biological opinion. Consequently, we will consider the amount or extent of take to be exceeded if more than ten large desert tortoises are captured and translocated from within the solar facility during construction of the proposed project. Additionally, we will consider the amount or extent of take to be exceeded if any combination of killed and captured and translocated desert tortoises exceeds ten large desert tortoises (e.g., two desert tortoises die and nine are captured and relocated). We used these two scenarios because we encourage the applicant to capture and translocate all large desert tortoises we anticipate to be on site; however, the total number of desert tortoises taken in the form of mortality and/or capture and translocation should not exceed the ten large desert tortoises upon which we based our analysis.

More uncertainty exists in the numbers of small desert tortoises and eggs that are likely to be present because of the assumptions that we make to derive an estimate; additionally, circumstances could lead to the authorized biologists and monitors finding more small desert tortoises than we predicted (e.g., an unusually high survival rate in the previous year, long periods of good weather leading to greater activity levels, biologists with better search images

for small animals, etc.). Because our estimate of the number of large desert tortoises within the project area forms the basis for the estimate of the number of small desert tortoises, finding more large animals than we predicted would likely mean that our estimate of the number of small animals is too low. Therefore, we are not establishing an independent re-initiation criterion for the number of small desert tortoises or eggs that would be moved out of harm's way during construction of the proposed project.

We expect that most of the eggs present within boundaries of the solar facility will be destroyed. We cannot predict how many eggs desert tortoises will produce prior to the onset of construction and the number of eggs present would vary depending upon the time of the year clearance surveys are conducted. Biologists are unlikely to find many eggs because they are difficult to detect. For these reasons, predicting the number of eggs that may be taken is not possible and we are not establishing a re-initiation criterion for the loss of eggs. As we noted in the previous paragraph regarding small desert tortoises, the amount or extent of take of large desert tortoises we established previously in this section serve as a surrogate for the number of eggs; if the amount or extent of take for large desert tortoises is exceeded, the re-initiation of formal consultation would also require re-evaluation of the effects of the action on eggs.

Translocation of Desert Tortoises from the Solar Facility

Because the applicant will employ experienced biologists, approved by the Service and the Bureau, and sanctioned handling techniques, we do not expect that the take, in the form of capture or collection, required to move desert tortoises out of harm's way during construction of the proposed project will result in mortality or injury of any individuals. Consequently, we do not anticipate that the activities involved with capturing and transporting desert tortoises from the solar facility to the recipient site is likely to kill or injure any desert tortoises.

The work required to translocate desert tortoises would necessitate increased use of vehicles in suitable habitat when desert tortoises are active. We cannot predict how many desert tortoises are likely to be killed or injured in this manner because of the numerous variables involved (the density of desert tortoises in the area, how many animals are active when biologists are working in the area, the conditions of the road, etc.). Additionally some desert tortoises (particularly small individuals) may be killed or injured but never detected. Because the applicant will employ experienced biologists, approved by the Service and the Bureau, we expect that few desert tortoises are likely to be killed or injured by vehicle strikes during translocation. For these reasons, we will consider the amount or extent of take to be exceeded if more than one large desert tortoise is killed or injured as a result of vehicle strikes during translocation activities.

We anticipate that moving eggs from harm's way may result in the destruction of a portion of the eggs. Because some are likely to survive, we consider moving them from harm's way to be better for desert tortoises than leaving them in place in work areas, where they would most likely be destroyed. Therefore, we are not establishing a re-initiation criterion for the number of eggs that would be moved out of harm's way during construction of the proposed project.

Operation and Maintenance of the Solar Facility

Operations and maintenance activities would occur primarily within the perimeter fence; however, desert tortoises may occasionally breach the fence and would then likely be taken, either by being captured and moved outside the fence into suitable habitat or by being killed or injured. We cannot reasonably anticipate the number of desert tortoises that may breach the fence during the life of the project or predict the numbers of those individuals that would be killed, injured, or captured because of the numerous variables involved. For example, we cannot predict the future numbers of desert tortoises that may reside near the project site or when an animal would then find a hole in the fence and enter the facility. We also cannot predict whether the animal would be killed, injured, or captured.

Because we cannot precisely quantify the number of individuals that are likely to be killed, injured, or captured during operations and maintenance of the proposed solar facility, we will consider the amount or extent of take to be exceeded if more than one large desert tortoise is killed or injured within the solar facility in any calendar year or if more than five are killed or injured cumulatively.

Construction, Operation, and Maintenance of Linear Facilities

Determining the number of desert tortoises that are likely to be taken along linear facilities is extremely difficult. In addition to the reasons we have already discussed regarding why the take of desert tortoises is difficult to quantify; narrow linear facilities pose additional difficulty in that they most likely cross only a small portion of a desert tortoise's home territory. Consequently, desert tortoises that are detected during a survey may be absent during construction or vice versa. Additionally, the likelihood of encountering a desert tortoise varies with the time of day, season, and long- and short-term weather conditions.

Consequently, we have not tried to quantify the number of desert tortoises that likely to be encountered during the construction, operations, and maintenance of the linear facilities. Rather, because the proposed protective measures have been effective in minimizing the injury and mortality of desert tortoises in similar linear projects and the applicant is unlikely to find every desert tortoise it kills during construction, we will consider the amount or extent of take to be exceeded if more than one large desert tortoise is killed or injured during construction of the linear facilities. We will consider the amount or extent of take to be exceeded if more than one desert tortoise is killed or injured during operations and maintenance of the linear facilities in any calendar year or if more than five are killed or injured cumulatively. We are not establishing a limit for moving desert tortoises from harm's way if they are encountered during construction, operations, or maintenance of linear facilities. As we discussed previously, we cannot reasonably assess how many individuals are likely to be encountered during work activities and moving these desert tortoises a short distance from harm's way will not adversely affect them in a measurable manner.

General Considerations

The exemption provided by section 7(o)(2) to the take prohibitions contained in section 9 of the Endangered Species Act extends only to the action area as described in the Environmental Baseline section of this biological opinion.

Incidental take that may be associated with decommissioning of the project is not covered by this incidental take statement because most activities would occur within fenced facilities where desert tortoises are absent. When more information becomes available at the end of the right-of-way grant, the Bureau will determine how it wants to proceed in light of the information that is available at that time. Re- authorization of industrial use of the site may require re-initiation of formal consultation.

We did not have enough information to analyze the potential effects of the measures to offset the adverse effects of the proposed project on the desert tortoise. Consequently, this biological opinion does not cover the incidental take that may occur as a result of those future actions. The Bureau is required to follow the consultation procedures of section 7(a)(2) of the Act with regard to those future actions.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize take of desert tortoises during the construction, operation, and maintenance of the proposed facility:

> The Bureau must condition the right-of-way grant to reduce adverse effects associated with moving desert tortoises.

Our evaluation of the proposed action includes consideration of the protective measures proposed by the Bureau in the biological assessment and re-iterated in the Description of the Proposed Action section of this biological opinion. Consequently, any changes in these protective measures may constitute a modification of the proposed action that causes an effect to the desert tortoise that was not considered in the biological opinion and require re-initiation of consultation, pursuant to the implementing regulations of the section 7(a)(2) of the Act (50 Code of Federal Regulations 402.16).

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Bureau must ensure that applicant complies with the following terms and conditions, which implement the reasonable and prudent measure, and the following reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement the reasonable and prudent measure described above:

1. The Bureau must require the applicant to monitor desert tortoises that are moved during fence line and clearance surveys until an authorized biologist determines the animals are exhibiting behavioral signs of adjusting to the translocation area (e.g., returning to burrows during inactive periods, not walking the fence line, not attempting to cross Interstate 15 for desert tortoises in the east of desert tortoise recipient site, etc.). Once the authorized biologist makes this determination, he or she may remove the transmitter and cease monitoring.

2. The Bureau must prohibit the applicant from translocating desert tortoises during summer months (i.e., once animals have generally become inactive).

REPORTING REQUIREMENTS

The Bureau must provide an annual report to the Service by January 31 of each year that the facility is being constructed or operated that provides details on the effects of the action on the desert tortoise. Specifically, the reports must include information on any instances when desert tortoises were killed, injured, or handled, the circumstances of such incidents, and any actions undertaken to prevent similar mortalities or injuries from re-occurring. If animals are moved from harm's way during the reporting period, the Bureau must include that information in these reports. The reports must also include a description of any monitoring efforts that the applicant implements. In addition, within 60 days of the completion of the proposed action (i.e., at the conclusion of all activities related to decommissioning), the Bureau must provide final report to the Service with this information.

We also request that the Bureau provide us with the names of any monitors who assisted the authorized biologists and an evaluation of the experience they gained on the project; the qualifications form on our website (http://www.fws.gov/carlsbad/PalmSprings/DesertTortoise/DT%20authorized%20biologist%20request%20form.pdf), filled out for the project, along with any appropriate narrative would provide an appropriate level of information. This information would provide us with additional reference material in the event these individuals are submitted as potential authorized biologists for future projects.

DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Within 3 days of locating any dead or injured desert tortoises, you must notify the Palm Springs Fish and Wildlife Office by telephone (760 322-2070) and by facsimile or electronic mail. The report must include the date, time, and location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Injured desert tortoises must be taken to a qualified veterinarian for treatment. If any injured desert tortoises survive, the Bureau must contact the Service regarding their final disposition.

The Bureau must ensure that the applicant takes care in handling dead specimens to preserve biological material in the best possible state for later analysis, if such analysis is needed. The Service will make this determination when the Bureau provides notice that a desert tortoise has been killed by project activities.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to use their authorities to further its purposes by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the Bureau and applicant develop a disposition plan for any nests of desert tortoises that are relocated from the project site. We recommend that the nests be monitored periodically to ascertain whether the eggs hatched. This information may prove useful in determining whether our current guidance (Service 2009a) needs revision.

2. We recommend that the Bureau require the applicant to conduct specific searches for small desert tortoises in portions of the project areas where densities of these individuals may be greater. Biologists at the Ivanpah Solar Electric Generating System removed numerous small individuals by using search techniques specific to small desert tortoises.

RE-INITIATION NOTICE

This concludes formal consultation on the Bureau's proposal to issue a right-of-way grant to construct and operate the Soda Mountain Solar Project. As provided in 50 Code of Federal Regulations 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take specified in the incidental take statement is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action.

In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) may lapse and any further take may be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending re-initiation.

If you have any questions, please contact Vincent James at (760) 322-2070, extension 215 or Ray Bransfield at (805) 644-1766, extension 317.

Appendices

Appendix 1. Solar projects for which the U.S. Fish and Wildlife Service has issued biological opinions or incidental take permits.

Appendix 2. Methodology used to estimate the number of desert tortoises and eggs present in the action area.

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Appendix 1. Solar projects for which the U.S. Fish and Wildlife Service has issued biological opinions or incidental take permits.

The following table summarizes information regarding the solar projects that have undergone formal consultation with regard to the desert tortoise. In the Citations column, a single reference indicates that the acres of desert tortoise habitat and number of desert tortoises are estimates from the biological opinion; when the column includes two citations, the first is for the acreage of habitat and the estimated number of desert tortoises from the biological opinion and the second is for number of desert tortoises that were found onsite prior to or during construction.

Project and Recovery Unit	Acres of Desert Tortoise Habitat	Desert Tortoises Estimated[1]	Desert Tortoises Observed[2]	Citations[3]
Eastern Mojave				
Ivanpah Solar Electric Generating System	3,582	1,136	175[7]	Service 2011a, Davis 2014
Stateline Solar	1,685	947	34	Service 2013a, LaPre 2014
Silver State North – NV	685	14[6]	4	Service 2010a, Cota 2013
Silver State South – NV	2,427[4]	1,020[4]	152	Service 2013a, Cota 2014
Amargosa Farm Road – NV	4,350	4[6]	-	Service 2010e
Western Mojave				
Abengoa Harper Lake	Primarily in abandoned agricultural fields	4[6]	-	Service 2011b
Chevron Lucerne Valley	516	10	-	Service 2010b
Northeastern Mojave				
Nevada Solar One - NV	400	[5]	[5]	Burroughs 2012, 2014
Copper Mountain North - NV	1,400	30[5]	30[5]	Burroughs 2012, 2014
Copper Mountain - NV	380	[5]	[5]	Burroughs 2012, 2014
Moapa K Road Solar - NV	2,141	186	157	Service 2012, Burroughs 2013

Colorado				
Genesis	1,774	8	0	Service 2010c, Fraser 2014a
Blythe	6,958	30	0	Service 2010d, Fraser 2014b
Desert Sunlight	4,004	56	7	Service 2011c, Fraser 2014a
McCoy	4,533	15	0	Service 2013b, Fraser 2014b
Desert Harvest	1,300	5	-	Service 2013c
Rice	1,368	18	1	Service 2011d, Fraser 2014a
Total	**37,503**	**3,483**	**560**	

1. The numbers in this column are not necessarily comparable because the methodologies for estimating the numbers of desert tortoises occasionally vary between projects. When available, we included an estimate of the numbers of small desert tortoises.
2. This column reflects the numbers of desert tortoises observed within project areas. It includes translocated animals and those that were killed by project activities. Project activities may result in the deaths of more desert tortoises than are found.
3. The first citation in this column is for the biological opinion or incidental take permit and is the source of the information for both acreage and the estimate of the number of desert tortoises. The second is for the number of desert tortoises observed during construction of the project; where only one citation is present, construction has not begun or data are unavailable at this time.
4. These numbers include Southern California Edison's Primm Substation and its ancillary facilities.
5. These projects occurred under the Clark County Multi-species Habitat Conservation Plan; the provisions of the habitat conservation plan do not require the removal of desert tortoises. We estimate that all three projects combined will affect fewer than 30 desert tortoises.
6. These estimates do not include smaller desert tortoises.
7. In the table attached to the electronic mail, the number of desert tortoises translocated from the project site is represented by the total number of translocated animals minus the number of animals born in the holding pens.

The Service completed biological opinions for the Calico and Palen projects. The applicant for the Calico project, which was located in the Western Mojave Recovery Unit, has abandoned the project and the Bureau of Land Management has withdrawn the request for consultation (Bureau of Land Management 2013). The Palen project, which is located in the Colorado Desert

Recovery Unit, has had several owners; most recently, the project proponent (Palen Solar Holdings, LLC) submitted a letter to the California Energy Commission in which it withdrew its application (California Energy Commission 2014). Another company may pursue a solar project at this location, although it has not filed applications with the Bureau and California Energy Commission to date (Fraser 2014c).

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Appendix 2. Methodology used to estimate the number of desert tortoises and eggs present in the action area.

We used the life table contained in Turner *et al*. (1987) to estimate the number of smaller desert tortoises that may be present in the action area based on the upper confidence limit of the number of desert tortoises predicted by the U.S. Fish and Wildlife Service's (Service 2010) protocol. We predicted the numbers of animals that would likely occur in each size class using the expected percentages in each size class and the total number of animals that were actually found. The following table depicts these values.

Mean Carapace Length (mm) [1]	**Life-table Distribution (percentage)** [2]	**Number of Desert Tortoises Likely to Be Present in the Action Area**[3]
<60	39.7	30.92
60 – 99	32.0	24.92
100 – 139	10.8	8.41
140 – 179	4.5	3.51
180+	13.2	10.28
Total		77.88

[1] Modified from Turner *et al*. (1987). One live female desert tortoise approximately 220 millimeters in size was detected in the action area (Woodman 2014). We combined the size classes used by Turner *et al*. above this size because it did not affect our calculation of the number of small animals.

[2] In this column, we used the life-table distribution percentage from Turner *et al*. (1987) but combined the percentages for the size classes above 180 millimeters.

[3] We used the upper confidence limit derived from the Service's (2010) protocol as the number of desert tortoises in the greater-than-180-millimeter class. We then used the equation 10.28/x = 13.2/100 to derive the total number of desert tortoises based on 10.28 animals being in the 180+ size class. Finally, we used the equation (% in size class)/100 = x/77.88 to derive the number of desert tortoises likely to occur in the remaining size classes.

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APPENDIX 3
Minor Clarifications of Proposed PA/FEIS/EIR

Introduction

The Bureau of Land Management (BLM) prepared the Proposed PA/FEIS/EIR for the Soda Mountain Solar Project (Project) in consultation with other agencies, taking into account public comments received during the Federal Land Policy and Management Act of 1976 (FLPMA) and National Environmental Policy Act (NEPA) process undertaken for the Project. The Proposed PA/FEIS/EIR described the Proposed Action and alternatives, analyzed the proposed CDCA Plan Amendment and Project decisions, and responded to written comments received during the public review period for the Draft PA/EIS/EIR (see Proposed PA/FEIS/EIR Chapter 4, *Consultation, Coordination and Public Involvement*, and Appendix K, *Individual Responses to Comments*). Review of the Proposed PA/FEIS/EIR by the BLM and others has resulted in the minor corrections and clarifying statements listed below. Revisions to language as it appears in the Proposed PA/FEIS/EIR are indicated as follows: Quoted language is *italicized*, new language is shown in *underscore*, deleted language is shown in *~~strikethrough~~*. None of these minor corrections and clarifying statements affects the adequacy of the underlying NEPA analysis in the Proposed PA/FEIS/EIR.

- Pages 3.1-7 and 3.1-8. Unnecessary text regarding the Los Angeles Department of Water and Power is deleted:

  ~~Additionally, the Los Angeles Department of Water and Power (LADWP) has its own RPS, with a goal of providing 35 percent of its electricity from renewable sources by 2020 (LADWP, 2013a). As of 2011, LADWP's current portfolio contained approximately 19 percent renewable energy (LADWP, 2012). As of 2013, LADWP also provided 39 percent of its electricity from coal-fired power plants in Arizona and Utah, but intends to end all coal-fired electricity imports by 2025, in part by procuring new renewable energy sources (LADWP, 2013b).~~

- Page 3.4-14. Text is revised to clarify that BLM conducted golden eagle surveys in 2012 and the results of those surveys are included in the analysis:

  Survey Results

  No golden eagles were identified near the Project ROW during aerial and ground surveys in 2009 ~~and~~ or in surveys conducted by BLM in 2012; however, in 2011 surveyors identified an active eagle nest on the south face of Cave Mountain approximately 8 miles southwest of Project site (Figure 3.4-4) (Panorama Environmental, Inc., 2013a; Appendix L). A pair of eagles was observed incubating an unknown number of eggs, and a second alternate nest was detected directly below the active nest.

Biologists observed an additional sub-adult golden eagle interacting with the adult male, perching and soaring around the summit of Cave Mountain.

Two inactive nests were also identified in the north Soda Mountains during BLM surveys in 2012. The results of the BLM survey are shown in Figure 2.3-1 in Appendix L-6. The inactive nests included a large nest on a north-northwest facing slope and a dilapidated nest located in a cave. The two previously-observed golden eagle nests in the north Soda Mountains were not relocated during the 2012 survey and are characterized as historical in Figure 2.3-1 in Appendix L-6.

- Page 3.4-36: Text is revised to clarify that the proposed Project would not affect known, suspected, or inactive golden eagle nests:

A golden eagle nest was observed 7.75 miles from the Project site during surveys and a possible nest may exist in the Mojave National Preserve approximately 4 miles east of the Project site (Panorama Environmental, Inc., 2013c). Noise, night lighting, and visual impacts during Project construction would not impact golden eagle nesting behavior at these known and suspected or inactive nests due to their distance from the Project site.

- Page 3.4-42. Mitigation measure references are corrected:

a) Impact Veg-B1: Alternative B would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of APM 50 and Mitigation Measures 3.3-2 and 3.3-3. For the reasons discussed in Section 3.3.7, the contribution of Alternative B to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-B2: Alternative B would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative B would impact up to 348.89 acres of waters of the State, representing a significant impact. Implementation of Mitigation Measures 3.3-2 and 3.3-~~5~~4 would avoid, or reduce some of the direct and indirect construction-related impacts to these features to less than significant.

- Page 3.4-43. Mitigation measure references are corrected:

a) Impact Veg-C1: Alternative C would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of Mitigation Measures 3.3-2 and 3.3-3, and the contribution of Alternative C to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-C2: Alternative C would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative C would impact up to 462.72 acres of waters of the State, representing a significant impact. The implementation of Mitigation Measures 3.3-2 and 3.3-~~5~~4 would avoid, or reduce some of the direct and indirect construction-related impacts to these features.

- Pages 3.4-43 and 3.3-44. Mitigation measure references are corrected:

a) Impact Veg-D1: Alternative D would indirectly affect special-status plants. (Less than Significant with Mitigation Incorporated)

As described for Alternative A, direct and indirect impacts to special-status plants would be less than significant with implementation of Mitigation Measures 3.3-2 and 3.3-3, and the contribution of Alternative D to cumulative impacts to special-status plants would not be cumulatively considerable.

b) Impact Veg-D2: Alternative D would result in direct and indirect impacts to waters of the State. (Less than Significant with Mitigation Incorporated)

Alternative D would impact up to 446.44 acres of waters of the State, representing a significant effect. The implementation of Mitigation Measures 3.3-2 and 3.3-~~5~~4 would avoid, or reduce some of the direct and indirect construction-related impacts to these features.

- Page 3.4-35. Mitigation measure applicability is clarified:

Indirect effects to Mojave fringe-toed lizard would be minimized through implementation of APM 50 (Integrated Weed Management Plan or IWMP) and of Mitigation Measures 3.3-2 (specific requirements for IWMP), 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction); and 3.4-1c (WEAP).

- Page 3.4-51. Mitigation measure applicability is clarified:

Potential indirect effects to Mojave fringe-toed lizard from the Proposed Action and all action alternatives would be minimized through implementation of APMs 44 (WEAP training), 50 (IWMP) (Appendix E-2), and 72 (Raven Monitoring and Control Plan), and of Mitigation Measures 3.3-2 (specific requirements for IWMP), 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP).

- Page 3.4-74. Mitigation measure applicability is clarified:

Impact Wild-2: The Proposed Action would have substantial adverse indirect effects on Mojave fringe-toed lizard. (Less than Significant with Mitigation Incorporated)

Indirect effects to Mojave fringe-toed lizard would be minimized through implementation of APM 50 (IWMP) and Mitigation Measures 3.3-2 (specific requirements for IWMP), 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP). Following the implementation of these measures, impacts to Mojave fringe-toed lizard would be less than significant.

Impact Wild-3: The Proposed Action could have substantial adverse direct and indirect effects on special-status birds. (Significant and Unavoidable)

Nesting Birds

Direct and indirect impacts may occur to nesting special-status birds in and near the Project site or foraging habitat for these species, including burrowing owl, golden eagle, loggerhead shrike, and other birds that are protected by the MBTA and California Fish and Game code. These impacts

would be minimized through implementation of APM 50 (IWMP) and Mitigation Measures 3.3-2 (specific requirements for IWMP), 3.4-1a (compliance monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), and 3.4-1c (WEAP).

- Page 3.4-76. Mitigation measure applicability is clarified:

Impact Wild-7: The Proposed Action would have a substantial adverse effect on special-status bats. (Less than Significant with Mitigation Incorporated)

Direct and indirect impacts to special-status bats would be reduced to less than significant through implementation of Mitigation Measures 3.4-1a (monitoring by a designated biologist), 3.4-1b (biological monitoring during construction), 3.4-1c (WEAP), 3.4-1e (lighting specifications to minimizes bird and bat impacts), ~~and~~ 3.4-1g (BBCS), and 3.4-1h (AMMP).

- Page 3.14-14. Area of potential electricity consumption is clarified:

The Proposed Action would not indirectly induce substantial population growth by introducing a new source of electricity because although it would produce additional electricity and increase service capacity, it is intended to meet the demand for energy that is already projected based on growth in demand for electricity in ~~LADWP's service area~~ California, which extends well beyond the regional study area, and therefore would not induce substantial growth or concentration of population in either the regional or local study areas.

- Page 3.14-27. Area of potential electricity consumption is clarified:

The Proposed Action would not indirectly induce substantial population growth through the extension of infrastructure because although it would produce additional electricity and increase service capacity, it is intended to meet the demand for energy that is already projected based on growth in demand for electricity in ~~LADWP's service area~~ California, and therefore would not be growth-inducing.

- Page 3.21-3. Area of potential electricity consumption is clarified:

LADWP operates the Market Place-Adelanto 500 kV transmission line to which the Project would interconnect ~~and~~. LADWP provides electricity to approximately 3.9 million people in a service area covering 465 square miles (LADWP, 2013).

- Page 3.21-6. Area of potential electricity consumption is clarified:

The Project would begin generating electricity upon the connection of the first solar arrays completed, resulting in a net increase in electricity resources available to the regional grid, and would help ~~LADWP~~ California meet its goal of increased reliance on renewable energy sources and decreased reliance on coal power.

and

Additionally, Project operation would have a beneficial effect on the electricity supply to the grid and would help ~~LADWP~~ California meet its goal of increased reliance on renewable energy sources and decreased reliance on coal power.

- Page 3.21-7. Area of potential electricity consumption is clarified:

  Electricity generated by the Project would be sold in the competitive market~~, most likely under the terms of a 30-year Power Purchase Agreement with LADWP~~. Consequently, the Project would contribute toward meeting ~~LADWP's~~ California's requirements under the Renewables Portfolio Standard.

- Page 4-24. Estimated compensatory mitigation acreage is clarified:

  Thus, it is estimated that the proposed Project would require ~~2.455.77~~ 2,455.77 acres of compensatory lands; and this number would be revised to reflect final site impacts in accordance with Mitigation Measure 3.4-2d.

APPENDIX 4
Adopted Mitigation Measures

Introduction

The table that follows presents a compilation of Applicant Proposed Measures (APM) and Mitigation Measures (MM) adopted in the Record of Decision (ROD) for the Soda Mountain Solar Project (Project). The purpose of the table is to provide a single comprehensive list of the measures that will be implemented to avoid or reduce impacts of the Soda Mountain Solar Project on the human environment, the timing for their implementation, and related monitoring and reporting requirements.

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Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Air Resources			
APM 1: The Applicant shall use periodic watering for short-term stabilization of disturbed areas to minimize visible fugitive dust emissions. Use of a water truck to maintain surface moisture on disturbed areas and surface application of water during visible dusting episodes shall be considered sufficient to maintain compliance.		All project phases	BLM
APM 2: The Applicant shall apply BMPs to prevent Project-related visible bulk materials transport (trackout) onto paved surfaces. BMPs may include, but not be limited to, the following: a. Use of wheel-washers (or equivalent) installed at all access points and laydown areas where trackout onto paved public roads could occur b. Construction of stabilized construction site entrance/exit areas c. Implementation of regular street sweeping/cleaning of paved surfaces d. Installation of corrugated steel panels at all site exits		Prior to and during construction	BLM
APM 3: The Applicant shall cover haul vehicles loaded with earthen materials while operating on publicly maintained paved surfaces.		During construction	BLM
APM 4: The Applicant shall stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than 14 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.		During construction	BLM
APM 5: The Applicant shall clean up Project-related visible bulk materials transport (trackout) or spills on publicly maintained paved surfaces within 24 hours.		All project phases	BLM
APM 6: The Applicant shall discontinue non-essential earth-moving activities under high wind conditions when wind speeds exceed 25 miles per hour and those activities result in visible dust plumes. All grading activities shall be suspended when wind speeds are greater than 30 miles per hour.		During construction	BLM
APM 7: The Applicant shall limit the speed of vehicles traveling on unpaved roads and disturbed areas to 15 miles per hour.		All project phases	BLM
APM 8: The Applicant shall apply water to all unpaved roads and unpaved parking areas actively used during construction, except when moisture remains in the soils such that dust is not produced when driving on unpaved roads.		During construction	BLM
APM 9: The Applicant shall use off-road construction diesel engines that meet the Tier 3 California Emission Standards for Off-road Compression-Ignition Engines unless such engine is unavailable for a particular item of equipment. If a Tier 3 engine is unavailable, that engine shall be equipped with retrofit controls providing nitrogen oxides and particulate matter emissions equivalent to a Tier 3 engine.		All project phases	BLM
APM 10: The Applicant shall apply Level 3 diesel particulate filters to diesel engines of off-road construction equipment.		During construction	BLM
Mitigation Measure 3.2-1: After construction and prior to the use of unpaved roads and parking areas, the Applicant shall apply BLM-approved dust palliatives to all unpaved roads and parking areas per manufacturer recommendations. Palliatives shall be reapplied every 2 years or as requested by the BLM per manufacturer recommendations. During operation and maintenance disturbed areas within the Project site that still produce visible dust plumes shall be watered twice daily or as needed.		Prior to and during operation and maintenance	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Air Resources (cont.)			
Mitigation Measure 3.2-2: During construction, vehicles and equipment shall not idle for more than 5 minutes if not performing construction activities. The use of idling vehicle air conditioner units to reduce the effects of heat shall be prohibited unless required for a medical emergency or to prevent a medical emergency when temperatures on the Project site exceed 100 °F.		During construction	BLM
Mitigation Measure 3.2-3: The Applicant shall discontinue non-essential earth-moving activities under high wind conditions (i.e., when wind speeds exceed gusts of 25 miles per hour or when sustained wind speeds exceed 15 miles per hour based on a 15-minute average as indicated by a wind instrument on-site and those activities result in visible dust plumes). All grading activities shall be suspended when wind gusts are greater than 30 miles per hour.		During construction	BLM
Mitigation Measure 3.2-4: The Applicant shall make a good faith effort to use 2007 and newer diesel haul trucks and use available construction equipment that meets the highest USEPA-certified tiered emission standards. An Exhaust Emissions Control Plan that identifies each off-road unit's certified tier specification, Best Available Control Technology (BACT), as well as the model year of all haul trucks to be used on the Project that are under direct control of the Applicant or its construction contractor shall be submitted to BLM and the County for review and approval at least 30 days prior to commencement of construction activities. Construction activities cannot commence until the plan has been approved. For all pieces of equipment that would not meet Tier 4 emission standards, the Exhaust Emissions Control Plan shall include documentation from two local heavy construction equipment rental companies that indicates that the companies do not have access to higher-tiered equipment for the given class of equipment. In the event that 2007 or newer diesel haul trucks are not available for the Project, the Exhaust Emissions Control Plan shall document that a good faith effort to obtain such haul trucks has been made.		Submit plan at least 30 days prior to commencement of construction Implement plan during construction	BLM and San Bernardino County
Biological Resources – Vegetation			
APM 34: The site shall be revegetated after decommissioning according to the Final Closure Plan prepared in conformance with BLM requirements at the time of decommissioning.		After decommissioning	BLM
APM 35: Preconstruction Surveys for Rare or Special-Status Plant Species and Cacti. Before construction of a given phase begins, the Applicant will stake and flag the construction area boundaries, including the construction areas for the solar arrays and associated infrastructure; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A BLM-approved biologist will then survey all areas of proposed ground disturbance for rare or special-status plant species and cacti during the appropriate period (blooming or otherwise identifiable) for those species having the potential to occur in the construction areas. All rare or special-status plant species and cacti observed will be flagged for transplantation.		Prior to construction	BLM
APM 36: Vegetation Resources Management Plan. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components: a) Vegetation Salvage plans that discuss the methods that will be used to transplant cacti present within the proposed disturbance areas following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur within proposed disturbance areas. b) Restoration plans discussing the methods that will be used to restore any of the four native plant community types (creosote bush-white bursage scrub, cheesebush scrub, creosote bush scrub, and smoke tree woodland) present within the Project right-of-way that may be temporarily disturbed by construction activities. The Applicant would obtain BLM approval for any seed mix used for restoration. c) Vegetation Salvage and Restoration plans that will specify success criteria and performance standards. The Applicant will be responsible for implementing the VRMP according to BLM requirements.		Submit plan at least 30 days prior to commencement of construction Implement plan during and following construction	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
APM 37: Mitigate Direct Impacts to Rare or Special-Status Plants. To the extent feasible, the Project will be designed to avoid impacts to the Emory's crucifixion-thorn population within the project ROW. No construction shall be allowed within a 100-foot buffer area around the Emory's crucifixion-thorn population. All other California Rare Plant Rank (CRPR) 1 and 2 plant occurrences within the Project ROW will be documented during preconstruction surveys. The Applicant will also provide a 100-foot buffer area surrounding each avoided occurrence, in which no construction activities will take place, if feasible. If avoidance is not feasible, the Applicant will provide on-site mitigation (e.g., vegetation salvage) for impacts to rare plants.		Prior to and during construction	BLM
APM 38: Herbicides shall not be applied systemically over the entire project area. Herbicides shall be applied in focused treatments in areas where invasive weed infestations have been identified, such as where there is a clump or monotypic stand of invasive weeds. Herbicides shall not be applied within 100 feet of a special-status plant or Emory's crucifixion thorn.		All project phases	BLM
APM 39: Only a State of California and federally certified contractor (i.e., Qualified Applicator), who is also approved by BLM, and holds and maintains a Qualified Applicator License from California Department of Pesticide Regulation, will be permitted to perform herbicide applications. Herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. All herbicide applications must follow USEPA label instructions.		All project phases	BLM
APM 40: Herbicides shall not be applied during rain events, within 48 hours of a forecast rain event with a 50 percent or greater chance of precipitation or when wind velocity exceeds 10 miles per hour (mph) (for liquids) and 15 mph for granular herbicides.		All project phases	BLM
APM 50: The Applicant will implement an Integrated Weed Management Plan to control weed infestations and the spread of noxious weeds on the Project site.		Submit plan at least 30 days prior to commencement of construction Implement plan during all project phases	BLM
Mitigation Measure 3.3-1: Designated Biologist. The Applicant shall assign at least one Designated Biologist to the Project. The Applicant shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the BLM Authorized Officer (AO) for approval in consultation with CDFW and USFWS. The Designated Biologist must meet the following minimum qualifications: 1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field; 2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; 3. Have at least one year of field experience with biological resources found in or near the Project site; 4. Meet the current USFWS Authorized Biologist qualifications criteria (www.fws.gov/ventura/speciesinfo/protocols_guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; 5. Possess a CESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the BLM AO, in consultation with CDFW and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the mitigation measures.		Prior to construction	BLM in consultation with CDFW and USFWS

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
Mitigation Measure 3.3-2: Vegetation Best Management Practices. The Applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to vegetation resources: 1. *Limit Area of Disturbance*. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas within the Project site. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, Project vehicles, and equipment shall be confined to the flagged areas. 2. *Minimize Road Impacts*. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction. 3. *Minimize Traffic Impacts*. Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. 4. *Monitor During Construction*. In areas that have not been fenced with desert tortoise exclusion fencing and cleared, a Designated Biologist shall be present at the construction site during all Project construction activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall review areas immediately ahead of equipment during brushing and grading activities. 5. *Minimize Impacts of Staging Areas*. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing. For construction activities outside of the solar plant site, access roads, pulling sites, and storage and parking areas shall be designed, utilized, and maintained with the goal of avoiding or minimizing impacts to native plant communities and sensitive biological resources. Staging areas outside of the plant site shall maintain a minimal disturbance footprint, avoid jurisdictional wetlands, and avoid disturbance to native plant communities whenever possible. 6. *Avoid Use of Toxic Substances*. Soil bonding and weighting agents used on unpaved surfaces (per Mitigation Measure 3.2-1) shall be non-toxic to plants and wildlife. 7. *Implement Erosion Control Measures*. All erosion control measures promoted by the Lahontan RWQCB in its Project Guidelines for Erosion Control (Board Order No R6T-2003-0-04 Attachment G; Lahontan RWQCB, 2003) shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter "waters of the State." Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into drainages. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential. To avoid impacts associated with generation of fugitive dust, surface application of water would be employed during construction and operation and maintenance activities. 8. *Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization*. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.		Item 1: Prior to and during construction Item 2: Prior to and during construction Item 3: All project phases Item 4: During construction Item 5: During construction Item 6: All project phases Item 7: All project phases Item 8: Prior to construction Item 9: Submit plan at least 30 days prior to commencement of ground-disturbing activities. Implement plan during construction. Item 10: Submit plan at least 30 days prior to commencement of construction. Implement plan during all project phases.	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
9. *Revegetation of Temporarily Disturbed Areas*. The Applicant shall prepare and implement a Temporary Disturbance Revegetation Plan to restore all areas subject to temporary disturbance to pre-Project grade and conditions. The plan shall be submitted to the BLM for review and approval at least 30 days prior to the start of ground-disturbing activities. Temporarily disturbed areas within the Project site include, but are not limited to: all proposed locations for linear facilities, temporary access roads, berms, areas surrounding the drainage diffusers, construction work temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas. The Temporary Disturbance Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and plan to achieve the following performance standards by the end of monitoring year 2: a. at least 80 percent of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and b. relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60 percent relative to pre-disturbance conditions. 10. *Integrated Weed Management Plan.* This measure provides further detail and clarifies requirements for the Applicant's draft Integrated Weed Management Plan (IWMP) (see Appendix E-2). Prior to beginning construction on the Project, the Applicant shall prepare, circulate to the BLM for comment and approval, and then implement an IWMP that meets the approval of BLM's Authorized Officer and conforms to the CDCA Plan (Table 1) to prevent the spread of existing invasive species and the introduction of new invasive species to the Project site. The Plan shall be consistent with BLM's Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM, 2007) and the National Invasive Species Management Plan (National Invasive Species Council, 2008). The IWMP shall include, at a minimum: specific management objectives and measures for each target invasive species; baseline conditions; weed risk assessment; measures (both preventative and containment/control) to prevent/limit the introduction and spread of invasive species; monitoring and surveying methods; and reporting requirements. The BLM-approved IWMP shall include: a. Preventative measures to prevent the spread of weeds into new habitats, such as equipment inspections, use of weed-free erosion control materials and soils, and a mandatory site training element that includes weed management; b. Weed containment and control measures such as the removal of invasive species primarily via mechanical means, with the use of herbicides restricted to BLM-policies and approved usage (e.g., BLM's *Herbicide Use Standard Operating Procedures* provided in Appendix B of the Record of Decision for the *Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement* (BLM, 2007); c. Monitoring and reporting standards annually during construction and for three years following the completion of construction to describe trend in weed distribution and direct weed management measures, and; d. Reporting of monitoring and management efforts in annual reports and a final monitoring report completed at the end of three years of post-construction monitoring. Copies of these reports will be provided to the BLM for review and comment. The BLM will use the results of these reports to determine if any additional monitoring or control measures are necessary. Weed control will be ongoing on the Project site for the life of the Project, but plan success will be determined by the BLM after the three years of operations monitoring through the reporting and review process. Success criteria will be defined as having no more than 10 percent increase in a weed species or in overall weed cover in any part of the Project site.			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
Mitigation Measure 3.3-3: Special-Status Plant Species and Cacti Impact Avoidance and Minimization. This measure will avoid unintended impacts to special-status plants on the Project site (e.g., Emory's crucifixion thorn) and provide for the salvage of protected cacti prior to construction. This measure includes the following requirements: 1. The Applicant shall establish Environmentally Sensitive Areas around Emory's crucifixion thorn plants and smoke trees that have been identified on the Project site (Figure 3.3-3) and/or may be identified in Project disturbance areas during site preparation. A minimum 100-foot exclusion area shall be established around the plants, which shall be clearly identified and maintained throughout construction to ensure that avoided plants are not inadvertently harmed. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages or compensatory mitigation. 2. *Worker Environmental Awareness Program (WEAP)*. The WEAP (APM 44; Mitigation Measure 3.4-1c) shall include training components specific to protection of special-status plants that occur on the Project site. 3. *Herbicide and Soil Stabilizer Drift Control Measures*. Special-status plant occurrences within 100 feet of the Project Disturbance Area, including Utah vine milkweed, shall be protected from herbicide and soil stabilizer drift. The IWMP (APM 50 and Mitigation Measure 3.3-2) includes measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's The Global Invasive Species Team (Hillmer and Liedtke, 2003), the USEPA, and the Pesticide Action Network Database.[1] 4. *Erosion and Sediment Control Measures*. Erosion and sediment control measures shall not inadvertently impact special-status plants (e.g., by using invasive or non-Mojave Desert native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). These measures shall be incorporated in the Comprehensive Drainage, Stormwater, and Sedimentation Control Plan (Mitigation Measure 3.19-2). 5. *Preconstruction Vegetation Salvage*. The Applicant has provided a draft *Vegetation Resources Management Plan* (Appendix L) that details the methods for the salvage and transplantation of target succulent species covered under the California Desert Native Plants Act. The Applicant shall implement a plan substantially similar to the draft provided, that shall be revised to include the salvage and transplantation of the six (6) palo verde trees and the single western honey mesquite that would be affected by the Project. The revised plan shall be submitted to the BLM AO for review and approval at least 30 days prior to the start of ground-disturbing activities and shall include at a minimum the following elements: a. **Soil baseline characterization**. The characterization shall be presented to the BLM AO prior to ground disturbance and shall include: i. Profile description of three representative pedons. (A pedon is the smallest three-dimensional sampling unit displaying the full range of characteristics of a particular soil and typically occupies an area ranging from about 1 to 10 square yards); ii. Characterization of surface application (desert pavement or biological soil crust present). Description of biological soil crust shall include major groups of organisms identified at the site (filamentous cyanobacteria, other cyanobacteria, mosses, lichens, liverworts) and the characteristics by which they were identified (see item b, below); iii. Documentation of soil macro-invertebrates (that is, presence of ants, termites, and other significant macro-invertebrates); iv. Soil texture (percent sand, silt, and clay), along with a reference to a widely accepted method for making the determination;		Prior to and during construction	BLM

[1] Available at: http://www.pesticideinfo.org

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
v. Bulk density, along with a reference to a generally accepted method for making the determination; vi. Fertility (nutrient status, electrical conductivity, sodium adsorption ratio), along with methods by which composite samples were collected and the laboratory methods used to determine these properties. Composite samples shall contain equal contributions from at least six randomly located collection points within the soil donor area; and vii. Organic matter content and total carbon and nitrogen content, along with a reference to generally accepted methods for making the determinations. Soil compaction shall be determined by measurement of bulk density in grams per cubic centimeter (g/cc) (or numerically equivalent units). Bulk density may be determined by any of several standard measurements, but the method used must be referenced to a widely accepted soil methodology publication. In no case shall soil be compacted to bulk density that exceeds 1.6 g/cc except where no planting is to take place. Penetrometer measurements are not a substitute for bulk density measurements. Once characterized, the top 3 inches of topsoil shall be salvaged from the areas where traditional grading will be used per the following protocol, and stored within the Project site. The upper 0.25 inch may be collected separately to preserve biological crust organisms. Topsoil may not be distinguishable from subsoils by color or organic content at the time of salvage, but is characterized as the layer that contains fine roots during the active growing season. Soil shall be collected, transported, and formed into stockpiles only while the soil is dry. The vegetation in place at or immediately before topsoil collection shall be healthy native vegetation with less than 15 percent absolute cover of exotic weed growth. Soil occupied by vegetation of high plant diversity shall be given priority over soil occupied by low diversity native vegetation. Soil may be collected with a front loader, bulldozer, or scraper and transported to storage areas by front loader, dump truck, or scraper. The equipment transporting the soil may not travel across the stockpile more than the minimum number of times required to build the soil to its intended depth. The depth of the stockpiles shall not exceed 4 feet in the case of sandy loam or loamy sand soils. Topsoil stockpiles shall be kept dry and covered if no vegetation is introduced. If native vegetation is grown on the stockpiles to increase seeds and soil organisms, no cover is required. Artificial watering may be provided at the Applicant's option. Stockpiled topsoil shall be used to grow native plant species for the purpose of producing native seeds and building beneficial microorganisms in the soil volume. All native plant species encountered in the vegetation surveys shall be included in the growing rotation on the stockpiles. Most growing space needs to be dedicated to the species for which the most seeds shall be required. At least half by area of the growing area during each growing cycle shall be dedicated to plant species known to be good mycorrhizal host plants. Members of the families Chenopodiaceae and Amaranthaceae should be limited to less than half the area of the soil stockpiles, with the other half occupied by known mycorrhizal host plant species. b. **Biological Soil Crust Characterization and Preservation.** Biological soil crust is defined here as a mixture of organisms that occupy and protect the surface of the soil in most desert ecosystems. The organisms often include filamentous and non-filamentous cyanobacteria, mosses, lichens, liverworts, and fungi. Biological soil crust shall be preserved by collecting the upper 0.25 inch of topsoil from areas to be graded. The Applicant and/or its contractor(s) shall collect from specific areas known to contain biological crust organisms or collect upper soil from the entire area to be graded. Collections shall emphasize filamentous cyanobacteria; but other cyanobacteria, mosses, lichens, and liverworts are also considered valuable contributors to biological soil crust and important in protecting against erosion and reducing weed invasion, and shall be collected as a secondary priority. Soil surface crust shall be air dried and stored dry in a shaded location in containers that allow air movement, such as loose-weave fabric bags. In no case may the stored crust be subject to wetting or direct sunlight during storage. All containers shall be clearly labeled with date and location of original collection; name and contact information of persons responsible for identifying suitable material to collect; and the persons who collected, stored, and maintained collections.			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
Biological soil crust shall be re-applied at the time of replanting by crumbling the stored material and broadcasting it on the surface of the soil. Approximately 10 percent of the stored material shall be broadcast on topsoil storage areas among plants being grown for seed and soil microorganisms. When the growing cycle progresses to new planting, the soil supporting biological crust shall be collected and stored by the same methods prescribed for collections from the original soil, in clearly labeled bags or other suitable containers. c. **Succulent Transplant**. The majority of the succulent plants located in areas to be dragged, rolled or spot graded, or above mowing height shall be salvaged and transplanted into a nursery area. The Succulent Transplant portion of the Vegetation Resources Management Plan shall include, at a minimum: i. The location of target plants on the Project site; ii. Criteria for determining which individual plants are appropriate for salvage; iii. The proposed methods for salvage, propagation, transport, and planting; iv. Procedures for identifying target species during preconstruction clearance surveys; v. Considerations for storing salvaged plants or pre-planting requirements; and vi. Suggested transplantation sites. Succulents to be transplanted into the nursery area shall be placed in their same compass orientation as they were in their original location. The salvaged plants also shall be kept in long-term soil stockpiles, along with natives grown on the stockpiles, to keep the soil biota fresh. Succulent transplants done during preparation of the Project site shall be fully documented and serve as trials of methods to be used during plant salvage on the Project site. Records shall be maintained for each transplanted specimen including species; height; number of branches or pads as appropriate; donor location by UTM coordinates; methods used to remove, transport, and store the plant; period of temporary storage; location; facility description; planting medium used for storage; and frequency of watering during storage. Records shall be kept at the time of planting at the storage area, and quarterly thereafter during storage until such time as each plant is placed in the field, or dies. Transplanted individuals shall be maintained for 3 years, including removal of invasive species and irrigation (if necessary), as well as monitored for 3 years to determine the percentage of surviving plants each year and to adjust maintenance activities using an adaptive management approach. d. **Seed Collection**. Seed collection shall be carried out within the ROW grant area and within 10 miles of the boundaries of the Project site on similar terrain, soil, exposure, slope and elevation to the project site. Seed collection guidelines shall conform to all laws and regulations in effect at the time of collection. Seed collection shall include all plant species known to be removed from the facility. If insufficient seeds are provided by “seed farming” and collection within 10 miles of the site, BLM may approve collection from a greater distance provided other environmental factors at the collection site are good matches to the Project site. Collected seed may be used to seed salvaged topsoil piles during the construction phase and after decommissioning related to restoring the Project site. e. If the palo verde or western honey mesquite trees on the site meet the CDFW size criterion for replacement (i.e., at least one stem greater than 2 inches in diameter) and cannot be salvaged based on the professional opinion of a qualified biologist/horticulturalist, then three (3) replacement plants shall be planted in or near the project site for each affected trees, and monitored following the above guidance.			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
Mitigation Measure 3.3-4: Impacts to State Waters. The Applicant shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the State and to satisfy requirements of California Fish and Game Code Sections 1600 and 1607. 1. *Acquire Off-Site State Waters*: The Applicant shall acquire, in fee or in easement, a parcel or parcels of land that includes at least 498.68 acres of state jurisdictional waters, or comparable area based on actual project impacts to ephemeral dry wash jurisdictional features (depending upon the selected project alternative and direct project impacts) that meets CDFW mitigation ratios (e.g., 1:1 for no net loss). Mitigation for impacts to state waters shall occur as close to the Project site as possible. If security is posted in accordance with Provision 2 below (*Security for Implementation of Mitigation*), the Applicant shall acquire the land, in fee or in easement, no more than 18 months after the start of Project ground-disturbing activities. Subject to BLM and CDFW review and approval, if after making a good faith effort to identify compensatory mitigation lands for acquisition as described in this measure, the Applicant determines that adequate lands are not available in proximity to the Project site, enhancement of state jurisdictional waters on public lands may be implemented in lieu of or in combination with land acquisition, provided that the total acreage of state jurisdictional waters acquired or enhanced is equal to the amount that meets CDFW mitigation ratios based on actual project impacts. 2. *Security for Implementation of Mitigation*: The Applicant shall provide financial assurances to the BLM AO and CDFW to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the BLM AO and CDFW in the form of an irrevocable letter of credit, a pledged savings account, a performance bond, or Security prior to initiating ground-disturbing project activities. Prior to submittal to the BLM AO, the Security shall be approved by the BLM AO, in consultation with CDFW and the USFWS, to ensure funding. Lands may concurrently be used to satisfy the requirements for desert tortoise habitat conservation (see Mitigation Measure 3.4-2d, *Desert Tortoise Compensatory Mitigation* in Section 3.4, *Wildlife*). The final mitigation acreage is also subject to CDFW concurrence with project impacts to waters of the State that were developed by the Applicant. 3. *Preparation of Management Plan*: The Applicant shall submit to the BLM AO and CDFW a draft Management Plan that reflects site-specific enhancement measures for the drainages on the compensation and/or enhancement lands. The objective of the Management Plan shall be to enhance the natural values of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. 4. *Jurisdictional Waters Best Management Practices*: The Applicant shall also comply with the following conditions to protect drainages in and near the Project site: a. The Applicant shall minimize road building, construction activities, and vegetation clearing within ephemeral drainages to the extent feasible. b. The Applicant shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows. c. Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages. d. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter a drainage by the Applicant or any party working under contract or with the permission of the Applicant, shall be removed immediately.		Item 1: No more than 18 months after the start of ground disturbance Item 2: Prior to start of ground disturbance Item 3: Submit plan no more than 30 days after parcel(s) in Item 1 identified for acquisition	CDFW

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Vegetation (cont.)			
e. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State. f. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.			
Mitigation Measure 3.3-5: Final Closure Plan. At least 12 months prior to Project closure, the Applicant shall prepare a Final Closure Plan to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project site. The Final Closure Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities, and shall cover the estimated cost as if BLM were to contract with a third party to decommission the Project and reclaim the Project site. The plan shall be subject to review and revisions from the BLM AO in consultation with USFWS and CDFW.		At least 12 months prior to Project closure and start of decommissioning	BLM, USFWS, and CDFW
Biological Resources – Wildlife			
APM 18: If, as described in APM 17, the recalibrated model predicts outflow from the northeast outlet of the Valley reduced by an amount in excess of 50 AFY, the Applicant will hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance of BLM and San Bernardino County. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Soda Mountain Valley, in the alluvial aquifer adjacent to Soda Spring and west of Soda Lake, and at Soda Spring during construction of the project. If the Project is shown to cause a decline in groundwater levels of 5 feet or more in the alluvial aquifer near Soda Spring, or there is a decrease in groundwater discharge at Soda Spring as a result of project groundwater withdrawal that results in the water level in the spring decreasing to less than 4 feet deep, which would threaten the tui chub, an evaluation would be conducted to determine if the Project is causing reduced groundwater discharge at Soda Spring. If it is determined that the Project has caused a decrease in the volume of groundwater discharged at Soda Spring such that the spring is less than 4 feet deep, thereby threatening the tui chub habitat, then the Project shall correspondingly curtail withdrawal of groundwater and import a corresponding amount of water from outside of the Soda Mountain Valley. Groundwater level measurements in the monitoring wells located in Soda Mountain Valley would be compared to the model predictions on an annual basis during construction and every 5 years during Project operation. The groundwater model would be recalibrated if the measured drawdown values in the monitoring wells exceed the predicted values by more than 15 percent. Monitoring would cease after 5 years of operational monitoring if two conditions are met: 1. The monitoring data support the model predictions. 2. The model predicts the reduction in outflow from the northeast outlet will be less than 50 AFY under proposed project conditions, as detailed in APM 17.		Prior to construction, and during construction, operation, and maintenance	BLM and San Bernardino County
APM 44: The Applicant will implement a Worker Environmental Awareness Program (WEAP) to educate workers about the environmental issues associated with the Project and the mitigation measures that will be implemented at the site, including nest awareness and non-disturbance exclusion zones.		During all Project phases	BLM
APM 45: Burrowing owls occupying burrows on site will be passively relocated outside the nesting season or after a qualified biologist determines that the burrow does not contain eggs or chicks and after consultation with CDFW. Prior to construction and passive relocation, artificial burrows will be installed in areas that would not be disturbed during construction at a ratio of 5:1 for each burrow that will be destroyed by project construction. Passive relocation will be conducted prior to construction and according to the Burrowing Owl Consortium Guidelines (CBOC, 1993).		Prior to construction	BLM

<table>
<tr><th>Mitigation Measure</th><th>Modification and Rationale</th><th>Timing for Implementation</th><th>Monitoring Agency(s)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>APM 46: Pre-construction clearance surveys to identify active bird nests will be conducted within 2 weeks of ground disturbance or vegetation removal in all active work areas during the breeding season (February 1 through August 31). The work area will need to be resurveyed following periods of inactivity of 2 weeks or more. Active nests will be avoided using non-disturbance buffer zones as shown below.
Avian Awareness and Baseline Non-Disturbance Buffer Zones
<table>
<tr><th>Type</th><th>Starting Distance of Awareness or Non-Disturbance Exclusion Zones</th><th>Implementation Notes</th></tr>
<tr><td>Passerines</td><td>300 feet from active nest</td><td rowspan="5">A qualified biologist may reduce or increase the buffer distance if there is sufficient evidence based on species, habitat, and other factors, that Applicant activity would not impact nesting activity.
Buffers would be maintained until a qualified biologist has determined that the nest is no longer active.</td></tr>
<tr><td>Raptors</td><td>500 feet from active nest</td></tr>
<tr><td>Golden Eagles</td><td>1 mile and line of sight from active nest</td></tr>
<tr><td rowspan="2">Burrowing Owls[1]</td><td>250 feet from active burrows during nesting season (February 1 through August 31)</td></tr>
<tr><td>160 feet from active burrows during the wintering period (September 1 through January 31)</td></tr>
</table>
NOTE:
[1] Described in CBOC, 1993</td><td></td><td>Prior to construction</td><td>BLM</td></tr>
<tr><td>APM 47: Monitoring of any active nests within or adjacent to the work areas will be conducted until nestlings have fledged and dispersed. Ongoing breeding-season monitoring of work areas will be conducted throughout the duration of construction.
Nest monitoring results will be recorded in a Nest Check Form. Typically a nest check will have a minimum duration of 30 minutes, but may be longer or shorter, or more frequent than one check per day, as determined by the Designated Biologist based on the type of construction activity (duration, equipment being used, potential for construction-related disturbance) and other factors related to assessment of nest disturbance (weather variations, pair behavior, nest stage, nest type, species, etc.). The Designated Biologist will record the construction activity occurring at the time of the nest check and note any work exclusion buffer in effect at the time of the nest check. Non-Project activities in the area should also be recorded (e.g., adjacent construction sites, roads, commercial/industrial activities, recreational use, etc.). The Designated Biologist will record any sign of disturbance to the active nest, including but not limited to parental alarm calls, agitated behavior, distraction displays, nest fleeing and returning, chicks falling out of the nest or chicks or eggs being predated as a result of parental abandonment of the nest.
Should the Designated Biologist determine project activities are causing or contributing to nest disturbance that might lead to nest failure, the Designated Biologist will coordinate with the Construction Manager to limit the duration or location of work, and/or set other limits related to use of project vehicles, and/or heavy equipment. Nest locations, Project activities in the vicinity of nests, and any adjustments to buffer areas will be described and reported in regular monitoring and compliance reports.</td><td></td><td>During construction</td><td>CDFW</td></tr>
<tr><td>APM 48: Preconstruction surveys for burrows containing suitable bat roosting habitat that could be used as individual bat roosts will be conducted in all Project work areas.</td><td></td><td>Prior to construction</td><td>BLM</td></tr>
</table>

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
APM 49: The connection from the substation to the transmission line will be designed to meet the most recent APLIC guidelines to the extent practicable.		Prior to construction	BLM
APM 50: The Applicant will implement an Integrated Weed Management Plan to control weed infestations and the spread of noxious weeds on the Project site.		During all Project phases	BLM
APM 51: Roads, power lines, fences, and other infrastructure associated with the Project will be minimized to reduce habitat loss. Fencing will use wildlife compatible design standards.		Project design and all Project phases	BLM
APM 52: Collector lines will be placed underground to reduce avian collisions.		During construction	BLM
APM 53: After Project construction, areas of temporary disturbance will be closed and the restoration measures in the Vegetation Resource Management Plan will be implemented.		Following completion of construction	BLM
APM 54: Federal and state measures for handling toxic substances will be followed to minimize danger from spills to water and wildlife resources. Facility operators shall maintain Hazardous Materials Spill Kits on site. Personnel will be trained to use the Hazardous Materials Spill Kits.		During all Project phases	BLM
APM 55: The Applicant will clear vegetation outside of the bird breeding season to the maximum extent practicable. Preconstruction avian clearance surveys will be conducted by a qualified biologist for vegetation clearing during the bird breeding season (February 1 through August 31). If a nest(s) is identified in the preconstruction avian clearance surveys, a qualified monitor will be on site during vegetation removal in order to enforce non-disturbance buffers and stop activities as necessary should construction disturb nesting activity.		Prior to construction	BLM
APM 56: Trash will be disposed of in covered containers and regularly removed from the site.		During all Project phases	BLM
APM 57: Surveys for burrowing owl will be conducted in suitable burrowing owl habitat prior to construction and if construction is suspended for 2 weeks or more. The survey protocol will follow the Burrowing Owl Consortium Guidelines (CBOC, 1993). If active burrows are found they will be avoided using non-disturbance buffer zones, as described in the table included in APM 46. Passive relocation would be used as described above once the burrow is determined to be inactive.		Prior to construction	BLM
APM 58: A qualified biologist will conduct a golden eagle clearance survey for a 4-mile area surrounding the project. Golden eagle clearance surveys will be conducted annually for each year of construction during the golden eagle nesting season. If active nests are found in the survey area, SMS will coordinate with BLM, USFWS, and CDFW to ensure that construction does not result in disturbance of the golden eagles.		Prior to and during construction	BLM
APM 59: Evaporation ponds will have 3:1 sloping sides to discourage wading birds from utilizing the ponds. A wire grid with visual deterrents, such as plastic colored ribbons, will be implemented to discourage birds and bats from landing on the ponds. The evaporation pond will be monitored for bird fatalities. Netting or other appropriate BMPs will be applied at the direction of the Designated Biologist and as approved by BLM, CDFW, and USFWS (as appropriate).	[likely deletion, no evap ponds]	During construction	BLM
APM 60: The Project will remove and dispose of road kill near the Project site to avoid attracting raptors and other scavengers to the site, and will regularly remove vegetation around larger facilities (such as the substation) to reduce raptor foraging.		During all Project phases	BLM
APM 61: The Project will minimize the use of lighting that could attract migrating birds and bats (that could feed on concentrations of insects at lights). Lighting will be kept to the minimum level necessary for safety and security. High intensity, steady burning, bright lights such as sodium vapor or spotlights will not be used on project facilities.		During all Project phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
APM 62: Project personnel and visitors will be instructed to drive at low speeds (<15 mph) and be alert for wildlife, especially in low-visibility conditions.		During all Project phases	BLM
APM 63: Decommissioning methods will minimize new site disturbance and removal of native vegetation.		During decommissioning	BLM
APM 64: Foundations will be removed to a minimum of 3 feet below surrounding grade during decommissioning, and covered with soil to allow adequate root penetration for native plants. Petroleum product leaks and chemical releases shall be remediated prior to completion of decommissioning.		During decommissioning	BLM
APM 65: Fencing will be removed at the completion of decommissioning.		After decommissioning	BLM
APM 66: Desert tortoise exclusion fencing will be installed at the perimeter of project construction areas (i.e., solar array areas, project buildings, substation/switchyard, earthen berms, and along the edge of access roads and collector line corridors). The fence locations will be determined during final design and will enclose areas of project activity. The fenceline and a 30-foot-wide buffer will be surveyed for desert tortoise before construction of the fence and according to USFWS protocol. Tortoises found in the fenceline survey area or spotted within 50 meters of the fenceline survey area will be: a. Assigned a USFWS identification number. b. Given a health assessment c. Fitted with a transmitter. Tortoises that are too small to accept a transmitter (i.e., no transmitter is available that is 10 percent or less of the tortoise's body weight) will be treated as a translocatee and held in situ. d. Moved into habitat adjacent to and outside the fenceline. The tortoise will be moved into an empty burrow if clearance of the fence area takes place outside the tortoise active season (i.e., from November to March and from June to August). Any of the moved tortoises that return to the project site before completion of fence construction will be treated as a translocatee. Desert tortoises remaining outside the fenceline prior to completion of the fence will be deemed residents. The transmitter will be removed from the resident tortoise, and no further action will be taken for the resident tortoises. USFWS procedures will be followed to clear and handle the desert tortoises.		Prior to construction	BLM
APM 67: The project site preconstruction clearance survey will be conducted during the desert tortoise active season (April through May and September through October) unless otherwise agreed to by USFWS and CDFW. The survey will be conducted according to USFWS protocol and preferably during early morning hours to increase the chance the juvenile tortoises are found, per the Guidelines. Any tortoise scat will be collected on each pass of a transect, per the Guidelines. USFWS procedures will be followed to clear and handle the desert tortoise.		Prior to construction	BLM
APM 68: The linear facilities preconstruction clearance survey(s) will be conducted at any time throughout the year. Linear facilities for this project will include the buried collector lines between arrays and connecting to the substation. Located desert tortoises will be undisturbed and allowed to clear the site without assistance or interference. Tortoises will be moved if necessary to reduce the potential for harm from construction activities, but will not be moved more than 500 meters in such a scenario. USFWS procedures will be followed to clear and handle the desert tortoise.		Prior to construction	BLM
APM 69: Data will be collected during clearance surveys as described in this section. The same data will be collected again on tortoises held in the interim in situ on the day that the tortoise is translocated from the project site. The data will include:		Prior to and during construction	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
a. Date b. Time c. Temperature (°C) d. Project Name e. Site type (project/recipient/control) f. Landowner (BLM) g. Permit/BO # h. Coverage # i. Field crew vendor j. Surveyor (first and last name) k. ID# l. MCL (mm) m. Sex n. UTM (Easting) o. UTM (Northing p. Location (e.g., burrow) q. Transmitter manufacturer r. Transmitter serial # s. Transmitter frequency t. Transmitter install date u. Battery life (months) v. Status (alive/dead/lost)			
APM 70: Following installation of the desert tortoise exclusion fencing, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 72 hours between March 15 and October 31 and within 7 days between November 1 and March 14 of observing damage. Inspections of permanent site fencing shall occur while desert tortoise fencing is in place.		During all Project phases	BLM
APM 71: No construction, operations, or decommissioning activities shall occur in unfenced areas without an approved desert tortoise biologist present. These activities include the construction phase (construction, revegetation), decommissioning phase, and maintenance activities during the operations phase that require new surface disturbance. An adequate number of trained and experienced monitors must be present during all construction and decommissioning activities in unfenced areas, depending on the various construction tasks, locations, and season. A biologist shall be on site from March 15 through October 31 (active season) during ground-disturbing activities in areas outside the exclusion fencing, and shall be on-call from November 1 to March 14 (inactive season). The biologist shall check all construction areas immediately before construction activities begin. The biologist shall inspect construction pipes, culverts, or similar structures: (a) with a diameter greater than 3 inches, (b) stored for one or more nights, (c) less than 8 inches aboveground, and (d) within desert tortoise habitat (i.e., outside the permanently fenced area), before the materials are moved, buried, or capped. Alternatively, such materials may be capped before storing outside the fenced area or placing on pipe racks.		During all Project phases	BLM
APM 72: A Raven Monitoring and Control Plan shall be prepared consistent with the most current USFWS-approved raven management guidelines. The purpose of the plan is to avoid any project-related increases in raven numbers during construction, operation, and decommissioning. The Raven Monitoring and Control Plan shall be submitted to BLM and CDFW for approval at least 30 days prior to the start of construction.		Prepare plan prior to construction Implement plan during all Project phases	BLM and CDFW
APM 73: Compensatory habitat mitigation shall be provided at a 1:1 ratio for impacts to suitable desert tortoise habitat during construction. A habitat compensation plan will be prepared to the approval of CDFW, USFWS, and BLM.		Prior to and during construction	BLM, CDFW, and USFWS
APM 74: No pets shall be allowed on site prior to or during construction, except kit fox scat detection dogs (with CDFW approval) used for preconstruction surveys.		Prior to and during construction	BLM and CDFW

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
APM 75: Two water sources will be created to encourage bighorn sheep migration to the north of I-15. The water source location(s) shall be determined through coordination with CDFW and BLM. The water sources shall be maintained throughout the life of the Project.		Create water sources prior to start of operation Maintain during operation and decommissioning	BLM and CDFW
Mitigation Measure 3.4-1a: Compliance Monitoring by the Designated Biologist. Prior to ground-disturbing activities, an individual shall be designated and approved by the BLM and Resources Agencies (USFWS and CDFW, as appropriate) as a Designated Biologist (i.e., field contact representative). Designated Biologist qualifications are presented below. The Designated Biologist shall be employed for the period during which on-going construction and post-construction monitoring and reporting by an approved biologist is required. Each successive Designated Biologist shall be approved by the BLM's Authorized Officer. The Designated Biologist shall have the authority to ensure compliance with all measures set forth in the Biological Opinion and CESA Section 2081 take authorization and with all mitigation measures included herein, and will be the primary agency contact for the implementation of these measures. The Designated Biologist will have the authority and responsibility to halt any project activities that are in violation of the terms of the Biological Opinion, Section 2081 take authorization, or Project mitigation measures. A list of responsibilities of the Designated Biologist is summarized below. To avoid and minimize effects to biological resources, the Designated Biologist shall: 1. Notify the BLM's Authorized Officer and USFWS at least 14 calendar days before initiation of ground-disturbing activities. 2. Immediately notify the BLM's Authorized Officer in writing if the Applicant/Owner does not comply with any of the mitigation measures or terms of the Biological Opinion and/or the Section 2081 take authorization including, but not limited to, any actual or anticipated failure to implement such measures within the periods specified. 3. Ensure performance of daily compliance inspections during on-going construction as clearing, grubbing, and grading are completed, and submit a monthly compliance report to BLM's Authorized Officer until construction is complete.		Designate biologist prior to start of construction Qualifications and duties apply throughout compliance monitoring	BLM, CDFW, and USFWS
Mitigation Measure 3.4-1b: Biological Monitoring. Biological Monitor(s) shall be employed to assist the Designated Biologist in conducting pre-construction surveys and monitoring ground disturbance, grading, construction, decommissioning, and restoration activities. Additionally, biological monitoring shall be performed during any ground disturbance or grading activities that occur during operation and maintenance. The Biological Monitor(s) shall have sufficient education and field experience to understand resident wildlife species biology, have experience conducting desert tortoise, burrowing owl, kit fox, and badger field monitoring, and be able to identify these species and their sign (including active burrows). The Designated Biologist shall submit a resume, at least three (3) references, and contact information for each prospective Biological Monitor to the BLM, and the Wildlife Agencies for approval. To avoid and minimize effects to biological resources, the Biological Monitor(s) will assist the Designated Biologist with the following: 1. Be present during construction activities that take place in suitable habitat for desert tortoise, burrowing owl, kit fox, badger, or other protected species to prevent or minimize harm or injury to these species. 2. Activities of the Biological Monitor(s) include, but are not limited to, ensuring compliance with all avoidance and minimization measures; monitoring for desert tortoise, burrowing owl, kit fox, badger, and other protected species; halting construction activity in the area if an individual is found; and checking the staking/flagging of all disturbance areas to be sure that they are intact and that all construction activities are being kept within the staked/flagged limits. If a desert tortoise, burrowing owl, kit fox, badger, or other protected species is found within a work area, the Biological Monitor(s) shall immediately notify the Designated Biologist, who shall determine measures to be taken to ensure that the individual is not harmed.		During construction and decommissioning	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
3. Inspect the Project area for any special-status wildlife species. 4. Ensure that potential habitats within the construction zone are not occupied by special-status species (e.g., potential burrows or nests are inspected). 5. In the event of the discovery of a non-listed, special-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat at least 200 feet from the limits of construction activities. 6. At the end of each work day, inspect all potential wildlife pitfalls (e.g., trenches, bores, other excavations) for wildlife and remove wildlife as necessary. If the potential pitfalls will not be immediately backfilled following inspection, the Biological Monitor(s) will ensure that the construction crew slopes the ends of the excavation (3:1 slope), provides wildlife escape ramps, or completely and securely covers the excavation to prevent wildlife entry. 7. Inspect the site to help ensure trash and food-related waste is place in closed-lid containers and to ensure that workers do not feed wildlife. Also inspect the work area each day to ensure that no microtrash (e.g., bolts, screws, etc.) is left behind.			
Mitigation Measure 3.4-1c: Worker Environmental Awareness Program (WEAP). Prior to Project initiation, the Designated Biologist shall develop and implement the WEAP (APM 44), which shall be available in English and Spanish. Wallet-sized cards summarizing the information shall be provided to all construction and operation and maintenance personnel. The WEAP shall include the following: 1. An explanation of the sensitivity of the vegetation communities and special-status plant and wildlife species within and adjacent to work areas, and proper identification of these resources. 2. Biology and status of the desert tortoise, golden eagle, burrowing owl, other nesting birds, kit fox, and American badger and measures to reduce potential effects to these species. 3. Actions and reporting procedures to be used if desert tortoise, burrowing owl, other nesting birds, kit fox, or American badger are encountered. 4. An explanation of the function of flagging that designates authorized work areas. 5. Driving procedures and techniques to reduce mortality of wildlife on roads. 6. Discussion of the federal and state Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act and the consequences of non-compliance with these acts. 7. The importance of avoiding the introduction of invasive weeds into the Project area and surrounding areas. 8. A discussion of general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures. **9.** A review of mitigation requirements that are applicable to their work.		Develop program prior to start of construction Implement WEAP throughout all Project phases for new personnel	BLM
Mitigation Measure 3.4-1d: Speed Limits. Speed limits along all access roads outside of permanent desert tortoise fencing shall not exceed 15 miles per hour to minimize dust during construction activities. Speed limits within permanent desert tortoise fencing shall not exceed 25 miles per hour to minimize impacts during operations and maintenance. Nighttime vehicle traffic associated with Project activities shall be kept to a minimum volume and speed (maximum of 15 miles per hour) to prevent mortality of nocturnal wildlife species.		During all Project phases	BLM
Mitigation Measure 3.4-1e: Lighting Specifications to Minimize Bird and Bat Impacts. The Applicant/Owner shall minimize night lighting during construction by using shielded directional lighting that is pointed downward, thereby avoiding illumination to adjacent natural areas and the night sky.		During construction	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
Mitigation Measure 3.4-1f: Burrowing Owl Protection Measures. No more than 14 days prior to the start of construction, a pre-construction survey for burrowing owls in conformance with the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012) shall be completed within suitable habitat at every work area and within a 150-meter buffer zone of each work area. Work areas will be resurveyed following periods of inactivity of 2 weeks or more. The Applicant/Owner shall submit the results of the pre-construction survey to BLM's Authorized Officer and CDFW. The Applicant/Owner shall also submit evidence of conformance with federal and state regulations regarding the protection of the burrowing owl by demonstrating compliance with the following: 1. Unless otherwise authorized by BLM and CDFW, no disturbance shall occur within 160 feet (50 meters) of occupied burrows during the non-breeding season (September 1 through January 31) or within 650 feet (200 meters) during the breeding season (February 1 through August 31). 2. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31). In the event that an occupied burrow absolutely cannot be avoided (e.g., due to physical or safety constraints), passive relocation of owls may be implemented prior to construction activities only if a qualified biologist approved by BLM verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Eviction outside the nesting season may be permitted pending evaluation of eviction plans (developed in accordance with BLM protocol for burrowing owls) by CDFW and receipt of formal written approval from BLM authorizing the eviction. A Burrowing Owl Mitigation and Monitoring Plan following the guidance in the CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012) shall be submitted to the BLM's Authorized Officer and CDFW for review and approval prior to passive relocation. 3. Unless otherwise authorized by BLM, a 650-foot buffer within which no activity will be permissible will be maintained between Project activities and nesting burrowing owls during the nesting season. This protected area will remain in effect until August 31 or at BLM's discretion and based upon monitoring evidence, until the young owls are foraging independently. 4. If accidental take (disturbance, injury, or death of owls) occurs, the Designated Biologist will be notified immediately. 5. Impacts to active burrowing owl territories shall be mitigated at a 1:1 ratio through a combination of off-site habitat compensation and/or off-site restoration of disturbed habitat capable of supporting this species. The acquisition of occupied habitat off-site shall be in an area where energy facilities would not pose a mortality risk. Acquisition of habitat shall be consistent with the CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The preserved habitat shall be occupied by burrowing owl and shall be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified ornithologist. The site shall be approved by BLM. Land shall be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. The off-site area to be preserved can coincide with other off-site mitigation lands, with the approval of the BLM and CDFW.		Survey no more than 14 days prior to the start of construction and after any 2-week period of inactivity Compliance with measures during construction	BLM and CDFW
Mitigation Measure 3.4-1g: Bird and Bat Conservation Strategy (BBCS). The Applicant/Owner shall develop a BBCS to address Project impacts to special-status avian and bat species that shall be consistent with the *Region 8 Interim Guidelines for the Development of a Project-Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities* (USFWS, 2010b). The Applicant/Owner shall submit the BBCS to the BLM and USFWS for review and approval prior to initiation of Project construction. The BBCS shall include an assessment of potential avian and bat impacts from lighting, noise, collision, electrocution, and ponds (including attraction of ravens), as applicable; measures to mitigate for the effects to birds; a description of general avoidance and minimization measures applicable during construction, operation and maintenance, and post-construction to include nest management and post-construction monitoring; a description of the reporting requirements and reporting schedule and duration; and the adaptive management strategy. A raven management element shall be included in the BBCS or provided separately that includes measures such as storage of garbage in raven-proof containers and installation of anti-nesting devices on structures where raven nests could be built.		Prepare BBCS prior to construction Implement measures during all Project phases	BLM and USFWS

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Biological Resources – Wildlife (cont.)			
Mitigation Measure 3.4-1h: Avian Monitoring and Mitigation Program. An AMMP shall be initiated and approved by the BLM in consultation with CDFW and USFWS prior to construction and continue for at least five years following commercial operation (and longer if determined necessary and appropriate by the Designated Biologist). The AMMP shall prevent substantial adverse effects to special status species through implementation of the approach outlined in the post construction monitoring and adaptive management provisions of *Region 8 Interim Guidelines for the Development of a Project-specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities* (USFWS, 2010b), in conjunction with any measures required after consultation with USFWS and/or CDFW under the ESA, CESA, or BGEPA, if applicable. The Program shall use surveys and monitoring of on-site avian and bat use and behavior to document species composition and changes in avian and bat use over time. The purpose of the AMMP is to provide an adaptive management and decision-making framework for reviewing, characterizing, and responding to avian and bat monitoring results, and reducing long-term impacts on these taxa. The AMMP shall include the following components: 1. A description of the baseline and ongoing avian and bat survey methods, including identification of onsite survey locations and seasonal survey considerations, and a description of acoustic bat monitoring methods. 2. Avian and bat mortality and injury monitoring that includes: a) Onsite monitoring of representative locations in the facility, at a level of effort that accounts for potential spatial bias and allows for the extrapolation of survey results to non-surveyed areas. The AMMP will provide a rationale justifying the proposed schedule of carcass searches. b) Low-visibility and high-wind weather event monitoring to document potential weather-related collision risks that may be associated increased risk of avian or bat collisions with project features, including foggy, highly overcast, or rainy night-time weather typically associated with an advancing frontal system, and high wind events (40 miles per hour winds) are sustained for period of greater than 4 hours. The monitoring report shall include survey frequency, locations, and methods. c) Scavenger and searcher efficiency trials to document the extent to which avian or bat fatalities remain visible over time and can be detected, and to adjust the survey timing and survey results to reflect scavenger and searcher efficiency rates. d) A description of statistical methods used to generate facility estimates of potential avian and bat impacts based on the number of detections during standardized searches during the monitoring season for which the cause of death can be determined. e) Field detection and mortality or injury identification, cause attribution, handling and reporting requirements. The AMMP shall include detailed specifications on data collection and provide a carcass collection protocol. 3. All post-construction monitoring studies included in the AMMP shall be conducted by a third party contractor for at least five years following commercial operation and approval of the AMMP by the BLM. At the end of the five-year period, the BLM shall determine whether the survey program shall be continued. 4. An adaptive management program shall be developed to identify and implement reasonable and feasible measures that would reduce levels of avian or bat mortality or injury attributable to Project operations and facilities. Such measures could potentially include efforts to make panels more visible to birds (e.g., white borders around panel edges, improved netting at water features, or the use of noise deterrents). The adaptive management program shall include (i) reasonable measures for characterizing the extent and importance of detected mortality and injuries clearly attributable to the Project; (ii) potential measures that the Project owner could implement to adaptively respond to detected mortality and injuries attributable to the Project. Adaptive actions undertaken will be discussed and evaluated in survey reports. Any impact reduction measures must be commensurate (in terms of factors that include geographic scope, costs, and scale of effort) with the level of avian or bat mortality or injury that is specifically and clearly attributable to the Project facilities; and (iii) Appropriate performance standards for mitigation of impacts to any species regulated by	Modification of the measure to further provide for performance measures in the AMMP.	Prepare AMMP prior to construction Implement program during construction and for at least five years following start of commercial operation, as determined by BLM	BLM, CDFW, and USFWS

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
BGEPA, ESA, and CESA as well as mitigation measures that reduce or offset mortalities caused by the Project to a level that avoids a substantial, long-term reduction in the demographic viability of the local population of the species in question.			
Mitigation Measure 3.4-1i: American Badger and Desert Kit Fox Protection. To avoid direct impacts to American badger and desert kit fox, pre-construction surveys shall be conducted for these species concurrent with the desert tortoise surveys. Surveys shall be conducted as described below: 1. Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the Project disturbance area, including a 20-foot swath beyond the disturbed area, utility corridors, and access roads. If dens are detected each den shall be classified as inactive, potentially active, or definitely active. 2. Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.		Survey prior to construction Implement measures prior to and during construction	BLM and CDFW
Biological Resources – Wildlife (cont.)			
3. Potentially and definitely active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. 4. If no tracks are observed in the tracking medium or no photos of the target species are captured after three consecutive nights, the den shall be excavated and backfilled by hand. 5. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den. 6. If an active natal den is detected on the site, the BLM Authorized Officer and CDFW shall be contacted within 24 hours to determine the appropriate course of action to minimize the potential for harm or mortality. The course of action would depend on the age of the pups, location of the den on the site (e.g., is the den in a central area or in a perimeter location), status of the perimeter site fence (completed or not), and the pending construction activities proposed near the den. A 500-foot no-disturbance buffer shall be maintained around active natal dens. 7. The following measures are required to reduce the likelihood of distemper transmission: a. No pets shall be allowed on the site prior to or during construction, with the possible exception of kit fox scat detection dogs during preconstruction surveys, and then only with prior CDFW approval; b. Any kit fox hazing activities that include the use of animal repellents such as coyote urine must be cleared through CDFW prior to use; and c. Any documented kit fox mortality shall be reported to CDFW and the BLM Authorized Officer within 24 hours of identification. If a dead kit fox is observed, it shall be retained and protected from scavengers until CDFW determines if the collection of necropsy samples is justified.			
Mitigation Measure 3.4-2a: Desert Tortoise Protection. The Applicant/Owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* (USFWS, 2009e) or more current guidance provided by CDFW and USFWS. The Applicant/Owner shall also implement all terms and conditions described in the Biological Opinion to be prepared by USFWS. These measures include, but are not limited to, the following, subject to modification by the terms of incidental take authorizations issued by the USFWS and CDFW: 1. ***Desert Tortoise Fencing along I-15.*** If required by the USFWS, to avoid increases in vehicle-related		Install fencing prior to construction Perform site clearance surveys after completion of fence installation Maintain fencing as needed throughout all Project phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
mortality from disruption of local movement patterns along the existing ephemeral wash systems, desert tortoise-proof fencing shall be installed along the existing freeway right-of-way fencing on both sides of I-15 for the entire east-west dimension of the Project site. The tortoise fencing shall be designed to direct tortoises to existing undercrossing to provide safe passage under the freeway, and shall be regularly inspected and maintained for the life of the Project. 2. ***Desert Tortoise Exclusion Fence Installation*.** To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along road corridors during construction. The proposed alignments for the permanent perimeter fence and temporary fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and temporary fencing areas shall be conducted by the Designated Biologist(s) using techniques outlined in the USFWS' 2009 Desert Tortoise Field Manual and may be conducted in any season with USFWS and CDFW approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide			
Biological Resources – Wildlife (cont.)			
100 percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line covering an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows and burrows constructed by other species that might be used by desert tortoises shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual*. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (USFWS, 2009e). a. *Timing, Supervision of Fence Installation*. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present. b. *Fence Material and Installation*. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence). c. *Security Gates*. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry d. *Fence Inspections*. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during or within 24 hours following all major rainfall events. Exceptions to inspections during major rainfall events may be made as needed to maintain crew safety. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the Project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All damaged temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise. 3. ***Desert Tortoise Clearance Surveys within Solar Arrays*.** Clearance surveys shall be conducted in accordance with the USFWS *Desert Tortoise Field Manual* (USFWS, 2009e) (Chapter 6 – Clearance			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the Project area by walking transects no more than 15 feet apart. If a desert tortoise is located during the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the Project site may only be conducted when tortoises are most active (April through May or September through October) unless the Project receives approval from CDFW and USFWS. Clearance surveys of linear features may be conducted during any time of the year. Any tortoise located during clearance surveys of solar arrays shall be translocated or relocated and monitored in accordance with the Desert Tortoise Translocation Plan (DTTP; Mitigation Measure 3.4-2b). The Designated Biologist, who may be assisted by the Biological Monitors, shall assess occupancy of each burrow by desert tortoises in accordance with the USFWS *Desert Tortoise Field Manual* (USFWS, 2009e). All potential desert tortoise burrows located during clearance surveys shall be excavated by hand, tortoises removed, and burrows collapsed or blocked to prevent occupation by desert tortoises in accordance with the DTTP.			
Biological Resources – Wildlife (cont.)			
4. ***Monitoring Following Clearing*.** Following the desert tortoise clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the Project site to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or Biological Monitor shall be on-site for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the DTTP. 5. ***Reporting*.** The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled tortoise. Desert tortoise moved from within Project areas shall be marked and monitored in accordance with the DTTP. All collected data related to tortoise relocation will be provided to the BLM Authorized Officer.			
Mitigation Measure 3.4-2b: Desert Tortoise Translocation Plan. The Applicant/Owner shall develop and implement a USFWS-approved Desert Tortoise Translocation Plan (DTTP). The DTTP, which shall be approved prior to any ground disturbance or tortoise relocation, shall include measures to minimize the potential for repeated translocations of individual desert tortoises. The goals of the DTTP shall be to: relocate all desert tortoises from the Project site to nearby suitable habitat; minimize impacts on resident desert tortoises outside the Project site; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring. The DTTP shall follow the *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (USFWS, 2011c) and shall clearly define how it addresses the 11 steps outlined in the guidance. The final DTTP shall be based on the draft DTTP prepared by the Applicant/Owner (Panorama Environmental, Inc., 2013d) and shall include all revisions deemed necessary by BLM, USFWS, and CDFW. The final plan will be subject to modification for consistency with USFWS take authorization and/or Biological Opinion conservation requirements.		Prepare DTTP prior to construction Implement measures during all Project phases	BLM, CDFW, and USFWS
Mitigation Measure 3.4-2c: Desert Tortoise Compliance Verification. The Applicant/Owner shall provide BLM, CDFW, and USFWS staff with unfettered access to the Project site and compensation lands under the control of the Project owner and shall otherwise fully cooperate with the BLM's efforts to verify the Project owner's compliance with, or the effectiveness of, adopted mitigation measures. The Designated Biologist shall do all of the following: 1. ***Notification*.** Notify the BLM Authorized Officer at least 14 calendar days before initiating construction-related ground disturbance activities; immediately notify the BLM in writing if the Project owner is not in		During all Project phases	BLM, CDFW, and USFWS

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification; 2. ***Monitoring During Grubbing and Grading*.** Remain on site daily while vegetation salvage, grubbing, grading, and other ground-disturbing construction activities are taking place to avoid or minimize take of listed species, and verify personally or have Biological Monitor(s) verify compliance with all impact avoidance and minimization measures, including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones. 3. ***Monthly Compliance Inspections*.** Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the BLM, USFWS, and CDFW during construction.			
Biological Resources – Wildlife (cont.)			
4. ***Notification of Injured or Dead Listed Species*.** If an injured or dead federal- or state-listed species is detected on or near the Project site, BLM, CDFW, and USFWS shall be notified immediately by phone. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via facsimile or electronic communication shall be submitted to these agencies within two calendar days of the incident and include the following information as relevant: a. *Injured Desert Tortoise*. If a desert tortoise is injured as a result of Project-related activities during construction, the Designated Biologist or Biological Monitor(s) shall immediately take it to a CDFW-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the Applicant/Owner. Following phone notification as required above, the CDFW and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, and circumstances of the incident and the name of the facility where the animal was taken. b. *Desert Tortoise Fatality*. If a desert tortoise is killed by Project-related activities during construction, operation and maintenance, or decommissioning, a written report with the same information as an injury report shall be submitted to the BLM, CDFW, and USFWS. These desert tortoises shall be salvaged according to federally established guidelines. The Applicant/Owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident. 5. ***Final Listed Species Report*.** The Designated Biologist shall provide BLM a Final Listed Species Mitigation Report that includes, at a minimum: 1) all available information about Project-related incidental take of listed species; 2) information about other Project impacts on the listed species; 3) construction dates; 4) an assessment of the effectiveness of conditions of certification in minimizing and compensating for Project impacts; 5) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future Projects on the listed species; and 6) any other pertinent information, including the level of take of the listed species associated with the Project. 6. ***Stop Work Order*.** The BLM may issue the Project owner a written stop work order to suspend any activity related to the construction or operation of the Project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or protected species. The Project owner shall comply with the stop work order immediately upon receipt thereof.			
Mitigation Measure 3.4-2d: Desert Tortoise Compensatory Mitigation: To fully mitigate for habitat loss and potential take of desert tortoise, the Project owner shall provide compensatory mitigation consistent with federal requirements, adjusted to reflect the final Project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the proposed Project, including all Project linears, as well as undeveloped areas inside the Project's boundaries that will no longer provide viable		During all Project phases	BLM, CDFW, and USFWS

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
long-term habitat for the desert tortoise. To satisfy this condition, the Project owner shall acquire, protect, and transfer 1 acre of desert tortoise habitat for every acre of habitat within the final Project footprint, and provide associated funding for the acquired lands, as specified below. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as provided below in section 3.i. of this measure. If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands include all of the following; subject to modification by the terms of incidental take authorizations issued by the USFWS and CDFW: 1. ***Selection Criteria for Compensation Lands.*** The compensation lands selected for acquisition in fee title or in easement shall:			
Biological Resources – Wildlife (cont.)			
a. be within the Western Mojave Recovery Unit, or, with prior USFWS approval, within the Eastern Mojave Recovery Unit as defined in the 2011 Revised Recovery Plan (USFWS, 2011a), with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands; b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed; c. be prioritized near larger blocks of lands that are either already protected or planned for protection, such as DWMAs within the Western Mojave Recovery Unit (or nearby portions of the Eastern Mojave Recovery Unit with prior USFWS approval) or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation; d. be connected to lands with desert tortoise habitat equal to or better quality than the Project site, ideally with populations that are stable, recovering, or likely to recover; e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible; f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and h. have water and mineral rights included as part of the acquisition, unless the BLM, in consultation with CDFW and USFWS, agrees in writing to the acceptability of the land. 2. ***Review and Approval of Compensation Lands Prior to Acquisition.*** The Project owner shall submit a formal acquisition proposal to the BLM, CDFW, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the BLM in consultation with CDFW and the USFWS shall be required for acquisition of all compensatory mitigation parcels. 3. ***Compensation Lands Acquisition Requirements.*** The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the BLM, in consultation with CDFW and USFWS, have approved the proposed compensation lands: a. *Preliminary Report*. The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the BLM, in consultation with CDFW and USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Conservation Board. b. *Title/Conveyance*. The Project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the BLM. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFW, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or BLM under terms approved by the BLM. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFW in a form approved by CDFW. If an approved non-profit holds a conservation easement, CDFW shall be named a third party beneficiary.			
Biological Resources – Wildlife (cont.)			
c. *Initial Habitat Improvement Fund*. The Project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code Section 65965) and if it meets the approval of CDFW and the BLM. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee. d. *Property Analysis Record*. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands. e. Long-term Maintenance and Management Fund. The Project owner shall deposit in NFWF's REAT Account a capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands. The BLM, in consultation with CDFW, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision. f. *Interest, Principal, and Pooling of Funds*. The Project owner, BLM, and CDFW shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions: i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFW designed to protect or improve the habitat values of the compensation lands. ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFW or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFW takes fee title to the compensation lands, monies received by CDFW pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFW designates NFWF or another entity to manage the long-term maintenance and management fee for CDFW. iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFW, or a BLM- and CDFW-			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFW. g. *Other expenses*. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to: title and document review costs; expenses incurred from other state agency reviews; overhead related to providing compensation lands to CDFW or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.			
Biological Resources – Wildlife (cont.)			
h. *Mitigation Security*. The Project owner shall provide financial assurances to the BLM and CDFW with copies of the document(s) to the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the Project in the event the Project owner fails to comply with the requirements specified in this condition, or shall be returned to the Project owner upon successful compliance with the requirements in this condition. The BLM's or CDFW's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Financial assurance can be provided to the BLM and CDFW in the form of an irrevocable letter of credit, a pledged savings account, or another form of security ("Security"). Prior to submitting the Security to the BLM, the Project owner shall obtain the BLM's approval in consultation with CDFW and the USFWS of the form of the Security. The actual costs to comply with this condition will vary depending on the final footprint of the Project and the actual costs of acquiring, improving, and managing the compensation lands. i. NFWF REAT Account. The Project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the Project owner shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than anticipated in the PAR analysis, the excess money deposited in the REAT Account shall be returned to the Project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the Project owner. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the BLM and CDFW. Such delegation shall be subject to approval by the BLM and CDFW, in consultation with USFWS, prior to land acquisition, initial protection, or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of BLM's approval.			
Mitigation Measure 3.4-3a: Bighorn Sheep Habitat Connectivity. In addition to APM 75, which will provide two water sources to improve bighorn sheep habitat connectivity, this measure provides additional detail and requirements for the proposed water sources. Water sources will be designed to exclude ravens to the extent possible, to minimize potential indirect effects on other wildlife species such as desert tortoise and Mojave fringe-toed lizard. To compensate for impacts to bighorn sheep habitat connectivity, the Applicant/Owner shall support current CDFW and NPS efforts to encourage connectivity of bighorn sheep populations between the south Soda Mountains, the north Soda Mountains, and the Avawatz Mountains, which are located further to the north of the Project site. More specifically, the Applicant/Owner shall provide funding for CDFW, or similar entity, to install between three and five (total) pre-fabricated bighorn sheep water sources (e.g., guzzlers) in the north Soda Mountains/Avawatz Mountains corridor and provide funding to refill them through the life of the		Provide funding for water sources prior to start of commercial operation Monitor, maintain, and provide refill funding for water sources during all Project phases	BLM and CDFW

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
project. The Project owner shall consult with BLM and with the CDFW Desert Bighorn Sheep Program Coordinator to identify strategic locations for water sources to promote bighorn sheep migration through the north Soda Mountain range. Water sources will be situated in locations that: 1) facilitate use of existing I-15 crossing sites at culverts and bridges; 2) are situated at key locations within the movement corridor; 3) are accessible using existing roads whenever possible for filling and maintenance; and 4) are situated outside of existing wilderness boundaries and outside of wilderness study areas. The Project owner shall monitor and manage the artificial or restored water source for the benefit of bighorn sheep for the life of the Project, or shall provide sufficient funding to support such monitoring and management by an approved third party. At the end of the Project, CDFW shall have the option to retain and manage the water sources or have them removed by the Applicant/Owner during the decommissioning process.			
Biological Resources – Wildlife (cont.)			
Mitigation Measure 3.4-3b: Bighorn Sheep Adaptive Management Strategy. The Applicant/Owner shall implement a *Bighorn Sheep Adaptive Management Strategy* in coordination with the BLM, NPS, and CDFW aimed at maintaining existing foraging, movement, and feeding opportunities for bighorn sheep near the Project site and at improving regional opportunities to restore bighorn sheep movement. The *Bighorn Sheep Adaptive Management Strategy* shall be submitted to the BLM, NPS, and CDFW for review and approval prior to initiation of ground-disturbing activities on the Project site and shall include, at a minimum, the following provisions: 1. The Applicant/Owner shall fund and/or implement a 10-year study that examines the response of bighorn sheep to the Project. This may include the use of radio collars to track the movements of bighorn sheep prior to, during, and post-construction. The study will be conducted in coordination with BLM, CDFW, and NPS. The tracking of bighorn sheep will inform the adaptive management approaches that follow. 2. The Applicant/Owner shall improve the culvert crossing north of Zzyzx Road for bighorn sheep through the use of temporary water sources on both sides of the I-15 freeway. Water sources will be maintained and refilled for a minimum period of 10 years. With CDFW approval, the Applicant/Owner will implement a monitoring study to examine bighorn sheep behavior near the temporary water sources through the use of motion-sensor cameras, radio tracking collars, direct observation of sheep sign (e.g., the presence of tracks or scat), and/or by other means. 3. If the temporary water sources successfully encourage bighorn sheep to use the culvert crossing, as measured by sheep drinking from the water sources and/or crossing through the culvert, identified through the study implemented in item 1, the water sources shall be left in place permanently. Concurrently, the one to three additional water sources described in Mitigation Measure 3.4-3a to encourage use of the north Soda Mountains/Avawatz Mountains corridor also shall be left in place and maintained/filled for the life of the Project. 4. Based on the results of item 1, the Applicant/owner will implement measures to minimize the effects of human activities on bighorn sheep. Such actions may include removing fences that currently block underpass movement, establishing new fences to funnel sheep towards underpasses and away from traffic, using shields to reduce the noise and visibility of traffic in key locations, ~~screening to visually separate the North Arrays from the wildlife crossing,~~ and/or redirecting Project traffic to the portion of the Project site on the northwest side of I-15 from Blue Bell Mine Road to an access road to the south of the North Array. 5. ~~The Applicant/Owner shall establish a $250,000 bond prior to the start of construction to be used either to fund the construction of a wildlife crossing over I-15 near the Project site, or at CDFW's discretion, to conduct regional translocation of bighorn sheep (see Mitigation Measure 3.4-3e, Bighorn Sheep Demographic and Genetic Management). If culvert crossing is not successful within 10 years of deploying the artificial water sources (identified through the study implemented in item 1), then within 6 months of the end of the tenth year, the Applicant/Owner shall coordinate with CDFW, Caltrans, NPS, and BLM to apply the bond toward the design, study, and/or construction of a wildlife crossing over I-15. Two potential locations have been considered to date, with the preferred location located north of the East Arrays and~~		Prepare strategy prior to construction Implement study during initial 10 years of commercial operation Establish bond prior to construction	BLM, NPS, and CDFW

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
~~approximately 0.3 mile south of the Zzyzx Road off-ramp on I-15. The bridge design specifications will include temporary water sources on either side to encourage sheep use.[2] Following construction, the Applicant/Owner will implement a 10-year study that examines bighorn sheep use of the crossing site using the survey methods described for the culvert crossing, above.~~ In order to provide for bighorn sheep demographic and genetic management, the Applicant/Owner shall establish a $250,000 bond prior to the start of construction to be used, at CDFW's discretion, to conduct regional translocation of bighorn sheep. If at any time, efforts are undertaken to construct an overcrossing near the Project, with the approval of BLM, NPS, and CDFW, these funds may be allocated to that construction effort.[2] If at any time, prior to expenditure of these funds, bighorn sheep are documented to move through the existing undercrossings between north and south Soda Mountains, or a bighorn sheep population has become established in the North Soda Mountains, these funds may be allocated for bighorn sheep connectivity and genetics management projects elsewhere in the Mojave desert."			
Biological Resources – Wildlife (cont.)			
Mitigation Measure 3.4-3c: Bighorn Sheep Monitoring. The Applicant will retain a biological consultant approved by the BLM, ~~USFWS,~~ and CDFW to serve as the Bighorn Sheep Monitor of construction activities located within 1,000 feet of bighorn sheep foraging or bedding areas. The Bighorn Sheep Monitor will be present if proposed construction activities are planned within approximately 0.5 mile of 20 percent slopes or within 0.25 mile of 10 percent slope (whichever is less). If bighorn sheep are observed, no construction activities will be conducted within 1,000 feet of the sheep until the Bighorn Sheep Monitor verifies that the sheep have moved to at least 1,000 feet from planned activities. If the Bighorn Sheep Monitor determines that planned activities are unlikely to adversely affect or disrupt normal sheep behavior, planned activities may proceed. If the Bighorn Sheep Monitor is not present on site when sheep are observed, all proposed activities within 0.5 mile of 20 percent slope or 0.25 mile of 10 percent slope will stop and the Bighorn Sheep Monitor will be contacted immediately for guidance on how to proceed with planned activities. The Bighorn Sheep Monitor will prepare daily monitoring reports that will be submitted to the Designated Biologist and BLM, NPS, and CDFW.		During construction	BLM, NPS, and CDFW
Mitigation Measure 3.4-3d: Bighorn Sheep Habitat Compensation. The Applicant/Owner shall acquire and protect suitable bighorn sheep foraging habitat to compensate for the loss of on-site foraging habitat within 0.25 mile of 10 percent slopes; estimated at 729 acres for the Proposed Action. The actual amount of compensation habitat shall be determined based on the final, BLM-approved construction plans. The off-site replacement habitat shall be connected to existing occupied bighorn sheep habitat. Compensation can be in the form of fee title acquisition or the acquisition of conservation easement or other habitat protecting measure. Compensation habitats must be approved by BLM and CDFW.		Prior to start of commercial operation	BLM and CDFW.
Mitigation Measure 3.4-3e: Bighorn Sheep Demographic and Genetic Management. In lieu of bridge funding, the bond described in Mitigation Measure 3.4-3b, Bighorn Sheep Adaptive Management Strategy, may be applied at CDFW's discretion toward bighorn sheep demographic and genetic management. If at any time, efforts are undertaken to construct an overcrossing near the Project, with the approval of BLM, NPS, and CDFW, these funds may be allocated to that construction effort. If at any time, prior to expenditure of these funds, bighorn sheep are documented to move through the existing undercrossings between north and south Soda Mountains, or a bighorn sheep population has become established in the North Soda Mountains, these funds may be allocated for bighorn sheep connectivity and genetics management projects elsewhere in the Mojave desert.		Following establishment of bond	BLM, NPS, and CDFW
Mitigation Measure 3.4-4: Avoid Disturbance to Nesting Birds. Vegetation clearing shall take place outside of the general avian breeding season (February 15 to September 1), when feasible. If vegetation clearing cannot occur outside the avian breeding season, the Designated Biologist/Biological Monitor(s) shall conduct a preconstruction survey for nesting birds no more than three (3) days prior to vegetation clearing. If no active nests are found, clearing can proceed. If active nests are found, no clearing shall be allowed within 150 feet (for passerines) to 250 feet (for raptors) of the active nests until the Designated Biologist/Biological Monitor(s)		Survey prior to construction	BLM, CDFW, and USFWS.

2 Implementation of wildlife crossings would require additional NEPA and CEQA analysis as well as biological and cultural resources surveys, as an agreed upon location has not been surveyed during this EIS/EIR process.

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
determines the nest is no longer active or the nest fails. The Designated Biologist/Biological Monitor(s) shall submit the results of the pre-construction nesting bird surveys to the BLM, USFWS, and CDFW. Following agency coordination, the size of the next buffer may be adjusted based upon the magnitude of proposed activities and observed sensitivity of the bird to disturbance.			
Mitigation Measure 3.4-5a: Minimize Vehicle and Equipment Impacts during Operation and Maintenance. The Applicant/Owner shall implement measures to minimize the potential for desert tortoise and other wildlife species mortality along access and maintenance roads. These measures shall include: 1. Speed limits identified in Mitigation Measure 3.4-1d shall continue to be applied during operation and maintenance. 2. Pedestrian access outside the limits of the designated access/maintenance roads is permitted year-round as long as no ground-disturbing activities take place. 3. Vehicle traffic and parking shall be confined to designated access roads, and equipment and materials staging areas shall be clearly defined to avoid impacting habitat during the operation phase.		During construction	BLM
Biological Resources – Wildlife (cont.)			
Mitigation Measure 3.4-5b: Operation and Maintenance Education Program. A WEAP shall be implemented during the operation and maintenance phase of the Project to alert workers to the hazards posed by ongoing operations to common and special-status wildlife species. The WEAP shall be repeated annually and include the same program elements discussed in Mitigation Measure 3.4-1c.		During operation and maintenance	BLM
Cultural Resources			
Mitigation Measure 3.6-1: Prior to any ground disturbing activities, the Applicant shall retain a qualified archaeologist, defined as one meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology and subject to approval by the BLM, to conduct cultural resources sensitivity training for all construction personnel. Construction personnel shall be informed of the types of cultural resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources. The Applicant shall ensure that all construction personnel are made available for and attend the training and shall retain documentation demonstrating attendance.		Prior to and during construction	BLM
Mitigation Measure 3.6-2: A Cultural Resources Discovery and Monitoring Plan (CRDMP) shall be developed at least 30 days prior to ground disturbing activities and implemented by an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for archaeology. The CRDMP shall detail provisions for the archaeological monitoring of Project construction. Archaeological monitoring during ground-disturbing activities shall be conducted by an archaeologist familiar with the types of historic and prehistoric resources that could be encountered within the APE, who shall have the authority to halt construction in the event of a discovery. The archaeological monitor shall work under the direct supervision of the qualified archaeologist. All cultural resources personnel will be approved by the BLM. The CRDMP shall detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, and assessing National Register- and California Register-eligibility in the event that unknown cultural resources are discovered during construction. The CRDMP shall require that the contractor immediately cease all work activities in the area (within 100 feet) of the discovery until it can be evaluated by a qualified archaeologist. After cessation of excavation, the contractor shall immediately contact the BLM Archaeologist. The contractor shall not resume work until authorization from the BLM is received. If the qualified archaeologist, in consultation with BLM, determines that the discovery constitutes a historic property per Section 106 of the National Historic Preservation Act or a historical or unique archaeological resource under the California Environmental Quality Act, preservation in place shall be the preferred manner of mitigation (Public Resources Code §21083.2). In the event preservation in place is demonstrated to be infeasible, a treatment plan shall be prepared by the qualified archaeologist and shall be approved by the BLM		Develop plan 30 days prior to ground disturbance Implement plan during construction	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
prior to implementation. The BLM shall consult with appropriate Native American representatives in determining appropriate treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. Archaeological materials recovered during any investigation shall be curated at an accredited curational facility. The CRDMP shall include provisions for reporting of monitoring and any treatment of resources in a timely manner.			
Mitigation Measure 3.6-3: If human remains are discovered during construction, all work shall be diverted from the area of the discovery and the BLM Authorized Officer shall be informed immediately. The BLM shall ensure that any Native American human remains, funerary objects, sacred objects, and/or objects of cultural patrimony discovered on BLM administered lands during implementation of the Project will be treated in accordance with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) (Pub. L. 101-601, 25 USC § 3001 et seq.) and 43 CFR Section 10. Avoidance and protection of inadvertent discoveries that contain human remains through Project redesign shall be the preferred protection strategy.		During construction	BLM
Geology and Soil			
APM 11: Facilities will be built in accordance with San Bernardino County and California State Building Code requirements applicable to “Seismic Zone 3.” No human-occupied structures will be placed across the trace of a documented active fault. No human-occupied structure will be placed within 50 feet of the trace of an active fault or within a seismic special studies zone without a fault evaluation report, satisfactory to the State Geologist, demonstrating that no undue hazard would be created by the construction or placement of the structure.		Prior to and during construction	BLM and San Bernardino County
APM 12: Roads shall be constructed at grade to maintain existing drainage patterns during storm events. Unpaved access roads shall be constructed of compacted native soils. Rock or gravel may be added to unpaved roads for stabilization to prevent rutting or erosion.		During construction	BLM
APM 13: Disturbed areas where clearing, grubbing, and cut-and-fill are required shall be compacted once construction is complete for greater resistance to wind erosion.		Following completion of construction	BLM
Mitigation Measure 3.7-1: Soil Erosion Control Plan Review and Approval. The Project SWPPP or BMP Plan required by Lahontan RWQCB for compliance with its General Permit R6T-2003-0004 and prepared consistent with its Project Guidelines for Erosion Control (Board Order No R6T-2003-0-04 Attachment G; Lahontan RWQCB, 2003) shall be prepared and submitted to the BLM and County for review and approval by a watershed specialist, hydrologist, and/or engineer from each lead agency before implementation. Erosion control and drainage plans for new and existing roads to be utilized for the Project shall be aimed at maintaining to the greatest extent feasible existing soil quality and integrity. In developing the Plan, the Applicant or its contractor shall consult with the BLM and the County to determine the appropriate soil quality objective(s) to be met following construction (for temporary construction disturbances) and following decommissioning (for total site restoration). As part of the erosion control and drainage plans, the Applicant and/or its contractor shall implement an appropriate combination of BMPs in order to meet or exceed the applicable soil quality objective(s) (e.g., maintain or enhance soil quality and function). All measures and facilities for controlling runoff and erosion shall be in place prior to ground disturbing activities. Desert tortoise fencing shall be installed consistent with part six of Mitigation Measure 3.19-2, which requires approved design to ensure a minimum impact to existing washes and to limit any substantial increase of erosion or sediment transport. Any desert tortoise fencing that creates substantial excess soil shall have straw wattles or other measures installed to prevent soil transport. All erosion control facilities shall be monitored immediately following a qualified storm event. A major rainfall event is defined as one for which flow is visibly detectable within the fenced drainage. All repairs shall be completed prior to the commencement of ground disturbing activity. Any erosion control facilities that are damaged by rainfall shall be repaired within 72 hours of any damage and shall be monitored after any precipitation. Clearance reports and inspection logs shall be submitted to the BLM and the County for approval. Substantial damage to erosion control facilities shall be reported to the BLM and the County and per the above, no ground disturbing activity shall restart until the facilities are repaired.		Submit plan 30 days prior to ground disturbance Implement plan during site preparation and ground-disturbing activities	BLM and San Bernardino County

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Mitigation Measure 3.7-2: Soils and Geotechnical Investigation. Prior to construction of Project facilities, a qualified California-licensed geotechnical engineer shall prepare and submit to BLM a final geotechnical investigation that provides design requirements for foundations, retaining walls/shoring, and excavation, compliant with the applicable seismic design standards in the 2013 California Building Code (24 Cal. Code Regs. Part 2). The scope of the geotechnical report shall include the solar array fields, collection line routes, substation and switchyard site, and the operation and maintenance buildings sites. The geotechnical investigation shall expand upon the preliminary investigations as necessary and identify and evaluate the presence of expansive, compressible, liquefiable, or mechanically unstable soils and, if present, shall make recommendations for site preparation or design necessary to avoid or reduce adverse structural impacts. Structural foundations shall not be founded on engineered fill, nor on native soil, unless it is demonstrated that the soils would be adequate to support the foundation. A California-licensed geotechnical engineer shall be retained by the Applicant to be present on the Project site during excavation, grading, and general site preparation activities to monitor the implementation of the recommendations specified in the geotechnical investigation. When/if needed, the geotechnical engineer shall provide structure-specific geologic and geotechnical recommendations that shall be documented in a report approved by the permitting agency.		Submit plan 30 days prior to construction Implement recommendations in final design	BLM
Geology and Soil (cont.)			
Mitigation Measure 3.7-3: Septic Site Feasibility Tests. Standard in-situ testing (deep percolation tests) would be performed at locations where septic or alternative wastewater disposal systems are proposed. The Applicant shall document that any proposed sites for septic or alternative wastewater disposal systems meet all applicable standards, and that documentation shall be made available to BLM.		Perform tests and submit documentation to BLM at least 30 days prior to construction of septic or alternative wastewater disposal systems	BLM
Mitigation Measure 3.7-4: Protection of Desert Pavement. Grading and other methods of ground disturbance in areas covered by desert pavement shall be avoided or minimized. If avoidance of these areas is not possible, the desert pavement surface shall be protected from damage or disturbance from construction vehicles by use of temporary mats on the surface. A Desert Pavement Identification, Avoidance, and Protection Plan shall be prepared and submitted to the BLM for review and approval at least 60 days prior to start of construction which shall include, at a minimum: 1. A pre-construction survey using accepted methodology to identify areas covered by desert pavement; 2. Identification of areas covered by desert pavement that can feasibly be avoided and methods for avoidance, such as through placement of Project structures during final design, flagging and/or fencing areas of desert pavement for avoidance, and/or other measures; 3. Identification of areas covered by desert pavement that cannot feasibly be avoided and methods for protection, including at a minimum the use of temporary mats on the surface. Other methods may include restrictions on vehicle weight in addition to the use of mats.		Submit plan at least 60 days prior to start of site preparation for construction Implement plan during construction	BLM
Hazards			
APM 22: General material safety data sheets for all hazardous materials stored on site will be retained on site during Project construction and operation.		During all Project phases	BLM
APM 23: On-site fueling of equipment and vehicles shall be completed in areas at least 100 feet away from drainages, or in designated fueling areas. Fuel stored on site will be located in areas with secondary containment, unless secondary containment is built into the tank.		During all Project phases	BLM
APM 24: Transformers shall be inspected for oil leakage on a regular basis and diversionary structures shall be provided for all oil-containing equipment, including transformers, at the Project site.		During all Project phases	BLM
APM 25: Employees shall attend a health and safety training and shall be trained in the proper protocol for notification and cleanup of hazardous materials.		During all Project phases	BLM
APM 26: A Health and Safety Plan, which complies with all OSHA and Cal-OSHA guidelines for the types of activities being performed, shall be prepared and presented to all personnel on site during construction and		During all Project phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
operation.			
APM 27: During conductor installation, guard structures consisting of temporary H-frame poles shall be erected over any natural or manmade obstacles to shield them from falling objects.		During construction	BLM
Lands and Realty			
Mitigation Measure 3.9-1: Prior to the start of construction, the Applicant shall provide cadastral survey data to the BLM for all sections within the requested ROW. All section corners shall be surveyed and monumented, and a record map completed and filed with San Bernardino County to ensure the descriptions for all lands within the Right-of-Way are recorded correctly.		Prior to construction	BLM
Mitigation Measure 3.9-2: Prior to issuance of the NTP, the Applicant shall provide 100 percent design drawings to the BLM for review and approval.		Prior to issuance of NTP	BLM
Noise			
APM 28: Noise exposure for construction and maintenance workers shall adhere to all federal, California, and San Bernardino County noise exposure regulations		During all Project phases	BLM and San Bernardino County
Mitigation Measure 3.11-1: Construction and decommissioning activities associated with the operation and maintenance buildings, pile driving within 1.5 miles of residences, and the Rasor Road reroute within 1 mile of residences shall not occur between the hours of 10:00 p.m. and 7 a.m., Monday through Saturday, or at any time on Sundays.		During construction and decommissioning	BLM
Paleontological Resources			
Mitigation Measure 3.12-1: Prior to any ground disturbing activity, design plans shall be compared with geotechnical data and foundation design requirements compiled under Mitigation Measure 3.7-2 to determine whether the subsurface geology has a higher paleontological sensitivity than the surface geology, and whether construction will disturb the underlying higher sensitivity geologic units. If disturbance will occur in areas found to meet the PFYC designation of 3 or higher, then monitoring of construction excavations in the disturbance areas shall take place in order to reduce potential adverse effects on significant paleontological resources.		Prior to construction	BL
Mitigation Measure 3.12-2: Prior to construction, a training session on the recognition of the types of paleontological resources that could be encountered within the requested ROW boundary and the procedures to be followed if they are found shall be presented to Project personnel by a qualified and BLM-permitted professional paleontologist.		Prior to construction	BLM
Mitigation Measure 3.12-3: Based on the results of the field survey (PaleoResource Consultants, 2009) and in accordance with the BLM's paleontological resource management policies, monitoring shall take place in all areas where excavations that disturb areas with PFYC designations of 3, 4, and 5 would occur during any Project phase. The monitoring program shall be designed and implemented by a qualified and BLM-permitted professional paleontologist and shall be consistent with Section IV of the Guidelines for Assessment and Mitigation of Potential Impacts to Paleontological Resources (BLM, 2008b). All scientifically significant fossils salvaged during construction monitoring shall be prepared to the point of curation, identified to element and the lowest possible taxonomic level, and transferred to the San Bernardino County Museum for permanent storage. The results of the paleontological monitoring program, including an itemized inventory of salvaged fossils, shall be detailed in a Final Paleontological Monitoring Report prepared according to BLM policy (BLM, 1998, 2008a, 2008b).		During construction	BLM
Mitigation Measure 3.12-4: If any potential fossils are discovered during construction, operation and/or maintenance activities, or during decommissioning, all activities within 100 feet in all directions from the		During all Project phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
discovery shall cease immediately to protect the discovery and its geological context from damage, and the Applicant shall notify the BLM Authorized Officer immediately. As soon as possible, but not later than 10 working days after being notified, the BLM Authorized Officer shall notify and work with a qualified and BLM-permitted professional paleontologist to evaluate the significance of the discovery. The BLM Authorized Officer and BLM-permitted professional paleontologist shall determine appropriate measures to mitigate adverse effects to significant paleontological resources in consultation with the Applicant. Activities may not resume within 100 feet in any direction of the discovery until the BLM Authorized Officer and BLM-permitted professional paleontologist concur that activities may resume.			
Recreation			
APM 32: The relocated segment of Rasor Road shall be completed and open to traffic prior to the permanent closure and decommissioning of the pre-Project (existing) location of Rasor Road.			
Mitigation Measure 3.13-1: Travel Management Area Maps for the Project area showing open, closed, and limited travel routes and open OHV areas shall be updated and printed by the Applicant for posting by the BLM during each phase of the Project when the status or location of routes and/or open areas changes as a result of Project construction, operation and maintenance, and/or decommissioning. These notices and signs shall clearly describe which routes and open areas will be closed temporarily or permanently.		During all Project phases	BLM
Mitigation Measure 3.13-2: If the Project encroaches on the Rasor OHV Area, t~~T~~he Applicant shall provide for and fund the BLM in the preparation of a Recreation Area Management Plan for the Rasor Road OHV area. Preparation of the Plan shall include baseline studies, field review and survey, planning documentation, and NHPA 106 and Section 7 compliance.	Clarifies applicability of measure.	Prior to construction	BLM
Mitigation Measure 3.13-3: If an alternative resulting in the realignment of Rasor Road is implemented, the Applicant shall install the new BLM informational kiosk at the entrance to the Rasor OHV Area along the relocated Rasor Road, at the location shown in Figure 3.13-2. The design for the relocated four-panel kiosk shall be submitted to the BLM for review and shall be approved by the BLM prior to installation of the new kiosk and prior to removal of the existing kiosk. The new kiosk shall be installed prior to the closure of the existing Rasor Road to facilitate the BLM's communication with visitors to the Rasor OHV Area.		Prior to and during construction, operations, and maintenance	BLM
Transportation			
APM 29: If Project traffic is scheduled on Fridays between 10:00 a.m. and 6:00 p.m. (on northbound I-15) and/or on Sundays between 11:00 a.m. and 8:00 p.m. (on southbound I-15), the Applicant shall implement a departing vehicle plan for those hours on Fridays and Sundays. The plan shall specify that work crew departures will be staggered on Friday and Sunday afternoons to avoid impacts to I-15 mainline traffic LOS.		During construction and decommissioning	BLM
APM 30: The Applicant shall document road conditions on Rasor Road, Blue Bell Mine Road, and any other local construction access roads prior to and the end of project construction and decommissioning, and restore the roads to pre-construction (and pre-decommissioning) conditions if construction damage is documented. The Applicant shall present a plan for restoration to the BLM and San Bernardino County within 60 days of completing construction and decommissioning. The restoration shall occur within 180 days of the BLM and San Bernardino County approval of the plan.		Document road conditions during construction and decommissioning Submit restoration plan within 60 days of completing construction and decommissioning Implement plan within 180 days of plan approval by both agencies	BLM and San Bernardino County
APM 31: Emergency access to the site shall be maintained at all times.		During all Project phases	BLM.
APM 32: The relocated segment of Rasor Road shall be completed and open to traffic prior to the permanent closure of decommissioning of the pre-Project location of Rasor Road.		Prior to decommissioning.	BLM.

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Visual			
APM 42: Where appropriate, a paint color acceptable to the BLM shall be used on project buildings to blend more naturally with the existing setting.		During all Project phases	BLM
APM 43: Lighting on the Project site shall be dark sky-compliant. Lighting shall be limited to areas required for operations or safety, directed on site to avoid backscatter, and shielded from public view to the extent practical. Lighting that is not required during nighttime hours shall be controlled with sensors or switches operated such that lighting will be on only when needed.		During operation and maintenance	BLM
Visual (cont.)			
Mitigation Measure 3.18-1a: Siting and Design. Visual design elements shall be integrated into the construction plans, details, shop drawings and specifications; these shall include, but not be limited to, grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural plans. Visual design elements within the plans shall be measureable by size and monitored while under construction, while operational, and when decommissioned. A careful study of the site shall be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered as well as seasons of peak visitor use (September 15 to April 15). Visual design elements to be integrated into construction plans, details, shop drawings and specifications must at a minimum include: 1. *Vary the grid layout to reduce contrast caused by long straight roads* – Employ an off-set in the grid layout to reduce visual contrast caused by long straight roads and, to the extent possible, arrays. The result shall be that no road extends from one side of the solar field to the other in a straight line. To further reduce contrast caused by exposing un-oxidized soils and rock in roadways, at select locations of concern from KOPs, spot applications of a product such as Permeon shall be used to dull and darken the ground plane in a short time. 2. *Color treat structures to reduce contrasts with the existing landscape* – In order to ensure the implementation of APM 42 and supplement its requirements to address adverse impacts, the Applicant shall color treat all operation and maintenance facilities, rear surfaces of the collectors, frames, tracker structures, PCS, and water tank facilities using a BLM standard environmental color that is identified through a site study for color and texture selection and approved by the BLM. Grouped structures shall be treated with the same color. Further: a. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible. b. Materials, coatings, or paints having little or no specular or reflective qualities shall be used on structures including, but not limited to, buildings, tanks, fences, fence railings, poles, aboveground pipes and culverts, and reverse sides of signs and guardrails. Substation equipment shall be specified with a low-reflectivity neutral finish. Insulators at substations and on takeoff equipment shall be non-reflective and non-refractive. The surfaces of substation structures shall be given low-reflectivity finishes with neutral colors that contrast minimally with the surrounding landscape. Chain-link fences are to have a dulled, darkened finish to reduce contrast. 3. *Lighting* – In order to ensure the implementation of APM 43 and supplement its requirements to address adverse impacts, all permanent lighting, except as required to meet minimum safety and security requirements, shall use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the light source), and must meet the Illuminating Engineering Society (IES) glare requirement limiting intensity of light from the luminaire in the region between 80 and 90 degrees from the ground. All fixtures must be mounted properly, at the proper angle. Further: a. Construction and operational (permanent) lighting – Except as required to meet safety and security		Implement requirements in final design and construction plans Monitor visual design elements during all Project phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
requirements, there shall be no exterior nighttime lighting on the Project site during the construction and operation periods. For these purposes, “nighttime” means the period of time between two hours after sunset until sunrise. To verify compliance with this measure, the Project Owner shall include a table that identifies projected times of sunrise and sunset for the upcoming month in the monthly summary reports that would be required by the Environmental and Construction Compliance Monitoring Program (ECCMP) for the project. During the compliance period, any outside nighttime lighting that would occur for safety and security reasons shall be logged and reported in the monthly summary report. The safety and security reasons that created the need for nighttime lighting shall be included in the log as well.			
Visual (cont.)			
b. Facility lighting – Lighting for facilities shall not exceed the minimum number, intensity, and coverage required for safety and basic security. Lighting shall be amber in color when accurate color rendition is not required. Use low-pressure sodium lamps or yellow LED lighting, or equivalent. No bluish-white lighting shall be used in permanent outdoor lighting. c. Lighting plan – A lighting plan shall be prepared that documents how security and safety lighting will be designed and installed to minimize night-sky impacts during facility construction and operation. The lighting plan shall include the safety and security reasons that require the need for all nighttime lighting on the facility during construction and operation periods. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security, and shall not cause excessive reflected glare. Low-pressure sodium light sources shall be used to reduce light pollution. Full cut-off luminaires shall be used to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the Project boundary. Lights in highly illuminated areas that are not occupied on a continuous basis shall be equipped with switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The lighting plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts. The Applicant shall submit the lighting plan to the BLM for review and approval at least 30 days prior to construction. 4. Vegetation and ground disturbance associated with access road construction, and distribution line installations shall be minimized and take advantage of existing clearings wherever feasible. 5. Along all off-site access roads, all off-site distribution line corridors, and all internal access roads 16 feet or wider, graveled surfaces, areas to be permanently cleared of vegetation, and (if applicable) cut slopes shall be treated with rock stains or other color treatment appropriate with the surrounding landscape. 6. Openings in vegetation for facilities, structures, and roads shall be feathered and shaped to repeat the size, shape, and characteristics of naturally occurring openings. 7. The distribution line shall utilize nonspecular conductors and nonreflective coatings on insulators.			
Mitigation Measure 3.18-1b: Glint and Glare Mitigation and Monitoring. Consistent with Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands, the Applicant shall prepare and submit to the BLM a Glint and Glare Mitigation and Monitoring plan identifies mitigation measures to reduce the potential health, safety, and visual impacts associated with glint and glare, and provides for monitoring of the effectiveness and maintenance of such measures. The goals of the mitigation shall be to ensure that glare with the potential for temporary after-image effects is not visible to drivers on I-15, and that glare visible from key observation points (KOPs) 8, 13, 14, and 17 does not exceed a cumulative total duration of 30 minutes per day. Mitigation measures to achieve these goals shall include, but not be limited to: 1. Program solar tracker arrays contributing to glare to turn away from affected KOPs during the times of day when glare visible at that KOP is generated. 2. Consider the use of panels made with textured glass surfaces to diffuse reflected light. If the use of textured		Submit plan at least 30 days prior to start of construction Implement plan during construction and operation phases	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
glass panels is found not to be feasible, the plan shall describe the reason for its infeasibility. 3. Where significant off-site glare is unavoidable, employ materials to reduce the effect where such materials would not result in greater adverse visual impacts than the glint or glare that would be offset, and would not result in shading the solar panels. These materials may include fencing with privacy slats or fabric screening of a BLM standard environmental color that is identified through a site study for color and texture selection and approved by the BLM, earthen berms, or vegetative screening. 4. If glare with the potential for temporary after-image remains visible to drivers on I-15, coordinate with Caltrans to place signs warning drivers of the potential for hazardous glare.			
Visual (cont.)			
Mitigation Measure 3.18-2: Construction. A pre-construction meeting with BLM landscape architects or other designated visual/scenic resource specialists shall be held before construction begins to coordinate on the VRM mitigation strategy and confirm the compliance checking schedule and procedures. Final design and construction documents will be reviewed for completeness with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The construction documents shall include, but not be limited to grading, drainage, revegetation, vegetation clearing, and feathering plans, and must demonstrate how VRM objectives will be met, monitored, and measured for conformance. 1. The Applicant shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving existing, native vegetation to the extent feasible; utilizing undulating surface-disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation. 2. Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin. 3. Existing rocks, vegetation, and drainage patterns shall be preserved to the extent feasible. 4. Brush-beating or mowing or using protective surface matting rather than removing vegetation shall be employed where feasible. 5. Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas. 6. If graveled surfaces are used during construction, the visual color contrast of graveled surfaces shall be reduced with approved color treatment practices. 7. No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate surveyor construction activity limits. 8. All stakes and flagging shall be removed from the construction area and disposed of in an approved facility.		Hold pre-construction meeting at least 30 days prior to start of construction Implement requirements during construction	BLM
Mitigation Measure 3.18-3: Operation and Maintenance. Terms and conditions for VRM mitigation compliance ~~should~~ shall be maintained and monitored on an annual basis for the life of the project for compliance with visual objectives, adaptive management adjustments, and modifications listed below and as necessary and approved by the BLM landscape architect or other designated visual/scenic resource specialist. Minimum measures are as follows: 1. The Applicant shall maintain revegetated surfaces until a self-sustaining stand of vegetation which does not require supplemental water or fertilizer is re-established and visually adapted to the undisturbed surrounding vegetation. No new disturbance shall be created during operation without completion of a VRM analysis and approval by the AO. 2. Interim restoration shall be undertaken during the operating life of the Project as soon as possible after	Clarify that terms and conditions shall be maintained and monitored	During operation and maintenance	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
disturbances. 3. Painted facilities shall be kept in good repair and repainted when color fades or flakes. 4. Color-treated solar panel backs/supports shall be kept in good repair, and retreated when color fades and/or flakes.			
Visual (cont.)			
Mitigation Measure 3.18-4: Decommissioning and Site Reclamation. A Decommissioning and Site Reclamation Plan, covering visual impact mitigation measures, shall be in place prior to construction, and reclamation activities ~~should~~ shall be undertaken as soon as possible after disturbances occur and be maintained throughout the life of the Project. The following decommissioning/reclamation activities/practices shall be implemented to partially mitigate visual impacts associated with solar energy development, where feasible: 1. Pre-development visual conditions, and the B-Quality scenery (BLM, 2010a) and integrity shall be reviewed, and the visual elements of form, line, color, and texture shall be restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the better visual quality and most ecologically sound outcome. 2. A Decommissioning and Site Reclamation Plan shall be developed, approved by the BLM, and implemented. The plan shall require that all aboveground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the Project's visual mitigation and reclamation objectives. 3. Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscapes. The Applicant shall contour to a rough texture (i.e., use large rocks/boulders, grade uneven surfaces, and/or vegetation mulches/debris) in order to trap seed and to discourage off-road travel, thereby reducing associated visual impacts. 4. A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of decommissioning activities enabling direct transplanting shall be utilized. Where feasible, native vegetation shall be used for revegetating to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape. 5. Stockpiled topsoil shall be reapplied to disturbed areas, and the areas shall be revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where applicable, or by using a mix of native and non-native species if necessary to ensure successful revegetation. Gravel and other surface treatments shall be removed or buried. 6. Rocks, brush, and vegetal debris shall be restored whenever possible to approximate preexisting visual conditions. 7. Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes. 8. A decommissioning VRM Monitoring and Compliance Plan shall be prepared by the Applicant and approved by the BLM that establishes the schedule and terms for monitoring and the conditions and methods of measurement for determining compliance.	Clarify that reclamation activities shall be undertaken as soon as possible after disturbances occur	Submit plan at least 30 days prior to start of construction Implement plan during all Project phases following disturbances	BLM
Water			
APM 17: The groundwater model will be recalibrated using the measured aquifer properties resulting from the 72-hour aquifer test. If the results of the recalibrated model indicate that reduction in outflow from the valley would be less than 50 AFY under proposed project conditions, then no further action will be taken. If the		Submit recalibrated model results at least 30 days prior to construction	BLM and San Bernardino County

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
recalibrated model predicts reduced outflow from the northeast outlet of the Valley in excess of 50 AFY, APM 18 will be implemented.			
Water (cont.)			
APM 18: If, as described in APM 17, the recalibrated model predicts outflow from the northeast outlet of the Valley reduced by an amount in excess of 50 AFY, the Applicant will hire a professional hydrogeologist or geologist to develop a groundwater monitoring plan for submittal to and acceptance of BLM and San Bernardino County. The groundwater monitoring plan would include monitoring and quarterly reporting of groundwater levels within the Soda Mountain Valley, in the alluvial aquifer adjacent to Soda Spring and west of Soda Lake, and at Soda Spring during construction of the project. If the Project is shown to cause a decline in groundwater levels of 5 feet or more in the alluvial aquifer near Soda Spring, or there is a decrease in groundwater discharge at Soda Spring as a result of project groundwater withdrawal that results in the water level in the spring decreasing to less than 4 feet deep, which would threaten the tui chub, an evaluation would be conducted to determine if the Project is causing reduced groundwater discharge at Soda Spring. If it is determined that the Project has caused a decrease in the volume of groundwater discharged at Soda Spring such that the spring is less than 4 feet deep, thereby threatening the tui chub habitat, then the Project shall correspondingly curtail withdrawal of groundwater and import a corresponding amount of water from outside of the Soda Mountain Valley. Groundwater level measurements in the monitoring wells located in Soda Mountain Valley would be compared to the model predictions on an annual basis during construction and every 5 years during Project operation. The groundwater model would be recalibrated if the measured drawdown values in the monitoring wells exceed the predicted values by more than 15 percent. Monitoring would cease after 5 years of operational monitoring if two conditions are met: 1. The monitoring data support the model predictions. 2. The model predicts the reduction in outflow from the northeast outlet will be less than 50 AFY under proposed project conditions, as detailed in APM 17.		Submit plan at least 30 days prior to construction Implement plan during construction and operation	BLM and San Bernardino County
APM 19: During the years of construction in which water extractions exceed 25 acre-feet per year, an annual report shall be provided and a fee shall be paid to the State Water Resources Control Board.		During construction	BLM, San Bernardino County, and State Water Resources Control Board
APM 20: If crossing existing washes is necessary, then at-grade crossings will be constructed to maintain existing flow channels and sediment transport, thereby leaving stormwater runoff volume unchanged.		During construction	BLM
APM 21: If the TDS values for Project well water exceed levels for potable water, then potable water shall be provided from another source, such as a tanker truck.		During construction and operation	BLM
~~**Mitigation Measure 3.19-1: Brine Pond Design.** If brine ponds are constructed for evaporation of reverse osmosis reject water, the ponds shall include berms or levees that reach at least 2 feet above the highest anticipated flood flows during a 100-year storm event, or at least 2 feet above the highest adjacent ground, whichever is greater, in order to protect the brine ponds from incident flooding events and ensure that the ponds are not inundated by flood flows.~~	Deleted. No brine ponds are approved for the Project.		
Mitigation Measure 3.19-2: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan. The Applicant shall prepare a Comprehensive Drainage, Stormwater, and Sedimentation Plan (Plan) consistent with its Project Guidelines for Erosion Control (Board Order No R6T-2003-0-04 Attachment G; Lahontan RWQCB, 2003) prior to the initiation of construction (or, for decommissioning, drainage design that is consistent with RWQCB guidelines will be incorporated into the Final Closure Plan). Detailed hydrologic analysis will be performed prior to final design of the Project. Results of these analyses will be submitted to the BLM and County for review. All proposed grading and impervious surfaces on site shall be reviewed and approved by the BLM and County, with respect to its potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation. The Plan shall include, but not be limited to, the following measures with the overriding goal to prevent a net impact to on-site or downstream waterways		Submit plan at least 30 days prior to construction Implement plan during all Project phases	BLM and San Bernardino County.

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
from the alteration of on-site drainage or patterns and rates of erosion or sedimentation:			
Water (cont.)			
1. All boulders and cobbles removed from construction access corridors and temporary access roads shall be stockpiled adjacent to the construction access corridors and temporary access roads. At the completion of construction (or decommissioning, as relevant), these boulders and cobbles shall be distributed on the surface of the construction access corridors and temporary access roads to help protect the exposed fine grained materials. 2. Construction of construction (or decommissioning, as relevant) access corridors and temporary and permanent access roads shall not block existing drainage channels and shall not significantly alter the existing topography. 3. The Applicant shall delineate the active drainage channels, defined as reflecting the standard flow regime for a 10-year storm event, within each drainage avoidance area, and avoid placement of proposed flood protection berms within active drainage channels. The drainage avoidance areas shall protect no less than 90 percent of the area of the active drainage channels from construction impacts. 4. The Applicant shall prepare hydraulic analyses that estimate the pre- and post-development peak discharges, water depths, and velocities for both smaller, more frequent events (2-, 5-, and 10-year events), as well as larger design storm events (100-year event) that would flow through each solar array field, drainage avoidance area, and/or on either side of each proposed flood protection berm. If hydraulic analyses indicate that flow depths and/or velocities may potentially be substantially altered for smaller, more frequent events, sediment transport analyses shall be performed to estimate changes in sediment transport from the South Array. Sediment transport from the South Array shall not significantly decrease as a result of the proposed project. 5. The Applicant shall provide the BLM design details for the flood protection berms including subgrade preparation, construction methods, and armoring or scour protection if needed (both along the drainage avoidance areas and on the array side of the berm). 6. The Applicant shall provide the BLM design details for Habitat Protection Fencing including how stormwater flows and debris will pass through the fencing. The use of flow-obstructing fencing shall be avoided; instead, fencing that allows for the passage of water while minimizing buildup of debris shall be utilized on site, such as an elevated chain link fence with a bottom portion of collapsible tortoise fence to allow it to collapse if too much ponding or debris buildup occurs. To ensure implementation of Applicant Proposed Measures 51, 66, and 70 and Mitigation Measure 3.4-2a, the Applicant shall coordinate with the BLM, CDFW, and USFWS to determine appropriate fencing design with respect to the protection of biological resources and the potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation.			
Mitigation Measure 3.19-3: Groundwater Monitoring and Mitigation Plan. The Applicant shall submit a Groundwater Monitoring and Mitigation Plan (GMMP) to the BLM and San Bernardino County. The lead agencies must review and approve the GMMP prior to Project approval and implementation. The County must approve the GMMP prior to issuance of a groundwater well permit. The GMMP shall conform to the guidelines for groundwater monitoring as detailed by San Bernardino County in the "Guidelines for Preparation of a Groundwater Monitoring Plan" (Guidelines) (San Bernardino County, 2000). The GMMP shall be prepared by a qualified professional geologist, hydrogeologist, or civil engineer registered in the State of California. The GMMP would substantially comply with the methodologies for monitoring, analysis, and reporting conditions described in the Draft GMMP presented in Appendix L and would incorporate specific thresholds for determining adverse effects on groundwater resources and corresponding corrective actions. The GMMP shall provide detailed methodologies for monitoring, testing, data analysis, and reporting procedures; and locate monitoring, extraction, and survey points. At a minimum, the GMMP will include		Submit plan prior to County issuance of a groundwater well permit and Project approval Implement plan during construction and operation unless lead agencies determine that monitoring requirements are no longer necessary	BLM and San Bernardino County

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
monitoring and quarterly reporting of groundwater levels in the observation wells installed as part of the			
Water (cont.)			
Project. Additionally, the GMMP will include a methodology for baseline, construction, and operation-phase monitoring at the Desert Studies Center and Soda Spring to define baseline depths to static water level and evaluate potential impacts from Project pumping on sensitive water resources. Monitoring at the Desert Studies Center will require coordination with that organization and the Mojave National Preserve (NPS). The GMMP shall provide a contingency method for monitoring if access to information at the Desert Studies Center or from Mojave National Preserve is unavailable. Monitoring shall be performed during pre-construction, construction, and operation of the Project, with the intent to establish pre-construction and Project-related groundwater level trends that can be quantitatively compared against observed and simulated trends near the Project pumping wells and near potentially affected wells and sensitive water resources. The GMMP shall include a schedule consistent with the Guidelines for submittal of data reports to the County and the BLM, for the duration of the Project. These data reports shall be prepared and submitted to the County and the BLM for review and approval, and shall include water level monitoring data (trend analyses) from all pumping and monitoring wells. Annual data reports shall be prepared and submitted to the County and the BLM for review and approval. The annual reports must be prepared consistent with County Guidelines and contain all necessary information and data summaries. The fifth annual report shall be submitted to the BLM and County in the form of a revised Hydrogeology Report. The 5-year report shall include a re-evaluation of the hydrology of the Project area based upon the monitoring data and any other information available. The 5-year report shall be prepared consistent with approved County Guidelines and submitted to the County and the BLM for review and approval. Data collected as part of the GMMP will be used to identify deviations from baseline conditions and groundwater model projections at monitoring locations. Deviations will be identified as early as possible to allow for identification and prevention of adverse impacts to critical groundwater and surface water resources as a result of Project groundwater use. At a minimum, the specific quantitative criteria that will trigger corrective actions, to prevent significant impacts, will be clearly defined to provide operating and decision-making framework for groundwater extraction. When an action criterion is triggered, the event will be reviewed to determine whether it can be attributed to or exacerbated by Project groundwater use and, if so, the specific corrective measures to be employed to achieve the performance standards for reduction or avoidance of adverse impacts to groundwater. The GMMP shall contain the following action criteria, associated corrective actions, and performance standards: ***Action criterion 1.*** Declines in groundwater levels in Project monitoring wells in the Soda Mountain Valley that exceed model predictions by 20 percent or more than 1 foot. ***Corrective measure 1.a*:** The Applicant/Owner shall recalibrate the groundwater model to match the observed groundwater levels, and the predicted decline in outflow from the valley will be recalculated. The results of the recalibrated model will be submitted to BLM and the County within 60 days of the action criterion triggering event occurring. If the recalibrated model predicts a further decline in outflow of groundwater through the Soda Mountain Valley outlets by more than 20 percent over pre-pumping outflow, the Applicant/Owner will provide the BLM and the County the recalibrated groundwater model and the agencies shall identify a safe rate of groundwater extraction. ***Corrective measure 1.b*:** If the rate of groundwater production for the Project exceeds the identified safe extraction rate, then the rate of groundwater production shall be curtailed to the identified safe extraction rate, or less as determined by the BLM and County. ***Performance standard*:** A safe rate of extraction is defined as where model-predicted groundwater outflow from the valley will decrease by less than 20 percent of the pre-pumping outflow.			

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Water (cont.)			
***Action criterion 2*.** Triggering of action criterion 1 and/or a declining trend in water levels in Soda Spring where such trends are attributable to the Project and could cause water levels to decline below sustainable levels for the Mohave tui chub. ***Corrective measure 2.a*:** The Project shall curtail, and, if necessary, cease pumping to the extent necessary to prevent the Project from causing water levels to decline below sustainable levels for the Mohave tui chub. ***Performance standard*:** A significant declining trend in groundwater levels that could cause water levels to decline below sustainable levels for the Mohave tui chub is defined as five consecutive quarters of mean water level declines totaling 3 feet or more for designated monitoring wells at the Desert Studies Center, or 1 foot of decline for Soda Spring, that cannot be attributed to seasonal variation, groundwater pumping or water level manipulation at the Desert Studies Center, or other non-Project causes. The GMMP shall also include, at a minimum, monitoring and quarterly reporting of groundwater elevations in the aquifer adjacent to Soda Spring and water surface elevations in Soda Spring. If NPS already collects these data and is able to share them, the NPS data can be used in lieu of collecting additional data. The BLM and the County shall determine whether existing groundwater supply wells or other water resources surrounding the Project site, such as Soda Spring, are influenced by Project activities. The GMMP shall describe additional corrective measures that may be implemented if the County and the BLM determine that additional corrective measures are required to meet the performance standards described above. Such additional measures could include importing a portion or all of the Project's water from outside of the Soda Mountain Valley subbasin, and would be implemented as agreed upon in the GMMP and with the concurrence of the County and the BLM. The fifth annual monitoring report shall evaluate the effectiveness of the monitoring program. At that time, recommendations for modifying or eliminating the monitoring program can be presented to the BLM and County for consideration. Monitoring shall continue through the life of the ROW Grant unless the BLM and County determine that the monitoring requirements detailed in the GMMP are no longer necessary.			
~~**Mitigation Measure 3.19-4: Groundwater Testing.** Subsequent to the publication of the Draft PA/EIS/EIR a groundwater well test was completed for the Project (Panorama Environmental, Inc., 2014a) to obtain additional scientific data on the Soda Mountain Valley aquifer (Appendix H-4).~~	Testing and the analysis associated with the data derived during the well installation and aquifer pump test, have fulfilled the requirements of Measure 3.19-4. Therefore, Measure 3.19-4 has been removed.	Not applicable.	Not applicable.
Mitigation Measure 3.19-5: Construction period flood protection. The Applicant shall ensure that during construction, temporary construction-related structures constructed within a 100-year floodplain, such as roads, berms, and other facilities would be constructed so as to avoid interference with 100-year flood flows. Temporary installation of the following types of facilities shall be avoided to the extent feasible within the 100-year floodplain: temporary elevated earthen structures such as roads and berms; earthen bridges or other structures within a waterway or flood conveyance that could interfere with flood flows; dams; unnecessary ditches; and other major structures that could concentrate flood flows. Additionally, to the extent practicable, the Applicant shall ensure that the construction process proceeds in a manner so as to minimize exposure of facilities to construction period flooding. Temporary ditches and trenches (such as for pipes, wires, or other infrastructure) should be completed and backfilled as quickly as possible, and should not be left open for extended periods. Drainage infrastructure, such as flood protection berms, should be installed prior to installation of the solar arrays and other facilities on site. Other facilities that may be susceptible to flood damage during construction should be managed so as to minimize construction time of those facilities.		Prior to and during construction	BLM

Mitigation Measure	Modification and Rationale	Timing for Implementation	Monitoring Agency(s)
Wildland Fire			
Mitigation Measure 3.20-1: The Applicant shall prepare and implement a Fire Safety Plan to ensure the safety of workers and the public during Project construction, operation and maintenance, and decommissioning activities. The Fire Safety Plan shall be provided to the BLM and the County's Victorville Fire Protection office (VFPO) for approval before the Applicant receives a Notice to Proceed (NTP). The Fire Safety Plan shall include, but not be limited to, the following elements: 1. All internal combustion engines used at the Project site shall be equipped with spark arrestors. Spark arrestors shall be in good working order. 2. Once initial two-track roads have been cut and initial fencing completed, light trucks and cars shall be used only on roads where the roadway is cleared of vegetation. Mufflers on all cars and light trucks shall be maintained in good working order. 3. Fire rules shall be posted on the project bulletin board at the contractor's field office and others areas such that they would be visible to employees. 4. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials. 5. The Applicant shall make an effort to restrict use of chainsaws, chippers, vegetation masticators, grinders, drill rigs, tractors, torches, and explosives to outside of the official fire season. When the above tools are used, water tanks equipped with hoses, fire rakes, and axes shall be easily accessible to personnel. 6. Smoking shall be prohibited in wildland areas and within 50 feet of combustible materials storage, and shall be limited to paved areas or areas cleared of all vegetation. 7. Each Project construction site (if construction occurs simultaneously at various locations) and the proposed solar plant site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires. 8. The Applicant shall coordinate with the VFPO to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site. 9. All construction workers, plant personnel, and maintenance workers visiting the plant and/or transmission lines to perform maintenance activities shall receive training on the proper use of fire-fighting equipment and procedures to be followed in the event of a fire. Training records shall be maintained and be available for review by the VFPO. 10. Vegetation near all solar panel arrays, ancillary equipment, and access roads shall be controlled through periodic cutting and spraying of weeds, in accordance with the Vegetation Management Plan. 11. The BLM and VFPO shall be consulted during plan preparation and fire safety measures recommended by the agencies shall be included in the plan. 12. The plan shall list fire prevention procedures and specific emergency response and evacuation measures that would be required to be followed during emergency situations. 13. All on-site employees shall participate in annual fire prevention and response training exercises with the VFPO 14. The Applicant shall designate an emergency services coordinator from among the full-time on-site employees who shall perform routine patrols of the site during the fire season equipped with a portable fire extinguisher and communications equipment. The Applicant shall notify the BLM and County of the name and contact information of the current emergency services coordinator in the event of any change. 15. Remote monitoring of all major electrical equipment (transformers and inverters) will screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating which under certain conditions could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken. 16. Fires ignited on site, or off-site as a result of Project-related activities, shall be immediately reported to BLM and the VFPO. 17. The engineering, procurement, and construction contract(s) for the project shall clearly state requirements 1 through 16 of this mitigation measure.		Submit plan at least 30 days prior to construction Implement plan during all Project phases	BLM and VFPO

SODA MOUNTAIN SOLAR PROJECT

Environmental and Construction Compliance Monitoring Program

Soda Mountain Solar, LLC

Lead Agency:

United States Department of the Interior
Bureau of Land Management

Case File Number: CACA-049584

United States Department of the Interior, Bureau of Land Management
Barstow Field Office
2601 Barstow Road, Barstow, CA 92311

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List of Acronyms and Abbreviations

AO	Authorized Officer
BLM	United States Bureau of Land Management
CBC	California Building Code
CD	Compliance Director
CDFW	California Department of Fish and Wildlife
CM	Compliance Manager
ECCMP	Environmental and Construction Compliance Monitoring Program
ECM	Environmental Compliance Monitor
EI	Environmental Inspector
PA/FEIS/EIR	Plan Amendment/Final Environmental Impact Statement/Environmental Impact Report
FLPMA	Federal Land Policy and Management Act
MW	Megawatt
NTP	Notice to Proceed
PM	Project Manager
POD	Plan of Development
ROD	Record of Decision
ROW	right-of-way
SWPPP	Storm Water Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service

1.0 Introduction

1.1 Background

The Bureau of Land Management (BLM) issued a right-of-way (ROW) grant authorizing the construction, operation, maintenance, and decommissioning of the Soda Mountain Solar Project (Project). Soda Mountain Solar, LLC (Grant Holder) is a wholly-owned subsidiary of Bechtel Development Company, Inc. The ROW will be issued for a term of 30 years with a right of renewal in accordance with 43 Code of Federal Regulations (CFR) 2807.22. The ROW grant will allow the Grant Holder the right to use, occupy, and develop public lands to construct, operate, maintain, and decommission an approximately 1,767-acre, 287-megawatt (MW) alternating current solar photovoltaic energy generation facility in San Bernardino County (County). The Project site is located approximately 6 miles southwest of Baker, California, along Interstate 15 (I-15). Under the BLM's Selected Alternative, which is defined in Section 2.4 of the Record of Decision (ROD), the Project would be located entirely on public lands managed by the BLM Barstow Field Office.

The BLM will have the primary oversight and regulatory authority over the Project's construction lifecycle in accordance with the National Environmental Policy Act (NEPA). Under Memorandum of Understanding Agreement No. 03-1211 between the BLM and the County, facilities requiring groundwater wells fall under the County's jurisdiction and would, therefore, be required to comply with County Ordinance No. 3872 regarding permitting and monitoring of groundwater extraction wells, including applicable local conditions of approval and mitigation measures stipulated in the well permit and Proposed Plan Amendment/Final Environmental Impact Statement/Final Environmental Impact Report (Proposed PA/FEIS/EIR), respectively.

The Council on Environmental Quality has established regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires mitigation monitoring in 40 CFR 1505.2(c), with additional specificity provided in the BLM NEPA Handbook (H-1790-1), Chapter 10 (Monitoring). The BLM also served as the lead federal agency for Section 7 consultation under the federal Endangered Species Act (FESA), and Section 106 consultation under the National Historic Preservation Act (NHPA) for the Project.

1.2 Purpose

The BLM requires holders of right-of-way (ROW) grants to prepare and fund an environmental compliance monitoring program to ensure compliance with the BLM terms, conditions, and stipulations in the ROW grants, the Plan of Development (POD), and other project-specific mitigation, terms, and conditions (listed in detail in Chapter 2.0, Objectives of the Environmental and Construction Compliance Monitoring Program). This report presents the objectives of the BLM Environmental and Construction Compliance Monitoring Program (ECCMP) for the Project. The purpose of the ECCMP is to provide an on-the-ground approach to compliance during Project construction which is designed to facilitate

successful implementation. This report also discusses the monitoring reporting and documentation requirements, stop work authority, and the variance process.

1.3 Authority of the ECCMP

In addition to the BLM's administration of approved activities on public land, other local, State, and federal agencies may have jurisdiction over resources or activities within the Project limits and may issue permits containing conditions for these activities. Jurisdictional agencies' designated representatives may visit construction areas at any reasonable and safe time, and may require information regarding the status of compliance with permit conditions issued by their respective agencies. While these data requests will be satisfied by the Grant Holder and coordinated with the BLM Compliance Monitoring Team, the CM team will be responsible for tracking implementation of and adherence to these conditions during the preconstruction and construction process in support of the BLM. It is expected that the Grant Holder will ensure this documentation is provided to the BLM AO and PM in a timely fashion.

1.3.1 Federal

The following federal documents may contain environmental mitigation requirements, stipulations, terms, conditions, and other measures requiring deliverables from the Grant Holder prior to, during, and post construction:

- 2016 ROD for the Project (lead agency, BLM), containing:
    - Adopted Applicant-proposed measures (APMs) and mitigation measures (Appendix 4 of the ROD)
    - A Biological Opinion issued by the United States Fish and Wildlife Service (USFWS) developed in accordance with the FESA (16 United States Code 1531-1544)
    - An Incidental Take Statement issued by the USFWS pursuant to Section 7(a)(2) of the FESA
- ROW Grant (lead agency, BLM), containing:
    - Terms, conditions, and stipulations
    - Notices to Proceed, which may contain additional conditions
    - Construction procedures in the approved POD for the project

1.3.2 State

The following State permits and documents may contain environmental mitigation requirements, stipulations, terms, conditions, and other measures requiring deliverables from the Grant Holder prior to, during, and post construction:

- Section 1602 Lake or Streambed Alteration Agreement process under the California Fish and Game Code (lead agency, California Department of Fish and Wildlife [CDFW])
- Porter-Cologne Water Quality Control Act Waste Discharge Requirements and BMP Plan (Lahontan Regional Water Quality Control Board)
- California Department of Transportation (Caltrans) encroachment permit

1.3.3 Local

The following local permits may contain environmental mitigation requirements, stipulations, terms, conditions, and other measures requiring deliverables from the Grant Holder prior to, during, and after construction:

- County of San Bernardino Groundwater well permits (production and monitoring)
- Mojave Desert Air Quality Management District Rule 403.2 Dust Control Plan

2.0 Objectives of the Environmental and Construction Compliance Monitoring Program

The overall objective of the ECCMP is to clarify agency requirements and expectations of the BLM Compliance Monitoring Team during the preconstruction, construction, and initial operation phases of the Project. The following elements are included in the ECCMP to support this objective:

- A description of the roles and responsibilities of the Compliance Monitoring Team
- A definition of the decision-making authority for each role within the Compliance Monitoring Team
- The level of effort anticipated from the Compliance Monitoring Team members
- Communication protocols among Compliance Monitoring Team members
- A description of the monitoring, reporting, and documentation requirements, including adaptive management processes during construction

In order to ensure the ECCMP remains applicable to changing site-specific conditions throughout project development, the ECCMP is a dynamic plan and may be modified at any juncture of the Project's lifecycle. Modifications to the document may be requested by the Grant Holder, the BLM project manager (PM), or the Compliance Director (CD). Ultimate approval of any modifications to the plan will be made by the BLM Administrative Officer.

Other objectives of the ECCMP are to:

- Facilitate the timely resolution of compliance-related issues in the field
- Provide continuous information to the BLM and other agencies and parties as authorized regarding noncompliance issues and their resolution
- Review, process, and track construction-related changes to project plans (as described later in Section 6.0, Variances, the Monitoring Contractor will assist with implementation of the variance process in accordance with a predetermined level of decision-making authority granted by the BLM)
- Develop and implement a system for storing the information collected during the ECCMP in a format that will allow easy retrieval and search functions

The ECCMP has been prepared to document and ensure compliance during the construction phase. Mitigation measures and stipulations of the ROW grant require the Grant Holder to implement long-term

mitigation activities for the life of the ROW grant beyond the construction phase. The AO, at his or her discretion, may determine that the long-term implementation of mitigation as required of the Grant Holder may necessitate engaging a third party to assist in tracking and monitoring these mitigation efforts on behalf of the BLM. If such determination is made, a separate compliance and reporting plan will be devised between the BLM and the Grant Holder to ensure successful implementation of mitigation measures applicable to ongoing Project operational activities for the life of the ROW grant. This plan would include at a minimum, the following provisions:

- A compliance manager representing the Grant Holder, in the role of ensuring compliance with the plan
- Adaptive management procedures to address change in conditions, regulations, etc.
- Means of accurately tracking compliance (e.g., compliance tracking database)
- Coordination with the BLM and other agencies to report Non-compliance issues
- Initial training and refresher training of personnel, commensurate with their roles and responsibilities
- Inspection and monitoring procedures
- Reporting and recordkeeping procedures
- Measures to address decommissioning of the Project at partial and final closure

3.0 Roles and Responsibilities

The Grant Holder will establish a Compliance Monitoring Team for the Project. In general, the Compliance Monitoring Team will consist of BLM personnel; third-party contractor compliance personnel, hired by the Grant Holder but accountable to and directed by the BLM; and Grant Holder personnel. This section describes roles, responsibilities, level of effort, and authority of key project personnel within the Compliance Monitoring Team with respect to the ECCMP.

3.1 BLM Personnel

The BLM's Compliance Monitoring Team will consist of the authorized officer (AO) and/or his/her designated officer, or project manager (PM) in charge of compliance and any other staff as required.

3.1.1 BLM Authorized Officer

The BLM Authorized Officer (AO) will be the BLM Barstow Field Office Manager with the administrative authority for the ROW grant issuance and authority for accepting and approving project-related changes. This may be the field office manager or his/her delegate.

3.1.2 BLM Project Manager

The BLM Project Manager (PM) is designated by the BLM AO as the point of contact for all compliance-related issues. The BLM PM is the primary point of contact at the BLM for the Compliance Manager (CM; see Section 3.2.2) and provides unified agency direction to the BLM/Grant Holder Compliance Team. The BLM PM will ensure, to the extent practicable, that information requiring agency review will be disseminated internally and that comments and direction are consolidated and presented to the Compliance Monitoring Team.

3.1.3 BLM Resource Specialists

Various resource specialists may be involved with implementation of this project. They will assist the BLM PM and environmental monitors with evaluation of conditions and project status relative to mitigation requirements or other stipulations. The support staff will include archaeologists, biologists, geologists, and other specialists as required. Any information, maps, reports, findings, etc. that need to be reviewed by the BLM Resources Specialists shall be coordinated with the BLM PM and the CM.

3.1.4 Surface Compliance Technician

The surface compliance technician (SCT) will serve as the on-the-ground BLM person responsible for observing and reporting compliance with the terms and conditions of the BLM ROW authorization for all phases of project construction. The SCT will report to the BLM PM and the AO and will regularly collaborate with the CM and the Grant Holder environmental inspectors (EIs; see Section 3.3.2). The SCT

will report all issues/concerns noted along the ROW to the Grant Holder EI and/or the BLM environmental compliance monitors (ECMs; see Section 3.2.3) and/or CM.

3.2 Monitoring Contractor Personnel

A third-party compliance contractor (Monitoring Contractor) will be responsible for providing BLM third-party oversight and reporting services for the Project. The Monitoring Contractor will conduct such monitoring and reporting as extension of BLM staff. The Monitoring Contractor shall enter into a contractual agreement with the Grant Holder for third-party monitoring and reporting program services associated with implementing the Project and all necessary support activities.

The Monitoring Contractor will provide the expertise, staffing, and technical capabilities required for monitoring and reporting associated with a Monitoring Contractor program. The Monitoring Contractor will not be responsible for implementation of the BLM terms, conditions, and stipulations in the ROW grant, the POD, and required mitigation as provided for in the ROD; these will be the responsibility of the ROW Grant Holder. Similarly, the Monitoring Contractor will not direct the day-to-day activities of Grant Holder personnel or subcontractors working on the site.

The Monitoring Contractor's planned monitoring coverage assumes that the construction contractors will demonstrate a high level of environmental compliance, and that the Grant Holder's compliance personnel will be qualified and experienced.

3.2.1 Compliance Director

The Compliance Director (CD) will have the oversight of contracts, budgets, and administrative processes, and may be consulted on major compliance issues with the CM. The CD may also facilitate the permit-to-construction transition process.

3.2.2 Compliance Manager

The Compliance Manager (CM) will be the primary point of contact position for the BLM and Grant Holder regarding all compliance-related issues (including variances) from an administrative perspective. The CM reports to the BLM AO and the BLM PM for compliance. The Compliance Manager will regularly evaluate the effectiveness of the environmental compliance monitoring in consultation with the BLM and Compliance Contacts to ensure adequate staffing.

Specific responsibilities of the CM include, but are not limited to, the following:

- Oversee management of the ECCMP
- Participate in the preconstruction kickoff meeting
- Participate in the Worker Environmental Awareness Program (WEAP)
- Supervise the ECMs' monitoring activities and schedules

- Provide guidance on and review of compliance issues
- Ensure that all reported non-compliances are tracked for resolution by the Grant Holder
- Revise and process variance requests
- Facilitate weekly construction progress meetings and providing weekly status updates
- Managing project documentation with respect to compliance (reviewing Grant Holder and BLM Compliance Monitoring Team reports, and correspondence for the administrative record, etc.)
- Disseminating weekly reports
- Ensuring adherence to the Scope of Work and discussing all potential modifications with the Grant Holder

3.2.3 Environmental Compliance Monitors

The Environmental Compliance Monitors (ECMs) will serve as the on-the-ground personnel responsible for observing and reporting compliance with the terms and conditions of the BLM ROW authorization for all phases of project construction. The ECMs report to the CM, but collaborate with the Grant Holder EIs on a daily basis. As appropriate, the Designated Resources Specialists (e.g., Designated Biologist, Designated Cultural Resources Specialist, etc.) approved by the BLM in accordance with relevant mitigation measures, and the monitors working under them, may serve as Compliance Monitors.

Responsibilities. In general, the ECMs will be deployed on site to observe activities performed by the Grant Holder's EIs and construction and development crew and to ensure these activities meet the description outlined in the POD; the intent of approved mitigation; and the terms, conditions, and stipulations of the ROW grant.

Prior to the start of construction, the ECMs will become familiar with the Project's approved design and the environmental and construction compliance management program, participate in the preconstruction meeting, participate in the WEAP on an as-needed basis, and receive additional training as needed from Grant Holder personnel. The ECMs will become familiar with the roles and responsibilities of the Project's immediate field team, environmental reporting responsibilities, and the chain of command.

Throughout construction, the ECMs will document the Grant Holder's compliance and/or noncompliance with the environmental requirements through the use of approved forms. The ECMs will record observations, including digital photograph documentation at each location visited. This process will ensure consistent and accurate reporting of site conditions at the time of inspection and will serve to record evolution of the site with respect to development. Each activity monitored will be assigned a compliance level.

The ECMs will regularly evaluate the effectiveness associated with environmental compliance monitoring in consultation with the CM and BLM PM to ensure the intent of the compliance plans are being

adequately met. Designated environmentally sensitive areas (marked and/or flagged by the Grant Holder EIs) will be regularly inspected to ensure protection of the resources.

The ECMs will review Level 1 Variances on site and may approve Level 1 Variance Requests, as appropriate to their authority level, for implementation of limited variations from mitigation measures previously agreed to by the Grant Holder or stipulated by other agencies (see Section 6.0, Variances).

In order to ensure a collaborative approach to environmental compliance, the ECMs will maintain, at a minimum, contact with the Grant Holder environmental staff and the construction and development crew. This approach will allow the Grant Holder and the ECMs to exchange information on the status of construction and to discuss any significant construction events scheduled in the near future. The ECMs may inspect all construction activities with Grant Holder construction monitors or independently.

Authority. The ECMs on site will have the authority to halt any construction activity that has the potential to damage a sensitive resource. This could include activity in Non-compliance with a term, condition, or stipulation of a ROW grant, etc. In the event of potential Non-compliance, the ECM will immediately notify the Grant Holder EI and the CM. The Grant Holder lead EI will initiate his/her approved chain of command system to initiate issue resolution.

Level of Effort. The level of monitoring effort and staffing will be evaluated by the CD and the CM in consultation with the BLM PM, with input from the ECMs throughout the life of the project. The number of ECMs may be determined based on the specific activities during each construction phase.

3.3 Grant Holder Compliance Personnel

The Grant Holder Compliance Monitoring Team will be responsible for development and implementation of the Project's compliance program. The Grant Holder Compliance Monitoring Team will report internally to Grant Holder supervisors and will report to the CM and the BLM, jointly.

In general, the Grant Holder Compliance Monitoring Team will be responsible for communication and coordination with the applicable regulatory agencies and ensuring compliance with the various conditions and requirements of the full range of project permits and approvals. The Grant Holder will ensure excellent record keeping with respect to due diligence on mitigation (including plans, surveys, reports, and keeping plans current) and distribution of those materials to the BLM Compliance Monitoring Team via electronic methods.

The Grant Holder compliance representatives for the project are identified in the following sections.

3.3.1 Compliance Lead

The Compliance Lead (CL) will be responsible for providing the appropriate level of resources for successful implementation of the ECCMP. The CL is the primary sole point of contact for Grant Holder Compliance Monitoring Team and, as such, will directly communicate with the CM as identified in Section 3.2.2 of this ECCMP. The CL directs the development and implementation of the preconstruction

environmental planning, permitting, and compliance activities; the environmental inspection program; and environmental training. The CL will be the designated official responsible for high-level coordination and dispute resolution with respect to mitigation compliance and authorized terms and conditions of the ROW.

3.3.2 Environmental Inspectors

The Environmental Inspectors (EIs) will be the on-the-ground compliance personnel responsible for implementing the compliance program mitigation dictated under the ROD, the ROW grant, and the NTP conditions for all phases of project construction. This includes resolution of all Problem Areas or activities found to be in Non-compliance.

A lead on-site EI will be designated for the project and will serve as the primary point of contact for the ECM on site. A designated biological resource manager and cultural resource manager will be identified as part of the EI team and will be approved by the BLM per applicable mitigation measures and ROW stipulations. Other environmental specialists, approved by the BLM and the Grant Holder, will be called upon to support the CL and overall environmental compliance efforts.

4.0 Environmental Compliance Monitoring and Management

4.1 Implementation

Appendix 4 of the ROD lists the mitigation measures included in the Proposed PA/FEIS/EIR and adopted in the BLM ROD. The mitigation monitoring table is the core document for environmental requirements of the Project and will be the primary guideline for determining compliance with the ECCMP. The CM shall ensure that a copy of the table is kept on site at all times, and all supervisory staff working on the Project should be familiar with its contents.

Many of the adopted mitigation measures require the implementation of mitigation plans that will be developed and approved prior to construction. While development, review, and approval of preconstruction mitigation plans represent a best attempt at due diligence with respect to ensuring that the intent of the mitigation measures is successfully met, it is possible that some mitigation strategies, once implemented on the ground, may prove infeasible, impractical, or unsuccessful. To reduce the likelihood of this scenario, the BLM may conduct an on-the-ground assessment of implementation activities designed to meet mitigation measures, and provide adaptive strategies through collaboration with the CM, ECMs, the Grant Holder, and other regulatory agencies as appropriate to ensure successful implementation. To further reduce the likelihood of unsuccessful implementation of mitigation strategies, the BLM may request as-needed meetings with the CM, the ECMs, the Grant Holder, and other regulatory agencies prior to on-the-ground implementation. Additionally, the BLM may coordinate milestone site visits to view the progress of implementation.

4.2 Communication

Communication and collaboration is a critical component of a successful environmental compliance program and can promote a positive and efficient work environment. BLM expects the Grant Holder's CL and EIs to interact regularly with the BLM Compliance Monitoring Team and to maintain professional, responsive communications at all times. Similarly, it is expected that the Grant Holder's representatives will coordinate closely with BLM's Compliance Monitoring Team to address and resolve issues in a timely manner. This section provides several tools/requirements for open and transparent communication throughout the project, and to facilitate efficient dissemination of project information about ongoing surveys and mitigation measures, construction activities, and planned or upcoming work.

4.2.1 Preconstruction Compliance Coordination

In accordance with mitigation measures and ROW terms and conditions, the Grant Holder is required to perform a number of pre-construction activities, including but not limited to preconstruction biological surveys, preparing and submitting dust control plans, and submitting and obtaining BLM approval of mitigation plans. The purpose of the preconstruction coordination process between the Grant Holder and

the BLM Compliance Monitoring Team is to discuss submittal status, agency review and approval cycle, and preconstruction mitigation status (e.g., acquisition of mitigation lands). Additionally, the goal of the preconstruction process is to complete all required actions so the BLM and other agencies, as appropriate, can issue NTPs for each project component. The BLM Compliance Monitoring Team, CD, and CM may be asked to review preconstruction plans to ensure the plans meet required federal, state, or local standards, as well as the intent of mitigation measures adopted in the ROD.

Preconstruction Kickoff Meeting(s). A preconstruction meeting and/or several meetings will be held with the BLM, the Monitoring Contractor's CM and one ECM, the Grant Holder's compliance and construction team, the BLM Compliance Monitoring Team, and other agencies or parties as deemed appropriate by the BLM. The preconstruction kickoff meeting will serve to outline agency expectations of the team, to refine the ECCMP if appropriate, to agree on the Project's communication protocol and chain of command, discuss the WEAP, and to further discuss the POD.

4.2.2 Communication Protocol During Construction

The following protocols have been formulated to ensure that timely and accurate information is disseminated to all parties involved in the construction process of the Project, facilitating a responsive, solution-oriented work environment:

- The BLM Compliance Monitoring Team will adhere to a mutually agreed-upon communication protocol between Grant Holder and the BLM; the Grant Holder protocol will not interfere or inhibit the ECM's ability to communicate transparently with the BLM.

- In general, the BLM ECM's primary point of day-to-day contact on site will be the Grant Holder EIs. If issues can't be resolved at the ECM/Grant Holder EI level, they will be initially elevated to the CM and the BLM PM, and the Grant Holder CL via email or phone, whichever is determined to be applicable/appropriate to the situation.

- Grant Holder will inform the BLM ECM of all survey and construction activity on a daily basis, including, but not limited to, location of such activities and Grant Holder personnel mobilization associated with such activities. This will help facilitate timely and appropriate dispersion of BLM ECMs based on activity level.

- The BLM ECMs and any other designated agency representatives or staff may converse with any and all personnel on the construction site to ask questions about their activity, but the construction personnel may opt to refer him/her to the appropriate Grant Holder official for an answer. If the question relates to a potential resource-threatening Non-compliance issue, the BLM ECM will immediately notify the Grant Holder EI and jointly discuss the issue with the construction personnel on site.

- Grant Holder personnel will not, under any condition, direct the work of a BLM ECM. If concerns about an ECM arise, the CM will be notified immediately.

- Grant Holder will provide a list of all EIs or resource monitors on site, their titles/responsibilities, and their contact information. Updated distributions will be utilized to keep all parties informed of monitor and staff additions/changes. This list of personnel and all subsequent updates shall be distributed to all persons on the list throughout the construction process.

4.2.2.1 Construction Meetings

Grant Holder will conduct field meetings as-needed with PMs, contractor supervisors and foremen, and Grant Holder's environmental representatives to discuss work completed, work anticipated for the following period, and the implementation status of mitigation measures. The field meetings will also be a forum for discussing safety and environmental compliance issues. Grant Holder will include the BLM on-site Compliance Monitoring Team in daily construction and safety briefings to facilitate communication. Grant Holder may request the BLM's and any other previous period. Alternatively, Grant Holder or BLM ECM(s) may recommend a separate meeting to discuss mitigation, potential variances, or other project-related issues.

In addition to the progress meetings conducted at the field level, the Grant Holder CL, the Grant Holder CM, the Grant Holder EIs, the BLM ECMs, the BLM PM, and/or other jurisdictional agencies may participate in a regular teleconference call (see Section 5.1, Weekly Status Updates). The teleconference calls would be similar to the progress meeting; however, the conference calls would focus on mitigation monitoring.

4.2.2.2 Communication Specific to Non-Compliance

There are varying levels of severity with respect to non-compliant events. The communication protocols identified below have been formulated for non-severe Non-compliance events. Severe Non-compliance events specific to BLM's scope of authority, such as "take" or discovery of human remains during construction of the Project, have established protocols within approved documents such as the Biological Opinion, the Historical Properties Treatment Plan, the Native American Graves Protection and Repatriation Act, and their appendices. Regardless, the Grant Holder or the Compliance Monitoring Team will immediately notify BLM and the CM if such event occurs, and appropriate communication channels will be initiated.

- Step 1. The BLM ECM will notify Grant Holder EI of the suspected Non-compliance issue. The issue and communication is documented on the daily form.

- Step 2. The BLM ECM will notify the CM. Grant Holder will notify agencies directly if the Non-compliance issue relates to a permit condition issued by those agencies. The Non-compliance activity and communication efforts are noted on a consolidated tracking sheet for Non-compliance incidents.

- Step 3. Grant Holder acknowledges the Non-compliance issue and provides a response plan for corrective action to the BLM and the Compliance Team. Grant Holder will track the corrective actions and report completion status.

- Step 4. The BLM AO or the PM may inform other interested parties (e.g., permitting agencies) if Non-compliance actions relate to their jurisdictional authority or recognized interests.

4.2.3 Coordination with Other Agencies

As identified in Section 1.3, several local, state, and federal agencies have jurisdiction over portions of the project. The BLM, as the lead agency, is responsible for ensuring that mitigation measures reviewed and approved by the BLM during the NEPA process are implemented throughout construction. Other jurisdictional agencies are required to ensure compliance with their respective measures under their jurisdiction and may visit the project site from time to time and request information regarding the status of an applicable mitigation measure.

The Grant Holder will be responsible for satisfying requests from jurisdictional agencies and will notify and copy the BLM on all correspondences related to final approvals and verifications for the project if not otherwise copied on the correspondence.

The BLM CM and the Grant Holder's CL will include other agencies, such as the USFWS or the CDFW in the monitoring and documenting of environmental compliance to the extent requested by those agencies and authorized by the BLM; however, the primary point of contact regarding these requirements for the BLM CM will continue to be the BLM AO or designee.

4.2.4 Soda Mountain Solar Contacts

The Grant Holder has designated the following contact persons for the construction of the Project:

- **To Be Determined**

5.0 Reporting and Documentation

5.1 Notices to Proceed

As stipulated in approval and authorization documents, project-related construction activities will not begin until certain preconstruction mitigation measures and submittals have been satisfied. Grant Holder shall submit comprehensive documentation proving satisfaction of preconstruction requirements to the CM and the BLM prior to the BLM issuing an NTP for project construction. In the event BLM elects to issue multiple NTPs for the project, this same documentation will be required prior to each NTP issuance. Additionally, the NTP may include applicable conditions or requirements that must be satisfied prior to the start of work or during construction. BLM will further refine "comprehensive documentation" during the preconstruction meeting in collaboration with Grant Holder, agencies, and the BLM Compliance Monitoring Team. This could include, but is not limited to, the following:

- A further refined description of the activities, the duration of activities, and the sequential phase during which the activities will occur (schedule)
- Detailed maps, photographs, and/or other supporting documents or geographic information system data not already included as part of the POD package
- Verification that all mitigation measures have been met or do not apply to the work covered by the NTP
- Verification that all applicable jurisdictional permits or agency approvals have been obtained
- Verification of agency approval of specific biological monitors

5.2 Daily Reporting

5.2.1 Grant Holder Environmental Inspector

The Grant Holder Compliance Lead will compile all daily site observation forms (which could include biological or general-focused reports) completed by Grant Holder EIs and distribute them to the BLM, the BLM Compliance Monitoring Team, and the Grant Holder team via a mutually agreed-upon methodology (e.g., email or password-protected project website) at the completion of daily construction activities. The daily forms will identify, but will not be limited to, the type of construction activities occurring, compliance levels, and communication between all parties on site regarding the status of environmental compliance.

5.2.2 Environmental Compliance Monitor

The ECM will provide a daily site observation form to the CM at the completion of daily site observations. The ECM report will identify compliance levels with environmental mitigation measures

and communications provided to any Grant Holder representative and/or agency representative. Based on the ECM daily report compliance levels, the CM may distribute to the BLM PM and/or discuss issues/concerns via email or phone.

5.3 Weekly Status Updates

Each ECM will compile his/her activity logs and contact information documents into a weekly status update on the required cover and form provided in Attachments A and B, respectively. The ECM will document the construction level as a percent complete or other identifying method as agreed to by the BLM; the presence of sensitive species or habitat and culturally sensitive sites; and provide a brief description of the construction activities observed (such as road grading, foundation installation, erosion control, etc.). When appropriate, relevant digital photographs will be taken and included in the weekly report and/or individual activity logs.

Each separate activity monitored and documented in a log will be assigned a compliance level. The compliance levels that will be used for the Project are:

- Communication;
- Acceptable;
- Problem Area;
- Noncompliance; and
- Serious Violation.

5.3.1 Communication

A communication report will be prepared when necessary to document and track relevant meetings or discussions between the ECM and agencies, Grant Holder representatives, monitors, inspectors, or other contractor personnel.

5.3.2 Acceptable

An acceptable report will be prepared when an ECM determines that an inspected area or activity is in compliance with the project specifications and all mitigation measures have been adequately implemented.

5.3.3 Problem Area

The ECM will prepare a problem area report to record an observation that a location or activity does not meet the definition of acceptable but is not considered a noncompliance. The problem area category will be used to report a range of events and observations including:

- An incident that is accidental or unforeseeable but is not out of compliance with the project specifications, and the Grant Holder's response is appropriate and timely. An example would be a fuel leak where project personnel respond properly by stopping, containing, and cleaning up the spill in accordance with the project specifications.

- A location where the project is not out of compliance with the specifications but, in the judgment of the ECM, damage to resources could occur if corrective actions are not taken. Some examples are:

    - A topsoil pile located on the bank of a drainage; or

    - An improperly constructed/located erosion control structure.

- An activity that the ECM determines is an unintentional and isolated departure from the project specifications, with no damage to resources. An example would be a small amount of blading or mowing outside the access pathway that has no effect on sensitive resources such as sensitive plant habitat or a water body.

If a problem area is resolved in a timely manner, it will not be considered a noncompliance. If a problem area is found to be a repeat situation or multiple instances of a similar nature occur, is not corrected within the established time frame, or results in resource damage because timely corrective action failed to occur, the ECM may document the problem area as a noncompliance as described in the following section.

5.3.4 Noncompliance

A noncompliance report will be issued when an ECM observes an activity that violates (defined as not in compliance with) the Project specifications, building codes, or other requirements; results in damage to resources; places sensitive resources, personal safety or worker safety at unnecessary risk; and/or is a repeated scenario of actions noted as "Problem Areas." Non-compliance may also include deficient or nonexistent implementation of mitigation measures/stipulations, ultimately having the potential to result in irreversible environmental damage; this can include not implementing mitigation measures in accordance with stipulated timing restrictions. Some examples of noncompliance activities are:

- Failure to install or maintain required erosion control devices or failure of erosion or sediment control structures if it puts a sensitive resource at risk;

- Ground-disturbing activities conducted outside the approved ROW and disturbance limits;

- Surface-disturbing activities conducted without an appropriate biological or cultural resources monitor present;

- Heavy equipment or truck encroachment into a designated avoidance area (environmentally or culturally sensitive area);

- Gross negligence in vegetation salvage as defined in restoration and revegetation plans; or

- Construction activity in locations where seasonal restrictions exist, if applicable.

The ECM will notify the Grant Holder's EI or CL about a noncompliance before issuing a noncompliance report. The noncompliance report will include the name of the inspector or monitor and the time of notification. Where practicable and where the nature of the noncompliance activity warrants, the inspector or monitor will work closely and collaboratively with the ECM to determine the appropriate corrective action.

Resolution of noncompliance activities will involve close coordination with the Grant Holder EIs,, the BLM SCT, the BLM PM, and contractor construction supervisory personnel to ensure that the corrective measures are properly understood and implemented. It is the responsibility of the Grant Holder EI team to provide follow-up documentation to the BLM and other agencies with appropriate jurisdiction over the issue as well as to the CM. Once the Grant Holder documents the resolution of a noncompliance, the applicable ECM will inspect the area and verify and document that the noncompliance has been adequately resolved.

5.3.5 Serious Violation

A serious violation report will be issued by an ECM immediately on observing an activity that is not in compliance with the Project specifications and causes substantial harm to resources or poses a serious threat to sensitive resources or worker/public safety. Examples of serious violations include deliberately conducting an activity that results in disturbance within an exclusion zone for a sensitive resource, repeated or cumulative noncompliance activities that could lead to a substantial impact on resources, and failure to correct previously identified noncompliance activities in an established time frame.

A serious violation report requires that the CM and the BLM PM participate in a conference call or meeting with the Grant Holder Compliance Lead for the project and EI(s) to discuss the violation, the proper corrective actions, and possible follow-up enforcement actions that could be imposed. It will be the responsibility of the Grant Holder EI team to provide follow-up documentation to the BLM and other agencies with appropriate jurisdiction over the issue as well as to the CM. Once the Grant Holder documents the resolution of a serious violation, the ECM will inspect the area and verify that the issue has been adequately resolved.

5.4 Monthly Summary Reports

The Monitoring Contractor and all compliance monitoring personnel will use a comprehensive monthly summary database reporting system that is posted on a non-public, secure website and available for review to other jurisdictional agencies. Under this program, each monthly report, consisting of all compliance levels and photographic documentation from logs, will be available each month and will provide the BLM project personnel, Grant Holder, and applicable agencies with a readily accessible record of construction progress, photographic documentation, and documentation of compliance with the project environmental requirements. If archaeology-focused reports are required, the BLM may request a specific password-protected site be established for this process.

Monthly summary reports will be issued that briefly describe construction activities during the reporting period and summarize by compliance level the number of reports completed by the ECMs during that reporting period and cumulatively for the construction period for that project phase. The monthly summary report will also include a table of problem area and noncompliance reports issued by the ECMs during the reporting period and the Level 1, 2, and 3 variance requests approved by the ECMs and the CM during the reporting period. The monthly summary report will also include a table summarizing the net acreage of land affected by approved variances on federal land and, for the Archeological Resources Protection Act and Endangered Species Act, nonfederal land for the reporting period as well as cumulatively. The Monitoring Contractor's baseline electronic database reporting system will be designed to generate all the information in the tables of the monthly summary report (Figure 1).

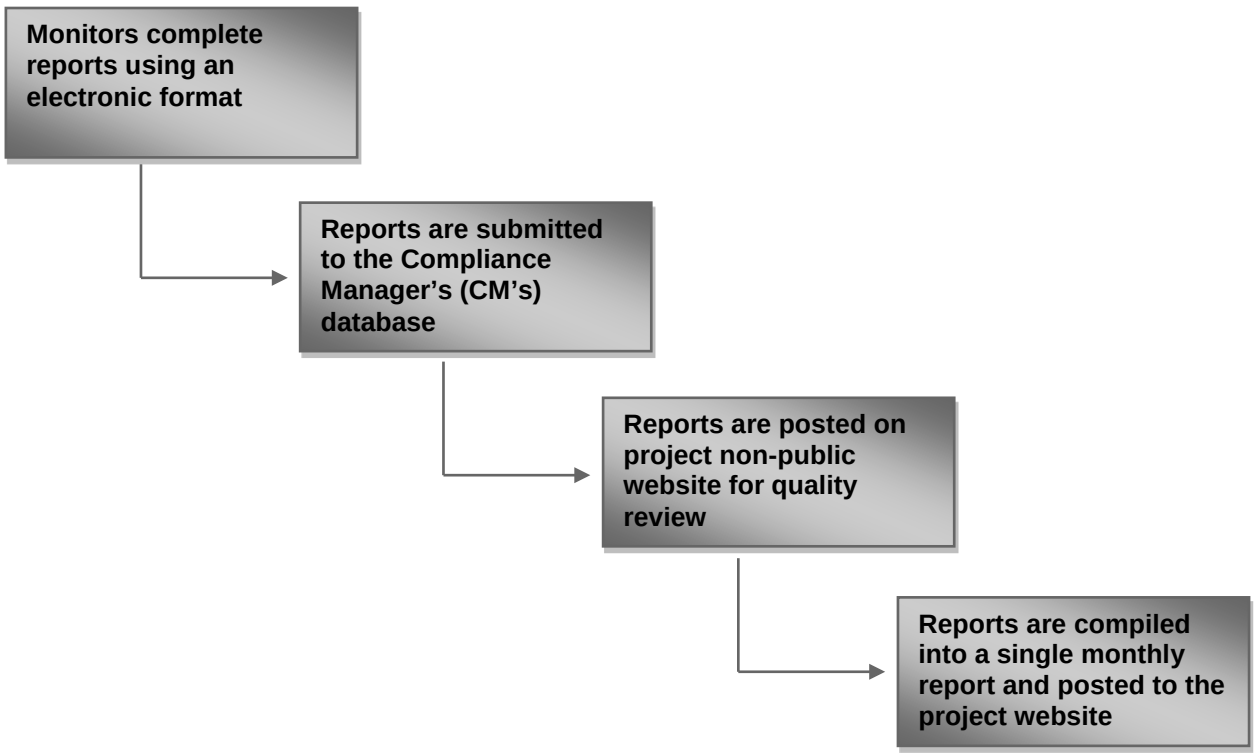

Figure 1: Web-based Reporting System

The monthly summary reports will be posted on the non-public project website (refer to Section 5.5). When the monthly summary report is posted, the CM will send an email to the authorized distribution that it is available. The email will include the link to the website. The BLM, Monitoring Contractor, and Grant Holder representatives will be included in the distribution for the monthly summary report. A sample monthly summary report is provided in Attachment C.

5.5 Non-Public Project Website

The Monitoring Contractor will establish and maintain a non-public, password-protected project website to display the weekly status updates and monthly monitoring reports and the approved Level 1, 2, and 3 variances (refer to Section 6.0, Variances). The Project website may also be used to post meeting minutes, notes from conference calls, and guidance from agencies regarding interpretation of environmental requirements. The BLM and Monitoring Contractor representatives will have access to the entire website. The Grant Holder representatives will have access to parts of the website as authorized by the BLM PM and Information Technology.

5.6 Public Website

In order to facilitate public awareness about the Project, the BLM's CM will establish and maintain a website for the Project. This will be hosted by the Monitoring Contractor. Documentation of the construction monitoring process may include, but would not be limited to, the ECCMP; links to the BLM website containing the Proposed PA/FEIS/EIR, the ROD, and the ROW grant; NTP (s); variances; maps and photographs; project schedule; and links to other publicly available permits issued by other agencies. If determined appropriate by the BLM, the public website will also include a project hotline by which interested parties can contact the BLM regarding project concerns throughout construction.

5.7 Final Report

The Grant Holder will provide all final documentation to the BLM in a compiled report, including all finalized mitigation plans (inclusive of revisions), regular EI and monitor reports required by ROW stipulations, and administrative record emails regarding issue resolution. This may be submitted to the BLM directly or via the project's password-protected site. The CM will provide all final documentation to the BLM regarding weekly reports, meeting minutes, variance requests, and administrative record emails regarding issue resolution. Prior to the Project's Operation and Maintenance Phase, the BLM may elect to have a final closeout meeting to discuss the construction process of the Project, recommendations, and lessons learned in an effort to ensure the future betterment of the overall agency compliance process.

6.0 Variances

During construction of the Project, unforeseen or unavoidable site conditions could result in the need for changes from the approved mitigation measures and construction procedures. Additionally, the need for route realignments, extra workspace, or changes to previously approved construction work areas may arise. Changes to previously approved mitigation measures, construction procedures, and construction work areas will be handled in the form of variance requests to be submitted by the Grant Holder and reviewed and approved or denied by the BLM, with the delegation of some authority for variances to the Monitoring Contractor. The variance process will also be a good mechanism to clarify discrepancies or inconsistencies discovered in project materials and/or to distribute information to the entire project team.

A system of three variance levels (Levels 1, 2, and 3) will be used to categorize and process variance requests. The three variance levels, the review and distribution process, and the decision-making authority proposed for each level are discussed in the following sections. A sample variance request form is provided in Attachment E.

6.1 Level 1 Variances (Field Decisions)

Level 1 variances are site-specific, minor, performance-based changes to project specifications, construction methods, or mitigation measures that provide equal or better protection to environmental resources or better constructability. These minor variance requests can be reviewed and either approved or denied by the Compliance Monitors in the field during normal construction activities.

Examples of Level 1 variance requests include:

- Allowing rubber-tired vehicles to use additional access roads that would not require any improvement to the road or repairs after construction ("like use");
- Minor variations in site-specific plans that reflect differences in site conditions from those that were expected when the plan was developed (e.g., relocation of a spoil storage area within previously approved work areas); and
- Minor changes to the project design that are required due to site-specific restrictions.

Level 1 variances may also be used to document and disseminate agency-directed changes to mitigation measures.

To initiate a Level 1 variance request, the Grant Holder's representative will fill out a variance request form using the form in Attachment E and obtain the appropriate signatures. The Grant Holder's representative will then contact an ECM to review the proposed change. The Grant Holder's representative and the ECM will work together to evaluate the site-specific situation and determine if the variance request is appropriate.

The ECM may approve a Level 1 variance request if the results of implementing the change will provide equal or better protection for the resource than the original mitigation measure or if the original mitigation measure is not applicable to that specific site. If a Level 1 variance request is approved in the field, the ECM will sign the variance request form. A Level 1 variance request can be implemented in the field as soon as it is approved by the ECM.

The ECM will document the variance approval in his/her log and will include the variance in the daily and weekly status update and will transmit the approved form to the CM for posting on the project website (refer to Section 5,5, Non-Public Website).

If the requested variance exceeds the ECM's authority level, the ECM will inform the Grant Holder's representative that a Level 2 or Level 3 variance request is required.

6.2 Level 2 Variances

A Level 2 variance request exceeds the field decision authority of the ECM and requires processing by the CM. Before the CM can issue approval of a Level 2 variance request on federal land, the BLM PM must approve the request. Level 2 variance requests generally involve project changes that would affect an area outside the previously approved work area, but within the areas previously surveyed for cultural resources, sensitive species, and biological resources. Level 2 variance requests typically require the review of supplemental documents, correspondence, and records.

Examples of Level 2 variance requests include:

- The use of extra workspace outside the previously approved work area but within previously surveyed areas;
- The use of existing access roads that have not been previously approved if the use would not be considered "like use" that could be approved as a Level 1 variance (refer to Section 6.1, Level 1 Variances);
- Modifications to the plans that are specifically different than those in the approved POD.

To initiate a Level 2 variance request, the Grant Holder's representative or other designated representative will fill out a variance request form, prepare the appropriate supporting documentation, and obtain the required signatures.

A Grant Holder representative will complete and submit the variance request form and supporting documentation by e-mail (scanned copy) or fax to the applicable BLM PM with a copy to the CM. Once the approval of the BLM PM is obtained, the CM will process the request.

If the Level 2 variance request is approved, the CM will sign the variance request and e-mail the approved form (scanned copy) to the designated Grant Holder representatives, the ECMs, and the BLM PM and Compliance Contacts. The variance may be implemented in the field as soon as the approved variance is

received. Verbal approval for Level 2 variance requests will not be granted. The CM will log the variance approval and will include it in the weekly status update (refer to Section 5.3) and post the approved variance request form on the non-public project website (refer to Section 5.5).

6.3 Level 3 Variances

Level 3 variance requests generally involve project changes that would affect an area outside the previously approved work area that are outside the areas previously surveyed for cultural resources, sensitive species, and biological resources, or one that would change the function, structure, technology required, or other part of the project previously approved in the POD. Level 3 variances may need to be implemented through an amendment to the ROW grant.

To initiate a Level 3 variance request, the Grant Holder's representative or other designated representative will fill out a variance request form, prepare the appropriate supporting documentation, and obtain the required signatures.

The designated Grant Holder representative will complete and submit the variance request form and supporting documentation by e-mail (scanned copy) or fax to the applicable BLM PM and the CM. Once the approval of the BLM PM is obtained, the CM will process the request.

Level 3 variance request approvals must be signed by the BLM PM or the BLM AO in the case of a ROW grant amendment. The variance may be implemented in the field as soon as the approved variance is received. The CM will document the variance approval in the log and weekly status update (refer to Section 5.3) and post the approved variance request form on the non-public project website (refer to Section 5.5).

7.0 **Stop Work Authority**

The BLM has the authority to stop construction of the Project if an activity is determined to be a deviation from the project environmental and cultural resource protection requirements or approved construction plans authorized by the BLM ROW grant. This authority may be delegated to the Monitoring Contractor, the CM, and/or the ECMs, as determined appropriate by the BLM.

8.0 Worker Environmental Awareness Program and Other Training

The Monitoring Contractor will ensure that the Grant Holder prepares and conducts an Environmental Training Program for the environmental compliance personnel and construction contractor personnel prior to the start of construction (a Worker Environmental Awareness Program [WEAP] is specified in the mitigation measures identified in Appendix 4 of the Record of Decision). The BLM PM and Compliance Contacts and the Monitoring Contractor's CM and ECMs will participate in the WEAP to present an overview of the ECCMP and to become familiar with Grant Holder's environmental inspection program and personnel. The Monitoring Contractor's CM or the BLM PM will explain the various components of the ECCMP, emphasizing the objectives of the ECCMP. The discussion will focus on the activities of the ECMs and their interactions with Grant Holder's inspection and construction personnel.

The monitoring and documentation of compliance issues and construction progress will be described. A clear and concise explanation will be presented with respect to the variance request decision authority that the ECMs will have in the field. Procedures that may be required to address variance requests will also be presented, as well as the time frame required for decisions to be made prior to implementation.

In addition to participation in the WEAP, the Monitoring Contractor's CM will train the ECMs in all project-specific procedures, duties, responsibilities, reporting requirements, and authorities, which includes the authority to grant variances, to complete their assigned tasks during monitoring of the Project construction activities.

9.0 **Equipment**

Personnel responsible for monitoring and documenting compliance with the measures in the Environmental and Construction Compliance Monitoring Program (ECCMP) will require field support equipment. Specifically, the Monitoring Contractor's CM and each ECM will be equipped with the following:

- Notebook computer and appropriate software to facilitate the compilation, transfer, and storage of data (see Section 5.0)
- Digital camera
- Cellular phone (smart phone) and vehicle adapter for power charge
- Four-wheel drive vehicle
- Additional equipment such as binoculars may also be needed, but would be provided on an as-needed basis.

Attachment A

Monitoring Report Cover Page Form

PROJECT: SODA MOUNTAIN SOLAR PROJECT

COMPLIANCE MONITORING PROGRAM
MONITORING REPORT COVER PAGE

SAMPLE MONITORING REPORT (COVER PAGE)

The following report is a compilation of the monitoring reports issued by the Compliance Monitors and/or Compliance Manager for activities conducted on [Month] [Day], 20[XX]. Should you have any questions regarding the information contained in this report, please contact MONITOR at (XXX) XXX-XXXX (office) or (XXX) XXX-XXXX (cell phone).

Communication
Acceptable
Problem Area
Noncompliance
Serious Violation
Approved Level 1 Variance
Approved Level 2 Variance
Approved Level 3 Variance

Compliance Level

Total Reports

Attachment B

Monitoring Report Form

PROJECT: SODA MOUNTAIN SOLAR PROJECT

ENVIRONMENTAL COMPLIANCE MONITORING PROGRAM MONITORING REPORT

Report Number: _____ Date of Report: _____

Compliance Monitor: _____ Construction Method: _____

Environmental Inspector: _____ Location: _____

Compliance Level: ☐ Communication ☐ Acceptable

☐ Problem Area ☐ Non-compliance

☐ Serious Violation

DESCRIPTION OF OBSERVED ACTIVITY

ISSUES REQUIRING CORRECTIVE ACTION

Issue	Grant Holder Notification	Corrective Actions Implemented by Grant Holder

Photos:

Attachment C

Monthly Summary Report Form

DEVELOPER: SODA MOUNTAIN SOLAR, LLC

PROJECT: SODA MOUNTAIN SOLAR PROJECT

Environmental Compliance Monitoring Program
Summary Report for the Period: XX-XX, 20XX

The following is a summary of the reports issued by the Compliance Monitors and Compliance Manager for activities conducted between XX-XX, 20XX. This report also summarizes Level 1, 2, and 3 variance requests approved during the same period. The environmental compliance monitoring program for the _____ Project is being implemented under the direction of the Bureau of Land Management (BLM). Copies of the monitoring reports and approved Level 1, 2, and 3 variance requests are posted and available for review on the environmental compliance monitoring program website.

Should you have any questions regarding the information contained in this report, please contact MONITOR at (XXX) XXX-XXXX (office) or (XXX) XXX-XXXX (cell phone).

SUMMARY OF ACTIVITIES

Between XX-XX, 20XX, the Compliance Monitors and Compliance Manager issued X monitoring reports. A tabular summary of the reports by compliance level is presented below.

PROJECT: Soda Mountain Solar Project

ENVIRONMENTAL COMPLIANCE MONITORING PROGRAM
Summary of Monitoring Reports for the Period: XX-XX, 20XX

Compliance Level	Compliance Reports for the Period	Cumulative Compliance Reports for the Project
Communication	X	X
Acceptable	X	X
Problem Area	X	X
Noncompliance	X	X
Serious Violation	X	X
Approved Level 1 Variance	X	X
Approved Level 2 Variance	X	X
Approved Level 3 Variance	X	X
Total Reports	**X**	**X**

During this period, XX full-time Compliance Monitors conducted inspections of project-related activities and documented the Grant Holder's compliance with the project documents and permits. The Compliance Monitors continued to coordinate with the Compliance Lead and other EIs to inspect and discuss areas of concern prior to construction, review areas potentially subject to variance requests, assist with resolution of landowner complaints, and clarify interpretations of the project requirements. The activities of the XX Compliance Monitors were directed by the Compliance Manager who continued to coordinate with the BLM as well as with the Grant Holder's field management and support staff.

A brief summary of the activities conducted during the reporting period is presented below. Copies of the detailed monitoring reports that were used to prepare this summary are posted and available for review on the environmental compliance monitoring program website.

Summary of Activities
A brief text summary of activities that occurred by spread during the reporting period will be provided here

PROBLEM AREAS AND NONCOMPLIANCES

XX problem area report and XX noncompliance reports were issued by the Compliance Monitors between XX-XX, 201X as shown in the table below. The Compliance Monitors were notified of XX noncompliance report(s) issued by the Grant Holder's EIs.

SUMMARY OF PROBLEM AREA AND NONCOMPLIANCE REPORTS

Compliance Level/Report Number	Date Issued	Location (Spread/ Milepost)	Description	Corrective Action
Problem Area				
-None-				
Monitoring Report #XX	X/X/201X	Spread X – X.X	A construction vehicle was parked outside of the approved right-of-way.	The Lead EI was notified and contacted the foreman to have the vehicle moved back onto the approved workspace.
Noncompliance				
-None-				
It was reported to the Compliance Monitors that the Grant Holder's EIs issued XX noncompliance report(s). This noncompliance occurred on Spread X on XX, 201X and was issued to the trenching crew for partially burying the windrowed seedbank with trench spoil for approximately 1,000 feet.				

VARIANCES

One Level 1 variance request was approved during the period. No Level 2 and no Level 3 variance requests were approved between XX-XX, 201X as shown in the table below. A summary of the acreage of land affected by the approved variance requests is also provided below.

SUMMARY OF APPROVED LEVEL 1, 2, AND 3 VARIANCES

Variance Number	Date Issued	Location (Spread/Milepost)	Brief Description	Net Acreage Affected – Federal Land	Net Acreage Affected – Non-Federal Land
LEVEL 1					
XX-XX-001	X/X/201X	Spread X - X.X	Approved the like-use of an existing gravel road. This road is needed to allow travel around and 8-inch-diameter aboveground waterline that crosses the right-of-way.	X.X	X.X
LEVEL 2					
-None-					
LEVEL 3					
-None-					

SUMMARY OF ACREAGE AFFECTED BY VARIANCES

	Acreage Affected This Reporting Period	Cumulative Acreage Affected
Federal Land	X.X	X.X
Non-Federal Land with some Federal Jurisdiction	X.X	X.X
Total	**X.X**	**X.X**
Includes variances on non-Federal land that are within 300 feet of previously identified cultural resources or listed species or their habitat.		

Attachment D

Certification of Completion of Worker Environmental Awareness Program

Certification of Completion
Worker Environmental Awareness Program

This is to certify these individuals have completed a mandatory Bureau of Land Management-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

Cultural Trainer: _____ Signature: _____ Date: ____/____/_____

Paleo Trainer: _____ Signature: _____ Date: ____/____/_____

Biological Trainer: _____ Signature: _____ Date: ____/____/_____

Attachment E

Variance Request Form

Variance Request Form

LOGO

COMPANY
ADDRESS
CITY, STATE ZIP
PHONE

Variance:_____
Request No.:_____
Date Submit:_____
Date Approval Needed:_____
Date Agency Received:_____
Agency Approval Reference No.:_____

Request Prepared by:
Spread/ Location (Milepost):
Alignment Sheet / Sta. No.:
Net acreage affected:
Tract No:
Landowner:
In or within 50 feet of a wetland: ☐ Yes ☐ No
Current Land Use/ Vegetative Cover:
Within 50 feet of a water body: ☐ Yes ☐ No
Nearby Features (Water body, T&E Habitat, Wetland, Noxious Weed) Area, Residence, Cultural Resource Site (distance, etc.):

Variance Level: ☐ Level 1 ☐ Level 2 ☐ Level 3 **(To Be Assigned by Designated Representative)**

Variance From: ☐ Permit ☐ Plan/Procedure ☐ Specification ☐ Drawing ☐ Mitigation Measure ☐ Other:

Detailed Description of Variance: Attachments? ☐ Yes ☐ No Photos? ☐ Yes ☐ No

Variance Justification:

For (Company Name) Use Only

Additional Surveys Required	Surveyed Corridor Description	Additional Surveys Completed
Cultural Survey ☐ Yes ☐ No		☐ Yes ☐ No
T & E Survey ☐ Yes ☐ No		☐ Yes ☐ No

Report Documenting Survey:

Sign-off (as appropriate)	Name (print)	Approval Signature	Conditions (See Attached)
Contractor Sup't. or Env. Coordinator			☐ Yes ☐ No
Lead Environmental Inspector			☐ Yes ☐ No
Spread Supervisor			☐ Yes ☐ No
Environmental Field Manager			☐ Yes ☐ No
ROW Agent			☐ Yes ☐ No

For BLM Project Manager or Compliance Contact Use Only

Variance Approved: ☐ Variance Denied: ☐ Date:

Signature:

For Compliance Manager and Monitor Use Only

Variance Approved: Variance Denied: Date:

Signature:

Stipulations:

Spread: OPPC Variance Request No.:

VARIANCE CONDITIONS

Name: Title: Organization:

Conditions:

Name: Title: Organization:

Conditions:

Name: Title: Organization:

Conditions: