

**Biological Resources Mitigation  
Implementation and  
Monitoring Plan for the  
Ivanpah Solar Electric Generating  
System, San Bernardino County,  
California (07-AFC-5C)**

Revision 1

Prepared for  
**Solar Partners I, LLC; Solar Partners II, LLC;  
and Solar Partners VIII, LLC**

October 2010

Prepared by

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Mitigation Compliance, Ivanpah Solar Electric Generating System  
**BIO-7, Biological Resources Mitigation Implementation and Monitoring Plan**  
**Version 1, Dated: July 2010**

*(Pre-decisional July 2010 Submittal: Solar Partners I, LLC,  
Solar Partners II, LLC, and Solar Partners VIII, LLC)*

The table below sets forth requested revisions based upon California Energy Commission (CEC) Staffs' preliminary review of the draft Biological Resources Mitigation Implementation and Monitoring (BRMIMP). This Plan currently does not meet the requirements of the Conditions of Certification. Please supply an appropriately revised draft document for further review.

Page No.	Paragraph/ Sentence	CEC Comments: Carol Watson	Response: Mark Cochran
N/A		Please include a placeholder for any outstanding biological requirements and documents, particularly the Streambed Alteration Agreement (SAA), which should be included in its entirety as an Appendix, and encompassed in Table 2-4, Key Construction Events and Essential Biological Resource Protection Measures.	Place holders inserted as requested for SAA as a 'pending' attachment. The SAA is referenced in Table 2-4.
iii	Table of Contents	Section 3 can be condensed--species accounts are unnecessary--however, a table of species and accompanying photographs may better accomplish the goal of presenting species of concern.	Done.
vi	Table of Contents	Figure 7-1: per the USFWS' draft BO in Attachment B, update map to remove reference to "relocation", any movement of desert tortoise (DT) is now considered translocation, and graphically indicate the phased approach to construction work, and DT translocations.	Figure 7-1 revised. Changed remaining reference from 'relocation' to 'translocation.' Added which translocation areas would be used for the corresponding construction phase.
ix	Preface	Include the SAA within discussion of plans included in BRMIMP.	The pending SAA was included as a bulleted item. Discussions of the 10 plus plans are not appropriate in the section.
2-16	Bullet points	Update bulleted information to reference DT fencing with the construction logistics area (CLA), and also reference DT work efforts within Table 2-3 (same page).	Information updated.
2-19	Table 2-4	This table is an excellent way to present activities throughout the project. It might be useful to address each biological mitigation component in each row (if applicable)—e.g weed management, SAA mitigation, burrowing owl surveys, etc.	Table updated

Page No.	Paragraph/ Sentence	CEC Comments: Carol Watson	Response: Mark Cochran
2-19	Table 2-4	Update Table 2-4 to reference current approach: constructing DT holding pens within the CLA. Please be specific with details of timing of fencing holding pens, when DT would be located, blood tested, <i>etc.</i> , and include any details regarding ISEGS 2 and 3 DT approach, if known. Please clearly state any such work efforts that are yet to be planned, and if agency involvement is necessary.	Table 2-4 revised. Specific details are in the DT Translocation Plan (BIO-9) and in the Biological Opinion (Attachment B). Additional details are provided in Section 6.1.3 and 6.1.4
2-11	Table 2-4, No. 11	States “Area within fenced perimeters of Ivanpah 1, and later Ivanpah 2 and 3...”. As currently written, this fails to provide an understanding of timing of construction events within ISEGS 2 and 3. Please consider addressing ISEGS 2 and 3 in a separate table, or placing them later in the table, at the appropriate time period and adding more construction detail.	Timing added to Table 2-4. More detail on Ivanpah 2 and 3 has been added to the table.
2-23	Table 2-4, No. 15	This row states that no wildlife monitoring will occur during this time period: this is misleading, as monitoring of DT in holding pens, and perhaps location and monitoring of DT within ISEGS 2, will be occurring simultaneously. Please clarify this statement, and add these details to Table 2-4.	Revised as requested.
2-24	Table 2-4, No. 24	This row indicates construction of wheel-washing stations at specified point in time—however; these stations must be in place prior to bringing equipment in. As currently written, many features would already be constructed, necessitating multiple trips on and off-site, and having the potential to introduce weeds onto the site. If using off-site washing stations up to that point in time, state this fact within Table 2-4, in the appropriate time period/row, <i>e.g.</i> , prior to construction, indicate site locations, or insert a placeholder if site locations are unknown.	Timing for installation of a temporary wash station has been added.
2-26	Table 2-4, last row	Under the “operations inside fenced area” heading, please expand discussion to include a bulleted list of specifics of Conditions of Certification (COC).	Expanded to include relevant COCs.
2-26	Table 2-4, last row	Please expand row, to include at a minimum, the post construction monitoring period, and a brief, bulleted list of major tasks being undertaken during that time frame (per <b>BIO-7</b> , #9).	Expanded to include relevant COCs.
Figure 2-2		Update map to show DT holding pens within CLA.	Figure 2-3 has been updated to show the location of the holding pens (Figure 2-2 was too busy already)

Page No.	Paragraph/ Sentence	CEC Comments: Carol Watson	Response: Mark Cochran
3-8	Section 3.5.1	Please include a map of any known burrowing owl locations. Under this heading (as with all special-status species) remove species accounts, and instead reference the specific COC pertinent to the species, provide a map of known locations, and the boundaries and timing of any surveys for the species, etc., as the BRMIMP is intended to be more of a working reference manual.	Revised as directed. There are no known locations to map for the wildlife species of concern other than the desert tortoise.
3-15	Section 3.6	The purpose of this section is unclear; either tie into the BRMIMP or delete. The following subsection, "CDFG Sensitive Natural Communities" would also be of more use if a map were provided, and the location and any conservation measures for this sensitive community detailed within the subsection.	Agreed – this section does not have a purpose in the context of a BRIMP and was deleted.
4-1	4.1	"Botanical monitor" is not a term used in the COCs, please clarify origin of this designation, and what qualifications are necessary for this position.	Since rare plant protection is a major part of this project it's important that a highly qualified botanist (the Qualified Botanist) be responsible for rare plant protection. Like the Designated Biologist, the Qualified Botanist may need to be assisted by Botanical Monitors. Qualifications are duties are explained in Sec. 4.2.3.
4-3	4.2	Throughout the section, please reference the specific COC that guides the efforts of each type of personnel, as well as any other agency-supplied requirements or guidelines, such as those from the USFWS' Final BO, or the SAA. It may be useful to paste the text of each relevant COC at the beginning of each discussion, in addition to providing them at the end of the document, for ease of reference.	Text has been added to refer to the appropriate documents and guidance. However, a more detail treatment is not warranted in this table.
4-5	Bullet list	Please add a bullet noting that the DB has the authority to stop work.	Noted – language added.
4-5	3 <sup>rd</sup> bullet	Please clarify that a DB will be onsite. It is the intent that the DB will relocate to the area, and even if not present on the site, shall be close to the project to lend in-person coordination.	Noted – language added.
6-1	Section 6	Please note that this section will need to be updated following receipt of final BO and Commission Decision.	This section has been updated to conform to the conditions of the Final BO.
6-7	Handling guidelines	Please check stated timelines for DT translocation against the USFWS guidelines, which typically do not allow for DT after the end of October.	These guidelines have been updated to conform with the BO.

Page No.	Paragraph/ Sentence	CEC Comments: Carol Watson	Response: Mark Cochran
7-1	Section 7	Please update section with most current mitigation and translocation plan details, when available.	Updated to be consistent with the DT Translocation Plan and BO
N/A		<p>Please provide aerials as per <b>BIO-7, #8</b>:  “Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Provide planned timing of aerial photography and a description of why times were chosen.”</p> <p>Resolution for the pre-disturbance aerials can be as low as 1-meter resolution, taken within the last 2 years.</p> <p>Post-construction aerials are preferred at 1 foot resolution.</p> <p>Electronic copies requested; print-outs at same scale as AFC are fine.</p>	A CD containing high-resolution pre-construction aerial photos was added as Attachment E.

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A CEC Biological Conditions of Certification

B Biological Opinion

C BLM Right-of-way Grant Conditions

D Best Management Practices from the Stormwater Pollution Prevention Plan

D Streambed Alteration Agreement (pending – would replace current Attachment D)

E High-resolution Aerial Photos (Pre-construction) – on CD-ROM

BIO-1 Resumes of Designated Biologists, Approved Biologists and Biological Monitors

BIO-6 Worker Environmental Awareness Program

BIO-9 Desert Tortoise Translocation Plan

BIO-12 Raven Management Plan

BIO-13 Weed Management Plan

BIO-14 Closure, Revegetation, and Rehabilitation Plan

BIO-16 Burrowing Owl Mitigation and Monitoring Plan

BIO-18 Special-status Plant Protection and Monitoring Plan (Pending)

BIO-18 Special-status Plant Remedial Action Plan (Pending)

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# Acronyms and Abbreviations

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°F	degrees Fahrenheit
afy	acre-feet per year
APLIC	Avian Power Line Interaction Committee
BLM	U.S. Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
BSE	BrightSource Energy
Caltrans	California Department of Transportation
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CLA	construction logistics area
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
COC	condition of certification
CPM	Compliance Project Manager
DTRPAC	Desert Tortoise Recovery Planning Assessment Committee
DWMA	Desert Wildlife Management Area
ESA	Endangered Species Act
ESAs	Environmentally Sensitive Areas
EITP	Eldorado-Ivanpah Transmission Project
FLPMA	Federal Land and Policy Management Act
FSA/DEIS	Final Staff Assessment and Draft Environmental Impact Statement

gpm	gallons per minute
GPS	global positioning system
ISEGS	Solar Electric Generating System
KRGT	Kern River Gas Transmission
LID	low-impact design
LORS	laws, ordinances, regulations, and standards
MW	megawatt(s)
NECO	Northern and Eastern Colorado
NEMO	Northern and Eastern Mojave
NPDES	National Pollutant Discharge Elimination System
PIT	Passive Integrated Transducer
ROW	right-of-way
RPAA	Rare Plant Avoidance Areas
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SPS	Special Protection Schemes
SPT	solar power tower
SRSG	solar receiver steam generator
STG	steam turbine generator
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program
WEMO	West Mojave
WMP	weed management plan

# Preface

---

This report presents the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for the Ivanpah Solar Electric Generating System (ISEGS) project in San Bernardino County, California. It is being submitted to meet the condition of certification (COC) BIO-7 set by the California Energy Commission (CEC) for the ISEGS project. It is anticipated that the CEC and the Bureau of Land Management (BLM) will approve the project and issue a license and right-of-way (ROW) grant for the construction and operation of ISEGS in mid-October, 2010.

The purpose of the BRMIMP is to identify all mitigation, monitoring, and compliance measures related to biological resources that will be implemented during facility construction and operation. This BRMIMP addresses all components of the ISEGS project and will be amended as necessary to account for new information or changing conditions. All applicable laws, ordinances, regulations, and standards (LORS) applicable to the ISEGS project are listed in Section 4. This document includes a summary of the various mitigation, monitoring, and compliance measures contained in the biological plans required by the COCs. The full plans are also included in the attachments by COC number. Hence, a copy of the Worker Environmental Awareness Program (WEAP), required by COC BIO-6, is included as Attachment BIO-6. As these various plans are approved (or modified) they will be updated in the attachments.

This plan incorporates the terms and conditions of the following license, permits, opinions, and agreements:

- CEC - Findings, Conclusions, and Conditions of Certification
- Biological Opinion (BO) (Attachment B)
- BLM ROW grant conditions (will be added when received)
- Streambed Alteration Agreement (pending)

Copies of the above-referenced agency documents are provided in the attachments. Attachment A contains the CEC conditions of certification, Attachment B the U.S. Fish and Wildlife Service's Final Biological Opinion, Attachment C the BLM ROW grant conditions and Attachment D will contain the Streambed Alteration Agreement when it's available.



## SECTION 1

# Purpose and Background of the BRMIMP

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This Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) summarizes the sensitive biological resources that will be potentially affected by the ISEGS project and the measures required to avoid, minimize, or compensate for impacts to these resources. The biological resources mitigation and monitoring procedures discussed in this plan were outlined in COC BIO-7 as set forth in the Final Staff Assessment and Draft Environmental Impact Statement and Draft California Desert Conservation Area Plan Amendment (FSA/DEIS) (CEC and BLM, 2009)<sup>1</sup>. It is anticipated that the CEC and BLM will approve the project and issue a license and right-of-way (ROW) grant for the construction and operation of ISEGS in mid-September, 2010.

This BRMIMP describes the measures that will be implemented by the project owner, its employees and contractors during the construction, operation, and maintenance phases of the ISEGS project. This BRMIMP addresses all features of the project, including construction of Ivanpah 1, 2, 3 and all associated common and linear facilities. The BRMIMP is being implemented to ensure that the project is completed in a manner that minimizes impacts to the natural environment by appropriate compliance with terms and conditions of various permits and approvals.

The requirements of the BRMIMP as set forth in the Decision are as follows:

The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the BLM-Authorized Officer and the CPM (for review and approval) and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Desert Tortoise Translocation Plan, the Raven Management Plan, the Closure, Revegetation and Rehabilitation Plan, the Burrowing Owl Mitigation and Monitoring Plan, and the Weed Management Plan.

The BRMIMP shall be prepared in consultation with the Designated Biologist and include the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;
3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;

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<sup>1</sup> The requirements of these COCs, as set forth in this BRMIMP, will be revised if changed in subsequent documents until they are finalized in the Commission Decision.

4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;
5. All required mitigation measures for each sensitive biological resource;
6. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
7. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction and operation;
8. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Provide planned timing of aerial photography and a description of why times were chosen. Provide a final accounting of the before/after acreages and a determination of whether additional habitat compensation is necessary in the Construction Termination Report;
9. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
10. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
11. All performance standards and remedial measures to be implemented if performance standards are not met;
12. A discussion of biological resources-related facility closure measures including a description of funding mechanism(s); and
13. A process for proposing plan modifications to BLM's Authorized Officer and the CPM and appropriate agencies for review and approval; and (Sic)

**Verification:** The project owner shall submit the BRMIMP to the BLM Authorized Officer and the CPM at least 60 days prior to start of any project-related site disturbance activities. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No ground disturbance may occur prior to approval of the final BRMIMP by BLM's Authorized Officer and the CPM.

BLM's Authorized Office and the CPM, in consultation with other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Authorized Office and the CPM within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within at least 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to BLM's Authorized Officer and the CPM.

The project owner shall notify BLM's Authorized Officer and the CPM and no less than five working days before implementing any modifications to the approved BRMIMP to obtain BLM's Authorized Officer and CPM approval.

Any changes to the approved BRMIMP must also be approved by BLM's Authorized Officer and the CPM and in consultation with appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures (construction activities that were monitored, species observed) will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

Table 1-1 provides a list of the various conditions of certification that are a part of this BRMIMP.

TABLE 1-1  
Summaries of Conditions of Certification for Biological Resources

<b>COC #</b>	<b>Condition of Certification</b>
BIO-1	Designated Biologist Selection and Qualifications
BIO-2	Designated Biologist Duties
BIO-3	Biological Monitor Selection and Qualifications
BIO-4	Designated Biologist Duties
BIO-5	Designated Biologist and Biological Monitor Authority
BIO-6	Worker Environmental Awareness Program
BIO-7	Biological Resources Mitigation Implementation & Monitoring Plan
BIO-8	Desert Tortoise Clearance Surveys and Fencing
BIO-9	Desert Tortoise Translocation Plan
BIO-10	Desert Tortoise Compliance Verification
BIO-11	Impact Avoidance and Minimization Measures
BIO-12	Raven Management Plan
BIO-13	Weed Management Plan
BIO-14	Closure, Revegetation and Rehabilitation Plan
BIO-15	Pre-construction Nest Surveys
BIO-16	Burrowing Owl Impact Avoidance and Minimization Measures
BIO-17	Desert Tortoise Compensatory Mitigation
BIO-18	Special-status Plant Protection and Monitoring Plan

TABLE 1-1  
Summaries of Conditions of Certification for Biological Resources

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<b>COC #</b>	<b>Condition of Certification</b>
BIO-18	Special-status Plant Remedial Action Plan
BIO-19	Nelson's Bighorn Sheep Mitigation
BIO-20	Streambed Impact Avoidance and Compensation Measures
BIO-21	Avian and Bat Monitoring and Management Plan

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## SECTION 2

# Project Description and Schedule

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## 2.1 Project Description

The Ivanpah Solar Electric Generating System (ISEGS) project will consist of three independent solar thermal electric generating facilities (see Figure 2-1, all figures are at the end of this section) that will be co-located approximately 1.6 miles west of the Ivanpah Dry Lake and 4.5 miles southwest of Primm, Nevada, in San Bernardino County, California. The project site will be located on federal property managed by BLM. The three facilities will have a combined nominal rating of 370 megawatts (MW).

The total ISEGS project area consists of approximately 3,451 acres of new disturbance. Ivanpah 1 (the southern unit) will require approximately 913.5 acres (1.4 square miles); Ivanpah 2 (the middle unit) will require approximately 1,097 acres (1.7 square miles); and Ivanpah 3 (the northern unit) is larger and will require approximately 1,227 acres (1.9 square miles). The remaining disturbance areas include common access roads, gas lines, generation tie-lines, and construction and operations facilities. A breakdown of the ISEGS project components is provided in Table 2-1.

Following completion of low-impact development design (LID) and issuance of permits, the proposed project will be constructed in three phases, and completed within approximately 42 months (target completion by December 2013). Construction is planned in the following order: (1) Ivanpah 1 (nominal 120 MW) and shared facilities; (2) Ivanpah 2 (nominal 125 MW); and (3) Ivanpah 3 (nominal 125 MW). Alternative sequencing of the facilities is a possibility, but in each case the construction logistics area (CLA) and shared facilities (administration/storage building, groundwater production wells, nursery and succulent plantation, and portions of linear facilities) will be constructed with the first plant's phase. For purposes of this plan, impacts have been placed into three categories.

1. **Permanently disturbed areas:** This includes those features that would remain after the project's 50-year span<sup>2</sup>. They would include the Southern California Edison (SCE) substation, diversion berm and existing transmission line corridor, the paved portion of Colosseum Road from the Golf Club to the substation, the rerouted trails, and stabilized channel crossings. The transmission line corridor and a portion of the Colosseum Road segment between the golf club and the project site are not included in the calculations for ISEGS disturbance since they are existing features. The Applicant will perform no work within the transmission corridor except for the access road crossing and the gen-tie line crossing.
2. **Long-term disturbance areas:** This includes facilities that will remain in place for the duration of the project life. Examples include the solar plants, administration/warehouse building, water supply wells, monitoring well, plant access roads, and utility

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<sup>2</sup> The BLM right-of-way lease will initially be for 30 years, which includes construction and decommissioning/restoration. The lessee may request an extension to the lease; therefore, the plant's operating life may reach 45 years.

lines. Areas affected by these facilities will be revegetated following closure, which would take place in the reverse sequence as construction, with the exception that the shared facilities would be part of the last phase that is closed.

3. **Short-term disturbance areas:** This includes areas that will be revegetated within 12 months of completion of construction (referred to as temporary impacts) and those areas that would be revegetated upon completion of construction activities (i.e., planned to occur within 5 years or less from the time of disturbance). Facilities that fall into the temporary category include the utility and roadway construction corridors, while those areas within the CLA that are used for construction purposes only are considered short-term uses.

TABLE 2-1  
Breakdown of ISEGS Components (in acres) for Purposes of Determining Mitigation Requirements

Facility	No Impact	Short-term <sup>a</sup>	Long-term	Per-manent	Notes
<b>Gas Line</b>					
Kern River Gas Transmission Line Tap Station & construction area		0.9(T)	0.3		Construction (200' x200') + long-term (100' x 150')
Master Metering Set for Ivanpah 1, 2, and 3 located near the tap for each unit.			---		20' X 40' Included within other areas
Gas line from I-3 to tap point at KRGT		5.1(T)	1.4		7,675' long * 8' wide dirt access road; Construction corridor 37' - 8' = 29' wide
<b>Gas Line Subtotal</b>		6.0(T)	1.7		
<b>Ivanpah 1</b>			913.5		
<b>Ivanpah 2</b>			1,097.0		
<b>Ivanpah 3</b>			1,227.0		
<b>Construction Logistics Area and site access road</b>					
Improved section from Golf Club to Ivanpah 2 (Not part of the CLA)		3.9(T)		5.8	24' A/C (2 lanes) + 3' dirt shoulders ea. side = 30' width; + 20-ft wide constr. corridor
Administration/warehouse, parking & wells			8.3		
Substation and diversion channel				44.4 <sup>b</sup>	See Note b
SCE Transmission ROW Ivanpah 3 Gen-tie line and towers			1.4	40.9 <sup>c</sup>	Not used by ISEGS. See Note c
Underground Gen-tie line for Ivanpah 1 to substation		3.4(T)			50' diameter around each tower & 12' wide service road. Double circuit gen-tie line along nursery included in nursery acreage.
Re-routed Colosseum Rd. from edge of CLA ROW then along south of Ivanpah 2			0.7	4.8	Construction corridor is 50' wide. All to be revegetated except 8' maintenance path
					20' A/C (2 lanes) + 3' dirt shoulders ea. side = 26' width. 20-ft wide constr. corridor included in laydown area calculations.

TABLE 2-1  
Breakdown of ISEGS Components (in acres) for Purposes of Determining Mitigation Requirements

Facility	No Impact	Short-term <sup>a</sup>	Long-term	Permanent	Notes
Road to Substation				---	20' A/C (2 lanes) + 3' dirt shoulders ea. side = 26' width. 20-ft wide constr. corridor (incl. in Substation/Diversion Channel total area)
Road to Ivanpah 1			2.9		
Soil Stockpile within the CLA			---		Included in Laydown and/or Succulent Storage Area
Main Construction Laydown Area		49.3			
Equipment, Fabrication, and Wash Area		67.8			
Area used for Rare Plant & Succulent Storage			26.1		
Unused Area in the CLA	127.6				
<b>CLA &amp; Site Access Subtotal</b>	<b>127.6</b>	<b>124.3</b>	<b>39.4</b>	<b>95.9</b>	
Credit for existing trails				-9.9	Existing trails running through facility
Credit for Colosseum Road (existing)				-3.1	Credit is for existing width of road which averages approx. 16 feet
<b>PROJECT TOTAL</b>	<b>127.6</b>	<b>130.3</b>	<b>3,278.7</b>	<b>82.8</b>	<b>3,632.4 acres (includes the 13 acres of existing roads &amp; trails)</b>
Less SCE Portion				--40.9 <sup>b</sup>	Transmission ROW and also see Note b.
<b>TOTAL BRIGHTSOURCE DISTURBED AREA</b>		<b>130.3</b>	<b>3,278.7</b>	<b>82.8</b>	<b>3,619.4 acres</b>
Less Temporary (T) portions		-13.3(T)			This includes temporary impacts of only a few months.
<b>BRIGHTSOURCE TOTAL DISTURBANCE FOR MITIGATION</b>		<b>117.1</b>	<b>3,278.7</b>	<b>41.9</b>	<b>3,437.6 acres</b>

**Notes**

a. This column is further subdivided into temporary impacts which are less than 12 months in duration shown with the "(T)" and short-term impacts less than 5 years in duration.

b. Approximately 50 acres within the CLA will be assigned to SCE for mitigation purposes. The area included will be the substation pad and adjacent area to the stormwater diversion channel, the stormwater diversion channel to the north, northwest, southwest and south of the substation, and a 400-foot-wide transmission line access buffer located along the northeast and southwest borders of the substation.

c. This portion of the transmission line is SCE's right-of-way and will not be used by BrightSource except for the two crossings, the acreage of which has been removed from the remaining total.

A breakdown of the project's temporary, short-term, long-term and permanent disturbance areas is presented in Table 2-1. Most of the short-term disturbance will occur in the CLA, located between Ivanpah 1 and 2 (see Figure 2-2). The CLA is approximately 377.5 acres in

size, of which about 250 acres will be used for construction and plant storage/nursery. Portions of the CLA will be used during construction for staging, laydown, heliostat assembly, and temporary offices. Once construction has been completed, the shared facilities and nursery will remain in this area. In addition to the CLA, temporary impacts would occur to approximately 6.0 acres that will be used for construction of the gas line tap station at the existing Kern River Gas Transmission (KRGT) pipeline, and construction of the gas pipeline north of Ivanpah 3.

### 2.1.1 Project Elements

Each of the three proposed solar plants will consist of heliostat fields surrounding a power block, which is supplied with the necessary utilities through a utility corridor (see Figure 2-3.). Each of the power blocks will be connected to SCE's planned step-up substation, which will in turn tie into SCE's electric-power transmission network through a transmission line corridor that runs through the CLA between Ivanpah 1 and Ivanpah 2. Construction of each project phase will result in temporary land disturbances, with site rehabilitation and revegetation in temporary disturbance areas occurring as soon as practical after construction. The main construction laydown, staging and heliostat assembly area will be rehabilitated at the conclusion of construction activities. Other project elements are associated with long-term facilities (e.g., structures and access roads, see Table 2-1), and site rehabilitation and revegetation of these areas will occur after closure and decommissioning following the planned up to 50-year period of construction and operation. With the exception of the permanent facilities, these impacted areas will require some degree of rehabilitation and revegetation.

The sections that follow describe each project element. Additionally, discussion that is germane to required rehabilitation and revegetation, including the heliostat (mirror) fields and collectors, the power blocks, water supply and treatment facility, shared and individual (plant-specific) utility corridors, substation and switchyard, access roads and drive zones, and the administration and maintenance complex is addressed. The project specifically includes LID methods, which will reduce the rehabilitation effort that will be required to restore the sites.

#### Heliostat Fields

The Ivanpah 1 (nominal 120 MW) plant will have a heliostat array consisting of approximately 53,500 heliostats. Ivanpah 2 and 3 (nominal 125 MW each) will have heliostat arrays consisting of approximately 60,000 heliostats. The heliostat arrays would be arranged around a single centralized solar power tower (SPT). The heliostats would automatically track the sun during the day and reflect the solar energy to the solar receiver (boiler) located on top of the SPT.

Each of the heliostat assemblies is comprised of two mirrors approximately 7.2 feet high by 10.5 feet wide (2.2 meters by 3.2 meters) with a reflecting surface of 75.6 square feet (7.0 square meters). Each heliostat assembly is mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. Communication cables connecting the heliostats between one another will be strung aboveground.

Heliostat Field Preparation. Consistent with the LID approach to this project, vegetation clearing, grubbing, and contour smoothing in the heliostat fields will occur only where necessary to allow for equipment access and stormwater management. In areas where these activities are not required for access or construction, the vegetation will not be removed but will be mowed to a height of approximately 12 to 18 inches.

A linear swath of vegetation along the outer edge of each heliostat field will be cleared, grubbed and smoothed to create an external perimeter path for installation and maintenance of the tortoise and security fence and associated external perimeter inspection roads. Grading of the roads will be performed in limited areas to afford safe passage of vehicles. To allow for external roads, the setback area will be a minimum 20 feet wide within the ROW boundaries between the tortoise fence and the ROW boundary on the upslope boundary of the ROW, and a minimum 8 to 12 feet wide between the tortoise fence and ROW boundary on the side and downslope boundaries. Additional setbacks may be required due to installation of gas and electric utilities. Elsewhere, vegetation will remain but will be cut to a height that will allow clearance for heliostat function while leaving the root structures intact. Occasional cutting of the vegetation will be performed as needed to permit unobstructed heliostat mirror movement.

Drive zones that will be used for installation of the heliostats and then subsequent washing of the mirrors. The drive zones will be located approximately every 130 feet in a circumferential fashion surrounding the power blocks (see Figure 2-4 for Ivanpah 1). This spacing is approximately every fourth to fifth row of heliostats. The drive zones will be 12 to 20 feet in width and will be cleared, grubbed, smoothed and rolled to permit safe and efficient installation of the heliostats and washing of the mirrors. The shoulders of washes crossed by the drive zones will be graded to an approximate 15:1 slope to permit safe passage of vehicles for installation and maintenance activities.

Installation of Heliostats. The heliostats will be installed in two steps. Initially, the support pylons will be installed using either a screw-type pile, sonic, or vibratory technology to insert the pylons into the ground. (Pre-augering prior to the installation of the pylon may be required.) Then, the mirrors and aiming system will be mounted to the pylon. As a result of the LID, a majority of the project site will maintain the original grades and natural drainage features, and therefore construction will require machines that are maneuverable and can negotiate the terrain. The siting of pylons will be guided by global positioning system (GPS) technology. Pylons will be delivered by an all-terrain vehicle.

Installation of the heliostat mirrors will be accomplished with a rough terrain crane. The crane will be able to mount mirrors on several pylons before moving to the next location. In addition, an aboveground communications cable will be strung linking the heliostats to the communication center. The cable installation will be done manually.

Washing of Heliostat Mirrors. Operation requirements necessitate the washing of some portion of the project's solar heliostats on a nightly basis. Individual mirrors are washed about once every 2 weeks. The application rate per heliostat (two mirrors) is approximately 2.5 gallons of de-ionized water once every 2 weeks. Heliostat wash water requirements for Ivanpah 1 will be about 3,500,000 gallons per year or almost 11 acre-feet per year (afy). Ivanpah 2 and 3 would use about 3.9 million gallons each or about 12.0 afy each, for total deionized water consumption of about 35 afy for mirror washing after project build-out.

Because of dust created during site grading, it is possible that this washing cycle may need to be more frequent during initial operation of Ivanpah 1 and 2 while construction of the other units continues. The amount of additional water needed for mirror washing during this period depends on several factors such as the frequency, speed, and direction of wind and the amount of dust created by the construction activities. However, if the washing frequency is doubled, the amount of additional water required would be less than 6 acre-feet.

High-quality deionized water containing only minimal iron and copper from the water piping will be used for heliostat mirror washing. Assuming uniform dispersion of the 1.25 gallons of water across the mirror surface and no evaporation, runoff onto the ground will be about 0.17 gal, or about 22 fluid ounces, per linear foot per washing episode. Given such small amounts, no water will run offsite as a result of heliostat washing. Due to the high evaporation rates in the area, and the minimal amount of water used, it is likely that wash water will evaporate at or just below the ground surface in most seasons.<sup>3</sup> The area underneath the mirrors will be inspected for weeds and addressed per the requirements of the Weed Management Plan (BIO-13).

Washing of individual mirrors is planned to occur biweekly (once every other week) by a machine currently under design. Continued research and development for a mirror washing machine is in progress. The mirror washing machine is being designed to operate on the drive paths used for heliostat installation.

### Power Block

Each solar power plant will have a power block located in the approximate center of the heliostat array. The power block includes an SPT, a receiver boiler, a steam turbine generator (STG) set, air-cooled condensers, and other auxiliary systems. The size of all three power blocks (including the diversion berms and stormwater channel) will be approximately 14 acres each. Acreage estimates include the power block perimeter road, stormwater diversion channel and berm. Each power block will contain, but is not limited to, the equipment listed in Table 2-2. The power block footprint will be graded to create level pad elevations with approximately balanced cut and fill earthwork for each power block.

TABLE 2-2  
Power Block Major Equipment List

Steam Turbine	Solar Receiver Steam Generator (SRSG) including Superheater/Reheater Sections
Generator	Power Tower
Auxiliary Boiler	Switchyard
Air-cooled Condenser	Generator Step-up Transformer
Feed Water Heaters	Unit Auxiliary Transformer
Boiler Feed Pumps	SUS Transformer

<sup>3</sup> At an estimated 1.8 oz of water per inch every other week, the potential for the wash water to stimulate weed growth is minimal.

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Plant Services Building	Raw Water/Fire Water Tank
Water Treatment Equipment Area	Demineralized Water Tank
Underground Gas Pipeline	Raw Water Forwarding Pumps
Condensate Tank/Pump	Demineralized Water Forwarding Pumps
Emergency Generator	Access Roadway
Local Control Building	115-kV Generation Tie Line

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Stormwater run-on and runoff will be diverted around the power blocks.

### Water Supply and Treatment

Two new groundwater production wells will be drilled and developed to provide raw water for the ISEGS project. The two wells will be located in the CLA (see Figure 2-3). These wells will supply all three solar plants and will be used for make-up water, mirror-wash water (each plant will include a water treatment and deionizing facility in the power block structure), and for domestic uses. The combined 370-MW nominal capacity of the three plants will require up to 50 gallons per minute (gpm). To provide adequate operating flexibility, 100 afy of water is required for operations and 200 afy will be needed during construction.

Make-up water for the steam system will be treated by means of a mixed-bed ion-exchange system to produce feedwater-quality water for use in the boiler system. The ion exchange resins will be sent offsite for regeneration. Water will be distributed to the plants via underground pipeline, which will be installed in utility corridors leading to the power blocks from the two supply wells. Each power block will contain a 250,000- to 300,000-gallon raw water tank. A portion of the raw water stored in the tank (about 100,000 gallons) will be designated for plant use, while the majority will be reserved for fire water.

The groundwater production wells will be accessed from the asphalt road leading to the Administration and Maintenance Building complex. As shown in Figure 2-3, the water supply line will go from the wells north along the paved access road to the rerouted Colosseum Road segment that runs on the south border of Ivanpah 2. On the west end of that road segment it will follow the asphalt road north to the Ivanpah 3 power block. On the east end of that road segment it will follow the asphalt road south to the Ivanpah 1 power block, and in the middle of that road segment it will follow the asphalt road north to the Ivanpah 2 power block.

**Monitoring Well.** A groundwater monitoring well will be installed on the east side of the CLA, just south of the SCE transmission corridor. The area required for the installation of the monitoring well is about 50 feet x 50 feet.

**Domestic Water Use and Wastewater Management.** A small filtration and purification system will be used to provide potable water for domestic including sanitary uses (sinks, showers, and toilets) at the Administration/Maintenance Building. Drinking water may also be trucked to the site. The power block sites will have urinals and toilets that discharge to a septic tank (that will be pumped out as needed by a qualified waste management

contractor), self-contained hand wash stations, and use bottled water for drinking. A septic system and leach field will be used at the Administration / Maintenance Building complex for sanitary wastewater.

### Utility Corridors

For Ivanpah 1, the generation tie line (gen-tie line) would be underground within the solar field and will be undergrounded from the solar field to the new Ivanpah substation to avoid problems crossing the existing transmission line corridor. Within Ivanpah 2 and 3, an electrical utility corridor will contain the gen-tie lines from the individual power block switchyards to the SCE substation. Those gen-tie lines will be underground within the solar fields. In addition, the roadway and utility corridor will contain a water pipeline and a natural gas pipeline, as applicable. These underground corridors will run parallel to local access roads between the power blocks and CLA (see Figure 2-2). Once outside of the solar field, the electrical gen-tie lines and 33-kV backup and common area power lines will be run overhead along the boundary of the solar fields, while complying with safety clearance requirements.

To maintain separation of the pipelines in the utility corridors, the water line, the gas supply pipeline (if applicable), and the gen-tie lines will be located in compliance with applicable codes for separation and required cover of soil. If open trench construction is used, the pipeline installation will include excavation of open trenches, each approximately 3 feet wide and at least 3 feet deep. With loose soil, a trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. During construction of the water, gen-tie, and gas lines outside of the solar fields, the construction corridor will be used to temporarily store the excavated soil and provide access for equipment, vehicles, and space for fitting the pipeline prior to installation and backfill. At the completion of construction, a portion of this corridor will be prepared with road base and paved to provide an all-weather access road to the power blocks of each unit. Disturbance within the utility corridors will include vegetation mowing, grubbing to remove surface vegetation, trench excavation, soil compaction, dust suppression activities, preparation and paving of the asphalt road or dirt road (depending on the location), and restoration of the non-road portion of the corridor.

### Shared Utilities

Each of the ISEGS units will be separately owned and operated. However, in many cases, all or portions of the utilities including natural gas pipeline, water supply line, and transmission lines will be shared among the owners. Further details are provided below.

**Electrical Transmission.** Ivanpah 1, 2, and 3 would be interconnected to the SCE grid through a new substation and an upgraded SCE 115-kV line passing between Ivanpah 1 and 2 on a northeast-southwest utility corridor. SCE will upgrade the existing transmission line from its new (to be constructed) Ivanpah substation and the existing El Dorado, Nevada substation ultimately to a double-circuit 220-kV transmission line. This SCE upgrade is a separate project (known as the Eldorado-Ivanpah Transmission Project, or EITP) which is designed to serve a number of developments planned in the general vicinity, and is not being built solely for the ISEGS project. It will, however, provide sufficient capacity for the ISEGS project as well as other projects anticipated by SCE. SCE will construct its "Ivanpah" substation within the CLA between Ivanpah 1 and 2. It will be used to connect all ISEGS

projects to the electrical grid (see Figure 2-3). The SCE transmission lines connecting to the new Ivanpah Substation will be 220 kV to the east and 115 kV to the west.

The undergrounded 115-kV transmission gen-tie line from the edge of the Ivanpah 1 solar field to the substation will be over 2,850 feet long. The Ivanpah 2 and 3 gen-tie lines extend approximately 2,322 feet and 12,680 feet, respectively, from their switchyards at the power block before coming together. The combined gen-tie line (double-circuit) will then extend approximately 1,900 feet from the southern end of Ivanpah 2 to the substation. Each circuit will be supported by single-pole structure at appropriate intervals (approximately 750 feet apart) with final heights to be determined during detailed design. The shared gen-tie line for Ivanpah 2 and 3 will be carried on double-circuit single-pole structures.

The 115-kV gen-tie poles, insulators, conductors, and other equipment will be delivered to a construction laydown area or marshalling yard located either within the CLA or near the switchyard at the power block of the unit under construction. Construction crews will deliver the poles and other equipment from the laydown area to the individual pole locations. In most locations, the poles will be placed on the side of access roads. Construction vehicles will follow a route between the substation and the heliostat field to erect the poles. Construction activity will be confined to the electrical easement with little or no disturbance to the adjacent lands.

For each embedded pole location, crews will auger a hole to a depth consistent with good engineering practice and codes as required. For poles without a concrete foundation, the soil will be backfilled and compacted around the pole. Soil that is excavated and is determined to be surplus will be used as fill elsewhere on the ISEGS site. Where the soils are sandy, approved soil stabilizers may be needed to prevent the soil from sloughing back into the pits. For poles with a concrete foundation, a circular cage of rebar would be assembled and lowered into the pit, and a concrete foundation would be poured and allowed to cure per design criteria. The steel pole would then be mounted and bolted to the foundation.

To string the conductors onto the poles, the construction crew would first pull a rope through travelers or pulleys, which would be attached to the insulators on the structures. Three ropes would be used – one for each conductor phase. Each rope will then be attached to its respective conductor. Reel trucks and tensioners would be used to pull the conductors and set the proper sag.

**Substation.** As noted above, Ivanpah 1, 2, and 3 will be interconnected to the existing electrical grid through an upgraded 115/220-kV line passing between Ivanpah 1 and 2 in a southwest – northeast interstate utility corridor. A 115/220-kV substation will be constructed by SCE in the CLA between Ivanpah 1 and 2 and will be used to connect ISEGS to the electrical grid. The approximate location of the substation is shown in Figure 2-2. The substation pad dimensions will be about 885 feet wide by 905 feet long. In addition, an asphalt road about 1,760 feet long will be needed to connect the substation to the rerouted Colosseum Road on the south side of Ivanpah 2.

Substation construction will be performed by SCE (or its contractor) and will consist of final grading and site preparation, foundation excavation and pouring, equipment delivery and installation, and wiring and testing. In addition, initial substation grading and a permanent berm and stormwater diversion channel will be constructed by the ISEGS EPC contractor to

protect the substation, administration/maintenance building complex, and heliostat fabrication areas from stormwater runoff (see Figure 2-2).

Grading of the substation site and construction of the stormwater berm/diversion channel is estimated to require 3 to 5 weeks. In addition, a 5-foot-wide graded apron will extend outside the boundary fence around the substation's perimeter. Once the substation is graded, SCE will apply gravel, and dunnage will be used for equipment and material storage during construction of the substation. The substation site is large enough to provide for laydown of substation construction materials and equipment as well as construction parking within it.

Equipment and materials for substation construction would be delivered and stored within the substation site. Hazardous materials such as paints, epoxies, grease, and compounds would be stored in lockers or covered containers within these areas. Transformer oil and caustic electrolyte (battery fluid) would be delivered after the electrical equipment is in place and managed by SCE in accordance with LORS.

Telecommunication Line. Also, as part of this separate SCE project, the Ivanpah Substation will require new telecommunication infrastructure to provide protective relay circuits, Supervisory Control and Data Acquisition (SCADA) circuits, Special Protection Schemes (SPS) and telephone services. These telecommunications lines will be owned by SCE. The primary telecommunication line will be a fiber-optic cable strung on the new 220-kV transmission towers. A second redundant telecommunication line will be installed consisting of microwave radio from the new Ivanpah substation to the town of Nipton. From there a fiber optic cable will be installed to the Eldorado - Lugo 500-kV line where 25 miles of optical ground wire will be strung all the way to Eldorado substation.

For the west-bound 115 kV interconnection, another telecommunication path will be added to the local carrier facility interface in the Mountain Pass area to the west. It will consist of approximately 8 miles of fiber optic cable installed overhead on existing poles, and new underground conduits to be constructed within the substation and at the telecom carrier interface point.

### Natural Gas System

Each phase of the project includes a small, package natural-gas fired startup boiler to provide heat for solar plant startup and during short-term periods of cloud cover. Natural gas will be obtained by the construction of an approximately 6-mile-long, 4- to 6-inch-diameter distribution pipeline from the existing KRGT pipeline, which is located approximately 0.5 mile north of the Ivanpah 3 site (see Figure 2-3). A long-term gas metering tap station (100 feet x 150 feet) and a short-term construction area (200 feet x 200 feet) will be located at the point of connection within and along the existing KRGT ROW.

From the tap station, the natural gas line will head south toward the ISEGS project, then along the edge of Ivanpah 3 property boundary to a metering set (10 feet x 40 feet) along its east side. (The gas line and metering sets will be located outside the project's fenced heliostat fields, but within the project boundaries.) A gas pipeline will connect the gas main to the Ivanpah 3 power block by following the east radial dirt road that leads from the power block to the edge of the heliostat field. From the Ivanpah 3 metering set, the gas main

will continue south along the east side of the project. A 20-foot by 40-foot area for the metering sets for Ivanpah 1 and 2 will be located along the east side of Ivanpah 2, north of Colosseum Road. From that point, the gas line for Ivanpah 2 will head west along the rerouted Colosseum road, and then north following the main access road to the power block. The gas supply line for Ivanpah 1 will continue south through the CLA along the access road that leads to the Ivanpah 1 power block (see Figure 2-3). For maintenance access, a road (dirt is anticipated) will be located adjacent to (or on top of) the pipeline from the KRGT tap station along the edge of the project boundary to its terminus at the Ivanpah 1 power block.

**Construction of Gas Pipeline.** The construction contractor will determine which method to use to install the natural gas pipeline—a trench or trenchless method. The most common method of pipeline construction includes excavation of an open trench approximately 36 inches wide and at least 3 feet deep. With loose soil, a trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. The pipeline will be buried to provide a minimum cover of 36 inches. During construction, a 35 to 50 foot-wide construction corridor will be disturbed. This short-term construction corridor will be used to store the excavated soil, provide access for equipment and vehicles, and allow space for fitting the pipeline prior to installation and backfill via backhoe.

Construction will require short-term disturbance of the ROW (e.g., vegetation clearing, trench excavation, soil compaction, dust generation, and restoration). The short-term construction disturbance area for the KRGT tap station will be 200 feet by 200 feet. Construction activities related to the tap and metering station and the metering sets will include grading a small pad and installing aboveground and belowground gas piping, metering equipment, gas conditioning, pressure regulation, and pigging facilities. Construction of the metering sets will use a short-term laydown area within the heliostat fields. Once construction is completed, the construction corridor and construction area at the KRGT tap station will be revegetated, as described in this Plan.

#### Access Roads, Drive Zones, and Rerouted Trails

Project access will be from Colosseum Road to the project entrance road (Figure 2-3). Colosseum Road is an existing paved and dirt road, which will be paved (20-24 feet wide, two lanes) for a 1.6-mile<sup>4</sup> distance from the Primm Valley Golf Club to the project site. The project will reroute a portion of Colosseum Road around the southern end of the Ivanpah 2 plant site for a distance of about 1.25 miles. It will continue as a 20-24-foot-wide paved two-lane road along the southern perimeter of Ivanpah 2 (the northern periphery of the CLA) to the point where the asphalt road turns north toward the Ivanpah 3 power block. The road will become a 20-foot-wide asphalt road and will continue about 1.0 mile north along the west side of Ivanpah 2, where it enters Ivanpah 3 and continues on to the power block.

The internal roadway and utility corridors for each heliostat field and its power block will contain a 20-foot-wide paved or hardscape access road from the entrance of the solar plant site to the power block, and then around the power block. The paved access roads (and

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<sup>4</sup> A portion of which—from the Golf Club to their wells, about 5,000 feet—was recently paved, but lacks adequate road base for project use.

utility corridors) for Ivanpah 1 and 2 are located in the CLA (Figure 2-2). The total distance from the Ivanpah 2 access road to the entrance of Ivanpah 3 is about 1.6 miles. This corridor also serves as the Ivanpah 3 water pipeline route along the west side of the Ivanpah 2 boundary fence and the 33-kV backup power/gen-tie corridor.

In addition to the paved or hardscaped 20-foot-wide access road to the power block of each unit, three dirt roads will radiate out from the power block to provide access through the solar field to the internal perimeter access road. Within the heliostat fields, 10- to 12-foot-wide paths within 20-foot “drive zones” will be located concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning (Figure 2-4). The paths will be located about 130 feet apart and will be grubbed to remove vegetation and smoothed. There will also be 12-foot-wide dirt road on the inside perimeter of the project boundary fence, which will be used for plant security and to monitor and maintain perimeter security and tortoise fencing. These paths will be grubbed, bladed and smoothed to facilitate safe use. They will only be graded where necessary to cross washes.

Existing dirt trails that traverse the site will be rerouted around the project site. Each rerouted dirt trail will be 8 to 12 feet wide (to match the existing trail) and will be reconnected to the original dirt trail on the other side of the project site (see Figure 2-5). Permanent tortoise guards will be installed to prevent tortoises from entering internal roads.

**Construction of Roads and Trails.** New asphalt roadways (such as the improvements made to Colosseum Road) will be constructed in accordance with approved local and federal standards using an engineered road base with either aggregate or bituminous concrete surface. Trails that are rerouted as well as interior dirt roads and perimeter roads will be grubbed and smoothed.

### Construction Logistics Area

An administration, warehouse, and maintenance complex will be located in the central portion of CLA between the relocated Colosseum Road and the entrance to the substation south of Ivanpah 2. It will include parking and landscape areas. The complex will require about 8.3 acres and will be served by power from the local 33-kV distribution system and water from the water supply wells (see Figure 2-3). The CLA will also contain the main construction parking areas, construction trailers, tire cleaning station, heliostat assembly buildings, and other construction support facilities. Soil may need to be imported for the heliostat assembly building though every effort is being made to balance soil cut and fill in the area. The surface areas within the CLA that are used for construction will be stabilized and dust suppression maximized with a layer of crushed stone in areas subject to heavy daily traffic. Permanent parking areas will be provided at each of the facility’s power blocks. An asphalt-paved parking lot will be constructed at the Administration/Maintenance Building. An asphalt parking area may also be provided within the new SCE substation and installed by SCE.

In addition, the CLA will contain a rare plant and succulent storage area. The size of the storage areas total about 26 acres (Figure 2-2). A portion of the area will be reserved for rare plants with the remainder being used for common succulents such as barrel cactus and yucca. The number and type of rare plants to be salvaged is discussed in the Special-status

Plant Protection and Monitoring Plan. The number and type of common succulent species that will be salvaged is summarized in the Closure, Revegetation and Rehabilitation Plan.

### Fences and Gates

Security fencing will be 8-foot-tall, galvanized steel, chain link. Fencing will be positioned around the outer perimeter of each facility, and in areas targeted for construction activities within the CLA. Gates that permit access to the transmission corridor for utility vehicles will be 20 feet wide per utility requirements. Tortoise barrier fencing will generally be combined with the perimeter security fence. However, in some locations, the security fence and tortoise fence may be separated. The tortoise fence will be buried a minimum of 12 inches below ground level as described in the Tortoise Translocation Plan.

## 2.1.2 Low-Impact Development Design Considerations and Construction

To date, most solar energy facilities have approached the construction of their projects in the same fashion as most other industries. Initial site preparation includes “clearing and grubbing” followed by grading, which results in a surface that is level and clear, and therefore, optimum for construction. It is also devoid of life and frequently possesses hydrologic characteristics, such as increased potential for runoff, that require yet further engineering to mitigate. BrightSource Energy (BSE) believes that this is no longer an appropriate approach to take in construction, and that attributes of the natural landscape in and of themselves possess properties that will assist in mitigating construction effects. The LID adopted for this project incorporates several approaches to reduce environmental impacts and take advantage of the site’s natural attributes. These include the following.

- Cutting vegetation to a height that will not interfere with construction and operation of the heliostat fields but not clearing or grading
- Restricting clearing and grading activities to areas where foundations, drainage facilities, and all-weather roads must be placed
- Taking advantage of the natural permeability of the alluvium at the site by minimizing compaction and decompacting soils where necessary
- Implementing a revegetation and rehabilitation program to accelerate the return of areas that have been temporarily disturbed to a vegetated state
- Implementing a stormwater control design that promotes sheet flow and greater infiltration, rather than channelization and concentration of stormwaters

This Plan provides the background as well as methods to implement components of BSE’s LID philosophy during construction as well as decommissioning of the project.

### Vegetation Clearing and Cutting

To construct the heliostat array fields located within these sites, some vegetation clearing will occur but only where necessary to allow for equipment access and stormwater management. In areas where general site grading is not required, vegetation clearing will not occur, except for the drive zones, which will be grubbed, bladed and smoothed.

An approximate 8- to 12-foot-wide linear swath of vegetation along the entire outer edge of the area to be developed will be cleared and grubbed (but not graded except as required for safe passage of vehicles) to create an internal perimeter path for installation of the tortoise and security fencing. Vegetation clearing, with leveling or grading limited to arroyo walls will be performed throughout the sites beneath the heliostats where the existing vegetative cover will not permit access of installation equipment and materials. Other than access roads and drive zones, vegetation will be cut to a height of approximately 12 inches to allow clearance for heliostat function and at the same time leave the soil surface and root structures intact. As noted earlier, the vegetation will be cut with a mower. Occasional trimming of the vegetation may be required during the operational phase of the project to control plant regrowth that could affect heliostat mirror movement.

Clearing and grubbing, where shrubs including roots are removed, will be performed for maintenance roads for each facility, drive zone paths, the power blocks, in CLA where existing topography must be modified to make suitable parking, building pads and laydown areas; in areas to be graded in Ivanpah 1, 2, and 3; and to provide access for installation equipment and materials during construction (areas requiring leveling by grading). For all other areas, existing vegetation (and root systems) will be maintained to anchor the soil and reduce the potential for erosion. Where existing site topography is favorable, the natural drainage features will be maintained.

### General Grading and Leveling

At some washes, slopes will be close to vertical, too steep for safe equipment passage, and therefore cuts into the side of the existing embankments will be necessary. Surface rocks and boulders will need to be relocated to allow proper installation of heliostats and facilities when they cannot be avoided. These rocks and boulders will be harvested using LID construction techniques to minimize any necessary clearing or grading.

The highest concentration of large rocks occurs in the northeastern 20-acre area of Ivanpah 3 where the rocks and boulders will be used for rip-rap and other uses where possible. Site grading will be designed to maintain local materials onsite and attempt to minimize the import of offsite material. To the extent possible, the site's excavation and embankment volumes will be approximately balanced to eliminate or minimize the import of material to the site. Light grading for equipment access and boulder clearing, including rock harvesting, is anticipated in a 20-acre area in Ivanpah 3. These areas of light grading will be recompacted to allow for existing infiltration rates.

Reusable local materials will be hauled to lay-down areas for reuse or placed directly in the fill or backfill locations. A stone crusher facility may be used onsite for the production of subgrade materials (gravel) from local stone. Stockpiles of local materials shall be neatly shaped and free to drain. Material that does not meet the requirements for fill, backfill, or subgrade shall be disposed of onsite.

Heavy to medium grading will be performed within the solar project's proposed receiver tower and power block areas, for the substation, within the administration/ maintenance building area, and for the heliostat assembly buildings. The deepest excavations will be restricted to foundations and sumps. Within each of these individual areas, earthwork cuts and fills will be balanced to the degree possible. The earthwork within the power block and

Construction Logistic Area will be excavated and compacted to the recommendations of the associated geotechnical report.

The surface soil grade of each facility will be designed to provide the minimum requirements for access of installation equipment and materials during site construction and operations. Most of the natural drainage features will be maintained and any grading required will be designed to promote sheet flow where possible. Areas disturbed by grading and other ground disturbance will be protected from erosion by implementation of appropriate best management practices (BMPs) that will be identified in the project's Construction Stormwater Pollution Prevention Plan (SWPPP).

### Storm Drainage System

The majority of the project site will maintain the original grades and natural drainage features and, therefore, will require no added storm drainage control. In limited areas, such as the power blocks, substation, heliostat assembly buildings and administrative areas, the stormwater management system will include diversion channels, bypass channels, or swales to direct run-on flow from up-slope areas and run-off flow through and around each facility. Diversion channels will be designed so that a minimum ground surface slope of 0.5 percent will be provided to allow positive, puddle-free drainage. To reduce erosion, storm drainage channels may be lined with a nonerodible material such as compacted rip-rap, geo-synthetic matting, or engineered vegetation. The design will be developed for sheet flow for all storm events less than or equal to a 100-year, 24-hour storm event.

All surface runoff during and after construction will be controlled in accordance with the requirements of the Drainage, Erosion, and Sedimentation Control Program (DESCP) (, and all other applicable laws, ordinances, regulations, and standards (LORS).

### Erosion and Sediment Control Measures

Protection of soil resources will be an important factor in the design of ISEGS erosion and sedimentation controls. To minimize wind and water erosion, open spaces will be preserved and left undisturbed maintaining existing vegetation (to the extent possible with respect to site topography and access requirements). Areas compacted during construction activities will be restored, as appropriate, to approximate preconstruction compaction levels in order to minimize the opportunity for any increase in surface runoff.

If needed, stone filters and check dams will be strategically placed throughout the project site to provide areas for sediment deposition and to promote the sheet flow of stormwater prior to leaving the project site boundary. Where available, native materials (rock and gravel) will be used for the construction of the stone filter and check dams. A rock crusher may be provided onsite to use local stone for the production of gravel. Diversion berms will be used to redirect stormwater around critical facilities, as required.

Periodic maintenance will be conducted as required after major storm events and when the volume of material behind the check dams exceeds 50 percent of the original volume. Stone filters and check dams are not intended to alter drainage patterns but to minimize soil erosion and promote sheet flow.

## 2.2 Construction Sequence

After the CEC license and BLM ROW grant have been issued, the proposed project will be constructed in three phases. Construction is anticipated to be performed in the following order: (1) the Construction Logistics Area; (2) Ivanpah 1 (the southernmost site) and other shared facilities; (3) Ivanpah 2 (the middle site); and (4) Ivanpah 3 (the plant on the north). However, given that the three plants will receive separate, independent Right of Way grant approvals, it is possible that the order of construction may change. The shared facilities will be constructed in connection with the first plant construction, whether it is Ivanpah 1, 2, or 3. Construction is planned to take place over approximately 42 months, beginning the fourth quarter of 2010. Commercial operations are expected to commence in late 2012 or early 2013 at Ivanpah 1, in 2013 at Ivanpah 2, and late 2013 or early 2014 at Ivanpah 3.

There would be an average workforce of approximately 474 construction craft people, supervisory, support, and construction management personnel onsite during construction. The peak construction site workforce level (959 workers) is expected to occur in early 2013.

The Project Owners will make a reasonable effort to maintain continuous public access either across or around the project site. Due to safety concerns during construction and the large number of construction workers within the project site, the preferred public access to areas west of the project site will be on the perimeter roads around the southern and northern project boundaries. These access routes should be generally available except during clearing and construction of the perimeter roads, certain heliostat and fencing construction activities, and during construction of the gas line (northern route).

Typically, construction would be scheduled to occur between 5 a.m. and 7 p.m. on weekdays and Saturdays. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities (e.g., pouring concrete at night during hot weather and working around time-critical shutdowns and constraints). During some construction periods and during the startup phase of the project, some activities would continue 24 hours per day, 7 days per week. During summer, construction may start substantially earlier to avoid the heat of the day.

Construction laydown and parking would occupy areas of the solar plant sites within the heliostat fields as well as the Construction Logistics Area between Ivanpah 1 and Ivanpah 2 (see Figure 2-2). For example, while constructing the power block, materials for the construction of the power block as well as vehicles for those workers would be parked near the power block. Similarly, steel pipes to be used for the heliostats may be laid out in the heliostat field near where they are to be placed. The Construction Logistics Area would also contain additional equipment laydown and worker parking and construction trailer areas. Temporary construction support facilities within the construction logistics area are expected to include but not be limited to:

- 20 to 25 multi-wide or single-wide full-length trailer offices, or equivalent
- Chemical toilets/porta-potties
- Parking for up to 400 vehicles
- Multiple tool sheds/containers
- Equipment parking for multiple pieces of construction equipment
- Construction material laydown area

- Solar field equipment laydown area
- Fabrication sheds
- Heliostat fabrication building and staging area
- Desert tortoise fencing around perimeter and tortoise holding pens

A construction equipment wash station would be constructed within the project site (in the CLA adjacent to Colosseum Road) or within an alternate area approved by the Bureau.

Table 2-3 provides a construction sequence for the project.

TABLE 2-3  
ISEGS Construction Sequence

<b>Preliminary Stage</b>
Site and CLA fence lines are staked by land surveyors
Improved Colosseum Road location staked by land surveyors
Some minor areas such as ground water and monitoring wells, and construction power drops from the utility may be fenced and installed.
Approved biologists survey staked borders of internal perimeter road and area of Colosseum Road, and translocate all desert tortoises found, as directed by the Biological Opinion.
10-foot-wide perimeter road (within the staked fence line) is cleared of all vegetation and graded
Fencing company installs combined tortoise/security fence along staked fence line and installs tortoise gates at entrances
Fencing company installs tortoise exclusion fence along Colosseum Road.
Fencing company installs tortoise exclusion fence around CLA
Area within fenced perimeters is surveyed by biologists and desert tortoises translocated.
Installation of rare plant "haloes" in solar fields
Relocation of succulents and some rare plants commences in nursery area
<b>Site Development Stage</b>
Vegetation mowed to within 12 to 18 inches above ground surface
Locations of roads, buildings and structures staked by land surveyors
Pads, parking areas and construction laydown areas graded if needed, and construction trailers moved to locations within the CLA
Grading of Substation pad
Colosseum Road graded and paved from golf course to project site.
Rough Grading of certain site locations.
Grading of power block, building pads, internal roads and solar field (as necessary)
<b>Construction Stage</b>
Wheel-washing stations established
Power block excavated and foundations poured
Internal roads graded, graveled, or paved
Fabrication shops erected

TABLE 2-3  
ISEGS Construction Sequence

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All Power Block equipment and materials brought onsite

Installation of underground piping and wiring

Heliostat materials brought onsite

Construction of power block

Construction of Administration/warehouse building

Construction of heliostat field

Construction of gen-tie lines

Construction of EITP (by SCE which includes new substation and 115/220-kV transmission line from Ivanpah to El Dorado Substation)

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**Removal/Restoration Phase**

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Once populated, the nursery's exclusion fence will be removed to permit access to the nursery habitat by indigenous animal species. This will occur several months after initial fencing, so will be reopened well ahead of the conclusion of construction. An exclusion and security fence will remain between the nursery and areas of ongoing construction.

Once construction has been completed, all construction equipment and temporary buildings will be removed.

Areas used for construction that are not required for operation will be restored per the Closure, Revegetation and Rehabilitation Plan.

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## 2.3 Sequence of Construction and Biological Resources Projective Measures

A project milestone schedule, showing construction activities along with surveys and monitoring designed to protect biological resources, is presented in Table 2-4. A list of the key construction events is provided in Table 2-4 along with protection measures and construction limitations identified for biological resources.

Construction activities have been scheduled to avoid or minimize disturbance to special-status species in coordination with the BLM, USFWS and California Department of Fish and Game (CDFG). The project construction schedule is summarized in this section along with the biological monitoring requirements.

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
No. 1: Certification by CEC	Expected Date is September 22, 2010 by CEC, and October 6, 2010 by BLM	9/22/2010
<b>Preliminary Stage (Fence )</b>		
No. 2: Biologists and botanists field preparation	<p>July 2010 – September 2010</p> <p><u>Wildlife:</u> Assemble materials required for clearance surveys and translocating tortoises. Includes fiber-optic scopes, tortoise tags. Obtain approval for Designated Biologists (DM) and Biological Monitors (BM).</p> <p><u>Plants:</u> During pre-construction plant activities will include the following: Avoid impacts to rare plants by excluding from the project area a 433-acre area in the northernmost portion of Ivanpah 3 that is densely populated with rare plants; establish two additional Rare Plant Mitigation Areas in the CLA within which direct impacts to rare plants will be completely avoided; demark and/or fence Mojave milkweed and Rusby's desert mallow rare plant localities proposed for avoidance within the heliostat array to protect the rare plants from direct impacts during pre-construction and construction activities; salvage individual Mojave milkweed and Rusby's desert mallow plants that cannot be avoided for use in translocation, revegetation, and rehabilitation; salvage of all rare cactus (desert pincushion and Parish's club-cholla) onsite for use in translocation, revegetation, and rehabilitation.</p> <p><u>Note:</u> Weed management measures (Weed Management Plan – BIO-13 Attached) and measures in the pending Streambed Alteration Agreement (Attachment D) are ongoing.</p>	
No. 3: Site and Construction Logistics Area (CLA) staked by land surveyors	<p>July 2010 - September 2010</p> <p><u>Administer WEAP</u> (refer to attached BIO-6 Worker Environmental Awareness Program).</p>	
No. 4: Improved Colosseum Road location staked by land surveyors	<p><u>Wildlife:</u> Survey vehicles to remain on existing roads.</p> <p>July 2010 - September 2010</p> <p><u>Administer WEAP</u> (refer to attached BIO-6 Worker Environmental Awareness Program).</p> <p><u>Wildlife:</u> Survey vehicles to remain on existing roads.</p>	
No. 5: Weed inspection station established	<p>October 2010- January 2011</p> <p><u>Plants:</u> A weed inspection station will be established on the first day of construction. Until the permanent facility is operational (see No. 26) vehicles that require washing will be turned back to be washed in Primm before returning to the site.</p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<p>No. 6: 10-foot-wide internal perimeter road (within the staked fence line) is cleared of vegetation and graded</p>	<p>October 2010 – November 2010</p> <p><i>Continue to administer WEAP of all new personnel at site or all subsequent events.</i></p> <p><i>Administer WEAP. (refer to attached BIO-6 Worker Environmental Awareness Program).</i></p> <p><u>Wildlife:</u></p> <p><i>An AB or BM will be onsite during installation of the temporary desert tortoise fence. If installation of temporary fencing, surveying or clearing is occurring at more than one location, more than one AB may need to be onsite to provide appropriate supervision. After installation of this temporary fencing and prior to initiation of construction activities, an AB and/or TM will perform a pre-construction sweep for desert tortoises. An AB will relocate any desert tortoises found in the project impact area. Desert tortoises will be moved to suitable habitat (at least 300 feet from the project site) outside the impact area and placed in a natural or artificial burrow or under a shrub, depending on time of day and year. An AB will also be available to relocate any desert tortoises that may wander into the impact area during construction. All ABs or BMs will have a copy of the Biological Opinion (Attachment B), Translocation Plan (BIO-9 attached), and be familiar with the COC BIO-11 all activities involving desert tortoise clearance surveys, handling, health assessments, and other related translocation activities.</i></p> <p><i>Concurrent with start of perimeter fencing, construct minimum of 16 desert tortoise holding pens for use in quarantining tortoise removed from Ivanpah 1 and the CLA.</i></p> <p><u>Plants:</u> <i>Concurrent with start of perimeter fencing, botanists will install protective fencing for rare plants and salvage any rare plants within the fence line corridor. Environmentally Sensitive Areas (ESAs) will be marked with signs</i></p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<p><u>No. 7:</u> Temporary (stand alone) tortoise fence installed on perimeter of Ivanpah 1</p>	<p>September 2010 – October 2010            Administer WEAP (refer to attached BIO- 6 Worker Environmental Awareness Program)..  <u>Wildlife:</u>            An AB or BM will be onsite during installation of the temporary desert tortoise fence. If installation of temporary fencing, surveying or clearing is occurring at more than one location, more than one AB may need to be onsite to provide appropriate supervision. After installation of this temporary fencing and prior to initiation of construction activities, an AB and/or TM will perform a pre-construction sweep for desert tortoises. An AB will relocate any desert tortoises found in the project impact area. Desert tortoises will be moved to suitable habitat (at least 300 feet from the project site) outside the impact area and placed in a natural or artificial burrow or under a shrub, depending on time of day and year. An AB will also be available to relocate any desert tortoises that may wander into the impact area during construction. All ABs or BMs will have a copy of the Biological Opinion (Attachment B), Translocation Plan (BIO-9 attached), and be familiar with the COC BIO-11 for all activities involving desert tortoise clearance surveys, handling, health assessments, and other related translocation activities.  <u>Plants:</u> Botanists continue installation of protective fencing for rare plants and salvage plants within the fence line corridor. Environmentally Sensitive Areas (ESAs) will be marked with signs.</p>	
<p><u>No. 8:</u> Permanent security/Combo fence installed on perimeter of Ivanpah 1</p>	<p>September 2010 – December 2010  <u>Wildlife:</u> Same as No. 7. Construction crews will require monitoring by DB/BMs until the fence installation is complete.  <u>Plants:</u> Botanists continue installation of protective fencing for rare plants and salvage plants within the fence line corridor.</p>	
<p><u>No. 9:</u> Tortoise exclusion fence installed along Colosseum Road</p>	<p>September 2010 – October 2010  <u>Wildlife:</u> An AB or BM will be onsite during installation of the fence.</p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<p>No. 10: Area within fenced perimeters of Ivanpah 1, and later Ivanpah 2 and 3, is completed</p>	<p>Ivanpah 1: October 2010 to October 31, 2010; Ivanpah 2 and 3, April 1 through May 31, 2011</p> <p><u>Wildlife:</u> <i>Within 24 hours prior to the initiation of construction of the desert tortoise-exclusion fence, a desert tortoise survey would be conducted by DB/TMs of those linear areas using techniques providing 100-percent coverage of the construction area and an additional transect along both sides of the fence line transect to provide coverage of an area approximately 90 feet wide, centered on the fence alignment. Transects would be no greater than 30 feet apart. Two passes of complete coverage would be conducted. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, would be examined to determine occupancy. Any burrow within the fence line corridor would be collapsed after confirmation that it is not occupied by a desert tortoise, or if occupied, the desert tortoise has been removed.</i></p> <p><i>Within 72 hours after the area to be cleared is fully enclosed with tortoise exclusion fencing, a desert tortoise clearance survey would be initiated per USFWS protocol (USFWS 1992) and project specific Guidelines (USFWS 2008). At least three complete clearance sweeps with 100 percent coverage would be conducted as described above. Each separate survey would be walked in a perpendicular direction to allow opposing angles of observation. The area will be considered clear after two complete passes have discovered no new desert tortoises. All ABs or BMs will have a copy of the Biological Opinion (Attachment B), Translocation Plan (BIO-9 attached), and be familiar with the COC BIO-11 for all activities involving desert tortoise clearance surveys, handling, health assessments, and other related translocation activities.</i></p> <p><i>Conduct concurrent clearance surveys for burrowing owls (BIO-16), Gila monsters and badger (BIO-11).</i></p> <p><i>Note: Nesting bird surveys (BIO-15) are required if construction occurs between February 1 and August 3.</i></p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<p>No. 11: Area within fenced perimeters of Ivanpah 1, and later Ivanpah 2 and 3, is completed -- <b>CONTINUED</b></p>	<p><u>Plants</u> Monitoring activities specific to special-status plants include: the Designated Biologist will oversee the salvage and transplantation of special-status plants designated on final project plans as "salvage". Salvaged plants will be installed in the Rare Plant Transplantation Area (RPTA); regular inspections of salvaged plants placed in the RPTA will be conducted by the Botanical Monitors to check that salvaged plants are watered and maintained as needed to maximize survivorship throughout the construction period; salvaged native plants that are stored offsite in a native plant nursery (should this be needed), will also be inspected by the Botanical Monitor to document that plants are maintained in good condition; the Botanical Monitor will oversee construction to confirm that no unauthorized construction activities occur in Rare Plant Avoidance Areas (RPAAAs); inspections of all fenced special-status plants within the heliostat array will be conducted by the Botanical Monitor to document that avoidance fencing is maintained in good condition; fencing surrounding the Rare Plant Mitigation Areas will be inspected regularly to check that fencing is maintained in good condition; the Botanical Monitor will monitor general construction activities for compliance with regulatory terms and conditions that pertain to special-status plants; and the Botanical Monitor will notify the project owner, BLM's Authorized Officer, and the CPM of any non-compliance with any biological resources condition of certification.</p>	
<p><b>Construction of Fiber-optic and Gas Lines</b></p>		
<p>No. 12: Fiber-optic line construction</p>	<p>November 2010 – September 2012 <u>Wildlife</u>: DB/BMs clear area of all desert tortoises immediately prior to construction and monitor construction.</p>	
<p>No. 13: Gas line construction</p>	<p>December 2010 – October 2012 <u>Wildlife</u>: DB/BMs clear area of all desert tortoises immediately prior to construction and monitor construction outside of fenced perimeter. <u>Plants</u>: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<b>Preliminary Stage (Fence ) of Ivanpah 2 and 3</b>		
No. 14: 10-foot-wide internal perimeter road (within the staked fence line) is cleared of vegetation and graded	March 2011 – April 2011 <i>Continue to administer WEAP of all new personnel at site or all subsequent events (refer to attached BIO-6 Worker Environmental Awareness Program).</i> <u>Wildlife:</u> Same as No. 6 <u>Plants:</u> Same as No. 6	
No. 15: Perimeter fence construction in Ivanpah 2	March 2011 – May 2011 <u>Wildlife:</u> Same as No. 7 and No.8. <u>Plants:</u> Same as No. 7 and No.8	
No. 16: Perimeter fence construction Ivanpah 3	March 2011 – MAY 2011 <u>Wildlife:</u> Same as No. 7 and No.8. <u>Plants:</u> Same as No. 7 and No.8	
<b>Site Development Stage (Primarily inside fenced areas)</b>		
No. 17: Rough Grading of sites	Ivanpah 1 & Common areas: November 2010 – January 2011 Ivanpah 2: January 2011 – April 2011 Ivanpah 3: April 2011 – June 2011 <u>Wildlife:</u> A Biological Monitor will onsite during initial grading to ensure no tortoise remain on the site. If a tortoise is found it will be translocated as previously described. <i>Conduct concurrent clearance surveys for burrowing owls (BIO-16), Gila monsters and badger (BIO-11).</i> <i>Note: Nesting bird surveys (BIO-15) are required if construction occurs between February 1 and August 3.</i> <u>Plants:</u> Rare plant protection areas. ESAs and RPAs monitored to ensure construction activities don't intrude	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<p>No. 18: Pads, parking areas and construction laydown areas graded if needed, and construction trailers moved to locations within the CLA</p>	<p>November 2010 – February 2011</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife for these construction activities as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented. Monitoring of overwintering tortoises in holding pens will be ongoing.</p> <p><u>Plants</u>: Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	
<p>No. 19: Locations of roads, buildings and structures staked by land surveyors</p>	<p>November 2010 - May 2012</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p>	
<p>No. 20: Grading of power block, building pads, internal roads and solar field (as necessary)</p>	<p>Ivanpah 1 &amp; Common: November 2010 - November 2011</p> <p>Ivanpah 2: January 2011 – January 2012</p> <p>Ivanpah 3: April 2011 – April 2012</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	
<p>No. 21: Vegetation mowed to within 10-12 inches of ground surface</p>	<p>Ivanpah 1 &amp; Common: December 2010 – December 2012</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<b>Construction Stage (Inside fenced areas)</b>		
No. 22: Colosseum Road graded and paved from golf course to plant	October 2010 – November 2010 <u>Wildlife: DB/BMs clear fenced area of all desert tortoises prior to construction.</u> <u>Plants: No rare plants are located along Colosseum Road.</u>	
No. 23: Internal roads graded, graveled, or paved	Ivanpah 1: October 2010 – November 2012 Ivanpah 2: January 2011- February 2013 Ivanpah 3: April 2011 – February 2013 <u>Wildlife: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</u> <u>Plants: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude</u>	
No. 24: Power equipment and materials brought onsite	November 2010 <u>Wildlife: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</u> <u>Plants: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u>	
No. 25: Fabrication shops erected	November 2010 – August 2011 <u>Wildlife: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</u> <u>Plants: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
No. 26: Permanent wheel-washing station established	<p>January 2011—April 2011</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	
No. 27: Power block excavated and foundations poured	<p>Ivanpah 1: December 2010 – December 2011</p> <p>Ivanpah 2: April 2011 – February 2012</p> <p>Ivanpah 3: June 2011 - June 2012</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	
No. 28: Installation of underground piping and wiring	<p>Ivanpah 1: December 2010-September 2011</p> <p>Ivanpah 2: February 2011-October 2011</p> <p>Ivanpah 3: April 2011-December 2011</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: Rare plant protection areas. ESAs and RPAAAs monitored to ensure construction activities don't intrude.</p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

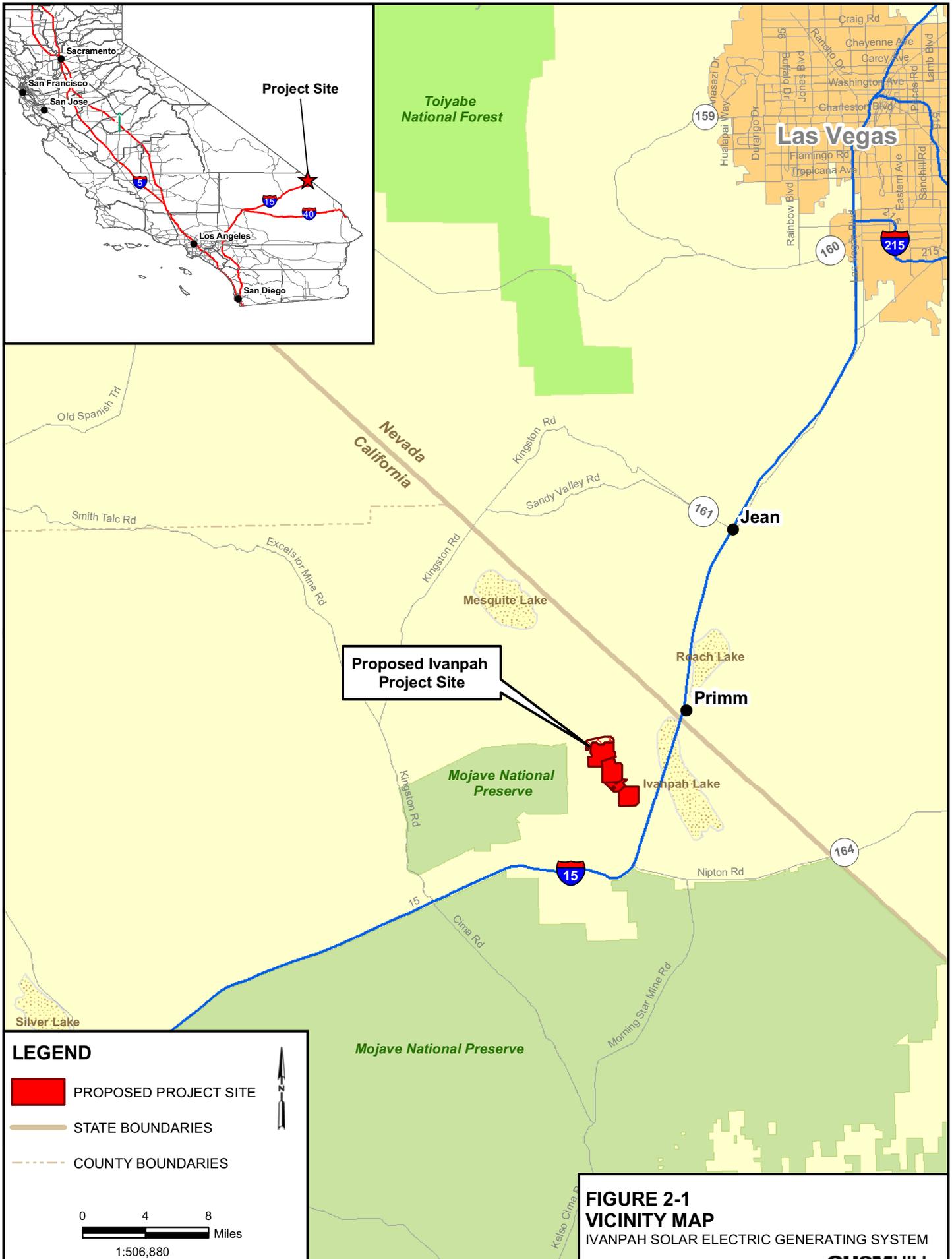
Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
No. 29: Construction of power block	<p>Ivanpah 1: December 2011 – January 2013</p> <p>Ivanpah 2: May 2011 – April 2013</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: <u>Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u></p>	
No. 30: Heliostat materials brought onsite	<p>February 2011</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: <u>Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u></p>	
No. 31: Construction of Administration/warehouse building	<p>February 2011 – October 2011</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: <u>Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u></p>	
No. 32: Construction of heliostat field	<p>Ivanpah 1: March 2011 –August 2012</p> <p>Ivanpah 2: May 2011-October 2012</p> <p>Ivanpah 3: March 2012- May 2013</p> <p><u>Wildlife</u>: No biological monitoring required for wildlife as long as all of the previously described construction events have occurred (e.g., perimeter fence installed) and resources protection measures have been implemented.</p> <p><u>Plants</u>: <u>Rare plant protection areas, ESAs and RPAAAs monitored to ensure construction activities don't intrude.</u></p>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
Solar plant construction Ivanpah 1	December 2010 – January 2013 <i>Implement all of the preceding measures for construction.</i>	
Solar plant construction Ivanpah 2	January 2011 – April 2013 <i>Implement all of the preceding measures for construction.</i>	
Solar plant construction Ivanpah 3	July 2011 – August 2013 <i>Implement all of the preceding measures for construction.</i>	
<b>Removal/Restoration Phase</b>		
Construction completed, all construction equipment and temporary buildings removed.	March 2013 - November 2013 <u>Wildlife:</u> <i>The permanent exclusion fencing would be inspected bimonthly (i.e., every other month) and after major rainfall events</i>  <u>Plants:</u> <i>Areas used for construction that are no longer required for operation are restored per the Closure, Revegetation and Rehabilitation Plan. Special-status plant monitoring will be conducted within the RPAAAs.</i>	
<b>Operation (Inside fenced areas)</b>		
	Life of the project (45 Years)  <i>WEAP repeated annually for permanent employees, and will be routinely administered within one week of arrival to any new construction personnel.</i>  <u>Wildlife:</u> <i>The permanent exclusion fencing is inspected bimonthly (i.e., every other month) and after major rainfall events.</i>  <i>Implement ongoing measures of Raven Management Plan (BIO-12).</i>  <i>Implement ongoing measures of Tortoise Translocation Plan. Monitoring and adaptive management measures for first 3 years of operation (see BIO-9 and Biological Opinion).</i>  <i>Implement ongoing measures of Avian and Bat Monitoring and Management Plan (BIO-21)</i>  <u>Plants:</u> <i>Maintain nursery plants. Special-status plant monitoring will be conducted within the RPAAAs. An adaptive management approach will be used during long-term monitoring as per BIO-14.</i>	

TABLE 2-4  
Key Construction Events and Essential Biological Resource Protection Measures

Event Description	Expected Dates and Essential Biological Resource Protection Measures	Date Completed
<b>Maintenance (Inside and outside of fenced areas)</b>		
Class I activities (do not result in surface disturbance)	Life of the project (45 Years) <i>Wildlife: DM/BM administers WEAP and monitors activity outside of fenced area that requires vehicles or construction equipment.</i>	
Class II activities (results in minimal surface disturbance)	Life of the project (45 Years) <i>Wildlife: DM/BM administers WEAP and monitors activity outside of fenced area that requires vehicles or construction equipment</i> <i>Plants: Minimize new disturbance – avoid vegetation.</i>	
Class III activities (result in new, major, surface disturbance outside of fenced areas)	Life of the project (45 Years) <i>Wildlife: Implement measures established for construction activities outside of fenced areas.</i> <i>Plants: Implement appropriate measures in the Closure, Revegetation and Rehabilitation Plan (BIO-14).</i>	
<b>Facility Closure</b>		
Decommissioning.	45 years from project's start of operation <i>Implement measures of the Closure, Revegetation and Rehabilitation Plan(BIO-14)</i>	



**FIGURE 2-1**  
**VICINITY MAP**  
 IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

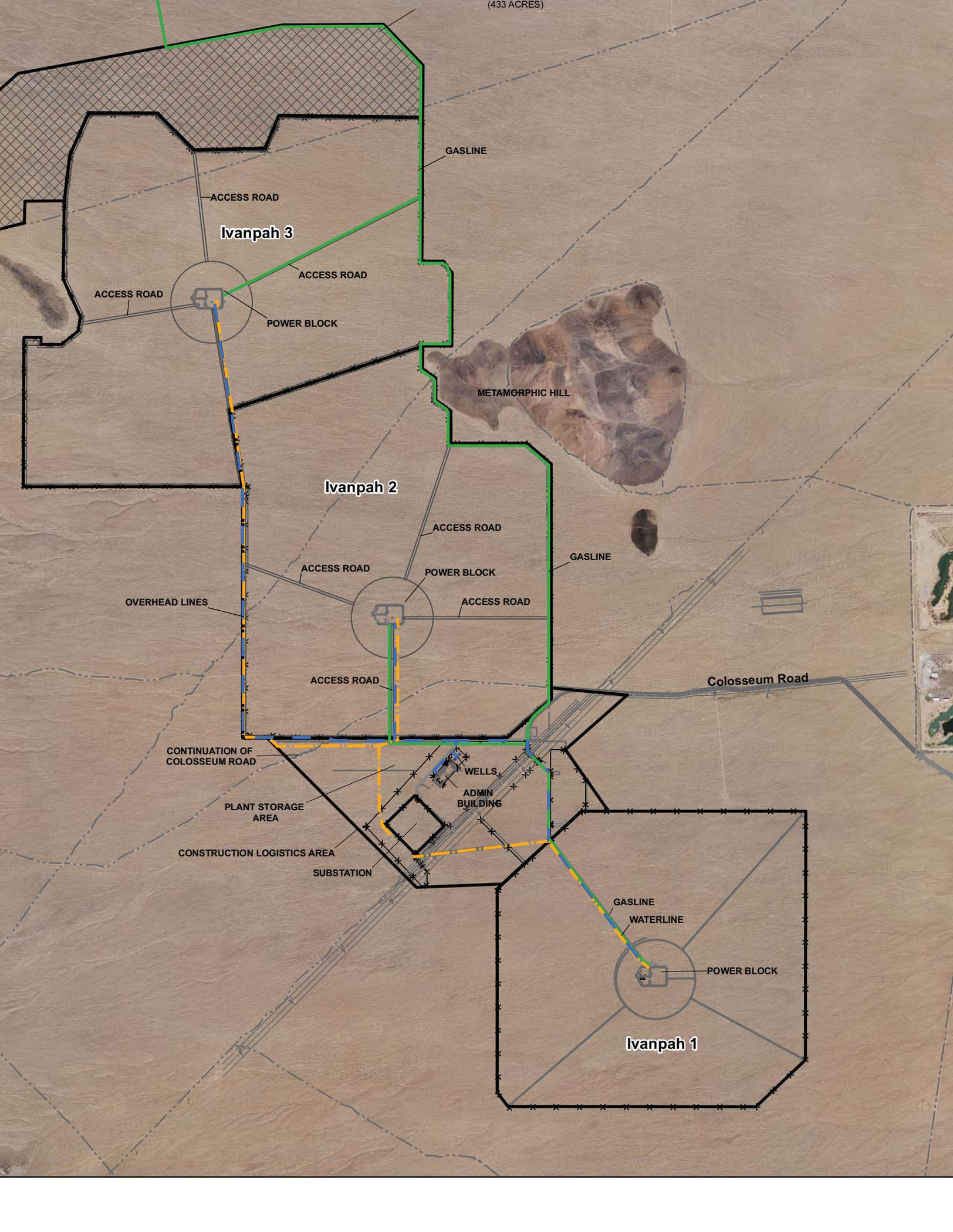
**CH2MHILL**

**LEGEND**

- PROPOSED PROJECT SITE
- STATE BOUNDARIES
- COUNTY BOUNDARIES

1:506,880





Ivanpah 3

POWER BLOCK

GASLINE

ACCESS ROAD

ACCESS ROAD

ACCESS ROAD

METAMORPHIC HILL

Ivanpah 2

ACCESS ROAD

GASLINE

OVERHEAD LINES

ACCESS ROAD

POWER BLOCK

ACCESS ROAD

ACCESS ROAD

Colosseum Road

CONTINUATION OF COLOSSEUM ROAD

WELLS

ADMIN BUILDING

PLANT STORAGE AREA

CONSTRUCTION LOGISTICS AREA

SUBSTATION

GASLINE

WATERLINE

POWER BLOCK

Ivanpah 1

MC	27May10	ER GK
MC	06Jun10	JB GK

Radius	North	East
16.24	N 65,200.61	E 33,396.87
168.8	N 64,999.10	E 33,537.43
321.36	N 64,999.10	E 33,537.43
473.92	N 64,999.10	E 33,537.43
626.48	N 64,999.10	E 33,537.43
779.04	N 64,999.10	E 33,537.43
931.6	N 64,999.10	E 33,537.43
1084.16	N 64,999.10	E 33,537.43
1236.71	N 64,999.10	E 33,537.43
1389.27	N 64,999.10	E 33,537.43
1541.83	N 64,999.10	E 33,537.43
1694.39	N 64,999.10	E 33,537.43
1846.95	N 64,999.10	E 33,537.43
1999.51	N 64,999.10	E 33,537.43
2152.07	N 64,999.10	E 33,537.43
2304.63	N 64,999.10	E 33,537.43
2457.19	N 64,999.10	E 33,537.43
2609.74	N 64,999.10	E 33,537.43
2762.31	N 64,999.10	E 33,537.43
2914.86	N 64,999.10	E 33,537.43
3067.42	N 64,999.10	E 33,537.43
3219.98	N 64,999.10	E 33,537.43
3372.54	N 64,999.10	E 33,537.43
3525.1	N 64,999.10	E 33,537.43
3677.66	N 64,999.10	E 33,537.43

**NOTES:**

- THE COORDINATES SHOWN ON A LOCAL PLANT GRID ARE CONSIDERED AS NEVADA DATUM 7276-A AND BASED ON NODE 1 ABOVE. THE LOCAL GRID IS ESTABLISHED AS FOLLOWS:
  - HORIZONTAL DATUM: NORTH AMERICAN
  - VERTICAL DATUM: NORTH AMERICAN
  - UNIT OF MEASURE: U.S. SURVEY FEET
  - GRID TYPE: FALSE NORTHING, FALSE EASTING, UTM ZONE 11N
- LATITUDE: LONGITUDE: ELEVATION:
- GRID ORIENTATION: GRID MERIDIAN: CENTRAL MERIDIAN: PLANAR SURFACE: GRID ORIGIN:
- THE COMBINED SCALE OF THIS DRAWING IS BASED ON THE BRIGHTSOURCE (GROUND TO GRID). This drawing is based on 25542-000-C2-0000-0000. The coordinate system uses the local grid shown in the AutoCAD drawing.
- CPDU Layout based on:
  - Document ID is 60
  - Based on excel file
  - Explained in word
- Heliostat & CPDU Naming:
  - NW Road width based

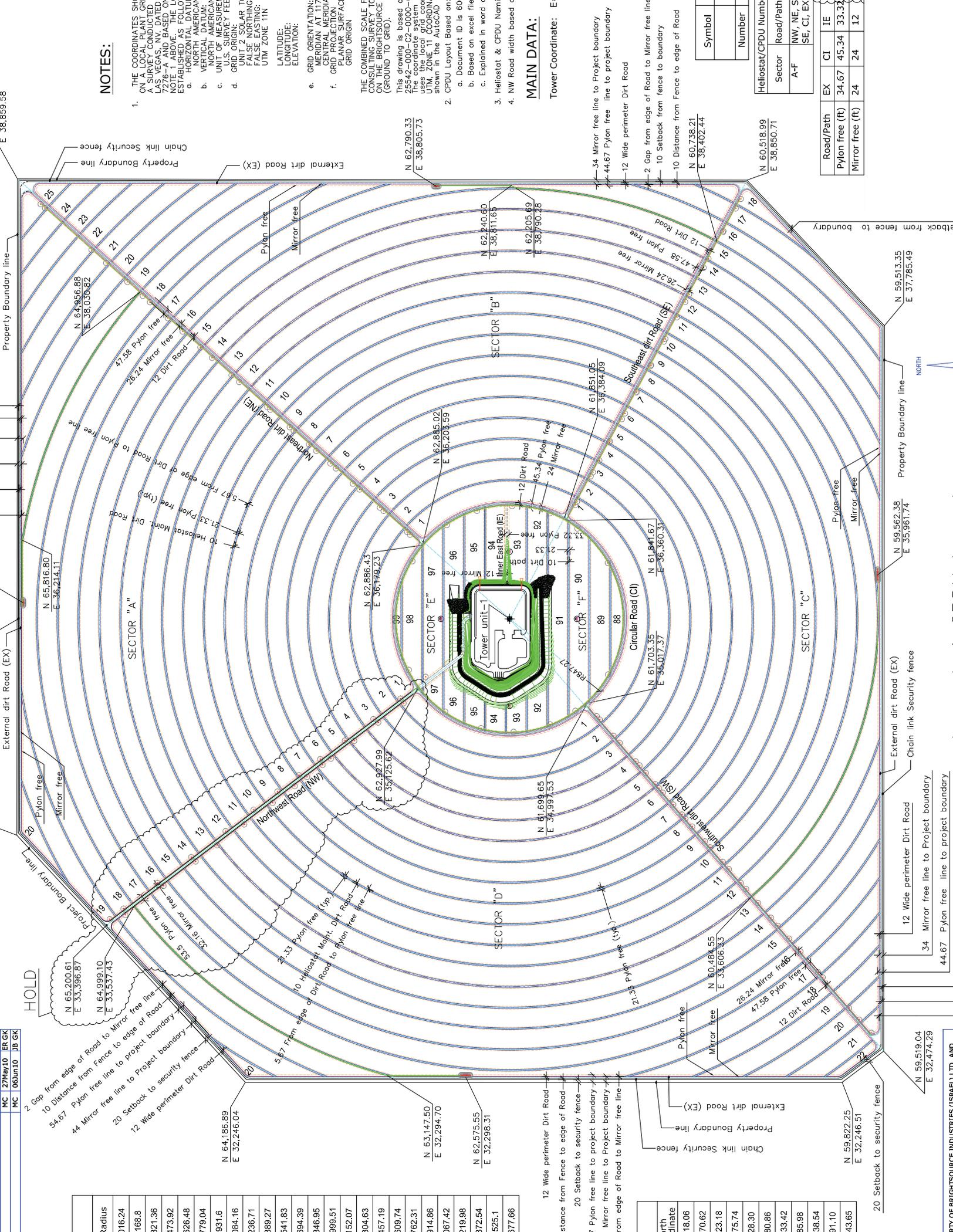
**MAIN DATA:**

Tower Coordinate: E

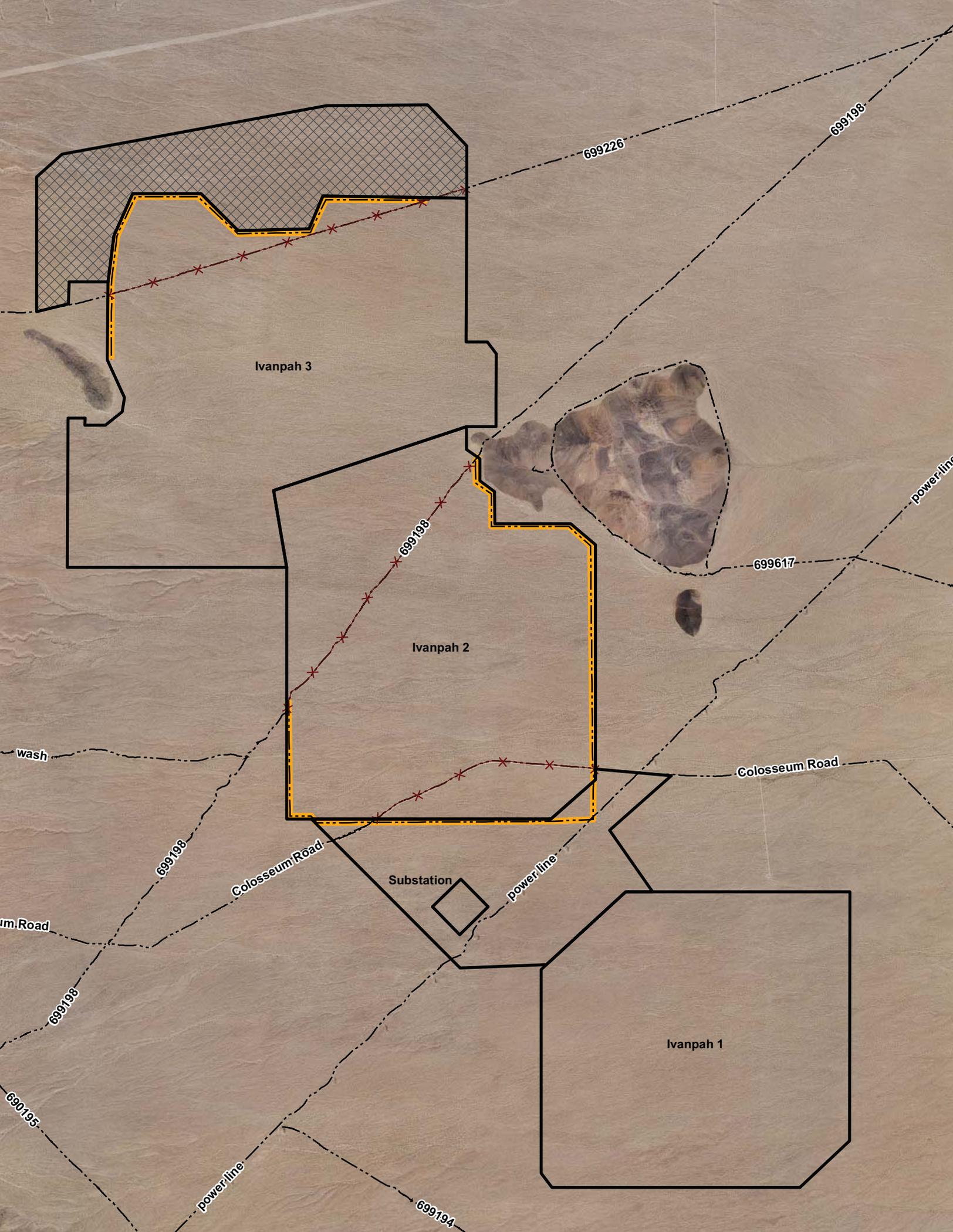
Symbol	Number

Sector	Road/Path	INW, NE, S, SE, CI, EX
A-F		

Road/Path	EX	CI	IE
Pylon free (ft)	34.67	45.34	33.32
Mirror free (ft)	24	24	12



North	East
18.06	N 60,488.55
70.62	E 33,606.33
23.18	N 60,488.55
75.74	E 33,606.33
28.30	N 60,488.55
80.86	E 33,606.33
33.42	N 60,488.55
85.98	E 33,606.33
38.54	N 60,488.55
91.10	E 33,606.33
43.65	N 60,488.55



Ivanpah 3

Ivanpah 2

Ivanpah 1

Substation

Colosseum Road

Colosseum Road

wash

um Road

699226

699198

699198

699617

699198

699198

690195

699194

power line

power line

power line



## SECTION 3

# Description of Biological Resources

---

## 3.1 Habitat

### 3.1.1 General Description

The ISEGS site is located on in a portion of the Ivanpah valley that has been subject to some development. This portion of the valley includes the Primm Valley Golf Club and I-15 to the east, an electrical transmission corridor running through the project site, associated unpaved roads (trails), a natural gas transmission line (Kern River Gas Transmission) to the north of the site, and an additional high voltage electrical transmission corridor to the north of it. Vegetation on the site and in the immediate project area consists of primarily Mojave creosote bush scrub, with Mojave yucca – Nevada ephedra scrub, and Mojave wash scrub also represented. Plant communities at the ISEGS site are characterized by high diversity and density of native succulents and relatively low levels of noxious weeds. Elevations in the project area range from approximately 3,150 to 2,850 feet above mean sea level. The Clark Mountain Range occurs to the north and west of the project area, and the topography slopes gradually down to the east and southeast toward Ivanpah Dry Lake on the alluvial fans and bajada on the Clark Mountains' east and south flanks. The northernmost phase of the project site is immediately flanked by two hills: a limestone hill to the west and a metamorphic hill to the east.

The dominant plant community on the site, Mojave creosote bush scrub, is common in the Mojave Desert and is comprised of drought-adapted native shrubs. A census of all individuals of California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*) and clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*) estimated densities at one to two mature barrel cacti per acre for the site overall; with some densities of 15 mature barrel cacti per acre occurring in some localized areas. This density is unusual because it occurs on a bajada rather than on rocky slopes where high barrel cactus densities would be expected.

Annual plants are also characteristic of Mojave creosote bush scrub but were notably absent during the initial field surveys in 2007 due to low rainfall. Follow-up field surveys were conducted in 2008 to characterize annual plant cover. In the project area, creosote bush (*Larrea tridentata*) is dominant in Mojave creosote bush scrub, and the following are commonly associated perennial species: burrobush (*Ambrosia dumosa*), clustered barrel cactus, Nevada ephedra (*Ephedra nevadensis*), California barrel cactus, cheesebush (*Hymenoclea salsola*), and Mojave yucca (*Yucca shidigera*). Additional plant communities and habitats within the project footprint include disturbed land associated with roads and transmission lines, Mojave wash scrub (contains acacia as described below), and numerous ephemeral washes also occur on the site. Additional vegetation types within a one-mile radius of the project footprint include Mojave yucca – Nevada ephedra scrub and limestone pavement plain. Plant communities of each of the three sites are described below.

### 3.1.2 Ivanpah 1

Ivanpah 1, the southernmost site, consists almost entirely of the Larrea-Ambrosia subtype of creosote bush scrub and occurs mainly in a form characterized by a low density and diversity of shrubs and cacti and a very low density of Mojave yucca. Here, the dominant shrubs of the larrea-ambrosia subtype are mainly less than 3 feet in height, with many less than 1 foot in height, and relatively widely spaced. Creosote bush and burrobrush are the most common shrubs, with cheesebush, pima ratany (*Krameria erecta*), Nevada ephedra, Mojave Desert California buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), silver cholla (*Opuntia echinocarpa*), buckhorn cholla (*Opuntia acanthocarpa* var. *coloradensis*), beavertail cactus (*Opuntia basilaris* var. *basilaris*), and pencil cholla (*Opuntia ramosissima*) all present in much lower abundance. Barrel cacti of both species (i.e., California barrel cactus and clustered barrel cactus) and Mojave yucca are present in low to very low numbers. The topography of the Ivanpah 1 site is relatively flat, although it is broken by a number of small to medium-sized ephemeral washes dominated by cheesebush.

### 3.1.3 Ivanpah 2

Vegetation of Ivanpah 2 consists predominantly of the larrea-ambrosia subtype of Mojave creosote bush scrub. This vegetation subtype varies in shrub and cactus density and species diversity from areas that are moderate in density and diversity at the upper elevation west end to areas that are low in density and diversity at the lower elevation east end. Creosote bush and burrobrush are the dominant shrubs and are typically 1 to 4 feet in height. Associated species include: cheesebush, pima ratany, Nevada ephedra, Mojave Desert California buckwheat, silver cholla, buckhorn cholla, beavertail cactus, and pencil cactus. The density of barrel cacti, including California barrel cactus and clustered barrel cactus, and Mojave yucca, is highest in the northern third of the site, moderately high in the western half of the site, and lowest in the southern half, especially to the east.

The topography is relatively flat overall and dissected by many small to medium-sized ephemeral washes with active channels usually less than 5 feet wide that flow from west to east in the northern half of Ivanpah 2 and trend from southwest to northeast and east in the southern half of Ivanpah 2. The vegetation of most of these is composed mainly of shrub species typical of larrea-ambrosia scrub. Cheesebush washes are in higher densities than in adjacent areas. North of Colosseum Road, in the southern half of Ivanpah 2, is a large drainage complex up to 75 feet wide in some areas, although the active channels are much narrower. This large wash system supports Mojave wash scrub, although in a form distinguished mainly by the presence of catclaw acacia (*Acacia greggii*). This form has lower shrub species diversity than the Mojave wash scrub observed in Ivanpah 3.

### 3.1.4 Ivanpah 3

Ivanpah 3 is the northernmost and largest of the three proposed sites and supports more complex plant communities than Ivanpah 1 and 2. The larrea-ambrosia scrub subtype of Mojave creosote bush scrub is the most common vegetation type and occurs throughout Ivanpah 3, covering about 75 to 80 percent of the site. The larrea mixed scrub subtype of Mojave creosote bush scrub occurs north and south of the limestone hill, along the southwest margin, and also immediately adjacent to the northern boundary of Ivanpah 3. In the western and northern parts of Ivanpah 3, larrea mixed scrub patches alternate with

patches of larrea-ambrosia scrub. Some of the larger drainage features, which are concentrated in the northern and western sections of Ivanpah 3, contain well-developed Mojave wash scrub. Within Ivanpah 3, the *Larrea ambrosia* scrub subtype varies from the low density-low diversity form to the high density-high diversity form. The patterns are complex but, in general, vegetation with lower densities and diversity of shrubs and cacti, and lower densities of Mojave yucca, is more widespread in the southeastern section of Ivanpah 3.

The elevation gradient within Ivanpah 3 trends very gradually downward from approximately 3,400 feet at the western margin to about 3,000 feet at the southeastern corner. The topography of Ivanpah 3 is more strongly undulating than that of Ivanpah 1 and 2 due to the presence of many small to large ephemeral wash drainage features that trend generally in a west-to-east direction. Mojave wash scrub is well-developed in some of the larger ephemeral wash drainage features in the northern and western sections of Ivanpah 3. These drainage features are typically 30 to 75 feet wide bank-to-bank, although the active channels occupy only a small portion of the entire feature.

Mojave wash scrub within Ivanpah 3 varies in density and diversity of shrubs. The dominant shrubs are drought-deciduous and are typically 3 to 10 feet in height. The best-developed stands include many large individuals of catclaw acacia, some scattered large desert-willow (*Chilopsis linearis*), and a variety of wash-associated smaller shrubs, including: cheesebush, desert almond (*Prunus fasciculata*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), bladder sage (*Salazaria mexicana*), Cooper's boxthorn (*Lycium cooperi*), and Anderson's boxthorn (*Lycium andersonii*).

## 3.2 Project Area Ephemeral Drainages

The project area is located in the Ivanpah hydrologic unit of the South Lahontan Watershed, which includes approximately 278,486 acres in the Ivanpah and Pahrump Valleys of California and Nevada. All drainage from the surrounding mountains and alluvial fans collect in closed basins in the Ivanpah Valley. Streams, washes, and playas are dry most of the year, with surface water only present in response to storm events. Ivanpah Dry Lake is located approximately 2 miles east and down slope of the project area. The extensive dry lake bed covers approximately 35 square miles and is located in California adjacent to the California/Nevada border. Two mapped springs, Whisky Spring and Ivanpah Spring, are located approximately 1.6 miles west of the proposed project site in the foothills of the Clark Mountains.

The project area is located on a broad bajada that extends from the base of the Clark Mountains to the western shoreline of Ivanpah Lake, with numerous ephemeral washes occurring throughout the broad, coalescing, alluvial fans that convey storm water runoff from the mountains towards Ivanpah Dry Lake. Larger washes are most abundant in the northern section of Ivanpah 3 as well as the east and west sides of Ivanpah 2. The larger washes tend to dissipate into smaller, more braided channels as they progress downslope. The majority of the drainages terminate prior to reaching Ivanpah Dry Lake with defined erosion features diminishing and becoming broad surface flow only. All of the ephemeral washes identified in the study area typically flow only in response to storm events. No wetlands or riparian habitat occurs within the ISEGS project area.

The active flow channels of the smaller washes are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contained cobble and scattered larger rocks. Most of the larger channels typically contained scattered vegetation including creosote bush and cheesebush especially in braided channels that contain slightly elevated areas intermixed with the active flow channels. Mojave wash scrub is limited to the larger washes (typically over 15 feet) with sandy gravel substrate and well-defined banks. Vegetation associated with these features includes catclaw, cheesebush, Mojave Desert California buckwheat, desert willow, black-banded rabbitbrush, bladder-sage, desert almond (*Prunus fasciculata*), Virgin River encelia (*Encelia virginensis*), Anderson's and Cooper's, sand-wash groundsel (*Senecio flaccidus* var. *monoensis*), wire lettuce (*Stephanomeria pauciflora*), and blue sage (*Salvia dorrii*).

### 3.3 Noxious Weeds

Noxious weeds are species of non-native plants included on the weed lists of the California Department of Food and Agriculture (CDFA, 2007), the California Invasive Plant Council, or those weeds of special concern identified by BLM. Noxious weeds were relatively low in abundance and diversity throughout the ISEGS project area. In 2008, five species of weeds from the target list were found within the project area: Saharan mustard (*Brassica tournefortii*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), Russian thistle (*Salsola* sp.), and London rocket (*Sisymbrium irio*).

In 2008, weeds within the project area were widespread but did not form a dominant element in any of the vegetation types. Red brome was by far the most abundant and widespread weed species. It was found throughout the project area, mainly growing at the bases of shrubs in small washes, where it occurs most frequently in groups of 1 to 10 individuals. Red brome occurs in the highest densities within the north and northwestern parts of the project area, in Ivanpah 3 and the utility corridor, where it extends beyond the shrub understory. The other weed species were each found within fewer than ten locations, in low abundance. Disturbance conditions were cataloged at each weed location. Natural disturbance in the form of small- to medium-sized active washes was the most common type of disturbance with which weeds were associated.

#### 3.3.1 Saharan mustard (*Brassica tournefortii*)

Saharan mustard was found in two locations, both in the northern part of the project area. One location was within Ivanpah 3, and a second location was within the utility corridor. The abundance category for the Ivanpah 3 location was between 11 to 100 individuals. There were no observable disturbance factors at this location. The abundance category for the location within the utility corridor was between 1 to 10 individuals, and this locality was associated with human-caused disturbance.

#### 3.3.2 Red brome (*Bromus madritensis* ssp. *rubens*)

Red brome was the most common and widespread weed encountered in 2008. It was found in 961 locations, scattered throughout the project area. About 72 percent of these locations consisted of 1 to 10 individuals, and most of these were associated with natural

disturbances, mainly small- to medium-sized washes. An additional 21 percent of the total locations consisted of 11 to 100 individuals, and these were also mainly associated with natural disturbance features. The highest local concentrations of red brome were found in the western half of Ivanpah 3, and the utility corridor. These sites contain the highest elevations of the project areas and are possibly somewhat less dry than the lower elevation sites. Ivanpah 3 is also the closest site to the Kern River Gas Transmission Line, where substantial disturbance has occurred.

### 3.3.3 Cheat grass (*Bromus tectorum*)

Cheat grass was found in nine widely scattered locations, with five in Ivanpah 1, one in Ivanpah 2, two in Ivanpah 3, and one in the Construction logistics area. Seven of these locations consisted of 1 to 10 individuals. All of the cheat grass locations were associated with natural disturbance factors.

### 3.3.4 Russian thistle (*Salsola* sp.)

One location of Russian thistle, consisting of 1 to 10 immature individuals that could not be identified to species, was found along the access road, Colosseum Road, in an area affected by human-caused disturbance.

### 3.3.5 London rocket (*Sisymbrium irio*)

One location of London rocket, consisting of 1 to 10 individuals, was found within the southern half of Ivanpah 2, in an area affected by natural disturbance.

## 3.4 Special-status Plant Species

Eight special-status plant species have been observed within project area boundaries during protocol-level surveys in 2008 and 2007 (GANDA, 2008). Subsequent to the 2008 botanical surveys, it was determined that one of the eight special-status plant species, small-flowered androstephium was misidentified onsite, and it therefore does not occur. This species is not discussed further in this BRMIMP.

On February 11, 2010, the project footprint was redesigned to reduce impacts to special-status plants as described in (the Biological Mitigation Proposal [Mitigated Ivanpah 3]) (CH2M HILL, 2010). This proposal excluded a 433-acre area with high rare plant density from Ivanpah 3 and defined two additional rare plant mitigation areas within the CLA. Only five species occur within the reduced impact project area.

- Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*)
- Mojave milkweed (*Asclepias nyctaginifolia*)
- Desert Pincushion (*Coryphantha chlorantha*)
- Parish's Club-cholla (*Grusonia parishii*)
- Nine-awned Pappus Grass (*Enneapogon desvauxii*)

None of the special-status plants observed within the 2010 project area are federally or state-listed. These five species are included on the California Native Plant Society (CNPS) List. One of these, Rusby's desert-mallow, is also a BLM sensitive species.

A summary on the natural history, distribution, and status of these species on the project area is provided below. More detailed information is provided in the ISEGS Botanical Resources Survey Report (GANDA, 2008) and the FSA (CEC, 2009).

### 3.4.1 Mojave Milkweed (*Asclepias nyctaginifolia*)

The California distribution of Mojave milkweed is limited to a very small area in eastern San Bernardino County. This perennial plant also occurs in Arizona, New Mexico, and Nevada but it has a CNDDDB state rank of S1 (critically imperiled and vulnerable to extirpation from the state due to extreme rarity). The habitat of Mojave milkweed in California includes washes and dry slopes from about 3,000 to 5,100 feet in Mojave Desert scrub and pinyon and juniper woodland (CNPS, 2008). Within the project area Mojave milkweed typically grows in small- to medium sized washes with sandy to gravelly substrates.

### 3.4.2 Desert Pincushion (*Coryphantha chlorantha*)

Desert pincushion is a stem succulent found in the Mojave Desert in San Bernardino and Inyo counties, and also occurs in Arizona, Nevada, and Utah. It has a CNDDDB global rank of G2 (imperiled and at high risk of extinction due to a very restricted global range) and a CNDDDB state rank of S1 (critically imperiled). In California its habitat is gravelly or rocky carbonate substrates. In California, desert pincushion is known from the Mojave Desert, in San Bernardino and Inyo counties (CNDDDB, 2009); it also occurs in Nevada, Arizona and Utah. Desert pincushion's distribution in California is apparently restricted to a few mountain ranges in the eastern Mojave Desert, in eastern San Bernardino County and southeastern Inyo County. Desert pincushion is widely scattered throughout the project area. Most individuals were found in Mojave creosote bush scrub.

### 3.4.3 Nine-awned Pappus Grass (*Enneapogon desvauxii*)

Nine-awned pappus grass is a widespread species of the southwestern U.S., Mexico and South America, but the California range of this species is restricted to a small portion of eastern Mojave Desert, in San Bernardino County (CNDDDB, 2009). It has a CNDDDB state rank of S2 (imperiled). Habitat of nine-awned pappus grass in California consists of rocky slopes, crevices, calcareous soils, in desert woodland. In the Ivanpah Valley, this species occurs on the often north-facing sides of medium-sized to large washes, and on cobble mounds within and outside of washes that include some calcareous rocks, from 2,900 to 3,400 feet, in Mojave creosote bush scrub. In 2007, no individuals of this species were detected within the ISEGS project area, but in the 2008 surveys over 8,000 plants were documented, suggesting that the population varies widely in response to seasonal variation in precipitation and other climate variables.

### 3.4.4 Parish's Club-Cholla (*Grusonia parishii*)

The California range of Parish's club-cholla has a CNDDDB state rank of S2 (imperiled). Currently, it is known from fewer than 20 occurrences but it has a wider range in California that extends south into Riverside County. This stem succulent also occurs in Nevada, Arizona, and possibly Texas. The habitat of Parish's club-cholla within the project area consists of sandy to somewhat gravelly uplands in the larrea-ambrosia sub-type of Mojave creosote bush scrub. Parish's club cholla is abundant within the ISEGS project area, where it is discontinuously distributed, with most locations found in Ivanpah 1 and 3, and

the construction logistics area. This species grows in clones consisting of spreading mats that may form separate patches over time. One “mat” (dense, clonal clumps) was defined as one individual during the surveys.

### 3.4.5 Rusby’s Desert-Mallow (*Sphaeralcea rusbyi* var. *eremicola*)

Rusby’s desert-mallow is a California endemic perennial herb; it is documented globally from less than 30 occurrences in Inyo and San Bernardino counties in the Death Valley Region and Eastern Mojave Desert in the Clark Mountain Range. It has a CNDDDB state rank of S2 (imperiled). It occurs in the Clark Mountain Range at Ivanpah Springs, on desert slopes and gravelly sandy washes and often in carbonate and limestone substrate, extending into the project area. This plant is the only BLM-sensitive plant species detected onsite.

## 3.5 Wildlife

The diverse plant communities and landscape features in and around the ISEGS site support a correspondingly high diversity of wildlife. Reptiles detected during the 2007/2008 surveys include desert tortoise, side-blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis*), long-nosed leopard lizard (*Gambelia wislizenii*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), common collared lizard (*Crotaphytus collaris*), and sidewinder (*Crotalus cerastes*). The banded Gila monster (*Heloderma suspectum cinctum*) was not detected during the surveys, but this large, seldom-seen lizard may occur in the project vicinity.

The diverse landscape features, vegetation, forage, and prey availability at the ISEGS project area is likely to attract a variety of mammal species such as Audubon’s cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), whitetail antelope squirrel (*Ammospermophilus leucurus*), desert kit fox (*Vulpes macrotis*), and coyote (*Canis latrans*). Given the proximity of the Clark Mountains, it is likely that mule deer (*Odocoileus hemionus hemionus*) and desert bighorn sheep (*Ovis canadensis nelsoni*) move down into the upper elevations of the valley to forage (CH2M HILL, 2008a). It is also likely that portions of Ivanpah Valley provide movement corridors for mule deer and this bighorn sheep subspecies.

The ISEGS project area provides forage, cover, roosting, and nesting habitat for a variety of bird species. Resident and migratory birds occur at the ISEGS site during the winter, migratory, and breeding seasons, including birds such as Say’s phoebe (*Sayornis saya*), black-throated sparrow (*Amphispiza bilineata*), white-crowned sparrow (*Zonotrichia leucophrys*), sage sparrow (*Amphispiza belli*), blue-gray gnatcatcher (*Poliophtila caerulea*), cactus wren (*Campylorhynchus brunneicapillus*), verdin (*Auriparus flaviceps*), western kingbird (*Tyrannus verticalis*), sage thrasher (*Oreoscoptes montanus*), house finch (*Carpodacus mexicanus*), lesser nighthawk (*Chordeiles acutipennis*), common ground-dove (*Columbina passerina*), mourning dove (*Zenaidamacrourea*), Gambel’s quail (*Callipepla gambelii*), American kestrel (*Falco sparverius*), burrowing owl (*Athene cunicularia*), and red-tailed hawk (*Buteo jamaicensis*).

### 3.5.1 Special-status Wildlife Species

Special-status birds potentially using the project area are the western burrowing owl (*Athene cunicularia hypugaea*), golden eagle (*Aquila chrysaetos*), loggerhead shrike (*Lanius ludovicianus*), Le Conte's thrasher (*Toxostoma lecontei*), Crissal thrasher (*Toxostoma crissale*), Vaux's swift (*Chaetura vauxi*), and Brewer's Sparrow (*Spizella breweri*). Burrowing owl survey and monitoring requirements are provided in Section 13 of this plan and in attached Burrowing Owl Mitigation and Monitoring Plan (BIO-16). Survey and monitoring requirements for other migratory birds are addressed in BIO-11, BIO-15, and BIO-21.

Special-status mammals potentially using the project area are the American badger (*Taxidea taxus*), Nelson's bighorn sheep (*Ovis canadensis nelsoni*), Pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). Badger impact avoidance is found in BIO-11, and BIO-19 specifically addresses mitigation for bighorn sheep. BIO-21 addresses measures to monitor both bat and bird impacts.

The only special-status reptile, other than the desert tortoise, with the potential to occur in the project area is the banded Gila monster (*Heloderma suspectum cinctum*). Impact avoidance for this species is addressed in BIO-11. Desert tortoise impact avoidance and minimization and compensation is specifically addressed by BIO-8, 9, 10, 12, and 17.

SECTION 4

# Authority and Lines of Communication

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The first part of this section describes the responsibilities of three groups of participants: regulatory agencies; third-party biologists (Designated Biologists, Biological Monitors, Qualified Botanists and Botanical Monitors); and the project owner, its employees, contractors, and construction crews. The qualifications that the Designated Biologist must satisfy are also described in this section.

The second part of this section describes the lines of communication and chain-of-command, and identifies which persons have the authority to stop or temporarily suspend surface-disturbing activities during construction, operation, and maintenance.

## 4.1 Definitions of Participants

The CEC has designated a staff member to serve as the project’s CPM. The CPM oversees compliance with the CEC conditions of certification for the ISEGS project. The CEC CPM is also responsible for processing post-certification changes, documenting and tracking compliance filings, and ensuring that compliance files are maintained and accessible.

The Designated Biologist(s), Biological Monitors, Qualified Botanist(s), Botanical Monitors and Environmental Compliance Manager will represent the project owner and will have compliance reporting responsibilities to the agencies. These responsibilities and relationships are further described later in this section.

The project owner’s construction personnel will be referred to as contractors and include the construction project manager, construction inspector, plant manager, contractor supervisor, resident engineer, and the crew foreman and crew.

Regulatory agencies involved include BLM, USFWS, U.S. Army Corps of Engineers (USACE), CDFG, CEC, and the regional water quality control board (RWQCB). Table 4-1 lists the project personnel and agency contacts for the ISEGS project.

TABLE 4-1  
ISEGS Key Project Personnel and Agency Contacts

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<b>Applicant</b> BrightSource Energy, Inc. 1999 Harrison Street, Suite 2150 Oakland, CA 94612	Project Manager: Todd Stewart Mobile: (925) 200-0629 Office: (510) 550-8908 Email: <a href="mailto:tstewart@brightsourceenergy.com">tstewart@brightsourceenergy.com</a>
<b>Applicant</b> BrightSource Energy 10161 Park Run Dr. Suite 150 Las Vegas, NV 89145	Onsite Compliance Manager: Doug Davis Mobile: (702) 239-6118 Email: <a href="mailto:ddavis@brightsourceenergy.com">ddavis@brightsourceenergy.com</a>
<b>Environmental Compliance Manager</b> BrightSource Energy 10161 Park Run Dr. Suite 150 Las Vegas, NV 89145	Tracie Wheaton Mobile: (702) 768-7188 Fax: (702) 515-7423 Email: <a href="mailto:twheaton@brightsourceenergy.com">twheaton@brightsourceenergy.com</a>

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TABLE 4-1

## ISEGS Key Project Personnel and Agency Contacts

<b>Designated Biologist (1) - Supervisor</b> Sundance Biology, Inc. 179 Niblick Rd. PMB 272 Paso Robles, CA 93446	Mercy Vaughn Mobile: (928) 380-5507 Email: manydogs10@aol.com
<b>Designated Biologist (2)</b> Kiva Biological Consulting PO Box 1210 Inyokern, CA 93527	Peter Woodman Mobile: (760) 861-3961 Email: kivabio@aol.com
<b>Designated Biologist (3)</b> Sundance Biology, Inc. 179 Niblick Rd. PMB 272 Paso Robles, CA 93446	Steve Boland Mobile: (928) 380-8850 Email: spboland@aol.com
<b>Qualified Botanist</b> CH2M HILL 2485 Natomas Park Dr. Sacramento, CA 95833	Amy Hiss Direct: 916-286-0282 Mobile: 530-304-9376 Fax: 916-614-3465 Email: amy.hiss@ch2m.com
<b>Qualified Botanist</b> CH2M HILL 2485 Village View Drive, Suite 350 Henderson, NV 89074	Geof Spaulding Direct: 702-953-1233 Mobile: 702-524-5860 Fax: 702- 953-6233 Email: gspauldi@ch2m.com
<b>AGENCY PERSONNEL</b>	
<b>CEC Compliance Project Manager</b> 1516 9th Street Sacramento, CA 95814	Joseph Douglas Direct: (916) 653-4677 Email: jdouglas@energy.state.ca.us
<b>BLM's Authorized Officer</b>	NAME Direct: Mobile: Fax: Email
<b>USFWS</b> U.S. Fish and Wildlife Service 602 Tippecanoe Ave. San Bernardino, CA 92408	Brain Croft Direct: (951)-697-5365 Email: Brian_Croft@fws.gov
<b>CDFG</b> California Department of Fish & Game 36431 41st Street East Palmdale, CA 93552	Becky Jones Direct: Email: dfgpalm@adelphia.net

## 4.2 Responsibilities of the Participants

Although responsibilities are divided, ultimately the project owner's construction team and the Designated Biologist collectively have the responsibility to reach a consensus when conflicts arise among construction, environmental, and landowner concerns. Weekly project status meetings will be held and attended by the Designated Biologist, the owner's Environmental Compliance Manager and the contractors. From time-to-time, it is possible that one or more of the regulatory agencies may be consulted as part of conflict resolution.

## 4.2.1 Designated Biologist

### Selection and Qualifications

The project owner shall assign at least one Designated Biologist to the project. It is anticipated that at least two Designated Biologist(s) will be required to perform the necessary functions. The project owner will submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the Energy Commission CPM and BLM's Authorized Officer for approval in consultation with CDFG and USFWS.

The project owner shall submit the specified information at least 90 days prior to the start of any project-related site disturbance activities. No site or related facility activities shall commence until an approved Designated Biologist is available to be onsite.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Authorized Officer and the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the BLM Authorized Officer and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to BLM's Authorized Officer and the CPM for consideration.

Designated Biologists shall complete a USFWS Qualifications Form (USFWS, 2008b) ([www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)) and submit it to the USFWS, BLM's Authorized Officer and the CPM within 60 days prior to ground breaking for review and final approval. The Designated Biologist will also function as the field contact representative as stipulated in the Biological Opinion (Attachment B).

The Designated Biologist<sup>5</sup> must meet the following minimum qualifications:

- A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
- 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;
- Have at least one year of field experience with biological resources found in or near the project area;

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<sup>5</sup> Note: USFWS <[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines/docs/dt](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt)> designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately, and have received USFWS approval. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The California Department of Fish and Game (CDFG) must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. Designated Biologists are the equivalent of Authorized Biologists. Only Designated Biologists and certain Biological Monitors who have been approved by the Designated Biologist would be allowed to handle desert tortoises.

- Meet the current USFWS Authorized Biologist qualifications criteria (USFWS, 2008b), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; and
- Possess a California ESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

### Duties

The project owner will ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, maintenance, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Authorized Officer and the CPM.

The Designated Biologist shall submit the Monthly Compliance Report to BLM's Authorized Officer and the CPM copies of all written reports and summaries that document biological resources compliance activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his/her duties cease, as approved by BLM's Authorized Officer and the CPM.

The Designated Biologist has the following duties:

- Advise the project owner's construction and operations staff on the implementation of the biological resources COCs
- Consult on the preparation of the BRMIMP, to be submitted by the project owner.
- Be available onsite to supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as ephemeral drainages and rare plants, special-status wildlife species, or their habitat.
- Clearly mark sensitive biological resource areas to protect rare plants and inspect those areas at appropriate intervals for compliance with regulatory terms and conditions.
- Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
- Notify the project owner, BLM's Authorized Officer and the CPM of any non-compliance with any biological resources condition of certification and stop work if necessary;
- Respond directly to inquiries of BLM's Authorized Officer and the CPM regarding biological resource issues;

- Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report;
- Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures [www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines), and;
- Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, BLM's Authorized Officer and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the CNDDDB.

#### 4.2.2 Biological Monitors Selection and Qualification

The project owner's BLM- and CPM-approved Designated Biologist will submit the resume, at least three references, and contact information of the proposed Biological Monitors to BLM's Authorized Officer and the CPM. The resume shall demonstrate, to the satisfaction of the CPM the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS, 2008b).

Biological Monitor(s) training by the Designated Biologist will include familiarity with the COCs, BRMIMP, WEAP, USFWS guidelines on desert tortoise surveys and handling procedures [www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines).

The project owner shall submit the specified information to the BLM's Authorized Officer and the CPM for approval at least 30 days prior to the start of any project-related site disturbance activities. The Designated Biologist shall submit a written statement to BLM's Authorized Officer and the CPM confirming that individual Biological Monitor(s) has/have been trained including the date when training was completed. If additional biological monitors are needed during construction the specified information shall be submitted to BLM's Authorized Officer and the CPM for approval at least 10 days prior to their first day of monitoring activities.

#### Duties

The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, maintenance and closure activities. The Designated Biologist shall remain the contact for the project owner, BLM's Authorized Officer and the CPM.

The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Authorized Officer and the CPM copies of all written reports and summaries that document biological resources compliance activities, including those conducted by Biological Monitors. If actions may affect biological resources during operation, a Biological Monitor, under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries

in the Annual Compliance Report unless their duties cease, as approved by BLM's Authorized Officer and the CPM.

### 4.2.3 Qualified Botanist and Botanical Monitor

The project owner or Designated Biologist shall assign at least one Qualified Botanist to the project. The Qualified Botanist shall have sufficient experience to be competent in recognizing and protecting rare plants found onsite and identifying noxious weeds. The Qualified Botanist would have the following minimum qualifications:

- A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field
- Three years of experience in field botany
- Have at least one year of field experience with botanical resources found in or near the project area

The Qualified Botanist will work under the direction of the Designated Biologist. The project owner will ensure that the Qualified Botanist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, and closure activities. The Qualified Botanist will be responsible to identifying Environmentally Sensitive Areas (ESAs) needed to protect rare plants, overseeing the storage of rare and common succulents that are being stored for future revegetation efforts, seed and/or propagule collection of rare plants, and implementing remedial action measures for rare plants, should such be necessary. The Qualified Botanist may be assisted by Botanical Monitors but remains the contact for the project owner, BLM's Authorized Officer and the CPM for botanical issues. Botanical Monitors will have a bachelor degree in the biological sciences and will be approved by the Qualified Botanist.

The Qualified Botanist will assist the Designated Biologist in maintaining written and photographic records of the tasks required by BIO-18, and summaries of these records will be submitted along with the Monthly Compliance Reports to the CPM, BLM Authorized Agent, and CDFG.

During project operation, the Qualified Botanist will assist the Designated Biologist in preparing and submitting record summaries in the Annual Compliance Report for a period not less than 10 years for the Gas Pipeline Revegetation Plan, and for the life of the project for the Special-status Plant Protection and Monitoring Plan, and the Special-status Plant Remedial Action Plan, including funding for the seed storage.

### 4.2.4 Designated Biologist and Biological Monitor Authority

The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification.

The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and Biological Monitor(s) the project owner's construction/operation manager shall halt all site

mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Authorized Officer and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, maintenance and operation activities. The project owner shall notify BLM's Authorized Officer and the CPM of the circumstances and actions being taken to resolve the problem.

#### 4.2.5 Agency Responsibilities

Regulatory agency personnel are responsible for enforcing state and federal laws protecting sensitive species and natural resources. Staff from these agencies generally have broad authority to monitor and evaluate projects implemented under permits authorized by them, and can take enforcement actions at any time violations occur. The following agencies have authority associated with biological and water resources at the project site:

- CEC through the CPM and BLM's Authorized Officer verifies compliance with conditions of certification and approves changes in implementation methodology.
- USFWS is responsible for protecting federally listed Endangered and Threatened species, and actions taken pursuant to an ESA Section 7 Incidental Take authorization as set forth in the project Biological Opinion (Attachment B). The USFWS contact will be notified immediately if a listed wildlife species is involved in an injury or fatality.
- CDFG is responsible for protecting species under CESA, construction activities authorized under a Streambed Alteration Agreement (SAA), or incidental take authorized under a Fish and Game Code Section 2080.1 agreement. The CDFG contact will be notified immediately if a state-listed species is involved in an injury or fatality.
- The agencies and the CPM will receive copies of the relevant monitoring reports that detail compliance with the permits and authorizations issued for the project. These agencies may also conduct unannounced site visits to ensure compliance with project conditions.

### 4.3 Authority and Lines of Communication

The regulatory agencies and the Designated Biologist identified above are on different tracks of responsibility involved in the implementation of mitigation measures to protect biological resources. This section of the BRMIMP describes how they will interact on the ISEGS project.

#### 4.3.1 Regulatory Agencies

If compliance problems arise during any phase of the project, agency representatives would discuss the issue with the CPM, Designated Biologist, BLM's Authorized Officer, project owner, and its contractors. If violations persist, work can be stopped on the whole project, or portions of it, by the revocation of permits.

### 4.3.2 Roles and Authority of the BSE Construction Personnel

The project owner, by signing the various project approval documents, has committed to fully implement the mitigation measures described in this BRMIMP. Construction contractors will also commit, by signing the contract documents when the job is awarded, to comply with the relevant mitigation measures and to cooperate with the Designated Biologist. The bid package will clearly identify the need to comply with environmental protection regulations, including requirements for the WEAP and cooperation with the Designated Biologist. Any new owners of the project will agree to the commitments made by the project owner under previous ownership, and agree to abide by all permit terms and conditions.

The Resident Engineer is obligated to cooperate with the Designated Biologist by assisting with formulating solutions to problems and potential problems related to the protection of biological resources, and by requiring all crews to follow the directions of the Designated Biologist. Table 4-2 summarizes the applicable LORS.

TABLE 4-2  
Laws, Ordinances, Regulations, and Standards Applicable to the ISEGS Project

<b>Federal</b>	
Endangered Species Act of 1973	Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for the protection of threatened and endangered plant and animal species, and their critical habitat. The administering agency is the USFWS.
Migratory Bird Treaty Act	Title 16, United States Code, sections 703 through 712, prohibit the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.
Clean Water Act of 1977	Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26), Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the USACE for a discharge from dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a RWQCB for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards.
Bald and Golden Eagle Protection Act	Title 16, United States Code, section 668, This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
California Desert Protection Act of 1994	An Act of Congress which established 69 wilderness areas, the Mojave National Preserve, expanded Joshua Tree and Death Valley National Monuments and redefined them as National Parks. Lands transferred to the National Park Service were formerly administered by the BLM and included substantial portions of grazing allotments, wild horse and burro Herd Management Areas, and Herd Areas.

TABLE 4-2  
Laws, Ordinances, Regulations, and Standards Applicable to the ISEGS Project

California Desert Conservation Area Plan	The California Desert Conservation Area (CDCA) comprises one of two national conservation areas established by Congress at the time of the passage of the Federal Land and Policy Management Act (FLPMA). The FLPMA outlines how the BLM will manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.
Northern and Eastern Mojave (NEMO) Desert Management Plan	As an amendment to the CDCA Plan, the BLM produced the Northern and Eastern Mojave (NEMO) Desert Management Plan (BLM, 2002). This document consists of proposed management actions and alternatives for public lands in the NEMO Planning Area. This area encompasses 3.3 million acres and is located in the Mojave Desert in southeastern California adjacent to Nevada. The area borders Nevada on the east, Fort Irwin and the West Mojave (WEMO) Planning Area on the west, and I-40 and the Northern and Eastern Colorado (NECO) Planning Area on the south. The ISEGS site is located in the southeastern portion of the NEMO Planning Area Boundary.
<b>State</b>	
California Endangered Species Act of 1984	Fish and Game Code sections 2050 through 2098 protect California's rare, threatened, and endangered species. The administering agency is the CDFG.
California Code of Regulations	California Code of Regulations Title 14, Division 1, Subdivision 3, Chapter 3, sections 670.2 and 670.5 list plants and animals of California that are designated as rare, threatened, or endangered. The administering agency is the CDFG.
Fully Protected Species	Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibit the take of animals that are classified as fully protected in California. The administering agency is the CDFG.
Nest or Eggs – Take, Possess, or Destroy	Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. The administering agency is the CDFG.
Birds of Prey – Take, Possess, or Destroy	Fish and Game Code section 3503.5 specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird. The administering agency is the CDFG.
Migratory Nongame Birds – Take or Possession	Fish and Game Code section 3513 protects California's migratory nongame birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is the CDFG.
Significant Natural Areas	Fish and Game Code section 1930 et seq., Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat
California Environmental Quality Act (CEQA)	CEQA Guidelines Section 15380, CEQA defines rare species more broadly than the definitions for species listed under the state and federal Endangered Species Acts. Under section 15830, species not protected through state or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the CNPS and some animals on the CDFG's Special Animals List.

TABLE 4-2  
Laws, Ordinances, Regulations, and Standards Applicable to the ISEGS Project

Streambed Alteration Agreement	Fish and Game Code sections 1600 et seq., regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.
California Native Plant Protection Act of 1977	Fish and Game Code sections 1900 et seq. designate rare, threatened, and endangered plants in the state of California. The administering agency is the CDFG.
<b>LOCAL</b>	
San Bernardino County General Plan: Conservation/Open Space Element of the County General Plan (County of San Bernardino, 2007)	Includes objectives to preserve water quality and open space to benefit biological resources, and specific policies and goals for protecting areas of sensitive plant, soils and wildlife habitat and for assuring compatibility between natural areas and development. Although ISEGS is not located on lands under county jurisdiction, the general plan provides objectives which are consistent with some of the LORS listed above.

## SECTION 5

# Worker Environmental Awareness Program

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The WEAP is required by CEC Condition of Certification BIO-6. It requires the project owner to develop and implement an ISEGS-specific WEAP and secure approval for it from USFWS, CDFG, BLM's Authorized Officer and the CPM. The WEAP will be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP will be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure.

At least 60 days prior to the start of any project-related site disturbance activities, the project owner shall provide to BLM's Authorized Officer and the CPM a copy of the draft WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site and related facilities mobilization, the project owner shall submit two copies of the BLM- and CPM-approved final WEAP.

## 5.1 Program Overview

Consistent with the CEC's requirements set forth in Condition of Certification BIO-6, this plan includes an onsite presentation (video) to employees of sensitive biological resources in the project area, a handbook describing measures to avoid sensitive biological resources, and a certificate of completion for participants. A detailed WEAP handbook for ISEGS is included in Attachment BIO-6.

## 5.2 WEAP Requirements

The WEAP must:

- Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants. The training presentation shall be made available in the language best understood by the participants;
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that Gila monsters are venomous and should not be handled, and that no snakes, reptiles, or other wildlife shall be harmed;

- Place special emphasis on desert tortoise, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
- Include a discussion of fire prevention measures to be implemented by workers during project activities; request workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;
- Present the meaning of various temporary and permanent habitat protection measures;
- Identify whom to contact if there are further comments and questions about the material discussed in the program; and
- Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines

The specific program can be administered by one or more competent individuals acceptable to the project's Designated Biologist.

### 5.3 Frequency and Documentation of Training

Throughout the life of the project, the WEAP will be repeated annually for permanent employees, and will be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees will sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Authorized Officer and the CPM upon request. Workers will receive and be required to visibly display a hardhat sticker or produce a certificate that they have completed the training.

Training acknowledgement forms signed during construction will be kept on file by the project owner for at least six months after the start of commercial operation. During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

## SECTION 6

# Desert Tortoise Minimization and Avoidance Measures

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Condition of Certification (COC) BIO-8 outlines the measures to be taken to manage the construction site and related facilities in a manner to avoid or minimize impacts to the desert tortoise. BIO-8 stipulates that all terms and conditions described in the Biological Opinion (^^^)^ prepared by the USFWS be incorporated in to this BRMIMP. The section presents how the Minimization Measures and Terms of Conditions contained in the Final BO and the additional requirements of COC BIO-8 and BIO-10 (i.e., those not also encompassed in the BO) will be implemented. In using this BRMIMP, the Designated Biologists, Authorized Biologists, and Biological Monitors will need to be familiar with the schedule of key construction events (Table 2-4) to know when essential protective measures for each construction event need to be implemented. The biologists will need to have access to a copy of the BO at all times as well as know and understand the additional minimization and avoidance measures required by the CEC.

There are some desert tortoise protective measures in the BO (Attachment B), the Translocation Plan (Attachment BIO-9), and COC's that are not addressed in this Section. These include some translocation measures (Section 7), raven management (Section 10), and weed management (Section 11).

## 6.1 Minimization Measures from the Biological Opinion

The Designated Biologists and Biological Monitors must be familiar with all minimization measures in the Final Biological Opinion (Attachment B) and have copies with them at all times.

The BO sets forth 17 *General Protective Measures* (Attachment B, pages 6 through 9) that are required during construction, operation, maintenance, and decommissioning activities. It should be noted that the most current guidance is provided in the BO, which is to be used rather than previous, now dated, guidance in COC BIO-8. The BO also describes measures for fencing and clearance surveys, translocation, and monitoring along with 19 specific protective measures required to be implemented during desert tortoise clearance and translocation activities (Attachment B, pages 17 through 19). The following subsection places the measures stipulated in the BO and Translocation Plan (that are to be implemented during construction) in their general chronological sequence.

### 6.1.1 Permanent Fencing

Prior to tortoise translocation activities, the site boundary of the unit being developed, or area being used, will be fenced with a permanent desert tortoise exclusion fence. A security fence will be installed either with the tortoise exclusion fence or following the tortoise fence installation. The tortoise fence will either be attached to the base of the security fence or

installed prior to, and outside of, the security fence. In areas where a security fence is not required, such as along Colosseum Road or the access road along the west side of the project going from Colosseum Road to the power blocks in Ivanpah 2 and 3, only a tortoise exclusion fence would be installed.

The boundaries of all areas to be disturbed will be flagged before beginning any activities in those areas, and all disturbances will be confined to the flagged areas. All project vehicles and equipment will be confined to the flagged areas. To reduce the potential for tortoise strikes by vehicles, a 35 mph speed limit will be enforced on paved roads and a 20 mph speed limit on dirt roads. Disturbance beyond the construction zone will be prohibited except to complete a specific task within designated areas or during emergency situations.

After an area is flagged, prior to any site clearance work, the perimeter of the area to be cleared will be fenced. Within 24 hours prior to the initiation of construction of the desert tortoise-exclusion fence, two complete desert tortoise clearance surveys of the proposed perimeter fence line and associated disturbance ROW will be conducted using techniques providing 100 percent coverage of the construction area and an additional transect along both sides of the fence line transect to provide coverage of an area approximately 90 feet wide, centered on the fence alignment. Transects will be no greater than 30 feet apart. During these surveys, an authorized biologist will inspect all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, to determine occupancy. Any burrow within the fence line corridor will be collapsed after confirmation that it is not occupied by a desert tortoise, or if occupied, the desert tortoise has been removed (CH2M HILL, 2009). Two complete passes with complete coverage will be conducted as described above. If no desert tortoises are observed during the second pass, a third pass would not be conducted.

A linear swath of vegetation along the outer edge of each heliostat field will be cleared to create a perimeter path for installation and maintenance of the tortoise and security fence and associated external perimeter inspection roads. To allow for external roads, the setback area will be a minimum of 20 feet wide within the ROW boundaries between the tortoise fence and the ROW boundary on the upslope boundary of the ROW, and a minimum 8 to 12 feet wide between the tortoise fence and ROW boundary on the side and downslope boundaries. Additional setbacks may be required for installation of gas and electric utilities.

All permanent fencing, including permanent tortoise fencing along roadways, will be constructed with durable materials (11 gauge or heavier) suitable to resist desert environments, alkaline and acidic soils, wind, and erosion. Permanent tortoise exclusionary fence material will consist of 1-inch horizontal by 2-inch vertical, galvanized welded wire, 36 inches high. This fence material will be buried a minimum of 12 inches below the ground surface, leaving 22 to 24 inches aboveground. A trench will be dug to allow 12 inches of fence to be buried below the natural level of the ground. Specifications for desert tortoise-proof fencing are provided in Appendix C and can be found at the following website: [http://www.fws.gov/ventura/speciesinfo/protocols\\_guidelines/docs/dt/DT\\_Exclusion-Fence\\_2005.pdf](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/DT_Exclusion-Fence_2005.pdf). The project owner will, if necessary, modify the current design of all desert tortoise exclusion fencing to comply with the most up-to-date USFWS guidance. The USFWS is currently using guidance provided in the *Desert Tortoise Field Manual* (USFWS, 2009).

Where a combined security/tortoise fence is needed, 8-foot-high standard chain link fencing will be installed with approximately 2 feet of tortoise fence overlapping the chain link fence creating a combined security/tortoise fence about 8 feet tall. The top end of the tortoise fence will be secured to the security fence with hog rings at 12- to 18-inch intervals. Distance between posts will not exceed 10 feet. Concrete footings for metal posts will not be required. The fence will be perpendicular to the ground surface, or slightly angled away from the road, towards the side encountered by tortoises. After the fence has been installed, excavated soil will be replaced and compacted to minimize soil erosion. Fence installation will be monitored by an authorized biologist or a biological monitor, and an authorized biologist will be available at all times to move any desert tortoises that are within the path of the fence line work.

Permanent I-beam-design desert tortoise guards will be installed across roadways to allow equipment access to the fenced sites and exclude desert tortoises. The specifications for the proposed desert tortoise guard are included in Appendix C. If monitoring indicates that the proposed permanent I-beam barriers are ineffective or problematic, the barriers will be replaced with another means of exclusion with input from the permitting agencies. Tortoise guards will be maintained and monitored as part of the permanent fence inspections and maintenance.

The following areas will require permanent tortoise exclusion fencing:

- Colosseum Road from the golf club to the CLA; this section of the road will be widened and paved
- The portion of the CLA that will be used for construction activities. It is possible that the entire CLA would not need to be fenced at the outset. Figure 2-2 shows the portion of the CLA that will likely be fenced as part of the initial construction activity. Regardless, permanent fencing will be required around the substation and the administration/warehouse building and water supply wells.
- The individual heliostat fields
- Natural gas tap station and gas metering sets

The location of all permanent tortoise exclusion fencing will be identified on construction drawings and preapproved by the permitting agencies prior to the start of construction activities.

Prior to translocation activities, the Applicant (or the California Department of Transportation [Caltrans]) will fence the project side of I-15 with permanent desert tortoise-proof fencing from Nipton Road to Yates Well Road. The Applicant will work with Caltrans regarding the appropriate location for this fencing along the I-15 corridor. The Applicant will also coordinate the location of the proposed Joint Port of Entry in locating this fencing. A record of conversation with Caltrans is provided in Appendix D.

Any damage to the permanent tortoise exclusion fencing will be promptly repaired. Following installation, the permanent exclusion fencing will be inspected at least bimonthly (every other month) and after major rainfall events. A major rainfall event is defined as any rainfall that causes the ephemeral washes in the project vicinity to flow and thereby

potentially damage the fencing. Extra fencing material will be kept onsite to accommodate needed repairs.

### 6.1.2 Temporary Exclusion Fencing

Temporary fencing, such as chicken wire, snow fencing, silt fencing, chain link, and other suitable materials will be used in designated areas to reduce encounters with tortoises during short-term projects. The fencing material will be securely attached to posts. The grid opening of the fencing material will not exceed 1 inch by 2 inches and the fence height will be no less than 24 inches. Concrete footings for posts will not be required. Because of the short duration of the work, temporary metal fencing need not be buried but any high or low points along the wire mesh fence line will be hand-excavated to maintain integrity with the ground. If non-metal fencing is used, it will be staked to the ground at intervals of sufficient distance to maintain fence integrity.

The following areas will require temporary exclusion fencing:

- Construction of the gas line from the Kern River Gas Transmission tap station to the edge of the Ivanpah 1 solar field
- Construction of the tap station and gas metering set construction areas
- Construction of any trails or temporary access roads outside of the fenced heliostat fields
- Construction of any generator tie lines, other utilities or access roads located outside of the permanently fenced areas that are specifically attributable to the ISEGS project.

The location of temporary exclusion fencing will be identified on construction drawings and approved by the permitting agencies prior to the start of construction activities. The following conditions apply to the use of temporary exclusion fencing.

- Within 24 hours prior to the initiation of construction of the temporary exclusion fence, a desert tortoise survey will be conducted using techniques providing 100-percent coverage of the construction area and an additional transect along both sides of the fence line transect to provide coverage of an area approximately 90 feet wide centered on the fence alignment. Authorized biologists will conduct at least three complete sweeps of the project site using transects no wider than 30 feet. Surveyors will conduct transects for each sweep in different directions to allow for opposing angles of observation. The site will be considered cleared after two complete passes have discovered no new desert tortoises.
- All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, will be examined to determine occupancy. Any burrow within the fence line corridor will be collapsed after confirmation that it is not occupied by a desert tortoise, or if occupied, the desert tortoise has been removed by an authorized biologist.
- An authorized biologist or biological monitor will be onsite during installation of the temporary exclusion fence. If installation of temporary fencing, surveying or clearing is occurring at more than one location, more than one authorized biologist may need to be onsite to provide appropriate supervision. After installation of the temporary fencing

and prior to initiation of construction activities, an authorized biologist and/or biological monitor will perform a pre-construction sweep for desert tortoises. An authorized biologist will translocate any desert tortoises found in the project impact area pursuant to the procedures set forth in Section 2.6, Transportation and Release. An authorized biologist will also be available to relocate any desert tortoises that may wander into the impact area during construction.

- To avoid any additional disturbance beyond what is proposed, the undisturbed areas outside the temporary exclusion fence will be designated Environmentally Sensitive Areas. All construction activities will be confined within the fenced project impact area. Equipment or construction personnel will not be allowed within the Environmentally Sensitive Areas.
- Once temporary exclusion fencing has been installed, the area within the temporary fencing may be mowed to facilitate access by the construction equipment. Unlike installation of the permanent fencing, vegetation will not be cleared for installation of the temporary exclusion fence. Vegetation clearing will be limited to the areas required for construction.
- At the end of each working day, the contractor will inspect the integrity of all temporary desert tortoise fencing within the work area to ensure that desert tortoises are prohibited from entry. If the fence is compromised, repairs must be completed at that time. Extra fencing material will be kept onsite during periods when construction requiring the use of temporary fencing is occurring.
- Prior to the start of work each day the authorized biologist or biological monitor will re-check the construction area to ensure that it is clear of tortoises. If work in the area has been delayed more than 24 hours (for example, weekend or due to a storm), a more detailed search for tortoises will be required prior to the start of work.

The following minimization measures will be implemented during all construction activities, including fence construction:

- Prior to performing onsite work, all personnel involved in the construction project will participate in WEAP training that includes desert tortoise protection training approved by the permitting agencies. At a minimum, training will include discussion of the fragility of desert habitats, the importance of the desert tortoise to the environment, the protections afforded to the desert tortoise by the Endangered Species Act, locations of Environmentally Sensitive Areas, and the correct protocol to follow if a desert tortoise is encountered.
- Open trenches, auger holes, or other excavations that may act as pit-fall traps will be inspected by an authorized biologist before backfilling. Any desert tortoise found will be safely removed and relocated out of harm's way by an authorized biologist. For open trenches located outside of fenced areas, earthen escape ramps will be maintained at intervals of no greater than 0.25 mile. The open trenches will be inspected three times per day (four times per day during the spring and fall seasons when tortoise are active) by an authorized biologist or biological monitor. Other excavations outside the fenced areas that remain open overnight will be covered to prevent them from becoming traps.

- Project personnel will check under parked vehicles and equipment for desert tortoises before operation. An authorized biologist will move desert tortoises found within the parking, staging, construction, or other traffic areas to a location away from danger and only as specified in the Draft Biological Opinion.
- At water and garbage/trash sources, measures will be implemented by the authorized biologist to preclude access by common ravens (*Corvus corax*) and other tortoise predators. Garbage (waste with organic content) will be placed in sealed containers and emptied at the close of business each day. Each water source will be caged. Fencing and netting will prevent desert tortoises and common ravens from accessing water sources in construction areas.
- If a desert tortoise that is either dead, injured, or entrapped, is found, the contractor will immediately notify the authorized biologist/biological monitor who will then immediately notify the permitting agencies directly or through the CEC's biology staff. Work in the immediate area will be temporarily halted while the authorized biologist consults with the permitting agencies. Any entrapped desert tortoise will be permitted to escape. The disposition of any carcasses or recovery of dead animals will be coordinated through the CPM or his designee.
- If a desert tortoise is injured during the course of construction, the CEC will be notified and the authorized biologist will transport the animal to a qualified veterinarian.<sup>6</sup> If a desert tortoise is killed during the course of construction, it will be left in place as is and the permitting agencies will be notified. The authorized biologist will document and remove the carcass.

### 6.1.3 Clearance Surveys of Permanent Exclusion Areas

To minimize adverse effects to the desert tortoise, BSE will fence the boundary of the Ivanpah 1, 2, and 3 project sites, the portions of the CLA where ground disturbance would occur, and Colosseum Road from the Primm Golf Club to the CLA with desert tortoise exclusion fencing. BSE will install desert tortoise guards, as described in attachment B of the biological assessment (CH2MHill 2009a), at gated entries to prevent desert tortoises from gaining entry to the project sites or CLA. BSE will also fence the construction area for the utility right-of-way (e.g., gas distribution line) with temporary desert tortoise fencing prior to clearance surveys and ground disturbance. BSE may choose to fence all phases of the ISEGS project and the CLA at one time, or it may fence each phase at the time of construction on a given phase.

Within 24 hours prior to the initiation of construction of the desert tortoise-exclusion fence, BSE will conduct two complete desert tortoise clearance surveys of the fence line segment and associated disturbance right-of-way that will be fenced that day. During these surveys, an authorized biologist will inspect all burrows to determine occupancy and collapse all unoccupied burrows. To the extent feasible, BSE will make modifications in fence line alignment to fence occupied burrows out of the ISEGS project areas. If the fence line cannot avoid a given desert tortoise burrow, an authorized biologist will remove the individual and place it in a sheltered location outside of the ISEGS project area being fenced. If BSE fences a

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<sup>6</sup> A list of licensed veterinarians in the Las Vegas area who treat desert tortoises can be found on the internet at: <http://www.deserttortoise.org/answeringquestions/appendix2.html>

given project phase and does not plan on immediate clearing of that phase, it will leave gaps in the fence in locations where desert tortoise burrows are found in the path of the fence line right-of-way. These gaps will buffer the burrow by a distance of 50 meters (25 meters on each side) and will remain open until the time that BSE is ready to commence with clearance surveys. BSE will not excavate and clear these burrows until it is ready to perform clearance surveys.

While the exclusion fencing is being constructed, BSE will concurrently began construction of 16 quarantine pens to allow tortoise captured during the clearance surveys to be quarantined until blood test results are known. The quarantine pens will be located in the southwest portion of the succulent storage area within the CLA, see Figure 2-3. At least one pen will be netted for use by juvenile tortoise. Additional pens will be netted as needed.

Following construction of the desert tortoise exclusion fence around a given portion of the ISEGS projects site (i.e., Ivanpah 1, 2, and 3 project sites, the CLA, or Colosseum Road), BSE will perform a full clearance survey of the fenced area during the spring (i.e., April to May) or fall (i.e., September 1 to f October 15). For fall translocations, BSE may extend this survey window until October 31 for phases in which all desert tortoises will be placed into a quarantine facility (e.g., Ivanpah 1 and the CLA) rather than translocated. Regardless of the method used to fence project site boundaries (i.e., at one time versus phased), clearance surveys would proceed according to the schedule described below.

In the fall of 2010, BSE intends to clear all desert tortoises from the CLA and Ivanpah 1. Also, in fall 2010, BSE also intends to construct temporary desert tortoise exclusion fencing around the Ivanpah 2 power block and the power block access road and clear desert tortoises from these areas. BSE would place desert tortoises moved from the Ivanpah 2 power block and power block access route into adjacent habitat on the remainder of Ivanpah 2 or from the remainder of Ivanpah 2 or from Ivanpah 3 until construction is ready to commence on those plants.

When performing clearance surveys, authorized biologists and supervised desert tortoise monitors will conduct at least three complete clearance sweeps over a given phase with transects no wider than 30 feet. Surveyors will conduct transects for each sweep in different directions to allow for opposing angles of observation. BSE will consider the site clear after two complete passes have discovered no new desert tortoises. Authorized biologists will excavate all potential desert tortoise burrows by hand to confirm occupancy status. BrightSource will collect data on all desert tortoises handled and examine all individuals for clinical signs of disease. A detailed list of data that BSE will collect on each desert tortoise is provided in this translocation plan.

Prior to the clearance of desert tortoises, the area may be open for installation of avoidance fencing to protect rare plants and conduct salvage of rare plants or succulents as described in the Special-Status Plant Protection and Monitoring Plan and the Closure, Restoration and Revegetation Plan. However, prior to the clearance of desert tortoises, any work done to install protection fencing or to salvage rare plants, must either be done on-foot or under the guidance of a tortoise monitor.

The authorized biologists will be primarily responsible for the clearance surveys. Some authorized biologists may be substituted with biological monitors who would be placed

between authorized biologists during the surveys. Once the sites are deemed free of desert tortoises after at least two consecutive clearance surveys have discovered no new desert tortoises then heavy equipment would be allowed to enter the construction site to perform earth work such as clearing or cutting vegetation, grubbing, leveling, and trenching. A biological monitor will monitor initial clearing and grading activities to find and relocate any tortoises missed during the initial tortoise clearance survey. If a tortoise is discovered, the authorized biologist will be responsible for relocating according to the requirements set forth in this plan.

The specific instructions for handling and processing of tortoises as established in the *Desert Tortoise Field Manual* (USFWS, 2009) will be followed. The authorized biologists will maintain a record of all desert tortoises encountered and translocated during project surveys and monitoring. This includes the following information for each individual: the location (narrative, vegetation type, and maps) and dates of observations; burrow data; general conditions and health; measurements; any apparent injuries and state of healing; if moved, the location from which it was captured and the location in which it was released; whether the animal voided its bladder; and diagnostic markings (for example, identification numbers).

All potential desert tortoise burrows located during clearance surveys will be excavated by hand by an authorized biologist, desert tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. In some cases, a fiber optic scope may be used to determine presence or absence within a deep burrow. The authorized biologist will also search for desert tortoise nests/eggs, which are typically located near the entrance to burrows. All desert tortoise handling and removal, and burrow excavations, including nests, will be conducted by authorized biologists in accordance with the most current USFWS-approved protocol; currently the *Desert Tortoise Field Manual* (USFWS, 2009).

All USFWS 2008 Guidelines for clearance surveys and stipulated in the Biological Opinion (USFWS, 2010 – Attachment B) will be followed as detailed in this plan.

#### 6.1.4 Processing and Release

Tortoise excavation, handling, artificial burrow construction, egg handling and other procedures will follow those described in the *Desert Tortoise Field Manual* (USFWS, 2009).

##### Handling Guidelines

Translocations will take place in the fall (September 1 to October 15) and in the spring (April 1 to May 31) to avoid extremely high thermal conditions (Cook et al., 1978; Nussear, 2004; *in* Esque et al., 2005). No desert tortoise will be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95°F (35°C). Ambient air temperature will be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. No desert tortoise will be captured if the ambient air temperature is anticipated to exceed 95°F (35°C) before handling and translocation can be completed. If the ambient air temperature exceeds 95°F (35°C) during handling or processing, desert tortoises will be kept shaded in an environment that does not exceed 95°F (35°C), and the animals would not be released until ambient air temperature declines to below 95°F (35°C). Further, desert

tortoises will not be released at translocation sites if ambient air temperatures are above or are expected to reach 90°F (32°C) within 3 hours of release.

Desert tortoises will be transported in clean cardboard boxes or plastic tote. If a cardboard box is used, a new box will be used for each individual tortoise and will be properly discarded after a single use. If a plastic tote is used, it will be sterilized with a 20 percent bleach solution between each use. The authorized biologists will wear disposable surgical gloves when handling desert tortoises. A new pair will be donned for each tortoise handled to avoid the transmission of upper respiratory tract disease. Any equipment used to handle tortoises will be sterilized with a 20 percent bleach solution between each use.

### Data Collection

Processing of tortoises found during the clearance surveys will be done in an appropriate facility to provide shade, should temperatures require such. A processing facility may use temporary shade structures (for example, a portable canopy) or a temperature-controlled facility (for example, a recreational vehicle). If desert tortoises need to be moved at a time of day when ambient temperatures could harm them (less than 40 degrees Fahrenheit (°F) or greater than 90°F), they will be held overnight in a clean cardboard box or plastic tote. These tortoises will be kept in the care of the authorized biologist under appropriate controlled temperatures and released the following day when temperatures are favorable. Refer to the Biological Opinion (Attachment B) to confirm current temperature and timing constraints. All cardboard boxes will be appropriately discarded after one use and never hold more than one tortoise. Plastic totes will be disinfected with a 20 percent bleach solution.

Data will be collected on all tortoises handled, as described previously. They will also be photographed and closely examined for clinical signs of disease at the time of capture. All authorized biologists and biological monitors performing examinations for health characteristics will be required to have experience identifying the clinical signs of upper respiratory tract disease, herpes virus, and cutaneous dyskeratosis in tortoises. The Applicant will provide USFWS with the qualifications of any authorized biologists that it will use to perform health assessments on desert tortoises during clearance and translocation activities (USFWS, 2010).

### Health Assessment

Authorized biologists will use the descriptions of clinical signs of disease described in the available scientific literature (Berry and Cristopher, 2001; Origgi et al., 2002; Ritchie, 2006), unless the USFWS provides more appropriate guidance. The authorized biologist performing the health assessment will contact the Ventura Fish and Wildlife Office within 24 hours of collection of an animal exhibiting clinical signs of disease to determine the appropriate disposition of such animals. These animals may require more extensive disease testing (for example, ELISA, Western Blot) prior to determination of their final disposition (USFWS, 2010 – Attachment B).

An authorized biologist will remove and temporarily quarantine any desert tortoises with clinical signs of disease that are encountered on the ISEGS project sites or those that are awaiting the results of blood tests. Quarantined tortoises will be kept in separate pens located in the CLS (Figure 2-2). The authorized biologist will be responsible to ensure that quarantined tortoises have adequate food and water.

Blood testing will be performed on all individuals collected. A licensed veterinarian in the Las Vegas area or qualified authorized biologist will draw blood and ship it to an appropriate laboratory for testing. All samples for ELISA or Western Blot tests will be sent to a laboratory approved by the USFWS for performing these tests. If blood collection for ELISA or Western Blot testing is needed, this collection will be performed between May 15 and October 31 (USFWS, 2010).

Tortoises collected after October 31 will be held in quarantine until May 15 when blood tests will be taken. Upon receipt of blood test results, healthy tortoises will be tagged and released. Tortoises showing clinical signs of infection or that have positive blood tests will be transferred to the Desert Tortoise Conservation Center in Las Vegas, Nevada.

### Tagging

All translocated tortoises will be marked and fitted with radio transmitters. Tortoises will be marked with Passive Integrated Transducer (PIT) tags (Gibbons and Andrews, 2004) (for example, Biomark model TX1400L), fitted with an external label (ASIH, 2004), and have a light-weight radio transmitter attached with a battery life of at least 1 year (for example, Holohil model AI-2F). This redundant method of marking ensures that tortoises are easily identified by field workers, even in the case of predation or shell wear. Transmitters will be attached using methods similar to those described in Boarman et al. (1998). All transmitters will be removed at the end of the monitoring period. Shell notching will not be performed.

Juvenile tortoises located during clearance surveys will be treated differently than adult tortoises. Before being released, all juvenile tortoises located will be affixed with specially designed radio transmitters that are small enough to minimize stress. Due to the small size of these transmitters and the subsequent short battery life, these juvenile transmitters will have to be exchanged out approximately every 10 weeks. Juveniles will also be marked using either a PIT tag and/or fitted with an external label using appropriate standards (ASIH, 2004) (adapted from Esque et al., 2005).

### Release

New burrows will be located at least 300 feet from the outside of the permanently fenced sites and will be of similar size, shape, and orientation to the original burrow. The new burrow locations will be determined by the authorized biologist. Translocated tortoises will not be placed in existing occupied burrows.

## 6.2 Additional Measures in COC BIO-8 and BIO-10

Many, but not all, of desert tortoise avoidance and minimization measures in the BO and Translocation Plan encompass COCs BIO-8 Desert Tortoise Clearance Surveys and Fencing and BIO-10 Desert Tortoise Compliance Verification. The Designated Biologists and Biological Monitors will need to be aware of the additional protective measures in these COCs stipulated by the CEC. They are presented below.

## 6.2.1 From Desert Tortoise Clearance Surveys and Fencing (BIO-8)

### Reporting

The Designated Biologist will 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 technology); 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 desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas will be marked for future identification as described in *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council, 1999) or the most current guidance on the USFWS website. Digital photographs of the carapace, plastron, and fourth costal scute will be taken. Scutes will not be notched for identification.

Implementation of the measures required by this Plan will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist will submit a report to BLM's Authorized Officer, the CPM, USFWS, and CDFG describing how each of the mitigation measures described above has been satisfied. The report will include the desert tortoise survey results, capture and release locations of any translocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

## 6.2.2 Desert Tortoise Compliance Verification (BIO-10)

COC BIO-10 stipulates notification and verification not likely to be encompassed by the final BO. The project owner, Designated Biologists and Biological Monitors must comply with these additional measures.

The project owner agrees to provide the CEC and BLM representatives with reasonable access to the project site and mitigation lands under the control of the project owner and will otherwise fully cooperate with the CEC's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the COCs. The project owner will hold the Designated Biologist, the CEC, and BLM harmless for any costs the project owner incurs in complying with the management measures, including stop work orders issued by BLM's Authorized Officer, the CPM, or the Designated Biologist.

The Designated Biologist will do all of the following:

1. Notify BLM's Authorized Officer and the CPM and at least 14 calendar days before initiating vegetation salvage or ground-disturbing activities.
2. Immediately notify BLM's Authorized Officer and the CPM in writing if the project owner is not in compliance with any COCs, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the COCs.
3. Remain onsite daily while vegetation salvage, grubbing, grading and heliostat installation activities are taking place to avoid or minimize take of listed species, to check for compliance with all impact avoidance and minimization measures, and to check all

exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

4. Maintain and check desert tortoise exclusion fences on a daily basis to ensure the integrity of the fence is maintained. The Designated Biologist will be present onsite to monitor construction and determine fence placement during fence installation.

5. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, grading, and heliostat installation activities are completed and submit a monthly compliance report to BLM's Authorized Officer and the CPM.

6. No later than January 31 of every year the ISEGS facility remains in operation, provide BLM's Authorized Officer and the CPM an annual Listed Species Status Report, which will include, at a minimum: 1) a general description of the status of the project site and construction activities, including actual or projected completion dates, if known; 2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; and 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts.

7. Ensure that all observations of listed species and their sign during project activities that have been reported to the Designated Biologist are included in the next monthly compliance report submitted to BLM's Authorized Officer and the CPM.

8. No later than 45 days after the first sale of power, provide BLM's Authorized Officer and the CPM a Final Listed Species Mitigation Report that will include, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented (see Table 2-4) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of COCs in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project.

9. In the event of a sighting in an active construction area (e.g., with equipment, vehicles, or workers), injury, kill, or translocation of any listed wildlife species, notify BLM's Authorized Officer, the CPM, CDFG and USFWS immediately by phone and in no event later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine what further actions, if any, are required to protect the listed animal. In the case of a sighting in an active construction area, the Designated Biologist will, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to BLM's Authorized Officer, the CPM, CDFG and USFWS.

10. Prepare written follow-up notification via FAX or electronic communication to these agencies within 2 calendar days of the incident and include the following information as relevant:

- a. If a desert tortoise is injured as a result of project-related activities during construction, the Designated Biologist will immediately take it to a BLM- and CPM-

- approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals will be paid by the project owner. Following phone notification as required above, BLM's Authorized Officer, the CPM, CDFG, and USFWS will determine the final disposition of the injured animal, if it recovers. Written notification will include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.
- b. If a desert tortoise is killed by project-related activities during construction, or if a desert tortoise is otherwise found dead, submit a written report with the same information as an injury report. These desert tortoises will be salvaged according to guidelines described in *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise* prepared by Kristin Berry, June 2001. The project owner will pay to have these desert tortoises necropsied. The report will include the date and time of the finding or incident.
  - c. BLM's Authorized Officer and the CPM may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project for an appropriate period determined in consultation with BLM's Authorized Officer and the CPM in order to prevent or remedy a violation of one or more COCs (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 candidate species. The project owner will comply with the stop work order immediately upon receipt thereof.



## SECTION 7

# Desert Tortoise Translocation Plan Implementation

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This section describes the requirement of the project's Desert Tortoise Translocation Plan (Attachment BIO-9) regarding the area selected for translocation along with the monitoring and reporting requirements specific to translocation activities.

## 7.1 Translocation Area

All healthy desert tortoises will be translocated to the west or north of the project site (Figure 7-1). Those located over 500 meters of the western and northern fence line boundary will require a health assessment. Authorized biologists will preferentially place desert tortoises in safe locations that are within 1,000 meters (3,280 feet) of their collection location on the project site, with consideration for the 300-foot buffer. If this criterion cannot be met for a given desert tortoise, an authorized biologist will move the individual to the closest translocation area (N1 through N4) also west of the project site (Figure 7.1).

Each proposed translocation area (N1 through N4) is approximately 124 acres in size. Each of the proposed translocation areas has been surveyed. Data on habitat characteristics that can be used to compare the proposed translocation sites to the project sites is provided in Appendix G of the attached Translocation Plan (BIO-9). Data on density and distribution of resident desert tortoises on each translocation site, results of visual health assessment on of resident animals, and presence of desert tortoise predators is provided in Appendix F of the attached Translocation Plan (BIO-9).

Although the ISEGS project sites will constructed in phases over several years, new surveys will not need to be conducted for each subsequent phase because habitat characteristics in the translocation areas will not change appreciably over the next 5 years, nor will the density and distribution of resident desert tortoises.

## 7.2 Monitoring and Reporting

BSE will provide for the monitoring of desert tortoises cleared from a given phase of the ISEGS project site for a period of 3 years following its initial clearance. As discussed above, BSE will attach transmitters to all desert tortoises translocated from the project site and to an equal number of resident desert tortoises to facilitate monitoring. Following the completion of the first 3 years of monitoring, BSE will perform an additional 2 years of monitoring if directed by the USFWS.

BSE will also attach transmitters to and monitor desert tortoises in a population that will serve as a control group for translocation monitoring. BSE would establish the control group prior to release of translocated individuals. When establishing this control group, BrightSource will collect blood samples from all desert tortoises desert tortoises that it

transmitters in the control population for ELISA testing. The number of desert tortoises monitored in this population will be equal to the number of desert tortoises translocated from the project site. The location of the control population will be within the BLM's Ivanpah Desert Wildlife Management Area. The final boundaries of the control population monitoring area will depend on the number of desert tortoises that BSE has to transmitter to match the translocated population. BSE will ensure that only qualified biologists, authorized by the USFWS, perform monitoring of these populations.

During monitoring, BSE will collect information on survivorship, mortality rates, health status, body condition, movement of individuals, and predation in all three populations (i.e., resident, translocated, and control) to inform adaptive management of the translocation effort on future phases. If monitoring shows a mortality rate of 10 percent or higher among the desert tortoises moved from the project site, BSE will review all data collected to develop a remedial action plan in coordination with the BLM and the USFWS prior to further phased translocation activities.

To assist in locating all translocated tortoises, they will be marked and fitted with radio transmitters. Tortoises will be marked with Passive Integrated Transducer (PIT) tags (Gibbons and Andrews, 2004) (for example, Biomark model TX1400L), fitted with an external label (ASIH, 2004), and have a light-weight radio transmitter attached with a battery life of at least 1 year (for example, Holohil model AI-2F). This redundant method of marking ensures that tortoises are easily identified by field workers, even in the case of predation or shell wear. Transmitters will be attached using methods similar to those described in Boarman et al. (1998). All transmitters will be removed at the end of the monitoring period. Shell notching will not be performed.

Juvenile tortoises located during clearance surveys will be treated differently than adult tortoises. Before being released, all juvenile tortoises located will be affixed with specially designed radio transmitters that are small enough to minimize stress. Due to the small size of these transmitters and the subsequent short battery life, these juvenile transmitters will have to be exchanged out approximately every 10 weeks. Juveniles will also be marked using either a PIT tag and/or fitted with an external label using appropriate standards (ASIH, 2004) (adapted from Esque et al., 2005).

All observations will be reported to the authorized biologist who will record the following information for the monthly compliance report: species name; location (global positioning system coordinates, narrative and maps) and dates of observations; general condition and health, including injuries and state of healing; diagnostic markings, including identification numbers or markers; and locations moved from and to.

All USFWS (2008) Guidelines for monitoring and reporting and more recent guidelines will be followed. Including the requirements for adaptive management should abnormally high mortality rates among the translocated desert tortoises occur. Hence, if monitoring shows a mortality rate of 10 percent or higher among the translocated population, the project owner will consult with the permitting agencies to develop a remedial action plan prior to further phased translocation activities.

Translocation N1

IVANPAH 3

Translocation N2

Translocation N3

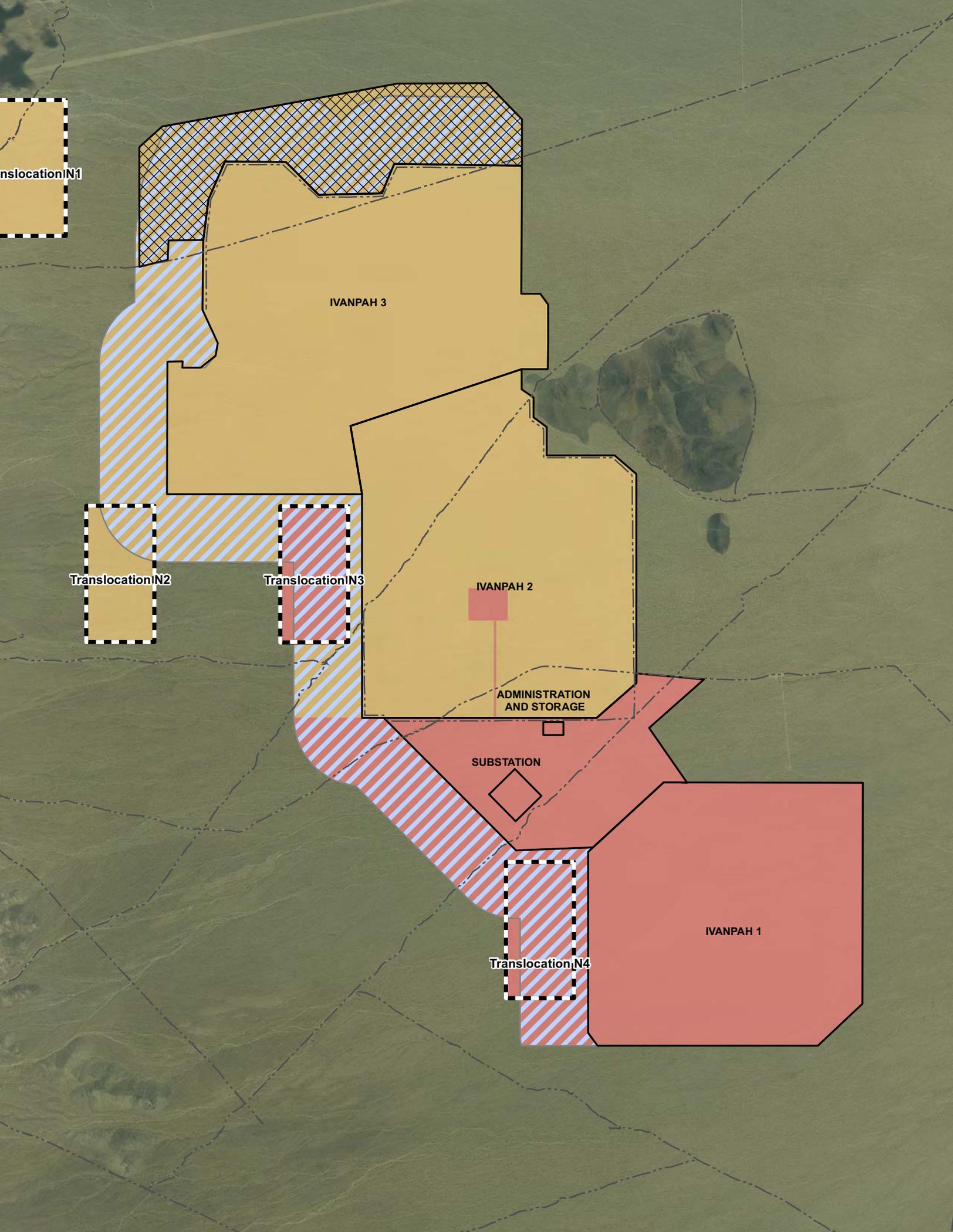
IVANPAH 2

ADMINISTRATION  
AND STORAGE

SUBSTATION

Translocation N4

IVANPAH 1





## SECTION 8

# Impact Avoidance and Minimization Measures

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The Designated Biologists, Authorized Biologists and Biological Monitors will need to be aware of the avoidance and minimization measures in COC BIO-11 not captured elsewhere in the BRMIMP. Those measures not addressed elsewhere are listed below.

## 8.1 BIO-11 Impact Avoidance and Minimization Measures

During construction the project owner will implement all feasible measures to avoid or minimize impacts to biological resources, including the following:

**Limit Disturbance Areas.** The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) will be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil not placed in the succulent salvage area will be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. All disturbances, project vehicles and equipment will be confined to the flagged areas.

**Minimize Road Impacts.** New and existing roads that are planned for construction, widening, or other improvements will not extend beyond the flagged impact area as described above. All vehicles passing or turning around will 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 will be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

**Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas.** Staging areas for construction on the plant site will be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas will be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components will be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Avian Protection on Power Lines (APLIC, 2006) and Mitigating Bird Collisions with Power Lines (APLIC, 2004) to reduce the likelihood of large bird electrocutions and collisions.

**Avoid Use of Toxic Substances.** Road surfacing and sealants as well as soil bonding and weighting agents used on unpaved surfaces will be non-toxic to wildlife and plants.

**Minimize Lighting Impacts.** Facility lighting will be designed, installed, and maintained to prevent side casting of light toward wildlife habitat. To minimize risk of avian collisions with the heliostat towers, only flashing or strobe lights will be installed on these towers.

**Badger Surveys.** Concurrent with the desert tortoise clearance survey, the Designated Biologist/ Authorized Biologist or Biological Monitor will perform a preconstruction survey for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If badger dens are found, each den will be classified as inactive, potentially active, or definitely active. Inactive dens will be excavated by hand and backfilled to prevent reuse by badgers. Potentially and definitely active dens will be monitored by the Designated Biologist, Authorized Biologist, or Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) at the entrance. If no tracks are observed in the tracking medium after 3 nights, the den will be excavated and backfilled by hand. If tracks are observed, the project owner will develop and implement a trapping and relocation plan in consultation with the Designated Biologist and CDFG. BLM approval may be required prior to release of badgers on public lands.

**Gila Monster Surveys.** If a Gila monster is encountered during clearance surveys or during construction, a qualified biologist experienced with Gila monster survey and capture techniques will capture and maintain it in a cool (<85 degrees F) environment until it can be released to a safe, suitable area beyond the construction impact zone. The biologist will coordinate with staff and CDFG biologists in the transport and relocation of any Gila monsters encountered during project surveys, construction, or operation.

**Avoid Wildlife Pitfalls:**

- a. **Backfill Trenches.** At the end of each work day, the Designated Biologist or Authorized Biologist will ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the area fenced with desert tortoise exclusion fencing have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations will be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing will be inspected periodically throughout the day and at the end of each workday by the Designated Biologist, Authorized Biologist, or Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist, Authorized Biologist, or Biological Monitor will remove and relocate the individual as described in the Desert Tortoise Translocation Plan (Attachment BIO-9). Any wildlife encountered during the course of construction will be allowed to leave the construction area unharmed.
- b. **Avoid Entrapment of Desert Tortoise.** Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground and within desert tortoise habitat (i.e., outside the permanently fenced area) for one or more nights, will be inspected for tortoises before the material is moved, buried or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks. These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.
- c. **Cap Heliostat Holes.** All holes drilled for heliostats will be capped the same day they are drilled. Caps will remain on the holes until heliostats are inserted into the holes, and will be securely fastened and sufficiently sturdy to cover the heliostat

holes indefinitely. The caps will exclude all wildlife, and will be inspected weekly by the Designated Biologist or Biological Monitors to ensure that the caps remain in place and that birds and terrestrial wildlife have not become trapped.

**Minimize Standing Water.** Water applied to construction areas and dirt roads for dust abatement will use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises, common ravens and coyotes to construction sites.

**Dispose of Road Killed Animals.** Road killed animals or other carcasses detected in the project area, or on roads near the project area, will be picked up immediately upon detection and delivered to the Designated Biologist, Authorized Biologist, or Biological Monitor who will appropriately dispose of the remains to avoid attracting common ravens and coyotes.

**Minimize Spills of Hazardous Materials.** All vehicles and equipment will be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist/ Authorized Biologist or Biological Monitor will be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills will be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment will take place only at a designated area. Service and maintenance vehicles will carry a bucket and pads to absorb leaks or spills.

**Reporting.** All mitigation measures and their implementation methods included in this BRMIMP will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner will provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.



## SECTION 9

# Pre-construction Nest Surveys

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The survey requirements for nesting birds (BIO-15) will be conducted concurrent with desert tortoise clearance surveys as stipulated below. The Designated Biologist will need to be aware of the dates of this seasonal requirement (February 1 and August 31) for implementing these measures. The Designated Biologist will also need to notify the project owner of its reporting requirements.

## 9.1 Pre-construction Nest Surveys

Pre-construction nest surveys will be conducted if ground disturbing activities occur from February 1 through August 31. The Designated Biologist, Authorized Biologist, or Biological Monitor conducting the surveys will be experienced bird surveyors familiar with standard nest-locating techniques and will perform surveys in accordance with the following guidelines:

1. Surveys will cover all potential nesting habitat in the project site or within 500 feet of the boundaries of the site and linear facilities
2. At least two pre-construction surveys will be conducted, separated by a minimum 10-day interval. One of the surveys needs to be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed 3 weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation
3. If active nests are detected during the survey, a buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist/ Authorized Biologist in consultation with CDFG) and monitoring plan will be developed. Nest locations will be mapped and submitted, along with a report stating the survey results, to the CPM
4. The Designated Biologist/ Authorized Biologist will monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist/ Authorized Biologist, disturb nesting activities, will be prohibited within the buffer zone until such a determination is made.
5. Reporting: At least 10 days prior to the start of any project-related ground disturbance activities (occurring from February 1 through August 31), the project owner will provide the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report will include a map or aerial photo identifying the location of the nest and will depict the boundaries of the no-disturbance buffer zone around the nest.

Refer to attached Avian and Bat Monitoring Plan (BIO-21, pending approval) for ongoing monitoring and reporting for deaths or injuries or to these species.



## SECTION 10

# Raven Management

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COC BIO-12 requires development and implementation of a Raven Management Plan that is consistent with the most current USFWS-approved raven management guidelines, and that meets the approval of USFWS, CDFG, BLM, and the Energy Commission staff. The ISEGS Raven Management Plan is provided as Attachment BIO-12. For references, see Attachment BIO-12). This portion of the BRMIMP and the attachment will be updated when the plan is approved by the resource agencies.

## 10.1 Introduction

The goal of the Raven Management Plan is to implement non-lethal measures to deter raven depredation of hatchling and juvenile desert tortoise such that overall numbers of desert tortoise and the recruitment of young tortoises into the local breeding population do not decrease due to conditions enabled by the construction or operation of the ISEGS. Ravens depend on human encroachment to expand into areas where they were previously absent or in low abundance. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. The Ivanpah Valley includes several unauthorized public and open community dumps (BLM, 2001) and the casinos at Primm generate a considerable amount of food-related trash that enable the presence of ravens and other bird species that are otherwise not as prevalent in the Mojave Desert. Associated structures, such as buildings, signs, lamps, and utility poles, provide roosting and nesting opportunities that otherwise would be unavailable. Landscape irrigation, swimming pools, decorative fountains, and ponds provide valuable water. The casinos are approximately 4.5 miles from the proposed ISEGS site, and the Primm Valley Golf Club (with water features) is approximately 0.5 mile from the project site.

## 10.2 Raven Management Measures

Raven management measures were designed to discourage the presence of ravens by limiting the availability of anthropogenic food and water resources, as well as roost and nest site opportunities. Lethal methods of raven control, such as shooting or poisoning, will be avoided to the greatest extent because of public and government agency concerns and associated implementation risks. The non-lethal measures outlined below are primarily based on guidance from the preferred Alternative B in the USFWS *Draft Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* (USFWS, 2007), *Summary of Predation by Corvids on Threatened and Endangered Species in California and Management Recommendations to Reduce Corvid Predation* (Liebezeit and George, 2002), and Boarman's extensive research and guidance for reducing raven predation on desert tortoises (Boarman, 2003).

Implementation of the raven management measures will be the responsibility of and fully funded by the project owners. The BLM will use \$5.00 per acre of the project compensation funds to apply to regional management programs for the common raven.

ISEGS will implement the following raven management measures (a detailed description of each measure is provided in COC BIO-12, Raven Management Plan):

- **Reduce Access to Anthropogenic Food and Water Resources.** To prevent the addition of food and water subsidies, as well as attracting ravens to the proposed solar facility, the project owner will implement the following measures:
  - Manage onsite trash to prevent access by ravens and other predators.
  - Install fencing along access road to decrease the potential for tortoise and other small animal roadkill.
  - Install security fencing around the project site to exclude coyotes and foxes from entering the site and exposing garbage for raven access; tortoise exclusion fencing will be attached to the bottom of or outside the security fence.
  - Reduce availability of water; water will be used in a manner that does not result in puddling.
- **Discourage Nesting.** To prevent nesting on structures associated with the ISEGS, the project owner will implement the following:
  - Utility and Building Structures
    - Design all new transmission lines associated with ISEGS in a manner that would reduce the likelihood of nesting by common ravens
    - Contact BLM when raven nests are found in any of the structures associated with the ISEGS.
    - Remove any raven nests that are found on its structures in cooperation with BLM, CDFG, and USFWS
  - Structure Removal Following Decommission
    - Remove elevated structures including utility poles from the ISEGS site when decommissioned and dormant.
  - Limit Raptor Enhancement Measures
    - Utility pole and tower construction will not include raptor-friendly designs intended to encourage or enhance the potential for raptor nests that also could be used by ravens.
  - Hazing
    - Focus on limiting raven attractants rather than hazing
    - Implement hazing only under the direction of BLM, CDFG, and USFWS in situations where it is considered the best course of action

- **Discourage Roosting/Perching.** To discourage perching on structures associated with ISEGS, the project owner will implement the following:
  - Roost Prevention as a Contingency
    - Monitor ISEGS facilities to identify frequently used perching locations for common ravens
    - Implemented contingency measures on a case-by-case basis – following specific discussion with the BLM, CDFG, and USFWS – when it becomes apparent that a particular structure is providing a favorable location for daytime perches or evening roosting
  - Hazing
    - Implement hazing only under the direction of BLM, CDFG, and USFWS in situations where it is considered the best course of action.
  - Structure Removal Following Decommissioning
    - Remove elevated structures including utility poles from the ISEGS site when decommissioned
- **Avoid Increased Predation Risk Associated with Tortoise Translocation.**
  - Manage onsite trash to prevent access by ravens and other predators.
  - Install fencing and netting to prevent desert tortoises and common ravens from accessing water sources in construction areas.
- **Removal of Problem Ravens.** If raven removal becomes necessary, the project owner will work under the direction of BLM to implement the following:
  - Avoid lethal removal except in cases where problem ravens have been identified and other deterrent or harassment methods have not been effective
  - Conduct lethal removal only by or under the direction of the BLM, CDFG, and USFWS

### 10.3 Success Criteria

The effectiveness of the Raven Management Plan will be monitored through the construction of all three site construction phases. Reporting associated with the implementation of the plan will continue for 2 years following completion of all three sites.

### 10.4 Adaptive Management

Adaptive management will be required if existing raven management measures are not effective in controlling significant raven predation of the desert tortoise. Ravens are notoriously adaptive, resourceful, and clever, further necessitating the need for adaptive management.

The project owner will consult with the CDFG, BLM, and the USFWS prior to implementing adaptive management changes. The BLM also will coordinate with USFWS to determine if and when further monitoring or adaptive management is warranted. The minimum 2-year monitoring period will be re-initiated following the implementation of any adaptive management changes.

## 10.5 Raven Population Monitoring

The objective of raven monitoring is to determine raven abundance, distribution, nest site locations, and behavior in the project vicinity prior to, during, and for a minimum of 2 years following completion of all three solar facilities.

### 10.5.1 Surveys

To determine raven population and monitor raven activity in the project area, the following surveys will be performed:

- Abundance and Behavior Surveys

The surveys will characterize raven presence in the project vicinity and monitor abundance and behavior in those areas over time. The purpose of the surveys will be to identify the local sources of anthropogenic subsidies and raven activity relative to the ISEGS.

- Nest Surveys

The areas underneath occupied and potential nests will be surveyed during the March through June visits for sign of juvenile tortoise predation.

- Incidental Observations

Biologists will have a year-round presence during ISEGS construction, conducting clearance surveys, monitoring construction activity, monitoring environmental compliance, translocating tortoises, and monitoring translocated tortoises. While conducting these activities, biologists will be instructed to record raven observations. Relevant incidental observations will be included in the yearly monitoring reports.

### 10.5.2 Monitoring Reports

Observations of raven predation of juvenile tortoises (including sign) and occupied raven nests will be reported to the designated contacts at BLM, CDFG, and USFWS by an electronic mail message within 2 days of the observation.

The project owner will submit annual monitoring reports to the CDFG, BLM, and USFWS no later than December 31 of each raven management year. If after 2 years of reporting following the operation of all three facilities, the agencies determine that the raven management program is effective, and ravens are not adversely affecting the local tortoise population because of ISEGS operation, then the raven surveys and reporting schedule will be phased out. However, the raven management practices, such as employee education, trash containment, and reporting raven nests, will be implemented for the life of the solar facility.

## SECTION 11

# Weed Management Measures

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COC BIO-13 requires ISEGS to develop and implement a Weed Management Plan that describes weed eradication and control methods, a reporting plan for weed management during and after construction, and best management practices to prevent the spread and propagation of noxious weeds. ISEGS's Weed Management Plan is provided as Attachment COC-13. This portion of the BRMIMP and the attachment will be updated when the plan is approved by the resource agencies.

## 11.1 Introduction

Noxious weeds are typically characterized by non-native plants that aggressively colonize disturbed areas, such as construction sites, and can grow to dominate native plant communities if uncontrolled. To control noxious weeds at the project site, the ISEGS Weed Management Plan has the following objectives:

- **Prevention:** Avoid weed infestation before it occurs through management actions such as vehicle cleaning prior to site entry and use of weed-free products.
- **Eradication:** Eliminate all individuals of a particular species within a specified area.
- **Suppression:** Reduce current infestation density.
- **Containment:** Prevent infestation expansion and spread.

Weed management will occur site-wide during both construction and operation of the facility.

## 11.2 Preconstruction Surveys Performed

Noxious weeds were searched for during all phases of the biological field surveys, when special attention was given to identifying non-native invasive plant species. During protocol surveys, all surveyors noted any plant species with which they were not familiar and took samples. The samples were identified by the project's lead botanists in part to determine whether these species were noxious weeds. The same procedure was used during reconnaissance surveys of the 1-mile buffer around the plant site. Several noxious weeds are known to occur in the project vicinity. The weeds of highest concern in the general area include Sahara mustard (*Brassica tournefortii*) and saltcedar (*Tamarix ramosissima*). The ISEGS Weed Management Plan provides detailed information about potentially occurring invasive species and species that were observed during site surveys.

## 11.3 Noxious Weed Management

During construction, the environmental compliance manager will be required to regularly update the list of potential noxious weeds, and identify any new potential threats. This will include developing a management strategy and management methods appropriate to the plant species and the nature of any potential invasion. Similarly, the facility plant manager or appropriate designee during operations will be required to continually update the potential noxious weed list and provide monitoring and management appropriate to any new species.

### 11.3.1 Preventative Measures

General measures to prevent the spread of weed propagules and inhibit their germination include:

- Limiting disturbance areas during construction to the minimal required to perform work and limiting ingress and egress to defined routes
- Maintaining vehicle wash and inspection stations, and closely monitoring the types of materials brought onto the site to minimize the potential for weed introduction
- Reestablishing vegetation as quickly as practicable on disturbed sites as the most effective long-term strategy to avoid weed invasions
- Monitoring and rapid implementation of control measures to ensure early detection and eradication for weed invasions

#### Construction

- Worker environmental awareness program will include training on weed abatement
- Wash stations will be used
- Infestation containment and control
- Site soil management (minimization of soil disturbance)
- Use of weed-free products
- Use of weed-free seed
- Site Reclamation

#### Operations

- Facility Staff Training
- Infestation Containment and Control

### 11.3.2 Eradication and Control Measures

Eradication and control of noxious weeds at the ISEGS site will be accomplished by physical and chemical removal of weeds. Mowing and tilling will not be used at ISEGS as a weed control technique.

## 11.4 Surveys and Monitoring

Surveys and monitoring during construction and operation will ensure timely detection and prompt eradication of weed infestations, which are essential to a long-term strategy for weed management.

### 11.4.1 Construction Areas

The environmental compliance manager will oversee biological monitors who will be present during site clearing and construction activities. Biological monitors will be responsible for inspecting all construction areas, identifying the presence of noxious weeds, and inspecting equipment cleaning facilities for weed seed removal. The environmental compliance manager will be responsible for prescribing management activities consistent with this plan if weeds become established. Monitoring of construction areas will be conducted daily during the growing season, including access routes, and will consist of walking or driving slowly over construction areas and looking for seedlings of exotic species. This will continue on a daily basis during the growing season until ground-disturbing construction activities are completed. Semi-monthly monitoring will continue thereafter.

### 11.4.2 Revegetation Areas

During the revegetation period, regular monitoring of sites will occur. This will be conducted monthly for the first 2 years after construction, then quarterly for the third and fourth years, and semi-annually after that for a total of 10 years. Monitoring schedules will be sufficiently flexible to take advantage of the variable precipitation regime of the eastern Mojave Desert. Surveys will identify areas of significant weed invasion or establishment and the weed species involved.

Monitoring of revegetation areas also will be required to track the progress of revegetation, and will occur concurrently. As part of this tracking, line or belt transects will be laid out to determine cover and density plant species, including native versus non-native species for the transect area.

### 11.4.3 General Operations Monitoring

General site monitoring of the operating facility will be conducted by grounds personnel on an ongoing basis. Weed control will be conducted, as needed, by grounds personnel at a minimum of every other week during the growing season (March through August), and once a month otherwise. Grounds personnel will be trained to identify weedy and native species.

### 11.4.4 Known Infestation Areas

Where weed infestation occurs, and treatment is implemented, the area will be targeted for ongoing monitoring to ensure that treatments are effective and that complete eradication has been achieved. Visits to known infestation areas will continue until noxious weeds in the area are controlled.

### 11.4.5 Offsite Areas

Potential exists for weed infestations on the ISEGS site to spread to adjacent areas outside the project ROW. For this reason, weed monitoring in the vicinity of known infestation areas will include monitoring adjacent BLM lands for a minimum of 500 feet outside of the ROW until the infestation is fully eradicated. Areas outside the ROW will be subjected to the same monitoring frequency and management actions as areas within the ROW where they are within 500 feet of an infestation area within the ROW.

### 11.4.6 Database and Mapping

GIS will be used to map and store the locations of noxious weed occurrences, with data on species, detection date, growth stage, infestation extent, treatments implemented, results of treatment, and current status, will be maintained during the construction and operation phases. The priority of infestation areas will be established based on species, vulnerability of the site to invasion, growth stage, and effectiveness of treatment. Also included will be areas mapped as vulnerable to weed invasions. Vulnerability will be assessed on the following: (1) availability of weed propagule sources, such as along roadsides, near soil stockpiles, or grazed areas; (2) areas disturbed, such as through land clearing and earthwork; or (3) areas near with known prior or treated weed infestations or existing infestations that are out of the managed area.

## 11.5 Reporting Requirements

Implementation of the noxious weed management plan will include the following data collection and reporting.

### 11.5.1 Construction

During the project construction phases, ongoing reporting on noxious weed management will be included in all monitoring reports. Construction weed monitoring reports will include:

- Survey findings on location, type, extent, and density of noxious weeds. These data will include mapping and photographs, as appropriate, as well as textual and tabular data content to fully describe conditions on the project site.
- Management efforts, including date, location, type of treatment implemented, and results. Ongoing evaluation of success of treatment will be included.
- Information on implementation and success of preventative measures, including status of equipment wash facilities and summary data of use. Data on the WEAP, including participants, will be included.
- Summary description of rehabilitation and revegetation efforts undertaken and their status.

It is anticipated that daily records will be kept by the Environmental Compliance Manager and the monitoring team. These daily records will be summarized into weekly summary

reports describing information relevant to noxious weed management. Monthly or quarterly summary reports also may be produced.

A single post-construction report will be produced after each phase of construction is completed at ISEGS, with a section summarizing the overall results of noxious weed management and weed status at the site. Construction reports will be made available to agency personnel. Agency personnel and contact information will be identified and would include the BLM and the CEC.

### 11.5.2 Operations

After implementation of site revegetation, long-term monitoring reports will be focused on success of revegetation sites. These reports will include:

- Survey findings on location, type, extent, and density of noxious weeds. These data will include mapping and photographs, as appropriate, as well as textual and tabular data content to fully describe conditions on the project site.
- Management efforts, including date of efforts, location, types of treatment implemented, and results. Ongoing evaluation of success of treatment will be included.
- The reports will also include a complete description of restoration efforts and status with regard to performance criteria.

Annual monitoring reports will be produced for the duration of the monitoring period. The site surveys conducted to support this are described as follows:

- Monthly surveys of revegetation sites will be conducted for the first year after installation. The data and results of these surveys will be compiled into the first year annual report, which include information on noxious weed management activities during that year.
- Quarterly visits will be implemented in year two. Results of quarterly visits will be summarized and reported in the second year annual report.
- Thereafter, semi-annual site visits will be conducted, summarized, and reported in an annual report through the completion of the monitoring period.
- At the end of the monitoring period, or if success criteria are met before that, a final monitoring report will be produced to describe the outcome to date of proposed restoration, including status of noxious weed management on the project site.
- All annual monitoring reports will be made available to agency personnel. Agency personnel and contact information will be identified and would include the BLM and the CEC.



## SECTION 12

# Closure, Revegetation, and Rehabilitation

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COC BIO-14 requires development and implementation of a revised Closure, Revegetation and Rehabilitation Plan in cooperation with BLM and CEC staff to guide site restoration and closure activities. The ISEGS Closure, Revegetation, and Rehabilitation Plan (Revision 3) is provided as Attachment BIO-14. References in this section can be found in that attachment.

## 12.1 Introduction

The ISEGS Closure, Revegetation, and Rehabilitation Plan presents the procedures and practices to be employed by the project owner to meet federal and state requirements for the revegetation of sites temporarily affected during project construction, and for the rehabilitation and revegetation of the project site after decommissioning.

The intent of the plan is to facilitate natural revegetation to the extent that a return to initial conditions of a functioning Mojave Desert scrub community is accomplished within 10 years of revegetation. It is also the intent of the plan to maintain contours of the site similar to preconstruction slopes and to return areas that are graded to slopes similar to preconstruction condition in order to promote stormwater sheet flow across the project site.

## 12.2 Revegetation and Rehabilitation

Rehabilitation and revegetation of areas that will be temporarily disturbed during project construction will occur as soon as practical following completion of construction activities in the affected area.

### 12.2.1 Soil Rehabilitation

Soils affected by construction impacts will be rehabilitated, if necessary, upon completion of construction activities. Areas with short-term impacts include the pipeline construction corridor, the underground gen-tie line corridor, lightly graded areas within heliostat fields, and construction/laydown areas within the Construction Logistics Area. Long-term impacts to soils that will involve rehabilitation following the approximate 50-year lifetime of each phase of the project include footprints of structures and paved roads, as well as drainage and erosion control features.

Soil rehabilitation at ISEGS will observe the following protocols:

- **Soil Baseline Characterization.** Baseline soil testing will be performed to determine reference site soil conditions, with the primary objective to characterize and preserve data on soil conditions prior to disturbance.
- **Soil Protection and Rehabilitation.** Construction activities at ISEGS will implement the following measures to protect and rehabilitate site soils:

- Measures identified in the ISEGS DESCOP will be followed to reduce impacts to soils.
- Short-term construction areas requiring soil disturbance will be flagged or staked prior to earth disturbance. No construction activities will occur outside the flagged areas.
- Low impact design measures will be used to minimize stormwater and vegetation impacts. Native desert scrub will be left in place wherever feasible; it will be mowed where reduction of height is needed.
- Subsoil and topsoil stockpile areas will be stored directly on or within existing vegetation if previously disturbed areas are not available.
- Rocks and boulders that impede site construction and maintenance access or facility placement will be relocated per the Closure, Rehabilitation and Revegetation Plan
- Woody plant material generated during clearing and grubbing operations will be preserved (windrowed) onsite as mulch for later use in soil rehabilitation of short-term impact areas.
- Topsoil will be stockpiled for replacement after construction activities are complete and short-term impact areas will be revegetated.
- Soil testing and decompaction will be implemented on all short-term disturbance areas as needed.

### 12.2.2 Plant Materials and Handling

Areas disturbed during project construction will be revegetated according to the following protocols:

- Stockpiled topsoil will be re-spread over disturbed areas to preserve a portion of the pre-existing seed bank.
- Disturbed areas will be reseeded with plant species most appropriate to the Mojave Desert and ISEGS site. Seeding will occur between October 15 and January 15.
- Seed collection will be conducted by contract with a native-seed collection company according to the approved seed collection plan.
- Salvaged succulents will also be transplanted as part of the revegetation of disturbed sites at ISEGS.
- Irrigation once to twice after transplanting of succulents is planned, but no irrigation is planned in support of seeding of native perennials or annuals.

### 12.2.3 Weed Management

A weed management plan (WMP) has been prepared for ISEGS. General measures to prevent the spread of weed propagules and inhibit their germination in the WMP include the following:

- Managing soil and revegetation processes to promote native plant establishment

- Limiting disturbance areas by defining ingress and egress routes
- Worker environmental awareness training
- Maintaining vehicle inspection stations, thereby assuring that all vehicles entering the site are cleaned and weed-free
- Reestablishing vegetation as quickly as practicable on disturbed sites
- Monitoring weed infestations
- Rapid implementation of weed management measures

#### 12.2.4 Revegetation Monitoring and Progress Criteria

Monitoring and adaptive management of revegetation sites is necessary to ensure long-term native plant community establishment. Data collected prior to site development at ISEGS will support long-term evaluation of revegetation targets and results.

Field monitoring will be conducted for a period of 10 years from the date of revegetation, or until success criteria are met (see Attachment BIO-14, Closure, Revegetation, and Rehabilitation Plan). Monitoring duration will be extended where remediation is necessary to ensure the criteria are met. Monitoring extensions will be on a year-by-year basis until success criteria are met. Monitoring will be performed annually during the first 3 years following revegetation, and biannually thereafter. Monitoring sessions will occur between April 1 and May 15.

#### 12.2.5 Revegetation Adaptive Management

The first 5 years of the adaptive management program will be focused on the revegetation methods and techniques, and on increasing their efficiency and effectiveness. After the first 5 years, focus will be on the 10-year goal and measures that might be taken to accelerate development of cover or increases in species richness, should it become evident that success criteria will not be met in that time frame. Where revegetation criteria are not met, remediation measures will be implemented. See Attachment BIO-14, Closure, Revegetation, and Rehabilitation Plan, for a detailed description of the elements of the adaptive management plan.

### 12.3 Facility Closure

Facility closure can be temporary or permanent. Temporary closure is a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of a steam turbine. Causes for temporary closure could include disruption in the supply of natural gas, damage to an integral component from natural events such as earthquake or flood, or a radical change in the market for electrical energy. Permanent closure is defined as a cessation in operations with no intent to restart operations because of plant age, damage to the plant beyond repair, economic conditions, or other reasons.

Decommissioning of the facility is expected to occur in the same sequence as project construction, with Ivanpah 1 being the first to be decommissioned, followed by Ivanpah 2, then Ivanpah 3 and the shared facilities. Based on the terms of the current lease being

negotiated between the project owners and BLM, and assuming a full lease lifetime, this process will begin more than 40 years after the beginning of commercial operation of the first component of the project, Ivanpah 1. With construction estimated to begin in 2010, closure of Ivanpah 1 would commence as early as 2037 or as late as 2058 and be completed in approximately 2 years.

### 12.3.1 Closure Activities

Site rehabilitation after facility closure will include the following general activities (not necessarily in the order listed below).

- Access roads that are no longer required by the land management agencies will be rehabilitated. Asphalt will be removed, soils will be decompacted, and the roadway areas will be revegetated.
- Physical components of the generation facilities and appurtenant utilities will be removed using practicable methods that are least disruptive to soils and surrounding habitat to a depth that will not impede growth of vegetative cover.
- Poles and wiring will be removed with the transmission wiring spooled for transport to the recycler. Transmission pole foundations will be removed to a depth of approximately 6 feet.
- Heliostat command and control wiring will be aboveground and will simply be picked up for recycling.
- The substation, its diversion berm and channels, and paved access from Colosseum Road will remain.
- Water supply wells will be abandoned and pipelines will be sealed off and abandoned in place.
- Stabilized channel crossings will be left in place.
- Surfaces will be recontoured, the soil environment rehabilitated, and the revegetation will be implemented according to the revegetation plan.
- Temporary disturbance areas from decommissioning activities will also be rehabilitated and revegetated.
- The revegetated areas will be monitored for noxious weeds, for unacceptable densities of invasive species, and for reasonable progress in the vegetation succession.

### 12.3.2 Final Closure Plan

The Final Closure Plan for the site facilities will include the following major elements:

- The establishment and continuing implementation of worker health, safety and environmental protection procedures throughout the decommissioning and restoration process.

- Complete rehabilitation planning pursuant to Section 8.1 that addresses the closure and rehabilitation objectives. That is, will the objective be a return to desert scrub or another objective that better meets the federal government's plans for the area?
- A plan for conducting pre-closure activities such as seed collection for revegetation efforts and establish timing of habitat restoration.
- Revision of any elements of this Plan (such as Sections 5, and 7) so that they are relevant and conform with practices and procedures in place at the time closure commences, and are consistent with the final restoration objectives of BLM.
- Review success criteria to ensure final objectives are clearly stated and measurable.

### 12.3.3 Decommissioning Plan

A Conceptual Decommissioning and Reclamation Plan for the ISEGS (WorleyParsons, 2010) was developed as part of the effort to return the land to a status consistent with land management policies and priorities as they may exist at the time of closure.

The project goals for site decommissioning include:

- Removal of all equipment and foundation to a depth of 6 feet of final grade; remove all pipelines within the solar fields and power blocks.
- Restoration of the lines and grades in the disturbed areas of the ISEGS site to approximate the gradients of the surround land
- Do so in such a manner so as to facilitate the effectiveness of the reclamation and revegetation procedures outlined in this Plan.

The proposed implementation strategies to achieve these goals include:

- Use industry standard demolition means and methods to decrease personnel and environmental safety exposures by minimizing time and keeping personnel from close proximity to actual demolition activities to the extent practical.
- Plan each component of the decommissioning project such that personnel and environmental safety are maintained while efficiently executing the work.
- Train field personnel for decommissioning actions to be taken in proportion to the personnel, project or environmental risk for those actions.
- Demolition of the aboveground structures (dismantling and removal of improvements and materials) in a phased approach while still using some facilities until close to the end of the project. For instance, the water supply, administrative facilities, and some electrical power components will be modified to be used until very late in the restoration process.
- Demolition and removal of belowground facilities (floor slabs, footings, and underground utilities) as needed to meet the decommissioning goals.
- Soils cleanup, if needed, with special attention applied to hazardous materials use/storage areas to ensure that clean closure is achieved.

- Disposal of materials in appropriate facilities for treatment/disposal or recycling.
- Recontouring of lines and grades to approximate the natural gradient and function of the alluvial fan, as reflected by current or planned land uses at the time of Final Closure.
- Evaluate the execution of the *Final Closure Plan* through project oversight and quality assurance.
- Document implementation of the *Final Closure Plan* and compliance with environmental requirements.

#### 12.3.4 Rehabilitation Plan

The Rehabilitation Plan provides guidelines, methods, and criteria for measuring the progress of rehabilitation and revegetation of the project site upon facility decommissioning either at the end of the project's planned 50-year life, or upon unplanned premature closure. The goals of the Rehabilitation Plan are to restore the land to a pre-project condition; establish quality habitat for desert tortoise and other fauna; and to minimize potential erosion through proper restoration activities and implementation of appropriate BMPs.

Rehabilitation Plan has the following objectives:

- Describe the methods for rehabilitation and revegetation of disturbance areas that will create natural-appearing topography, and reduce potential for erosion, especially through deflation.
- Implement a practical revegetation program that will accelerate natural vegetation succession and, over time, promote the establishment of a plant community dominated by native perennials.
- Establish a weed management program applicable to the decommissioning of the project site that will identify the non-native species requiring eradication, and the means to accomplish that eradication.
- Identify means and methods that will minimize, to the extent practicable, long-term maintenance and support requirements, such as irrigation, weeding, or reseeded.
- Reduce the visual contrasts between disturbed areas that have been decommissioned and adjacent undisturbed areas through revegetation.
- Anticipate wildlife management needs as habitat suitable to support cover and breeding opportunities for desert fauna development in reclaimed areas.

The proposed implementation strategies to achieve these objectives include:

- At least 5 years prior to planned closure, a *Final Closure Plan* will be prepared and submitted to BLM and CEC for review and approval. That Plan will include, among other things, the timing for seed collection, as described in Section 7.3.2, to ensure that sufficient seed stock is available for restoration efforts.
- Once areas have been decommissioned and facilities and structures removed, the surface will be contoured to match the lines and grades of the natural gradient of the surrounding area. An updated Construction SWPPP will be prepared and appropriate

BMPs will be implemented to provide an effective combination of erosion and sediment control until revegetation efforts have sufficiently stabilized the soil.

- Final surface preparation (unless revised in the *Final Closure Plan*) will be in concert with reseeded and other revegetation activities described in Section 7.2.6.
- A practically attainable approach to revegetation at ISEGS will be to accelerate the natural successional process by emphasizing seeding of early successional native plants (Appendix C). This strategy maximizes the probability of success; it has been used on comparable desert areas and is considered viable. However, if new techniques have been demonstrated to be viable prior to the initiation of closure, the *Final Closure Plan* will be prepared so that it incorporates those techniques.
- Unless revised in the Final Closure Plan, revegetation efforts will commence as described in Section 7.4. Prior to seeding succulents in excess of 200 pounds, and therefore requiring heavy equipment to move, they will be retrieved from the Succulent Storage and Stockpile Area for transplanting in the area being reclaimed. Smaller succulents that can be handled by a 3-person crew, or fewer, will be planted after seeding to avoid their potential damage during final seeding and ground preparation activities. Succulents will be planted during revegetation efforts in such a way as to be representative of the density and diversity that existed prior to construction.
- Unless revised in the *Final Closure Plan*, weed management will be implemented as described in Section 7.7.
- At the conclusion of the restoration activities, fences and tortoise guards will be removed and the area will be opened to wildlife for use as habitat. (No restoration work will occur outside of fenced areas without the presence of an Authorized Biologist or Biological Monitor.)
- Unless revised in the *Final Closure Plan*, revegetation monitoring will be implemented as described in Section 7.8 to ensure that revegetation efforts meet or exceed the criteria set forth in Section 7.9. If revegetation does not meet these criteria, remediation measures would be implemented as described in Section 7.10, unless revised in the *Final Closure Plan*.
- Subject to confirmation in the *Final Closure Plan*, during the 2-, 5- and 10- year monitoring episodes any and all desert tortoise sign noted in the vegetation plots, as well as elsewhere within the boundaries of the decommissioned project, will be recorded and reported.



## SECTION 13

# Burrowing Owl Impact Avoidance and Minimization Measures

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COC BIO-16 requires development and implementation of a Burrowing Owl Mitigation and Monitoring Plan. The ISEGS Burrowing Owl Mitigation and Monitoring Plan is provided as Attachment BIO-16. This portion of the BRMIMP and the attachment will be updated when the plan is approved by the resource agencies.

## 13.1 Introduction

Federal and California state laws and resource codes protect burrowing owls and their nesting habitat. Implementation of the plan will provide for the protection and monitoring of western burrowing owls if they are impacted from ISEGS construction. The proposed avoidance, minimization, and monitoring measures are subject to final approval by the resource agencies including the CDFG and CEC.

## 13.2 Proposed Mitigation Measures

During installation of the desert tortoise exclusion and/or security fencing biologists will survey the fence line corridor, 500 feet on each side of the centerline, for burrowing owls. Burrowing owl surveys will be conducted no more than 30 days prior to the start of the fence installation. Once the site is fenced, a pre-construction pedestrian survey of suitable habitat within the interior will be surveyed for burrowing owls as part of the desert tortoise clearance surveys. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the suitable habitat within the site will be resurveyed for burrowing owls.

### 13.2.1 Avoidance

ISEGS will implement no-work buffers around active burrows during the nesting season (February 1 to August 31) and during the non-nesting season. Consistent with CDFG protocol, no-work buffers during the nesting season will be 250 feet, and 160 feet during the non-nesting season. At the no-work setback, additional noise/visual barriers (for example, haystacks or plywood fencing) will be constructed to shield the active burrow from construction activities. Signs will be posted designating the presence of a biologically sensitive area.

### 13.2.2 Relocation

If occupied burrows are identified onsite during the pre-construction survey and cannot be avoided, the owls will be passively relocated with prior approval by CDFG. At least one or more weeks may be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

If found onsite, burrowing owls will be allowed to relocate themselves to suitable habitat within the desert tortoise translocation areas. If the required number of suitable burrows cannot be located, then artificial burrows would be installed within the desert tortoise translocation areas prior to relocation by a qualified biologist in consultation with CDFG. The following mitigation measures will be implemented to minimize impacts to the species:

- A suitable offsite mitigation area for burrowing owls will be determined in consultation with CDFG. This site may be located within the desert tortoise mitigation areas to the west of the site. Offsite mitigation will only occur if burrowing owls are found onsite during preconstruction surveys and must be relocated.
- When destruction of occupied burrows is unavoidable, the following actions will be performed in order. Suitable replacement burrows will be identified, or existing unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site.

If burrowing owls or active burrows are not observed during the pre-construction survey any unoccupied, but potentially suitable, burrowing owl burrows will be hand excavated by a qualified biologist to ensure that burrowing owls are not occupying burrows and then collapsed.

### 13.3 Monitoring

Monitoring will be conducted to assess the effectiveness of the proposed mitigation measures. If burrowing owls are identified onsite during the pre-construction survey, the following burrowing owl monitoring measures could be implemented:

1. Monitor burrowing owl pairs identified during the pre-construction survey within 500 feet of any work activities that exceed ambient noise and/or vibration levels.
2. Record impacts to burrowing owls during project construction and report these findings to the CEC and CDFG in the compliance reports.
3. Conduct monitoring visits by a qualified biologist twice a year (spring and winter) following the pre-construction survey until 2 years after the completion of the ground-disturbing activities on all three sites to determine status and effectiveness of owl passive relocation including if any new artificial burrows are being used by owls at the offsite mitigation area. Artificial burrows created during relocation will be maintained during the monitoring visits to ensure boxes are usable.

### 13.4 Reporting

Any injuries, mortality, or other unforeseen circumstances regarding burrowing owls will be reported to CDFG, USFWS, BLM's Authorized Officer, and the CPM within 24 hours.

A construction termination report will be provided to CDFG, USFWS, BLM's Authorized Officer, and the CPM within 30 days after completion of owl relocation and the start of ground disturbance or at least 90 days prior to the sale of power. The construction termination report will identify when surveys were completed, survey observations, how

mitigation measures were implemented, how the measures were completed, and the results of the mitigation.

If burrowing owl monitoring is needed, monitoring reports will be submitted annually to CEC, CDFG, and USFWS until 2 years after the completion of ground-disturbing activities at all three sites.

## 13.5 Success Criteria

The project owner will discontinue mitigation monitoring 2 years after ground-disturbing activities are complete if it can be determined that the plan has been successful and the ISEGS burrowing owl population has not declined significantly, either statistically or in the opinion of a qualified biologist.

## 13.6 Adaptive Management

To manage any unforeseen conditions that may arise, adaptive management may be required. Adaptations may include implementing new mitigation measures as appropriate based on the actual effects of the ISEGS on owls, and, as feasible, implement new owl mitigation measures developed by burrowing owl experts.

If the ISEGS owl population does not meet the success criteria, the following additional measures may be implemented:

1. Determine, using a qualified owl biologist, if the population decline is a result of ISEGS development and/or the source(s) of the population decline.
2. Implement actions and management activities designed by a qualified owl biologist in consultation with CDFG to mitigate the sources of population decline to return population levels to pre-project levels.
3. Continue to monitor owl populations to determine if the new mitigation measures are working to stabilize and return the population back to pre-project development levels.



## SECTION 14

# Special-status Plant Mitigation

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COC BIO-18 requires development and implementation of a Special-status Plant Protection and Monitoring Plan for special-status plants occurring within the Special-status Plant Protection Areas and onsite areas designated for impact avoidance and minimization. A summary of the special-status plant mitigation measures to be implemented is provided in the following sections. The ISEGS Special-status Plant Protection and Monitoring Plan is provided as Attachment BIO-18A. Attachment BIO-18B contains the ISEGS Special-status Plant Remedial Action Plan. The COCs, as described in this section, are based upon the CEC staff's recommended COCs dated March 29, 2010. However, the Applicant has not agreed to all of the mitigation measures proposed by staff, and therefore, has included only those conditions that are uncontested at this time. Information included in this summary section and Attachments BIO-18A and BIO-18B will be updated when the final COCs are issued by the Commission.

## 14.1 Introduction

The ISEGS Special-status Plant Protection and Monitoring Plan (BIO-18A) identifies the steps and procedures that will be implemented to avoid rare plant localities and minimize the extent of rare plant impacts to the maximum extent feasible while achieving energy generation objectives.

The following rare plant species are targeted for avoidance or salvage:

- Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*)
- Mojave milkweed (*Asclepias nyctaginifolia*)
- Desert Pincushion (*Coryphantha chlorantha*)
- Parish's Club-cholla (*Grusonia parishii*)
- Nine-awned Pappus Grass (*Enneapogon desvauxii*)

## 14.2 Goals and Objectives

The ultimate goal of the Special-status Plant Protection and Monitoring Plan is to maintain the special-status plant species as healthy, reproductive populations that are self-sustaining in perpetuity. Mitigation goals and objectives were identified in the Draft Special-status Plant Avoidance and Protection Plan [Exhibit 81] (CH2M HILL and GANDA, 2010).

Subsequent to the development of the Draft Special-status Plant Avoidance and Protection Plan, a reduced impact proposal (the Biological Mitigation Proposal [Mitigated Ivanpah 3]) was filed on February 11, 2010. This proposal excluded a 433-acre area with high rare plant density from Ivanpah 3 and defined two additional rare plant mitigation areas within the CLA. The amount of rare plant mitigation included in this proposal acreage totals about 476 acres. The location of the three rare plant mitigation areas is shown on maps provided in Attachment BIO-18A.

## 14.3 Pre-construction and Post-Construction Activities

### 14.3.1 Pre-construction Activities

Proposed actions that will be conducted to achieve the rare plant mitigation goals and objectives as defined in the Draft Special-status Plant Avoidance and Protection Plan [Exhibit 81] and the Mitigated Ivanpah 3 Biological Resources Proposal include the following:

- Avoid impacts to rare plants by excluding from the project area a 433-acre area in the northernmost portion of Ivanpah 3 that is densely populated with rare plants
- Establish two additional Rare Plant Mitigation Areas in the CLA within which direct impacts to rare plants will be completely avoided
- Demark and/or fence Mojave milkweed and Rusby's desert mallow rare plant localities proposed for avoidance within the heliostat array to protect the rare plants from direct impacts during pre-construction and construction activities
- Salvage individual Mojave milkweed and Rusby's desert mallow plants that cannot be avoided for use in translocation, revegetation, and rehabilitation
- Salvage of all rare cactus (desert pincushion and Parish's club-cholla) onsite for use in translocation, revegetation, and rehabilitation

### 14.3.2 Activities During Construction

Construction activities will be monitored by the Qualified Botanist and Botanical Monitors to confirm and document that required special-status plant mitigation measures required to avoid and minimize disturbance to special-status plant species are implemented correctly. These measures are described in more detail in Section 4 of this BRMIMP. Measures outlined in the WEAP will be implemented throughout construction (e.g., worker training). The project construction schedule is summarized in Section 2, along with the biological monitoring requirements. Monitoring activities specific to special-status plants include:

- The Botanical Monitor will oversee the salvage and transplantation of special-status plants designated on final project plans as "salvage". Salvaged plants will be installed in the Rare Plant Transplantation Area (RPTA)
- Regular inspections of salvaged plants placed in the RPTA will be conducted by the Botanical Monitors to check that salvaged plants are watered and maintained as needed to maximize survivorship throughout the construction period
- Salvaged native plants that are stored offsite in a native plant nursery (should this be needed), will also be inspected by the Botanical Monitor to document that plants are maintained in good condition
- The Botanical Monitor will oversee construction to confirm that no unauthorized construction activities occur in Rare Plant Avoidance Areas (RPAA)

- Inspections of all fenced special-status plants within the heliostat array will be conducted by the Botanical Monitor to document that avoidance fencing is maintained in good condition
- Fencing surrounding the Rare Plant Mitigation Areas will be inspected regularly to check that fencing is maintained in good condition
- The Botanical Monitor will monitor general construction activities for compliance with regulatory terms and conditions that pertain to special-status plants
- The Botanical Monitor will notify the project owner, BLM's Authorized Officer, and the CPM of any non-compliance with any biological resources condition of certification

### 14.3.3 Post-Construction Activities

#### As-built Assessment of Avoidance

Following construction, several activities will be conducted to assess the status of special-status plant species mitigation. Success criteria are proposed at two levels: initial avoidance and long-term persistence. Initial avoidance success will be determined by conducting a post-construction survey of the RPAA's to document which rare plant individuals and localities were avoided (compared to those planned) and environmental conditions in the RPAA's. Figures showing the location of RPAA's, by species, will be completed and provided in an as-built report. The as-built report will be submitted to the CPM and the BLM Authorized Officer. More information on performance standards and species-specific success criteria is presented in the Special-status Plant Protection and Monitoring Plan (Attachment BIO-18A).

- Prepare an as-built report summarizing results of the post-construction survey, including maps depicting the location of the RPAA's
- Conduct an as-built survey of the RPAA's and obtain baseline ecological data within the RPAA's.
- Post-construction, the temporary construction fencing will be removed and a more durable staking/fencing will be installed around each RPAA to protect the special-status plants from operational activities.

#### Long-term Monitoring

Once construction is complete, special-status plant monitoring will be conducted within the RPAA's. The ISEGS monitoring program will collect data needed to evaluate whether the proposed success criteria are being met, and will also collect information on habitat conditions and other factors needed for trend analysis and adaptive management.

Components of the monitoring plan include species-specific success criteria, a tabular summary of ecological characteristics to include in monitoring, copies of monitoring datasheets and variables included in the GPS data dictionary, and a schedule of monitoring activities. Special-status plant monitoring will be conducted by a botanist familiar with the Mojave desert flora and the special-status plant species onsite. Results of long-term monitoring will be submitted as required to the CPM and BLM Authorized Officer.

The program to avoid and maintain rare plants over the long-term will rely on adaptive management to assure that best management practices are being identified, implemented and evaluated over time.

### Adaptive Management

An adaptive management approach will be used during long-term monitoring. The results of monitoring and other observations will be used to determine whether rare plant avoidance and minimization measures implemented have functioned as intended, and whether alternate procedures are needed. Changes in management strategies will be implemented if deemed necessary to improve the likelihood of reaching ultimate goals for rare plant avoidance and impact minimization. For example, if rare plant mortality within the avoided rare plant localities is determined to occur as a result of a preventable action, to the degree feasible, procedural measures will be implemented in future operational or construction phases such that preventable mortality is reduced.

The effects of management changes and alternative mitigation will be evaluated through monitoring and reporting, followed by additional changes, if needed. If performance standards and success criteria are not achieved, remedial actions will be taken to improve onsite conditions for rare plants, and alternative mitigation measures will be considered. A summary of possible remedial measures that could be implemented are included in the following subsection. More information on remedial measures is provided in the Special-status Plant Remedial Action Plan (Attachment BIO-18B).

### 14.3.4 Remedial Actions

COC BIO-18 requires preparation and implementation of a Special-status Plant Remedial Action Plan if results of long-term monitoring show that success criteria are not achieved. Specifically, this Remedial Action Plan will be implemented if special-status plants within the three rare plant mitigation areas totaling about 476 acres and onsite minimization areas fail to meet success standards described in the Special-status Plant Protection and Monitoring Plan. Key components of the Special-status Plant Remedial Action Plan are described in the following subsection. The Special Status Plant Remedial Action Plan is included as Attachment BIO-18B.

#### Salvage and Onsite Translocation

One remedial measure is translocation of salvaged rare plants from the Rare Plant Transplantation Area to onsite avoidance areas or other locations (e.g., the Northern Rare Plant Mitigation Area). Salvaged plants will be maintained and watered during the construction period to maximize survivorship.

#### Seed Collection

Seed collection from individual Mojave milkweed and Rusby's desert mallow plants that would otherwise be salvaged may also be conducted. The amount of seed expected from these few plants is very small. Large quantities of seed are needed for favorable germination and growth of many desert species using direct-seeding. Therefore, a direct-seeding of rare plant seed is not viewed as the best possible remedial measure. Collected seed will be stored at a qualified native plant nursery that is experienced in the storage of native rare plant seed

and the Mojave flora. Small container plants may be grown at the nursery and out-planted, either in the Rare Plant Transplantation Area or in another location onsite (e.g., one of the three Rare Plant Mitigation Areas). As described in the Special-status Plant Remedial Action Plan (BIO-18B), any plantings will be carefully maintained to maximize survivorship and monitored.

#### Other Remedial Measures

Other possible remedial actions include donations of salvaged rare plant material that cannot be avoided as voucher specimens to accredited herbaria or as salvage and transplant of living plants to botanical gardens.



# Streambed Impact Avoidance and Minimization

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COC BIO-20, as proposed by CEC staff, provides measures to avoid, minimize, and mitigate impacts to ephemeral drainages. The Applicant has argued that this COC be replaced. Because the final COCs have not been determined, this section provides required avoidance and minimization measures proposed by staff. Compensation requirements have also been proposed by CEC Staff, but rejected by the Applicant. If the final COCs require compensation, those requirements will be added to Section 16, Compensatory Mitigation. This section will be revised based on the final COCs.

## 15.1 Compliance Monitoring and Notification

### 15.1.1 Right of Access and Review for Compliance Monitoring

The CPM reserves the right to enter the project site or allow CDFG to enter the project site at any time to ensure compliance with these conditions. The project owner herein grants to the CPM and to CDFG employees and/or their representatives the right to enter the project site at any time, to ensure compliance with the terms and conditions and/or to determine the impacts of storm events, maintenance activities, or other actions that might affect the restoration and revegetation efforts. The CPM and CDFG may, at the CPM's discretion, review relevant documents maintained by the operator, interview the operator's employees and agents, inspect the work site, and take other actions to assess compliance with or effectiveness of mitigation measures.

### 15.1.2 Notification

The project owner will notify the CPM and CDFG, in writing, at least 5 days prior to initiation of project activities in jurisdictional areas as noted and at least 5 days prior to completion of project activities in jurisdictional areas. The project owner will notify the CPM and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of a proposed project change in a manner that changes risk to biological resources or that may be substantially adversely affected by the proposed project. The notifying report will be provided to the CPM and CDFG no later than 7 days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the notifying change of conditions report will be included in the annual reports.

- **Biological Conditions:** a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or

nonnative, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

- **Physical Conditions:** a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.
- **Legal Conditions:** a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures from the Energy Commission Decision to all contractors, subcontractors, and the applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from another agency upon demand. The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the project owner, the CPM, if the CPM in consultation with CDFG, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:

- The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;
- New information becomes available that was not known to it in preparing the terms and conditions;
- The project or project activities as described in the Final Staff Assessment have changed; or
- The conditions affecting biological resources changed or the CPM, in consultation with CDFG, determines that project activities will result in a substantial adverse effect on the environment.

## 15.2 Best Management Practices

The project owners will implement the following BMPs:

- The project owner will minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.
- The project owner will not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other construction activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

- The project owner will comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.
- Spoil sites will not be located within drainages or locations that may be subjected to high storm flows, where spoil shall be washed back into a drainage.
- 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, will be prevented from contaminating the soil and/or entering waters of the state. These materials, placed within or where they may enter a drainage or Ivanpah Dry Lake, by project owner or any party working under contract or with the permission of the project owner will be removed immediately.
- When operations are completed, any excess materials or debris will be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.
- No equipment maintenance will occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow. If maintenance is required within 150 feet, barriers will be placed such that they will prevent petroleum products or other pollutants from the equipment from entering these areas under any reasonably expected flow at the time.



# Avian and Bat Monitoring and Mitigation Plan

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## 16.1 Introduction

The Avian and Bat Monitoring and Management Plan (ABMMP) was prepared to meet the Condition of Certification (COC) BIO-21. BSE will implement the plan to monitor death and injury of birds and bats from collisions with facility features. Of particular concern are collisions with the solar receiver towers and reflective heliostat mirrors, and exposure to bright light and heat from concentrating sunlight. Monitoring data will be used to inform and develop an adaptive management program that would avoid and minimize project-related impacts to avian or bat should they occur. Modifications to the plan will be made only after approval from the CPM in consultation with CDFG and USFWS.

The objectives of the ABMMP are to:

1. Monitor construction and operation of the project to determine whether deaths or injuries to avian and/or bats species are occurring do to project-related activities.
2. Should monitoring determine impacts to avian and/or bat species are occurring; develop and implement further conservation measures through adaptive management to avoid or minimize deaths or injuries to the species of concern.

## 16.2 Monitoring

Monitoring will take place during project construction and for one year following the beginning of project operation. Following the completion of the fourth quarter of monitoring, the DB will prepare an Annual Report that summarizes the year's data, analyzes any project-related bird or bat fatalities or injuries detected, and provide recommendations for future monitoring and any adaptive management actions that may be needed.

## 16.3 Reporting

During construction, bird and bat deaths or injuries will be reported in the Monthly Compliance Report for the Project. For one year following the beginning of power plant operation, the DB will submit quarterly reports to the CPM, CDFG, and USFWS describing the results of monitoring. The monthly and quarterly reports will provide a detailed description of any project-related bird or bat deaths or injuries detected during the monitoring study or at any other time. Reporting will include describing the dates, species found injured or dead, where found, expected cause of injury or death, other appropriate results of monitoring.

Following the completion of the fourth quarter of monitoring, the DB will prepare an Annual Report that summarizes the year's data, analyzes any project-related bird or bat

fatalities or injuries detected, and provide recommendations for future monitoring and any adaptive management actions needed.

No later than January 31st of every year the Annual Report will be provided to the CPM, CDFG, and USFWS. Quarterly reporting will continue until the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary. After 2 years of data collection, the project owner will prepare a report that describes the study design and monitoring results of this Plan. The report will be submitted to the CPM, CDFG and USFWS no later than the third year after onset of project operation.

## 16.4 Adaptive Management

Adaptive management measures would be developed and implemented to avoid or minimize deaths or injuries from project construction and operation if monitoring documents project-related bird or bat deaths or injuries. The CPM, in consultation with CDFG and USFWS, would determine if the project-related bird or bat deaths or injuries warrant implementation of adaptive management measures considered in this Plan. Adaptive management is a means to manage any unforeseen conditions. Death or injury of avian and species (i.e., birds and bats) from project-related construction and operation is currently an unforeseen condition. Adaptations would include implementing new mitigation measures as appropriate based on the actual effects of the Ivanpah SEGS on avian species and, as feasible, implement new mitigation measures developed by experts on the species of concern. All new measures would be in accordance with any applicable CDFG or USFWS guidelines to avoid or minimize avian and bat deaths or injuries.

## SECTION 16

# Compensatory Mitigation

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The CEC staff have proposed compensatory mitigation measures for desert tortoise (BIO-17), burrowing owl (BIO-16), Nelson's bighorn sheep (BIO-19) and streambed avoidance (BIO-20). Many of the compensatory mitigation measures have been objected to by BrightSource. Once, the compensatory mitigation requirements are determined by the Commission, this section will be revised to include them in the BRMMP.



# Operations and Maintenance Protection Measures

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## 18.1 Measures Required During Ongoing Operation

All ongoing operation-related activities would be confined to fenced areas and should not result in further impact to biological resources. The WEAP would continue to be administered to all personnel. As such, all personnel would be aware of reporting requirements should unanticipated impacts to biological resources be observed.

## 18.2 Measures Required for Maintenance Activities

### 18.2.1 Description of Maintenance Activities

In addition to regular, day-to-day operation of the ISEGS facility, the project may need to perform a variety of maintenance actions on facilities outside of the fenced portions of the ISEGS facility (e.g., natural gas pipeline, water wells, water pipelines, access roads, and project perimeter fence). These anticipated maintenance activities are grouped into three classes.

**Class I** activities are those maintenance actions that do not result in new surface disturbance. The project owner would perform these activities by hand or with the use of tools, equipment, and/or vehicles. Class I activities would take place on existing structures or would be staged from existing roads or other disturbed areas. These activities would not include off-road travel. Vehicles used during these activities might include low-boy tractor and trailer, flat bed, utility trucks, forklifts, scissor lifts, cherry pickers, and mechanical hoists. Labor may involve several workers confined to the area in need of maintenance. The project owner may need to perform these activities on a daily basis.

**Class II** activities would result in minimal surface disturbance, but would likely require heavy earth moving equipment including motor graders, bulldozers, front-end loaders, backhoes, water trucks, asphalt pavers, and dump trucks. Typical Class II activities would include: 1) underground utility (e.g., water, gas, sewage, electrical, communication, etc.) repairs, upgrades and tie-ins to structures; 2) motor grading and repairs of existing dirt roads, shoulders, and berms; 3) cut or fill of soil surface to re-establish appropriate cover due to soil erosion after rainfall events; 4) maintenance of drainages, fords and culverts for proper flow of water runoff; 5) maintenance of asphalt roads, shoulders and parking lots; 6) security and desert tortoise exclusion fence repairs; and 7) minor natural gas pipeline repairs that require excavation.

**Class III** includes maintenance activities that result in major surface disturbance. Typical Class III activities would include: 1) installation of a new underground pipeline a distance of

1,000 feet or more and 2) disturbance of an acre or more for construction of new storm water drainage features.

### 18.2.2 Protective Measures

**Class I Activities:** The WEAP would be administered to all construction personnel. No biological monitoring would be required for these activities unless the Designated Biologist determines it is warranted.

**Class II Activities:** The WEAP would be administered to all construction personnel. Any activities resulting in new surface activity outside of a fenced area would require an Authorized Biologist be present to monitor the activity. The area would be surveyed by an Authorized Biologist or Biological Monitor prior to the activity to ensure no tortoises, tortoise burrows, other protected wildlife, or rare plants would be impacted. Areas to be avoided, such as a tortoise burrow or rare plant adjacent to the work area, would be flagged.

**Class III Activities:** The WEAP would be administered to all construction personnel. Any activities resulting in new surface activity outside of a fenced area would require an Authorized Biologist be present to monitor the activity. The area would be surveyed by an Authorized Biologist or Biological Monitor prior to the activity to ensure no tortoises, tortoise burrows, other protected wildlife, or rare plants would be impacted. Areas to be avoided, such as a tortoise burrow adjacent to the work area, would be flagged. In the unlikely event an occupied tortoise burrow cannot be avoided, the tortoise would be relocated following all applicable measures described the project's Final Biological Opinion (Attachment B).

## SECTION 18

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**Attachment A**  
**CEC Biological Conditions of Certification**

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significant impact from the possible loss of individual special status plants (Mojave milkweed and desert pincushion) located on the project site but outside of protected areas. Our decision to override this and other significant impacts is described in the **Override Findings** section of this Decision.

3. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions of Certification, the ISEGS will conform to all applicable laws, ordinances, regulations, and standards related to biological resources as identified above and in the pertinent portion of **Appendix A** of this Decision.

## CONDITIONS OF CERTIFICATION

### Designated Biologist Selection and Qualifications<sup>3</sup>

**BIO-1** The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) and BLM's Authorized Officer for approval in consultation with CDFG 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 area;
4. Meet the current USFWS Authorized Biologist qualifications criteria (USFWS 2008), demonstrate familiarity with protocols and

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<sup>3</sup> USFWS <[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines/docs/dt](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt)> designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately, and have received USFWS approval. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The California Department of Fish and Game (CDFG) must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. Designated Biologists are the equivalent of Authorized Biologists. Only Designated Biologists and certain Biological Monitors who have been approved by the Designated Biologist would be allowed to handle desert tortoises.

guidelines for the desert tortoise, and be approved by the USFWS;  
and

5. Possess a California ESA 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 BLM's Authorized Officer and the CPM, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

**Verification:** The project owner shall submit the specified information at least 90 days prior to the start of any project-related site disturbance activities. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Authorized Officer and the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the BLM Authorized Officer and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to BLM's Authorized Officer and the CPM and for consideration.

Designated Biologists shall complete a USFWS Qualifications Form (USFWS 2008) ([www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)) and submit it to the USFWS, BLM's Authorized Officer and the CPM within 60 days prior to ground breaking for review and final approval.

### **Designated Biologist Duties**

**BIO-2** The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Authorized Officer and the CPM. The Designated Biologist Duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;
3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts,

particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
6. Notify the project owner and BLM's Authorized Officer and the CPM of any non-compliance with any biological resources condition of certification;
7. Respond directly to inquiries of BLM's Authorized Officer and the CPM regarding biological resource issues;
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report;
9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures <[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)>, and; and
10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, BLM's Authorized Officer and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base.

**Verification:** The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Authorized Officer and the CPM and copies of all written reports and summaries that document biological resources compliance activities. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his/her duties cease, as approved by BLM's Authorized Officer and the CPM.

## **Biological Monitor Selection And Qualifications**

**BIO-3** The project owner's BLM- and CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitors to BLM's Authorized Officer and the CPM. The resume shall demonstrate, to the satisfaction of the CPM the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS 2008).

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRMIMP, WEAP, USFWS guidelines on desert tortoise surveys and handling procedures <[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)>.

**Verification:** The project owner shall submit the specified information to the BLM's Authorized Officer and the CPM for approval at least 30 days prior to the start of any project-related site disturbance activities. The Designated Biologist shall submit a written statement to BLM's Authorized Officer and the CPM confirming that individual Biological Monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction the specified information shall be submitted to BLM's Authorized Officer and the CPM and for approval at least 10 days prior to their first day of monitoring activities.

## **Biological Monitor Duties**

**BIO-4** The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist shall remain the contact for the project owner, BLM's Authorized Officer and the CPM.

**Verification:** The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Authorized Officer and the CPM and copies of all written reports and summaries that document biological resources compliance activities, including those conducted by Biological Monitors. If actions may affect biological resources during operation a Biological Monitor, under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by BLM's Authorized Officer and the CPM.

## **Designated Biologist and Biological Monitor Authority**

**BIO-5** The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification.

The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and Biological Monitor(s) the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the construction/operation manager when to resume activities; and
3. Notify BLM's Authorized Officer and the CPM and if there is a halt of any activities and advise them of any corrective actions that have been taken or will be instituted as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

**Verification:** The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Authorized Officer and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify BLM's Authorized Officer and the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by BLM's Authorized Officer and the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by BLM's Authorized Officer and the CPM that coordination with other agencies will require additional time before a determination can be made.

### **Worker Environmental Awareness Program (WEAP)**

**BIO-6** The project owner shall develop and implement an Ivanpah SEGS-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from BLM's Authorized Officer and the CPM. The USFWS and CDFG shall also be provided a copy of the WEAP for review and comment. The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall

be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that Gila monsters are venomous and should not be handled, and that no snakes, reptiles, or other wildlife shall be harmed;
3. Place special emphasis on desert tortoise, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
4. Include a discussion of fire prevention measures to be implemented by workers during project activities; request workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;
5. Present the meaning of various temporary and permanent habitat protection measures;
6. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
7. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

**Verification:** At least 60 days prior to the start of any project-related site disturbance activities, the project owner shall provide to BLM's Authorized Officer and the CPM a copy of the draft WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site

and related facilities mobilization, the project owner shall submit two copies of the BLM- and CPM-approved final WEAP.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least six months after the start of commercial operation.

Throughout the life of the project, the worker education program shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Authorized Officer and the CPM and upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

### **Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)**

**BIO-7** The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the BLM-Authorized Officer and the CPM (for review and approval) and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Desert Tortoise Translocation Plan, the Raven Management Plan, the Closure, Revegetation and Rehabilitation Plan, the Burrowing Owl Mitigation and Monitoring Plan, and the Weed Management Plan.

The BRMIMP shall be prepared in consultation with the Designated Biologist and include the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;
3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;
4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

5. All required mitigation measures for each sensitive biological resource;
6. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
7. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction and operation;
8. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Provide planned timing of aerial photography and a description of why times were chosen. Provide a final accounting of the before/after acreages and a determination of whether additional habitat compensation is necessary in the Construction Termination Report;
9. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
10. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
11. All performance standards and remedial measures to be implemented if performance standards are not met;
12. A discussion of biological resources-related facility closure measures including a description of funding mechanism(s); and
13. A process for proposing plan modifications to BLM's Authorized Officer and the CPM and appropriate agencies for review and approval; and

**Verification:** The project owner shall submit the BRMIMP to the BLM Authorized Officer and the CPM at least 60 days prior to start of any project-related site disturbance activities. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No ground disturbance may occur prior to approval of the final BRMIMP by BLM's Authorized Officer and the CPM.

BLM's Authorized Office and the CPM, in consultation with other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Authorized Office and the

CPM within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within at least 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to BLM's Authorized Officer and the CPM.

The project owner shall notify BLM's Authorized Officer and the CPM and no less than five working days before implementing any modifications to the approved BRMIMP to obtain BLM's Authorized Officer and CPM approval.

Any changes to the approved BRMIMP must also be approved by BLM's Authorized Officer and the CPM and in consultation with appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures (construction activities that were monitored, species observed) will be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

### **Desert Tortoise Clearance Surveys and Fencing**

**BIO-8** The project 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 installation, tortoise handling, artificial burrow construction, egg handling and other procedures would be consistent with those described in the *Guidelines for Handling Desert Tortoise During Construction Projects* (Desert Tortoise Council 1999) or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion prepared by USFWS. These measures include, but are not limited to, the following:

1. Fence Installation. To avoid impacts to desert tortoises the proposed fence alignment shall be flagged and the alignment surveyed within 24 hours prior to the initiation of construction of tortoise-exclusion fence. Surveys shall be conducted by the Designated Biologist(s) using techniques approved by the USFWS and CDFG. Biological Monitors may assist the Designated Biologist under his or her supervision. These surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. This fence line transect will cover an area approximately 90 feet wide centered on the fence

alignment. Transects would be no greater than 30 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 USFWS-approved protocol.

2. Fence Installation. Prior to the initiation of construction activities for each solar plant, the project owner shall enclose the boundary of the affected solar plant with permanent chain-link fencing for security purposes and permanent desert tortoise exclusionary fencing would be attached to the bottom of the chain link fencing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.
  - a. Fence Material and Installation. The permanent tortoise exclusionary fencing shall consist of galvanized hard wire cloth 1-inch by 2-inch mesh sunk 12 inches into the ground, and 24 inches above the ground (but not less than 18 inches above the ground) (USFWS 2008). The fencing shall be buried approximately 6 inches below ground or bent at a right angle towards the outside of the project site and covered with dirt, rocks or gravel to discourage the tortoise from digging under the fence
  - b. 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
  - c. Utility Corridor Fencing. The utility rights-of-way shall be temporarily fenced on each side of the right-of-way prior to ground disturbing activities to prevent desert tortoise entry during construction. Temporary fencing must be capable of preventing desert tortoises from entering the work area, with supporting stakes sufficiently spaced to maintain fence integrity. The Designated Biologist or Biological Monitor shall be present to supervise all construction activities occurring within areas bounded by temporary fencing.
  - d. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during/following all major rainfall events. Any

damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within two days of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing must be inspected weekly and, where drainages intersect the fencing, during and immediately following major rainfall events. All 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. Clearance Surveys. Following construction of the security fence and the attached tortoise exclusion fence, the fenced area shall be cleared of tortoises by Biological Monitors under the supervision of the Designated Biologist. Two complete passes with complete coverage shall be conducted as described above. If a desert tortoise is located on the second survey, a third survey would be conducted. Transects would be no wider than 30 feet. Each separate survey would be walked in a different direction to allow opposing angles of observation. Vegetation salvage operations shall not begin until the area is deemed free of desert tortoises.
4. Burrow Searches. During clearance surveys all potential desert tortoise burrows within the fenced area shall be inspected to determine if tortoises are present. In some cases, a fiber optic scope may be needed to determine presence or absence within a deep burrow. To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined. Tortoises taken from burrows and from elsewhere on the site shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan.
5. Burrow Excavation/Handling. All potential desert tortoise burrows located would be excavated by hand by a Biological Monitor, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. Burrows inhabited by tortoises shall be excavated using hand tools under the supervision of the Designated Biologist. If excavated during May through July, the Biological Monitor would search for desert tortoise nests/eggs, which are typically located near the entrance to burrows. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist or a Biological Monitor in accordance with the Service-approved protocol (Desert Tortoise Council 1994, revised 1999). If the Desert Tortoise Council releases a revised protocol for handling of desert tortoises before initiation of project activities, the revised protocol would be implemented for the project.

6. Monitoring During Clearing. Following the tortoise clearance and translocation, workers and heavy equipment shall be allowed to enter the project site to perform vegetation salvage and earth work such as clearing, grubbing, leveling, trenching, and installation of heliostats. A Biological Monitor shall monitor clearing and grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan to an area approved by the Designated Biologist.
7. 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 technology); 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 desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked for future identification as described in *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council 1999) or more current guidance on the USFWS website. Digital photographs of the carapace, plastron, and fourth costal scute shall be taken. Scutes shall not be notched for identification.

**Verification:** All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM's Authorized Officer, the CPM, USFWS, and CDFG describing how each of the mitigation measures described above has been satisfied. The report shall include the desert tortoise survey results, capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

### **Desert Tortoise Translocation Plan**

**BIO-9** The project owner shall develop and implement a final Desert Tortoise Relocation/Translocation Plan (Plan) that is consistent with current USFWS approved guidelines, including the recently released "Translocation of Desert Tortoises (Mojave Population) from Project Sites: Plan Development Guidance, U.S. Fish and Wildlife Service, August 2010," and meets the approval of BLM's Authorized Officer,

USFWS and the CPM, in consultation with CDFG. The final Plan shall be based on the draft Desert Tortoise Relocation/Translocation Plan prepared by the applicant dated May 2009 and shall include all revisions deemed necessary by BLM's Authorized Officer, USFWS, and the CPM, in consultation with CDFG.

**Verification:** Within 60 days of publication of the Energy Commission Decision the project owner shall provide BLM's Authorized Officer and the CPM with the final version of a Desert Tortoise Relocation/Translocation Plan that has been reviewed and approved by BLM, USFWS, and the CPM in consultation with CDFG. BLM's Authorized Officer and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved translocation must be made only after consultation with BLM's Authorized Officer, USFWS and the CPM, in consultation with CDFG.

Within 30 days after initiation of translocation activities, the Designated Biologist shall provide to BLM's Authorized Officer and the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan.

### **Desert Tortoise Compliance Verification**

**BIO-10** The project owner shall provide Energy Commission and BLM representatives with reasonable access to the project site and mitigation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The project owner shall hold the Designated Biologist, the Energy Commission, and BLM harmless for any costs the project owner incurs in complying with the management measures, including stop work orders issued by BLM's Authorized Officer, the CPM, or the Designated Biologist. The Designated Biologist shall do all of the following:

1. Notify BLM's Authorized Officer and the CPM and at least 14 calendar days before initiating vegetation salvage or ground-disturbing activities;
2. Immediately notify BLM's Authorized Officer and the CPM in writing if the project owner is not in 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;
3. Remain onsite daily while vegetation salvage, grubbing, grading and heliostat installation activities are taking place to avoid or minimize take of listed species, to check for compliance with all

impact avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

4. Maintain and check desert tortoise exclusion fences on a daily basis to ensure the integrity of the fence is maintained. The Designated Biologist shall be present onsite to monitor construction and determine fence placement during fence installation.
5. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, grading, and heliostat installation activities are completed and submit a monthly compliance report to BLM's Authorized Officer and the CPM ;
6. No later than January 31 of every year the ISEGS facility remains in operation, provide BLM's Authorized Officer and the CPM an annual Listed Species Status Report, which shall include, at a minimum: 1) a general description of the status of the project site and construction activities, including actual or projected completion dates, if known; 2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; and 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts;
7. Ensure that all observations of listed species and their sign during project activities are reported to the Designated Biologist for inclusion in the next monthly compliance report submitted to BLM's Authorized Officer and the CPM;
8. No later than 45 days after the first sale of power provide BLM's Authorized Officer and the CPM a Final Listed Species Mitigation Report that shall include, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project;
9. In the event of a sighting in an active construction area (e.g., with equipment, vehicles, or workers), injury, kill, or relocation of any

listed species, notify BLM's Authorized Officer, the CPM, CDFG and USFWS immediately by phone and in no event later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine what further actions, if any, are required to protect listed species;

10. Prepare written follow-up notification via FAX or electronic communication to these agencies within 2 calendar days of the incident and include the following information as relevant:
  - a. If a desert tortoise is injured as a result of project related activities during construction, the Designated Biologist will immediately take it to a BLM- and CPM-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals will be paid by the project owner. Following phone notification as required above, BLM's Authorized Officer, the CPM, CDFG, and USFWS will determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.
  - b. If a desert tortoise is killed by project-related activities during construction, or if a desert tortoise is otherwise found dead, submit a written report with the same information as an injury report. These desert tortoises shall be salvaged according to guidelines described in *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise* prepared by Kristin Berry, June 2001. The project owner shall pay to have these desert tortoises necropsied. The report shall include the date and time of the finding or incident.
  - c. BLM's Authorized Officer and the CPM may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project for an appropriate period determined in consultation with BLM's Authorized Officer and the CPM in order 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 candidate species. The project owner shall comply with the stop work order immediately upon receipt thereof.

**Verification:** No later than 2 calendar days following the above required notification of a sighting, kill, or relocation of a listed species, the project owner shall deliver to BLM's Authorized Officer, the CPM, CDFG, and USFWS via FAX or electronic communication the written report from the Designated Biologist

describing all reported incidents of injury, kill, or relocation of a listed species, identifying who was notified, and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to BLM's Authorized Officer, the CPM, CDFG and USFWS.

### **Impact Avoidance and Minimization Measures**

**BIO-11** During construction the project owner shall implement all feasible measures to avoid or minimize impacts to biological resources, including the following:

1. Limit Disturbance Areas. 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 lacking native vegetation and which do not provide habitat for special-status species. 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 will 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 will 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. The speed limit shall not exceed 20 miles per hour within the project area, on maintenance roads for linear facilities, or on access roads to the ISEGS site.
4. Monitor During Construction. The Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to disturb soil, vegetation, and wildlife. In areas that have not been fenced with tortoise exclusion fencing and cleared, the USFWS-approved Designated Biologist or Biological Monitor shall walk immediately ahead of equipment during brushing and grading activities.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested Practices for Avian Protection on Power Lines (APLIC 2006) and Mitigating Bird Collisions with Power Lines (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.
6. Avoid Use of Toxic Substances. Road surfacing and sealants as well as soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.
7. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat. To minimize risk of avian collisions with the heliostat towers, only flashing or strobe lights shall be installed on these towers.
8. Badger Surveys. Concurrent with the desert tortoise clearance survey, the Designated Biologist or Biological Monitors shall perform a preconstruction survey for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If badger dens are found, each den shall be classified as inactive, potentially active, or definitely active. Inactive dens shall be excavated by hand and backfilled to prevent reuse by badgers. Potentially and definitely active dens shall be monitored by the Designated Biologist or Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) at the entrance. If no tracks are observed in the tracking medium after 3 nights, the den shall be excavated and backfilled by hand. If tracks are observed, the applicant shall develop and implement a trapping and relocation plan in consultation with the Designated Biologist and CDFG. BLM approval may be required prior to release of badgers on public lands.
9. Gila Monster Surveys. If a Gila monster is encountered during clearance surveys or during construction, a qualified biologist experienced with Gila monster survey and capture techniques shall capture and maintain it in a cool (<85 degrees F)

environment until it can be released to a safe, suitable area beyond the construction impact zone. The biologist shall coordinate with staff and CDFG biologists in the transport and relocation of any Gila monsters encountered during project surveys, construction, or operation.

10. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it will be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS protocol ([www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines) and Desert Tortoise Council 1999).

11. Avoid Wildlife Pitfalls:

- a. Backfill Trenches. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the area fenced with desert tortoise exclusion fencing have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically throughout the day and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.
- b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground and within desert tortoise habitat (i.e., outside the permanently fenced area) for one or more nights, shall be inspected for tortoises before the material is moved, buried or capped. As an alternative, all such structures may be capped before being stored outside the

fenced area, or placed on pipe racks. These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.

- c. Cap Heliostat Holes. All holes drilled for heliostats shall be capped the same day they are drilled. Caps shall remain on the holes until heliostats are inserted into the holes, and shall be securely fastened and sufficiently sturdy to cover the heliostat holes indefinitely. The caps shall exclude all wildlife, and shall be inspected weekly by the Designated Biologist or Biological Monitors to ensure that the caps remain in place and that birds and terrestrial wildlife have not become trapped.
12. Minimize Standing Water. Water applied to construction areas and dirt roads for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises, common ravens and coyotes to construction sites.
13. Dispose of Roadkilled Animals. Road killed animals or other carcasses detected in the project area or on roads near the project area shall be picked up immediately and delivered to the Biological Monitor. Within 1 working day of receipt of the carcass the Biological Monitor shall contact CDFG and/or USFWS for guidance on disposal or storage of the carcass.
14. On-site personnel shall photograph and record the location of all bird carcasses encountered within the solar fields, and shall provide the bird carcass, photograph, and location data to the Designated Biologist. The Designated Biologist shall identify the bird, ascertain a cause of death if possible, maintain a database of this information for all bird carcasses, and each year of operation shall provide a report summarizing this information to the CPM, BLM's Authorized Officer, CDFG and USFWS.
15. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

16. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic 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. The speed limit when traveling on Colosseum Road and other dirt access routes within desert tortoise habitat shall not exceed 20 miles per hour.
17. Monitor Ground Disturbing Activities Prior to Site Mobilization. If ground-disturbing activities are required prior to site mobilization, 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.

**Verification:** All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying how measures have been completed. The Designated Biologist shall provide to the CPM, BLM's Authorized Officer, CDFG, and USFWS an annual report summarizing all available data (species of carcass, date and location collected, and cause of death) describing bird and other carcasses collected within the project site each year.

### **Raven Management Plan**

**BIO-12** The project owner shall implement a Raven Management Plan that is consistent with the most current USFWS-approved raven management guidelines, and which meets the approval of USFWS, BLM's Authorized Officer, and the CPM in consultation with CDFG. The draft Raven Management Plan submitted by the Applicant (CH2M Hill 2008f) shall provide the basis for the final plan, subject to review and revisions from USFWS BLM's Authorized Officer and the CPM in consultation with CDFG. The project owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The amount shall be a one-time payment of \$105 per acre of permanent disturbance.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide BLM's Authorized Officer, the CPM, USFWS, and CDFG with the final version of a Raven Management

Plan that has been reviewed by USFWS, CDFG, BLM, and the Energy Commission staff. The CPM and BLM's Authorized Officer will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Raven Management Plan shall be made only after approval by BLM's Authorized Officer and the CPM, in consultation with USFWS, and CDFG.

No less than 10 days prior to the start of any Project-related ground disturbance activities, the project owner shall provide documentation to the CPM, CDFG and USFWS that the one-time fee for the USFWS Regional Raven Management Program has been deposited in the REAT-NFWS subaccount for the Project.

Within 60 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Raven Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

### **Weed Management Plan**

**BIO-13** The project owner shall implement a Weed Management Plan that meets the approval of BLM and the CPM. The draft Weed Management Plan submitted by the applicant (CH2M Hill 2008e) shall provide the basis for the final plan, subject to review and approval from BLM and in consultation with USFWS, and CDFG. In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction, the final Weed Management Plan shall include at least the following Best Management Practices to prevent the spread and propagation of noxious weeds:

1. Limit the size of any vegetation and/or ground disturbance to the absolute minimum, and limit ingress and egress to defined routes.
2. Maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.
3. Reestablish vegetation quickly on disturbed sites.
4. Monitoring and rapid implementation of control measures to ensure early detection and eradication for weed invasions.
5. Use only weed-free straw or hay bales used for sediment barrier installations, and weed-free seed.
6. Reclamation and revegetation shall occur on all temporarily disturbed areas, including pipelines, transmission lines, and staging areas.

**Verification:** At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide BLM's Authorized Officer and the CPM with the final version of a Weed Management Plan. BLM's Authorized Officer and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Weed Control Plan must be made only after consultation with the CPM and BLM's Authorized Officer, in consultation with USFWS, and CDFG.

Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM for review and approval, a written report identifying which items of the Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

### **Closure, Revegetation and Rehabilitation Plan**

**BIO-14** The project owner shall develop and implement a revised Closure, Revegetation and Rehabilitation Plan (Plan) in cooperation with BLM and Energy Commission staff to guide site restoration and closure activities, including methods proposed for revegetation of disturbed areas immediately following construction and rehabilitation and revegetation upon closure of the facility. This plan must address preconstruction salvage and relocation of succulent vegetation from the site to an on-site nursery facility for storage and propagation of material to reclaim disturbed areas. In the case of unexpected closure, the plan assumes restoration activities would possibly take place prior to the anticipated † closure of the plant. The Plan shall address all issues discussed in Biological Resources Appendix B: *Issues to Address in the Closure, Revegetation and Rehabilitation Plan*, and shall include but is not limited to the following elements in the revised plan:

1. Plan Purpose: The plan shall explicitly identify the objective of the revegetation plan to be re-creation of the types of habitats lost during construction and operation of the proposed solar energy facility. The final revegetation plan shall include introduction of mid- to late-successional species.
2. Standards/Monitoring: Performance standards for success thresholds, weed cover, performance monitoring methods and schedule, and maintenance monitoring in the revised Plan shall be conducted as described in Biological Resources Appendix B.
3. Baseline Surveys – Baseline vegetation surveys for planning restoration efforts shall be conducted as described in Biological Resources Appendix B.

4. **Vegetation Clearing:** Clearing of vegetation shall be limited to areas for which final maps are provided to BLM before approval of the ROW. Clearing of vegetation will be permitted on roads, utility routes, heliostat maintenance pathways, building and parking areas, and temporary staging areas provided these are specifically documented on a georeferenced construction alignment drawing or aerial photo or shape file, showing the exact locations of soil disturbance. BLM will consider relocating specific installations prior to the beginning of construction and during construction on a case by case basis but will not approve additional acreage beyond that addressed in the current application.
5. **Vegetation Mowing;** Vegetation mowing shall be limited to areas adjoining vehicle pathways used for heliostat installation to allow installation of the heliostat pylon and allow for tracking clearance under the heliostat. Vegetation mowing may be repeated during the life of the facility to maintain appropriate clearance for heliostat tracking.
6. **Succulent Salvage:** The revised Plan shall include a table that shows proposed succulent salvage by species the number of plants onsite, the lower threshold height for salvage, the number in each size class, and the fate of plants not salvaged. An inventory and map of proposed succulent transplants shall be provided as described in Appendix A. Information gained from succulent transplant experience gained in ISEGS 1 shall be applied to future salvage operations, as described in Biological Resources Appendix B.
7. **Seed Handling:** Seed collection, testing and application shall be conducted as described in Biological Resources Appendix B, with collection areas within 10 miles of the project boundaries and on similar terrain, soil, exposure, slope, and elevation to the project site.
8. **Soil Preparation:** Soil descriptions, compaction measurements, mulch application, soil storage, seed farming, mycorrhizal inoculation, and biological crust collection and storage shall be conducted as described in Biological Resources Appendix B. Soil stockpiles shall not be placed on areas that support special-status plant species or other sensitive biological resources.
9. **Weed Management.** Weed management activities needed to control weeds resulting from mirror washing shall be conducted as described in Biological Resources Appendix B.

10. Final Closure Plan. A Final Closure Plan, which addresses the final revegetation and rehabilitation activities upon closure and decommissioning of the project, shall be completed as part of the revised Plan. The Final Closure Plan shall include a cost estimate, adjusted for inflation, reflecting the costs of the revegetation, rehabilitation, and monitoring for the duration of time estimated to achieve the objective of re-creating plant communities impacted by the project.
11. The project owner shall implement the Closure, Revegetation, and Rehabilitation Plan, Revision 3, dated July 6, 2010, with the following modifications.
  - a. The long-term soil stockpiles, as discussed in Table 5-2 of the Plan, shall be no higher than 6 feet.
  - b. The Preliminary Seeding Plan for Short-Term Disturbed Areas, and to be used as the basis for the seeding during final project decommissioning, shall be based upon the species list provided in Table 7-1 of the Plan rather than the species list in Table 7-2. The list may be modified at the time of decommissioning based on seed availability.
  - c. Concrete will be removed to a minimum depth of 6 feet unless it is shown that a particular area is prone to flood hazards and a greater depth for concrete removal should be required. All concrete removed shall be hauled off the project site and disposed of in an approved facility. Crushed concrete shall not be used as backfill on the site during decommissioning.
  - d. Succulents salvaged during project construction shall not be sold by the project owner. Should excess succulents be removed that cannot be transplanted in the Succulent Nursery Area, their disposition will be managed by BLM.

**Verification:** No more than 30 days from the Energy Commission Decision and BLM Record of Decision the project owner shall provide BLM's Authorized Officer and the CPM with a draft version of the revised Closure, Revegetation and Rehabilitation Plan. At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide BLM's Authorized Officer and the CPM with the final version of the Closure, Revegetation and Rehabilitation Plan that has been reviewed and approved by BLM's Authorized Officer and the CPM. All modifications to the approved Revegetation and Reclamation Plan must be made only after consultation with BLM's Authorized Officer and the CPM.

Within 30 days after completion of project construction for each phase of development, the project owner shall provide to BLM's Authorized Officer and the CPM for review and approval, a written report identifying which items of the Closure, Revegetation and Rehabilitation Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

At least one year prior to planned closure and decommissioning the project owner shall submit to the BLM-Authorized Officer and the CPM a final Closure Plan for review to determine if revisions are needed. The project owner shall incorporate all required revisions to the final Closure Plan and submit to the BLM-Authorized Officer and the CPM no less than 90 days prior to the start of ground disturbing activities associated with closure and decommissioning activities.

### **Pre-Construction Nest Surveys**

**BIO-15** Pre-construction nest surveys shall be conducted if construction activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors familiar with standard nest-locating techniques and shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in the project site or within 500 feet of the boundaries of the site and linear facilities;
2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys needs to be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;
3. If active nests are detected during the survey, a buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG) and monitoring plan shall be developed. Nest locations shall be mapped and submitted, along with a report stating the survey results, to the CPM; and
4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made.

**Verification:** At least 10 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor (s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

### **Burrowing Owl Impact Avoidance and Minimization Measures**

**BIO-16** The project owner shall implement the following measures for the burrowing owl:

1. Complete a pre-construction survey for burrowing owls for any areas subject to disturbance from construction prior to the start of initial ground disturbance activities. If burrowing owls are present within 500 feet of the project site or linear facilities, then the CDFG burrowing owl guidelines (1995) shall be implemented;
2. Monitor burrowing owl pairs within 500 feet of any activities that exceed ambient noise and/or vibration levels;
3. Establish a 500-foot set back from any active burrow and construct additional noise/visual barriers (e.g., haystacks or plywood fencing) to shield the active burrow from construction activities. Post signs (in both English and Spanish) designating presence of sensitive area;
4. Passively relocate all owls occupying burrows that will be temporarily or permanently impacted by the project and implement the following CDFG take avoidance measures:
  - a. Occupied burrows shall not be disturbed during the nesting season (February 1 – August 31) unless a qualified biologist can verify through non-invasive methods that egg laying/incubation has not begun or juveniles are foraging independently and able to fly;
  - b. A qualified biologist must **passively** relocate owls, confirm that owls have left burrows prior to ground-disturbing activities, and monitor the burrows. Once evacuation is confirmed, the biologist should hand excavate burrows and then fill burrows to prevent reoccupation; and
  - c. Relocation of owls shall be approved by and conducted in consultation with CDFG.

5. Submit a Burrowing Owl Mitigation and Monitoring Plan to the CPM and CDFG for review and approval prior to relocation of owls (and incorporate it into the project's BRMIMP) as well as a construction termination report with results to CDFG and CPM 30 days after completing owl relocation and monitoring and at least 30 days prior to the start of commercial operation.

**Verification:** The project owner shall complete a pre-construction survey for burrowing owls for any areas subject to disturbance from construction no more than 30 days prior to the start of any project-related site disturbance activities, and submit a report to CDFG, USFWS, BLM's Authorized Officer and the CPM that describes when surveys were completed, observations, mitigation measures, and the results of the mitigation. If burrowing owls are to be protected on site or relocated, the project owner shall coordinate with and report to CDFG, USFWS, BLM and Energy Commission staff on these proposed activities in a Burrowing Owl Mitigation and Monitoring Plan. Within 30 days after completion of owl relocation and monitoring, and the start of ground disturbance **or** at least 90 days prior to the sale of power, the project owner shall provide to the CDFG and CPM a written construction termination report identifying how measures have been completed.

### **Desert Tortoise Compensatory Mitigation**

**BIO-17** To fully mitigate for habitat loss and potential take of desert tortoise, the project owner shall provide compensatory mitigation at a 3:1 ratio for impacts to 3,582 acres or the area disturbed by the final project footprint. At least two thirds of the 3:1 mitigation requirement shall be achieved by acquisition, in fee title or in easement, of no less than 7,164 acres of land suitable for desert tortoise or twice the area disturbed by the final project footprint. The Energy Commission's compensatory mitigation requirement consists of habitat acquisition at a 2:1 ratio as well as the BLM's 1:1 desert tortoise mitigation approach of habitat enhancement. The project owner shall provide financial Security as specified in this condition in an amount sufficient to ensure the entire 3:1 mitigation requirement, including acquisition, initial habitat improvements and long-term management for the compensation lands to be acquired and the mitigation to be provided through BLM. The 1:1 mitigation that will satisfy both BLM's mitigation requirements and a portion of the Energy Commission's mitigation requirements, shall be developed in accordance with BLM's desert tortoise mitigation requirements as described in the Northern and Eastern Mojave Desert Management Plan (BLM 2002). BLM's compensatory mitigation plan, serving as one third of the 3:1 mitigation ratio required to satisfy CESA, consists of desert tortoise habitat enhancement including installation of at least 50 miles of desert tortoise exclusion fencing on roadways in the Northeastern Mojave Recovery Unit, and habitat restoration of at least 50 routes within the Desert Wildlife Management Area. The project owner may elect to

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) [Deposit of Funds to a NFWF Account] as described in #4 of this condition. The Energy Commission requirements for acquisition of 7,164 acres of compensation lands and habitat enhancements through BLM shall include all of the following:

1. Responsibility for Acquisition of Compensation Lands: The project owner may delegate its responsibility for acquisition of compensation lands to a third party, such as a non-governmental organization supportive of Mojave Desert habitat conservation. Such delegation shall be subject to approval in writing by the CPM, in consultation with BLM, CDFG and USFWS, prior to land acquisition, enhancement or management activities. If habitat disturbance exceeds that described in this analysis, the project owner shall be responsible for funding acquisition, habitat improvements and long-term management of additional compensation lands or additional funds required to compensate for any additional habitat disturbances. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. Water and mineral rights shall be included as part of the land acquisition. Agreements to delegate land acquisition to CDFG or an approved third party and to manage compensation lands shall be implemented within 18 months of the Energy Commission's decision.
  2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition shall:
    - a. be as close to the project site as possible;
    - b. provide good quality habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;
    - c. be near larger blocks of lands that are either already protected or planned for protection, 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 currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover;
    - e. not have a history of intensive recreational use or other disturbance that 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, and
    - g. not contain hazardous wastes.

3. Review and Approval of Compensation Lands Prior to Acquisition. A minimum of three months prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the CPM, CDFG, USFWS and BLM 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 CPM, in consultation with BLM, CDFG and the USFWS, shall be required for acquisition of all parcels comprising the 7,164 acres.
4. Energy Commission Compensation Land Mitigation Security. The project owner shall provide Security to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation requirements described in this condition (Condition of Certification BIO-17). The CPM shall use the Security solely for implementation of the mitigation measures associated with the project in the event the mitigation is not provided as required in this condition. The Security may be in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. Security must be provided to the CPM prior to initiating ground-disturbing project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM

The Security estimates described below and in Biological Resources Table 1 (Estimate of Total Security), Table 2 (Estimate of Phase 1 Security), and Table 3 (Estimate of Phase 2 Security) are based on the most current guidance from the REAT agencies (*Desert Renewable Energy REAT Biological Resource Compensation/Mitigation Cost Estimate Breakdown for use with the REAT-NFWF Mitigation Account, July 23, 2010*) and may be revised with updated information. [These tables are new text to the PMPD but are not marked as such for ease of reading.] The Security shall be provided in conformance with one of the following two options or a combination of the two options if approved by the CPM:

- a. Project Owner Acquisition of Compensation Lands - If the project owner is locating, acquiring and protecting compensation lands itself, the project owner shall provide the CPM with Security in the estimated amount of \$33,183,648 prior to initiating any ground-disturbing project-related activities; if the project owner elects to construct the project in two phases in accordance with Condition of Certification BIO-22, the project owner shall provide Security in the amount of \$11,876,448 prior to initiating any ground-disturbing activities associated with Phase 1, and shall provide Security in the amount of

\$21,307,200 prior to initiating any ground-disturbing activities associated with Phase 2; or

- b. Deposit of Funds to a NFWF Account – If the project owner elects to comply with mitigation requirements by funding NFWF’s implementation of the project’s mitigation, the project owner shall deposit funds in the estimated amount of \$33,909,523 to the NFWF Account; if the project owner elects to construct the project in two phases in accordance with Condition of Certification BIO-22, the project owner shall deposit funds in the amount of \$12,163,207 prior to initiating any ground-disturbing activities associated with Phase 1, and shall provide Security in the amount of \$21,788,316 prior to initiating any ground-disturbing activities associated with Phase 2.

Actual Cost. The actual cost 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. Regardless of actual cost, the project owner shall be responsible for implementing all aspects of this condition.

### Biological Resources – Table 1 – Estimate of Total Security

Ivanpah (07-AFC-5)			9/3/2010
<b>CEC's Bio. Res. Mitigation/Compensation Cost Estimate -Owner Acquisiton &amp; NFWF Options</b>			
<b>Construction Not Phased Security Estimate for 3,582 acre Project Disturbance and 3:1 Mitigation</b>			
<b>Item</b>	<b>Desert Tortoise Compensation</b>	<b>Rare Plant Compensation</b>	<b>Streambed Compensation</b>
Phase 1 Number of Acres	3,582	30	175
Phase 1 Mitigation Number of Acres (3:1 for Desert Tortoise, 1:1 for Plants and Streams)	10,746	10	58
Estimated number of parcels to be acquired, at 160 acres per parcel <sup>2</sup>	67	1	0
Land cost at \$1000/acre <sup>3</sup>	\$10,746,000	\$10,000	\$58,000
Level 1 Environmental Site Assessment at \$3000/parcel	\$201,488	\$3,000	\$1,088
Appraisal at no less than \$5,000/parcel	\$335,813	\$5,000	\$1,813
Initial site work - clean-up, restoration or enhancement, at \$250/acre <sup>4</sup>	\$2,686,500	\$2,500	\$14,500
Closing and Escrow Cost at \$5000 for 2 transactions <sup>5</sup>	\$335,813	\$5,000	\$1,813
Biological survey for determining mitigation value of land (habitat based with species specific augmentation) at \$5000/parcel	\$335,813	\$5,000	\$1,813
3rd Party Administrative Costs (Land Cost x 10%) <sup>6</sup>	\$1,074,600	\$1,000	\$5,800
Agency cost to accept land donation <sup>7</sup> (Land Cost x 15%) x 1.17 (17% of the 15% for overhead)	\$1,885,923	\$1,755	\$10,179
<b>SUBTOTAL - Acquisition and Initial Site Work</b>	<b>\$17,601,948</b>	<b>\$33,255</b>	<b>\$95,004</b>
<b>Long-term Management and Maintenance (LTMM) fee at \$1450/acre<sup>8</sup></b>	<b>\$15,581,700</b>	<b>\$14,500</b>	<b>\$84,100</b>
<b>Subtotal -Owner Acquisition Option Excl. NFWF Fees</b>	<b>\$33,183,648</b>	<b>\$47,755</b>	<b>\$179,104</b>
<b>Total Phase 1 Mitigation -Owner Acquisition Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$33,410,507</b>
<b>NFWF Fees</b>			
Establish Project Specific Accounts <sup>9</sup>	\$12,000		
Call for and Process Pre-Proposal Modified RFP or RPF <sup>10</sup>	\$30,000		
NFWF Management fee for Acquisition and Enhancement Actions (Subtotal x 3%)	\$528,058	\$998	\$2,850
NFWF Management Fee for LTMM account (LTMM x 1%)	\$155,817	\$145	\$841
<b>Subtotal of NFWF Fees</b>	<b>\$725,875</b>	<b>\$1,143</b>	<b>\$3,691</b>
<b>TOTAL Estimated cost for deposit in project specific sub-account</b>	<b>\$33,909,523</b>	<b>\$48,898</b>	<b>\$182,795</b>
<b>Total Phase 1 Mitigation -NFWF Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$34,141,216</b>

## Biological Resources – Table 2 – Estimate of Phase 1 Security

Ivanpah (07-AFC-5)			9/3/2010
<b>CEC's Bio. Res. Mitigation/Compensation Cost Estimate -Owner Acquisiton &amp; NFWF Options</b>			
<b>Construction Phase I Security Estimate for 1,282 acre Project Disturbance and 3:1 Mitigation</b>			
<b>Item</b>	<b>Desert Tortoise Compensation</b>	<b>Rare Plant Compensation</b>	<b>Streambed Compensation</b>
Phase 1 Number of Acres	1,282	10	58
Phase 1 Mitigation Number of Acres (3:1 for Desert Tortoise, 1:1 for Plants and Streams)	3,846	10	58
Estimated number of parcels to be acquired, at 160 acres per parcel <sup>2</sup>	24	1	0
Land cost at \$1000/acre <sup>3</sup>	\$3,846,000	\$10,000	\$58,000
Level 1 Environmental Site Assessment at \$3000/parcel	\$72,113	\$3,000	\$1,088
Appraisal at no less than \$5,000/parcel	\$120,188	\$5,000	\$1,813
Initial site work - clean-up, restoration or enhancement, at \$250/acre <sup>4</sup>	\$961,500	\$2,500	\$14,500
Closing and Escrow Cost at \$5000 for 2 transactions <sup>5</sup>	\$120,188	\$5,000	\$1,813
Biological survey for determining mitigation value of land (habitat based with species specific augmentation) at \$5000/parcel	\$120,188	\$5,000	\$1,813
3rd Party Administrative Costs (Land Cost x 10%) <sup>6</sup>	\$384,600	\$1,000	\$5,800
Agency cost to accept land donation <sup>7</sup> (Land Cost x 15%) x 1.17 (17% of the 15% for overhead)	\$674,973	\$1,755	\$10,179
<b>SUBTOTAL - Acquisition and Initial Site Work</b>	<b>\$6,299,748</b>	<b>\$33,255</b>	<b>\$95,004</b>
<b>Long-term Management and Maintenance (LTMM) fee at \$1450/acre<sup>8</sup></b>	<b>\$5,576,700</b>	<b>\$14,500</b>	<b>\$84,100</b>
<b>Subtotal - Owner Acquisition Option Excl. NFWF Fees</b>	<b>\$11,876,448</b>	<b>\$47,755</b>	<b>\$179,104</b>
<b>Total Phase 1 Mitigation - Owner Acquisition Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$12,103,307</b>
<b>NFWF Fees</b>			
Establish Project Specific Accounts <sup>9</sup>	\$12,000		
Call for and Process Pre-Proposal Modified RFP or RPF <sup>10</sup>	\$30,000		
NFWF Management fee for Acquisition and Enhancement Actions (Subtotal x 3%)	\$188,992	\$998	\$2,850
NFWF Management Fee for LTMM account (LTMM x 1%)	\$55,767	\$145	\$841
<b>Subtotal of NFWF Fees</b>	<b>\$286,759</b>	<b>\$1,143</b>	<b>\$3,691</b>
<b>TOTAL Estimated cost for deposit in project specific sub-account</b>	<b>\$12,163,207</b>	<b>\$48,898</b>	<b>\$182,795</b>
<b>Total Phase 1 Mitigation - NFWF Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$12,394,900</b>

### Biological Resources – Table 3 – Estimate of Phase 2 Security

Ivanpah (07-AFC-5)			9/3/2010
<b>CEC's Bio. Res. Mitigation/Compensation Cost Estimate - Owner Acquisition &amp; NFWF Options</b>			
<b>Construction Phase 2 Security Estimate for 2,300 acre Project Disturbance and 3:1 Mitigation</b>			
	<b>Desert Tortoise Compensation</b>	<b>Rare Plant Compensation</b>	<b>Streambed Compensation</b>
Phase 2 Number of Acres	2,300	20	117
Phase 2 Mitigation Number of Acres (3:1 for Desert Tortoise, 1:1 for Plants and Streams)	6,900	20	117
Estimated number of parcels to be acquired, at 160 acres per parcel <sup>2</sup>	43	1	1
Land cost at \$1000/acre <sup>3</sup>	\$6,900,000	\$20,000	\$117,000
Level 1 Environmental Site Assessment at \$3000/parcel	\$129,375	\$3,000	\$2,194
Appraisal at no less than \$5,000/parcel	\$215,625	\$5,000	\$3,656
Initial site work - clean-up, restoration or enhancement, at \$250/acre <sup>4</sup>	\$1,725,000	\$5,000	\$29,250
Closing and Escrow Cost at \$5000 for 2 transactions <sup>5</sup>	\$215,625	\$5,000	\$3,656
Biological survey for determining mitigation value of land (habitat based with species specific augmentation) at \$5000/parcel	\$215,625	\$5,000	\$3,656
3rd Party Administrative Costs (Land Cost x 10%) <sup>6</sup>	\$690,000	\$2,000	\$11,700
Agency cost to accept land donation <sup>7</sup> (Land Cost x 15%) x 1.17 (17% of the 15% for overhead)	\$1,210,950	\$3,510	\$20,534
<b>SUBTOTAL - Acquisition and Initial Site Work</b>	<b>\$11,302,200</b>	<b>\$48,510</b>	<b>\$191,646</b>
<b>Long-term Management and Maintenance (LTMM) fee at \$1450/acre<sup>8</sup></b>	<b>\$10,005,000</b>	<b>\$29,000</b>	<b>\$169,650</b>
<b>Subtotal - Owner Acquisition Option Excl. NFWF Fees</b>	<b>\$21,307,200</b>	<b>\$77,510</b>	<b>\$361,296</b>
<b>Total Phase 2 Mitigation - Owner Acquisition Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$21,746,006</b>
<b>NFWF Fees</b>			
Establish Project Specific Account <sup>9</sup> (Initial Fee paid in Phase 1)	\$0		
Call for and Process Pre-Proposal Modified RFP or RPF <sup>10</sup>	\$30,000		
NFWF Management fee for Acquisition and Enhancement Actions (Subtotal x 3%)	\$339,066	\$1,455	\$5,749
NFWF Management Fee for LTMM account (LTMM x 1%)	\$100,050	\$290	\$1,697
<b>Subtotal of NFWF Fees</b>	<b>\$469,116</b>	<b>\$1,745</b>	<b>\$7,446</b>
<b>TOTAL Estimated cost for deposit in project specific sub-account</b>	<b>\$21,776,316</b>	<b>\$79,255</b>	<b>\$368,742</b>
<b>Total Phase 2 Mitigation - NFWF Option Desert Tortoise, Streambed &amp; Plants</b>			<b>\$22,224,313</b>

## Footnotes to Biological Resources Tables 1, 2, and 3:

1. Not all costs will apply to all REAT agency requirements.
2. All costs are best estimates as of summer 2010. Actual costs will be determined at the time of the transactions and may change the funding needed to implement the required mitigation obligation. Note: regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
3. Generalized estimate taking into consideration an 18-24 month window to acquire the land after agency decisions are made. If the agencies, developer, or 3<sup>rd</sup> party has better, credible information on land costs in the specific area where project-specific mitigation lands are likely to be purchased, those data may be considered by the CPM in finalizing the Security estimate. Note: Regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
4. Parcel sizes may range from 1 acre to 640 acres and above. The 160 acre parcel estimate is used in this security calculation.
5. Based on information from California Department of Fish and Game.
6. Two transactions at \$2500 each: landowner to 3<sup>rd</sup> party; 3<sup>rd</sup> party to agency. The transactions will likely be separated in time.
7. Federal agencies only. State agencies may or may not require cost to accept donations.
8. Estimate for purposes of calculating general costs. The actual long term management and maintenance costs will be determined using a Property Analysis Report (PAR) or a PAR-like assessment tailored to the specific acquisition.
9. Each renewable energy project will be a separate sub-account within the REAT-NFWF account, regardless of the number of required mitigation actions per project. If a project and its mitigation are phased, this fee is only applied when the project specific account is established and not charged again when additional funds are deposited with subsequent phases.
10. If determined necessary by the REAT agencies if multiple 3<sup>rd</sup> parties have expressed interest; for transparency and objective selection of 3<sup>rd</sup> party to carryout acquisition.

5. Compensation Lands Acquisition Conditions The project owner shall comply with the following conditions relating to acquisition of the Energy Commission compensation lands after the CDFG and the CPM, in consultation with BLM and the USFWS, have approved the proposed compensation lands and received Security as applicable and as described above.
- 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 documents for the proposed 7,164 acres. All documents conveying or conserving compensation lands and all conditions of title/easement are subject to a field review and approval by the CPM, in consultation with BLM, CDFG and the USFWS, California Department of General Services and, if applicable, the Fish and Game Commission and/or the Wildlife Conservation Board.
  - b. Title/Conveyance: The project owner shall transfer fee title or a conservation easement to the 7,164 acres of compensation lands to CDFG under terms approved by the CPM and CDFG. Alternatively, a non-profit organization qualified to manage compensation lands (pursuant to California Government Code section 65965) and approved by the CPM in consultation with CDFG may hold fee title or a conservation easement over the habitat mitigation lands. If the approved non-profit organization holds title, a conservation easement shall be recorded in favor of CDFG in a form approved by the CPM and CDFG. If the approved non-profit holds a conservation easement, CDFG or another designee of the CPM shall be named a third party beneficiary. If a Security is provided, the project owner or an approved third party shall complete the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities.
  - c. Initial Habitat Improvement Fund. The project owner shall fund the initial protection and habitat improvement of the 7,164 acres. Alternatively, a non-profit organization may hold the habitat improvement funds if they are qualified to manage the compensation lands (pursuant to California Government Code section 65965) and if they meet the approval of the CPM in consultation with CDFG. If CDFG takes fee title to the compensation lands, the habitat improvement fund must go to CDFG.

- d. Long-term Management and Maintenance Fund. Prior to ground-disturbing project activities, the project owner shall provide to CDFG in accordance with and as included in Item #4 of this condition a non-wasting capital long-term management and maintenance fee in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis that will be conducted for the 7,164 acres. Alternatively, a non-profit organization may hold the long-term management and maintenance fees if they are qualified to manage the compensation lands (pursuant to California Government Code section 65965) and if they meet the approval of the CPM in consultation with CDFG. If CDFG takes fee title to the compensation lands, the long-term management and maintenance fee must go to CDFG, where it will be held in the special deposit fund established pursuant to California Government Code section 16370. If the special deposit fund is not used to manage the long-term management and maintenance fund, the California Wildlife Foundation or similarly approved entity identified by CDFG shall manage the long-term management and maintenance fund for CDFG and with CDFG supervision.
- e. Interest, Principal, and Pooling of Funds. The project owner, and the CPM in consultation with CDFG, shall ensure that an agreement is in place with the long-term management and maintenance fund holder/manager to ensure the following requirements are met:
- Withdrawal of Principal. The long-term management and maintenance fund principal shall not be drawn upon unless such withdrawal is deemed necessary to ensure the continued viability of the species on the 7,164 acres.
  - Pooling Long-Term Management and Maintenance Funds. CDFG, or a CPM approved non-profit organization qualified to hold long-term management and maintenance fund pursuant to California Government Code section 65965, may pool the long-term management and maintenance fund with other such funds for the operation, management, and protection of the 7,164 acres for local populations of desert tortoise. However, for reporting purposes, the long-term management and maintenance fund must be tracked and reported individually to the CDFG and CPM.
  - Reimbursement Fund. The project owner shall provide reimbursement to the CPM, CDFG or an approved third party for reasonable expenses incurred during title,

easement, and documentation review; expenses incurred from other state or state approved federal agency reviews; and overhead related to providing compensation lands.

6. Long-term Maintenance of Fencing and Habitat Restoration. In addition to the funding described above for the acquisition, enhancement and management of the Energy Commission compensation lands, the Project owner shall provide sufficient funds to ensure that long-term management and maintenance is provided for the habitat improvements required by BLM for the ISEGS project, including fencing of roads in the Northeastern Mojave Recovery Unit, and habitat restoration of routes in the Desert Wildlife Management Area. The maintenance shall occur as long as the roads continue to operate as functional roadways and for the duration of project impacts. This long-term maintenance fee shall be calculated upon completion of a Property Analysis Record (PAR) or PAR-like analysis of the proposed enhancement actions, and shall be sufficient to fund annual inspections and repairs/maintenance of all fencing and habitat improvements completed as part of the BLM mitigation requirements for the ISEGS project.

The Project owner may choose to satisfy its mitigation obligations identified in this Decision by paying an in lieu fee instead of acquiring compensation lands, pursuant to Fish and Game code sections 2069 and 2099 or any other applicable in-lieu fee provision, to the extent the in-lieu fee provision is found by the Commission to be in compliance with CEQA and CESA requirements.

**Verification:** The Project owner shall provide the CPM with written notice prior to the start of ground-disturbing activities on the Project site.

If purchase of 7,164 acres of mitigation lands as described in this condition, or as described in BIO-22 (phasing), is not completed prior to the start of ground-disturbing activities, the Project owner shall provide the CPM with approved Security prior to the start of ground-disturbing activities. The Security shall be in accordance with Item # 4 of this condition and other requirements of this condition, allowing for either Acquisition of Mitigation Lands by the project owner or use of the NFWF Account to satisfy this condition, and with BIO-22 (phasing) if the project owner elects to use that option.

If the project owner elects to Deposit Funds to the NFWF Account, it shall provide documentation of deposit of the required security to the REAT-NFWF Account prior to start of ground-disturbing activities on the project site.

Within 6 months of the Energy Commission decision, the project owner shall provide to the CPM for review and approval a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount for the long-term maintenance fee to fund maintenance of the proposed enhancement actions

(desert tortoise exclusion fencing and DWMA route restoration). The project owner shall deposit the long-term maintenance fee into the REAT-NFWF account or another third-party recipient acceptable to the CPM in consultation with CDFG and BLM within 18 months of the Energy Commission decision.

Starting with the first year following construction and continuing for the duration of project impacts, the project owner shall provide to the CPM, BLM and CDFG an annual report describing: the results of the annual inspection of fencing and rehabilitated routes; a summary of fence repairs and maintenance of reclaimed routes completed during the year; and recommendations and a cost estimate for repairs and maintenance activities needed for the upcoming year.

A minimum of three months prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the CPM, CDFG, USFWS and BLM describing the parcels intended for purchase.

No later than 18 months following the publication of the Energy Commission Decision the project owner shall provide written verification to the CPM and CDFG that the Energy Commission compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient(s). The project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities. If NFWF or another approved third party is being used for the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. Within six months of the land or easement purchase, as determined by the date on the title, the project owner, or an approved third party, shall provide CDFG and the CPM with a management plan for the Energy Commission compensation lands and associated funds. The CPM shall review and approve the management plan, in consultation with CDFG, BLM and the USFWS.

Within 90 days after completion of project construction, the project owner shall provide to the CPM and CDFG an analysis with the final accounting of the amount of habitat disturbed during project construction. If habitat disturbance exceeds 3,582 acres, the project owner shall provide a compensation plan to the CPM for their review and approval, in consultation with CDFG, BLM and the USFWS. The compensation plan shall be submitted no later than 90 days from the CPM's receipt of the final accounting, and shall include a description of additional funds required or lands that must be purchased to compensate for the unanticipated habitat disturbances, and a schedule for that acquisition or funding inclusive of all associated long-term management and maintenance fund and enhancement costs. The amount of funding for habitat acquisition, initial habitat improvement, and long-term management shall be calculated at the adjusted market value at the time of construction.

If the project owner elects to satisfy its mitigation obligations by paying an in-lieu fee instead of acquiring compensation lands, pursuant to Fish and Game code

sections 2069 and 2099 or any other applicable in-lieu fee provision, the Project owner shall notify the Commission that it would like a determination that the Project's in-lieu fee proposal meets CEQA and CESA requirements.

## **SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION**

**BIO-18** The project owner shall implement the following measures to avoid and minimize impacts to special-status plant species. Items 2, 3, 5, 6, 7, 10, and 11 are recommended exclusively by Energy Commission staff.

1. On-Site Plant Avoidance/Minimization Areas: To the extent feasible the project owner shall avoid and minimize disturbance to all special-status plant species within the project site. Impact avoidance (i.e., protection from project-related impacts of any kind through removal of acreage from the project footprint) and impact minimization efforts shall occur in all feasible locations. Impact avoidance shall focus on areas that support the highest density and diversity of special-status plant species and shall remove, at a minimum, the three areas totaling 476 acres and labeled "Rare Plant Mitigation Area" in Project Description Figure 13 from the Staff's FSA Addendum dated March 16, 2010 (Exhibit 315). The natural gas pipeline shall be aligned and narrowed to avoid special-status plant occurrences north of Ivanpah 3 as depicted in Project Description Figure 13. Impact minimization shall be conducted throughout the site. Impact minimization within the solar field shall consist of protecting small perimeters ("halos") around Mojave milkweed, desert pincushion, and Rusby's desert-mallow plants as indicated in the applicant's January 2010 draft Special-Status Plant Avoidance and Protection Plan (Exhibit 81, Appendix B).
2. Protection Goals : The project owner shall implement all feasible measures to protect 75 percent of the individuals of Mojave milkweed, Rusby's desert-mallow, desert pincushion, nine-awned pappus grass, and Parish's club-cholla within the project area (as mapped in Figure 5-3 of the applicant's final botanical survey report [CH2M Hill 2008x]). Each year during construction the measurement of percent protection achieved shall be calculated based on a comparison of numbers of individuals of each of these five species present in this area identified before construction compared to numbers remaining post -construction. These pre- and post-construction plant numbers shall be based on floristic surveys conducted by a qualified botanist.
3. Identify and Establish Special-Status Plant Protection Areas: The project owner shall identify Special-Status Plant Protection Areas for exclusion from the project footprint and avoidance of project-related impacts of any kind to facilitate achieving the 75 percent

protection goal. To accurately identify the boundaries of these areas, pre-construction floristic surveys shall be conducted by a qualified botanist at the appropriate time of year for special-status plant identification, including both spring and summer/fall blooming periods. Summer/fall surveys will be conducted after rains that are likely to cause plant germination and may be suspended in years where no such rains occur. The surveys shall encompass at a minimum the three areas totaling 476 acres and labeled “Rare Plant Mitigation Area” in Project Description Figure 13 and shall extend 150 feet on both sides of the proposed gas pipeline alignment and 250 feet out from the project fenceline. The locations of the Special-Status Plant Protection Areas shall be clearly depicted on all final maps and project drawings and descriptions for exclusion of all project activities.

4. Protection of Adjacent Occurrences: The project owner shall identify special-status plants occurrences within 250 feet of the project fenceline during the pre-construction plant surveys described above. A qualified botanist shall delineate the boundaries of these special status plant occurrences prior to the initiation of ground disturbing activities. These flagged special status plant occurrences shall be designated as Environmentally Sensitive Areas on plans and specifications, and shall be protected from accidental impacts during construction (e.g. vehicle traffic, temporary placement of soils or vegetation) and from the indirect impacts of project operation (e.g., herbicide spraying, changes in upstream hydrology, etc).
  
5. Develop and Implement a Special-Status Plant Protection and Monitoring Plan: The project owner shall develop and implement a Special-Status Plant Protection and Monitoring Plan for special-status plants occurring within the Special-Status Plant Protection Areas and on-site areas designated for impact minimization. The goal of the Special-Status Plant Protection and Monitoring Plan shall be to maintain the special-status plant species as healthy, reproductive populations that can be sustained in perpetuity. At a minimum, the Special-Status Plant Protection and Monitoring Plan shall:
  - establish baseline conditions and numbers of the plant occurrences in all protected areas (i.e., those to be excluded from the footprint and on-site areas to be protected) and success standards for protection of special-status plant occurrences;
  
  - provide information about microhabitat preferences and fecundity, essential pollinators, reproductive biology, and

propagation and culture requirements for each special-status species;

- describe measures (e.g., fencing, signage) to avoid direct construction and operation impacts to special-status plants within all protected areas;
- describe measures to avoid or minimize indirect construction and operations impacts to special-status plants within protected areas (e.g., runoff from mirror-washing, use of soil stabilizers/tackifiers, alterations of hydrology from drainage diversions, erosion/sedimentation from disturbed soils upslope, herbicide drift, the spread of non-native plants, etc);
- provide a monitoring schedule and plan for assessing the numbers and condition of special-status plants; and
- identify specific triggers for remedial action (e.g., numbers of plants dropping below a threshold).

6. Develop Special-Status Plant Remedial Action Plan: The project owner shall develop a detailed Special-Status Plant Remedial Action Plan to be implemented if special-status plants within the 476 acres of protected area and on-site minimization “halos” fail to meet success standards described in the Special-Status Plant Protection and Monitoring Plan. The Plant Remedial Action Plan shall include specifications for ex-situ/offsite conservation of seed and other propagules, and the seed bank and other symbionts contained in the topsoil where these plants occur. The remedial measures described in the Plant Remedial Action Plan shall not substitute for plant protection or other mitigation measures. The Special-Status Plant Remedial Action Plan shall include, at a minimum:

- guidelines for pre-construction seed collection (and/or other propagules) for each species;
- specifications for collecting, storing, and preserving the upper layer of soil containing seed and important soil organisms;
- detailed replacement planting program with biologically meaningful quantitative and qualitative success criteria (see Pavlik 1996), monitoring specifications, and triggers for remedial action; and
- ecological specifications for suitable planting sites.

7. Seed Collection: Implementation of the Special-Status Plant Remedial Action Plan would require a source of local source of seeds/propagules. In addition, seed collection would serve to

preserve germplasm in the event that all mitigation fails. The project owner shall develop and implement a Seed Collection Plan to collect and store seed for Mojave milkweed, Rusby's desert-mallow, desert pincushion, nine-awned pappus grass, and Parish's club-cholla. The source of these seeds shall be from plants proposed for removal within the project footprint. The project owner shall engage the services of a qualified contractor approved by the CPM to undertake seed collection and storage.

8. Gas Pipeline Revegetation and Monitoring: In the natural gas pipeline construction corridor where disturbed soils will be revegetated, the topsoil excavated shall be segregated, kept intact, and protected, under conditions shown to sustain seed bank viability. At a minimum, the top 2 cm of the soil shall be separately stored and preserved. Topsoil salvage, storing, and replacement shall be replaced in its original vertical orientation following pipeline installation ensuring the integrity of the top 2 cm in particular. The project owner shall prepare a Gas Pipeline Revegetation and Monitoring Plan targeted at re-establishment of Rusby's desert-mallow, desert pincushion, Mojave milkweed, and potentially other special-status plant species. The Gas Pipeline Revegetation and Monitoring Plan shall identify success criteria for re-establishment and shall continue for a period of no less than 10 years until the defined success criteria are achieved. The Gas Pipeline Revegetation and Monitoring Plan shall include measures for seeding or other remedial actions. If no individuals of Rusby's desert-mallow, desert pincushion, or Mojave milkweed, are located during the first year of monitoring, the project owner shall conduct supplemental seeding or other remedial measures in the area disturbed by natural gas pipeline installation.
9. Surveys on Acquired and Public Lands: The project owner shall conduct floristic surveys for Rusby's desert-mallow and Mojave milkweed on all lands that will be acquired as part of the desert tortoise compensatory mitigation requirements (see Condition of Certification BIO-17). The goal of the surveys shall be to identify at least the same number of occurrences on off-site compensation or public lands as the number of occurrences in the project area excluding the occurrences in the Special-Status Plant Protection Areas in Project Description Figure 13. If this goal is not met by surveys on proposed acquisition lands, additional surveys shall be conducted within suitable habitat on public lands. To be counted toward fulfillment of the goal the occurrences must reflect new data not previously documented in other survey efforts. The survey requirements shall include the following:

- All surveys shall be conducted by a qualified botanist in accordance with BLM, CDFG, and CNPS plant survey guidelines;
  - Surveys shall occur the first spring after construction begins and continue each year for a maximum of ten years until the same number of Mohave milkweed and Rusby's desert-mallow occurrences are identified on acquisition lands and/or public lands as located outside Special-Status Plant Protection Areas;
  - For each year surveys are conducted yearly survey results shall be provided to the CPM, BLM's Authorized Officer and CDFG, and shall include CNDDDB field survey forms for all special-status plant species encountered during the surveys; and
  - All field survey forms shall be submitted to the CNDDDB at the time of submittal to the CPM, BLM and CDFG.
  - The project owner's qualified botanist shall submit a completion report documenting fulfillment of the target goals and which describe the number of new, previously undiscovered occurrences identified and mapped. Locations shall be reported with GPS coordinates compatible with inclusion in a GIS database.
10. Security for Implementation of Plans: The project owner shall provide security adequate to fund implementation of the Special-Status Plant Protection and Monitoring Plan, the Special-Status Plant Remedial Action Plan for the life of the project, as well as the Seed Collection Plan, and the Gas Pipeline Revegetation Monitoring Plan.
11. Acquire Off- Site Occurrence of Mojave Milkweed or Adjacent Land: The project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes at least 30 acres supporting a viable occurrence of Mojave milkweed (or suitable habitat adjacent to a known occurrence). The terms and conditions of this acquisition or easement shall be as described in Condition of Certification BIO-17 with the additional criteria that the Mojave milkweed mitigation lands: 1) provide habitat for the special-status plant species that is of similar or better quality (e.g., in terms of native plant composition) than that impacted; 2) contain OR about a known occurrence of Mojave milkweed, ideally with populations that are stable, recovering, or likely to recover, that shares the same watershed as the land; and 3) be adequately sized and buffered to support self-sustaining special-status plant populations. These mitigation lands may be included with the desert tortoise mitigation lands ONLY if the above criteria are met. Estimated security for acquisition of compensation lands for Mojave milkweed is

\$107,265. If the project owner elects to construct the project in two phases in accordance with Condition of Certification BIO-22, the project owner shall provide Security in the amount of \$47,755 prior to initiating any ground-disturbing activities associated with Phase 1, and shall provide Security in the amount of \$77,510 prior to initiating any ground-disturbing activities associated with Phase 2. If sufficient new Mojave milkweed occurrences are discovered on desert tortoise compensation lands (not public lands) in accordance with item 9 above prior to acquiring this land, the associated security shall be refunded to the project owner.

**Verification:** No less than 30 days following the publication of the Energy Commission Decision the project owner shall submit final maps and design drawings depicting the location of Special-Status Plant Protection Areas within and adjacent to the project site, and shall identify the species and numbers of plants within each of the Special-Status Plant Protection Areas.

No less than 30 days following the publication of the Energy Commission Decision the project owner shall submit draft versions of the Special-Status Plant Protection and Monitoring Plan, the Special-Status Plant Remedial Action Plan, the Seed Collection Plan, and the Gas Pipeline Revegetation Monitoring Plan for review by the CPM, BLM's Authorized Agent, and CDFG. The project owner shall also provide a cost estimate for implementation of these plans which is subject to approval by the CPM, BLM's authorized agent, and the CDFG. The final plans shall be submitted for approval by the CPM, in consultation with BLM's Authorized Agent, CDFG, and CNPS within 90 days of the publication of the Commission Decision. The final plans shall be incorporated into the BRMIMP. At this time, the project owner shall also provide security sufficient to fund the implementation of the plans.

Within 30 days of the start of construction, the project owner shall submit copies of the contract with the CPM-approved seed contractor and the check for seed collection and curation fees to the CPM.

The project owner shall identify special-status plants occurrences within 250 feet of the project fence line during the pre-construction plant surveys described above. A qualified botanist shall delineate the boundaries of these special status plant occurrences at least 30 days prior to the initiation of ground disturbing activities.

On January 31st of each year following construction the project owner's qualified botanist shall submit a report, including CNDDDB field survey forms, describing the results of off-site plant surveys for Mojave milkweed and Rusby's desert-mallow to the BLM's authorized officer, the CPM, CDFG, and CNDDDB. Submittal of survey reports shall continue for a maximum of 10 years until the same number of occurrences in the project area excluding the occurrences in the

Special-Status Plant Protection Areas. The project owner's qualified botanist shall submit a completion report documenting fulfillment of the target goals and which describe the number of new, previously undiscovered occurrences identified and mapped using GIS techniques for each species. Mapping results shall include GPS coordinates of the plants found.

The Designated Biologist shall maintain written and photographic records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM, BLM Authorized Agent, and CDFG. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report for a period not less than 10 years for the Gas Pipeline Revegetation Plan, and for the life of the project for the Special-Status Plant Protection and Monitoring Plan, and the Special-Status Plant Remedial Action Plan, including funding for the seed storage.

No less than 90 days prior to acquisition of the parcel(s) containing or adjacent to a known Mojave milkweed occurrence, the project owner, or a third-party approved by the CPM, in consultation with CDFG, shall submit a formal acquisition proposal to the CPM and CDFG describing the parcel(s) intended for purchase.

Draft agreements to delegate land acquisition to CDFG or an approved third party and agreements to manage compensation lands shall be submitted to Energy Commission staff for review and approval (in consultation with CDFG) prior to land acquisition. Such agreements shall be mutually approved and executed at least 60 days prior to start of any project-related ground disturbance activities. The project owner shall provide written verification to the CPM that the compensation lands have been acquired and recorded in favor of the approved recipients(s). Alternatively, before beginning project ground-disturbing activities, the project owner shall provide Security in accordance with this condition. Within 90 days after the lands purchase, as determined by the date on the title, the project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, for the compensation lands and associated funds.

### **Nelson's Bighorn Sheep Mitigation**

**BIO-19** To compensate for project impacts to Nelson's bighorn sheep the project owner shall finance, construct and manage an artificial water source in the eastern part of the Clark Mountain range or in the State Line Hills outside of designated Wilderness. The project owner shall monitor and control noxious and invasive weeds within 100 feet of the artificial water source. Control of weeds shall be coordinated with the CPM and BLM staff and shall consist of removal by mechanical methods, rather than herbicides. To minimize potential impacts to Nelson bighorn sheep, the project owner shall not use barbed wire fence on the northern perimeter of the Ivanpah 3 site, unless the project

owner provides evidence that such fencing is essential for security reasons.

**Verification:** Within 60 days of publication of the Energy Commission Decision the project owner shall submit to the BLM's Authorized Officer, the CPM and CDFG a Draft Bighorn Sheep Mitigation Plan identifying a proposed location for the artificial water source and providing plans for its construction and management. At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide BLM's Authorized Officer and the CPM with the final version of the Bighorn Sheep Mitigation Plan that has been reviewed and approved by BLM, CDFG, and the Energy Commission staff. BLM's Authorized Officer and the CPM will determine the plan's acceptability within 30 days of receipt of the final plan.

No later than 18 months following the publication of the Energy Commission Decision, the project owner shall provide written verification to BLM's Authorized Officer and the CPM that the construction of the artificial water source has been completed. At the same time, the project owner shall provide evidence of an agreement (Memorandum of Understanding) and a funding mechanism to provide ongoing maintenance of the water source by CDFG or some other party approved by BLM's Authorized Office and the CPM.

### **Streambed Impact Minimization and Compensation Measures**

**BIO-20** The project owner shall implement the following measures to avoid, minimize and mitigate for impacts to ephemeral drainages:

1. Acquire Off-Site Desert Wash: The project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes ephemeral washes with at least 175 acres of state jurisdictional waters. The terms and conditions of this acquisition or easement shall be as described in Condition of Certification BIO-17 with the additional criteria that the desert wash mitigation lands: 1) include at least 175 acres of state jurisdictional waters; 2) be characterized by similar soil permeability, hydrological and biological functions as the impacted drainages; and 3) be within the same watershed as the impacted wash. The desert wash mitigation lands may be included with the desert tortoise mitigation lands ONLY if the above three criteria are met.
2. Security for Implementation of Mitigation: A security in the form of an irrevocable letter of credit, pledged savings account, or certificate of deposit for the amount of all mitigation measures pursuant to this condition of certification shall be submitted to, and approved by, the CPM, in consultation with CDFG, prior to commencing project activities within areas of CDFG jurisdiction. This amount shall be based on a cost estimate which shall be

submitted to CDFG for review and to the CPM for approval within 60 days of the Energy Commission Decision's publication and prior to commencing project activities within areas of CDFG jurisdiction. Estimated security for acquisition of compensation lands for state waters is \$540,400. If the project owner elects to construct the project in two phases in accordance with Condition of Certification BIO-22, the project owner shall provide Security in the amount of \$179,104 prior to initiating any ground-disturbing activities associated with Phase 1, and shall provide Security in the amount of \$361,296 prior to initiating any ground-disturbing activities associated with Phase 2. The security shall be approved by the CPM, in consultation with CDFG's legal advisors, prior to its execution, and shall allow the CPM at its discretion to recover funds immediately if the CPM, in consultation with CDFG, determines there has been a default.

3. Preparation of Management Plan: The project owner shall submit to Energy Commission CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. No later than 12 months after publication of the Energy Commission Decision the project owner shall submit a final Management Plan for review and approval to the CPM and CDFG.
4. Right of Access and Review for Compliance Monitoring: The CPM reserves the right to enter the project site or allow CDFG to enter the project site at any time to ensure compliance with these conditions. The project owner herein grants to the CPM and to CDFG employees and/or their representatives the right to enter the project site at any time, to ensure compliance with the terms and conditions and/or to determine the impacts of storm events, maintenance activities, or other actions that might affect the restoration and revegetation efforts. The CPM and CDFG may, at the CPM's discretion, review relevant documents maintained by the operator, interview the operator's employees and agents, inspect the work site, and take other actions to assess compliance with or effectiveness of mitigation measures.
5. Notification: The project owner shall notify the CPM and CDFG, in writing, at least five days prior to initiation of project activities in jurisdictional areas as noted and at least five days prior to completion of project activities in jurisdictional areas. The project owner shall notify the CPM and CDFG of any change of conditions

to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of a proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM and CDFG no later than seven days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the notifying change of conditions report shall be included in the annual reports.

- a. Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.
  - b. Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.
  - c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.
6. Code of Regulations: The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures from the Energy Commission Decision to all contractors, subcontractors, and the applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from

another agency upon demand. The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the project owner, the CPM, if the CPM in consultation with CDFG, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:

- a. The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;
- b. New information becomes available that was not known to it in preparing the terms and conditions;
- c. The project or project activities as described in the Final Staff Assessment have changed; or
- d. The conditions affecting biological resources changed or the CPM, in consultation with CDFG, determines that project activities will result in a substantial adverse effect on the environment.

7. Best Management Practices: The project owner shall also comply with the following conditions:

- a. The project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.
- b. The project owner 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. The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.
- d. Spoil sites shall not be located within drainages or locations that may be subjected to high storm flows, where spoil shall be washed back into a drainage.
- e. 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 or Ivanpah Dry Lake, by project owner or any party working under contract or with the permission of the project owner shall be removed immediately.

- f. 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.
- g. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.
- h. 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.

**Verification:** No less than 90 days prior to acquisition of the parcel (s) containing 175 acres of waters of the state, the project owner, or a third-party approved by the CPM, in consultation with CDFG, shall submit a formal acquisition proposal to the CPM and CDFG describing the parcel(s) intended for purchase.

Draft agreements to delegate land acquisition to CDFG or an approved third party and agreements to manage compensation lands shall be submitted to Energy Commission staff for review and approval (in consultation with CDFG) prior to land acquisition. Such agreements shall be mutually approved and executed at least 60 days prior to start of any project-related ground disturbance activities. The project owner shall provide written verification to the CPM that the compensation lands have been acquired and recorded in favor of the approved recipient(s). Alternatively, before beginning project ground-disturbing activities, the project owner shall provide Security in accordance with this condition. Within 90 days after the land purchase, as determined by the date on the title, the project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, for the compensation lands and associated funds.

No fewer than 30 days prior to the start of work potentially affecting waters of the state, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM that the above best management

practices will be implemented and provide a discussion of work in waters of the state in Compliance Reports for the duration of the project.

## **AVIAN AND BAT MONITORING AND MANAGEMENT PLAN**

**BIO-21** The Project owner shall prepare and implement an Avian and Bat Monitoring and Management Plan (Plan) to monitor death and injury of birds and bats from collisions with facility features including the solar receiver tower and reflective heliostat mirrors, and exposure to bright light and heat from concentrating sunlight. The Project owner shall use the monitoring data to inform and develop an adaptive management program that would avoid and minimize Project-related avian or bat impacts. Any Project-related bird or bat deaths or injuries shall be reported to the CPM, CDFG and USFWS, and then the CPM in consultation with CDFG and USFWS, shall then determine if the Project-related bird or bat deaths or injuries warrant implementation of adaptive management measures contained in the Plan. The study design for the Plan shall be approved by the CPM in consultation with CDFG and USFWS, and, once approved, shall be incorporated into the project's BRMIMP and implemented.

During construction, bird and bat deaths or injuries shall be reported in the Monthly Compliance Report. For one year following the beginning of power plant operation, the Designated Biologist shall submit quarterly reports to the CPM, CDFG, and USFWS. describing the results of monitoring. The monthly and quarterly reports shall provide a detailed description of any Project-related bird or bat deaths or injuries detected during the monitoring study or at any other time, including describing the dates, species found injured or dead, where found, expected cause of injury or death, other appropriate results of monitoring, and a description of adaptive management measures proposed or implemented in accordance with any applicable CDFG or USFWS guidelines to avoid or minimize deaths or injuries. Following the completion of the fourth quarter of monitoring, the Designated Biologist shall prepare an Annual Report that summarizes the year's data, analyzes any Project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed.

**Verification:** No less than 30 days prior to the start of construction of the power tower the Project owner shall submit to the CPM, USFWS and CDFG a final Avian and Bat Monitoring and Management Plan. Modifications to the Plan shall be made only after approval from the CPM in consultation with CDFG and USFWS.

No later than January 31<sup>st</sup> of every year the Annual Report shall be provided to the CPM, CDFG, and USFWS. Quarterly reporting shall continue until the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary. After two years of data collection, the project owner or contractor shall prepare a report that describes the study design and monitoring results of the Avian and Bat Monitoring and Management Plan. The report shall be submitted to the CPM, CDFG and USFWS no later than the third year after onset of Project operation.

## **PROJECT CONSTRUCTION AND COMPENSATION PHASING PLAN**

**BIO-22** As an alternative to providing mitigation or security for compensatory mitigation for the entire project prior to the start of the first ground-disturbing activities, the project owner may elect to provide security for compensatory mitigation in two phases as specified in this condition.

Only the phases identified as Phase 1 and Phase 2, as described in this condition, and as provided by the applicant on September 2, 2010 in their Comments on the Presiding Member's Proposed Decision, may be used for the phasing of mitigation and security requirements. To the extent those sources are found to contain conflicting information about Project phasing, the description in this condition shall control. This condition presumes that the phases identified in this condition are identical to the phases that the Bureau of Land Management (BLM) will authorize work on through issuance of "notices to proceed"; if phases used by BLM are not identical to the phases as described in this condition and the materials identified above, the project owner shall obtain separate written authorization from the CPM prior to beginning work on each of the two phases. In no event shall any project disturbance occur unless security has been provided for the required mitigation associated with the particular phase of construction.

For purposes of this condition:

"Project Disturbance" or "ground disturbance" means any project-related ground, habitat, or species disturbing action.

"Project Disturbance Area" or "ground disturbance area" means all areas that would be temporarily or permanently disturbed during construction or operation of the Project, including all linear facilities, or which would be subject to any project-related ground, habitat, or species disturbing action.

"Project construction" or "construction" means any ground-disturbing activity, including but not limited to construction work, site mobilization, fence construction, or any desert tortoise translocation activities.

“Security” means the security that is required under other biological conditions of certification to ensure required mitigation measures will be implemented, or payments by the project owner into the National Fish and Wildlife Foundation (NFWF) mitigation account in accordance with the option provided in other conditions of certification.

### **Overview of Project Phases**

Phase 1 includes the following components (1,282 acres):

- a. Fence Colosseum Road;
- b. Fence the Construction Logistics Area (CLA) and Construct Holding Pens in the CLA;
- c. Fence, Conduct Clearance Surveys, and Construct Ivanpah 1
- d. Fence Access Road and Power Block for Ivanpah 2, and Perform Construction Within Ivanpah 2 Power Block.

Phase 1 would include 1,282 acres of desert tortoise mitigation, as well as 10 of the 30 acres of rare plant mitigation, and 58 of the 175 acres of state waters mitigation.

Phase 2 includes the following components (2,300 acres):

- a. Construct Ivanpah 2 – Consists of the diagonal access roads, perimeter road for fence, channel crossings as needed, and solar field including grading of approximately 90 acres in the southwest and central regions of the solar field area;
- b. Construct Ivanpah 3 - Consists of the diagonal access roads, perimeter road for fence, channel crossings as needed, power block, and solar field including grading of approximately 120 acres in the southern and western regions of the solar field area;
- c. Other external features including roads and gas line.

Phase 2 would include 2,300 acres of desert tortoise mitigation, as well as 20 of the 30 acres of rare plant mitigation, and 117 of the 175 acres of state waters mitigation.

### **General Requirements**

At no time may the project owner cause ground-disturbance to any location outside of the area that has been approved for construction according to the phasing plan identified in this Condition of Certification.

Prior to initiating construction in either phase of the Project, the project owner shall comply with all pre-construction requirements in this and other Conditions of Certification and shall notify the CPM that it has obtained a Notice to Proceed for the particular phase from the BLM.

Construction activities, including work on linear and non-linear features, shall not occur outside desert tortoise exclusion areas that have been fenced and cleared in accordance with USFWS protocols and as described in Condition of Certification BIO-8 (Desert Tortoise Clearance and Exclusion Fencing).

The project owner shall provide security to ensure implementation of the mitigation requirements in Conditions of Certification BIO-17 (Desert Tortoise Compensatory Mitigation), BIO-18 (Special-Status Plant Impact Avoidance and Minimization) and BIO-20 (Streambed Impact Minimization and Compensation Measures) for each of the two phases prior to any project construction associated with that phase. Phasing of security only applies to security required by the Conditions listed above. If the project owner elects to phase payments of security under either a Project Owner Acquisition or NFWF option and if the commencement of construction is delayed beyond June 1, 2011, the amount of the security (including payments to NFWF if applicable [see definition of security above]) will be adjusted by the CPM in consultation with DFG, BLM and USFWS prior to each phase to reflect the CPM's best estimate at that time of the estimated costs of land acquisition, long-term management and maintenance costs, and other costs that are included in the security computation. Those costs may be greater than the costs identified in the conditions of certification.

Even when security has been provided, the project owner shall complete the acquisition, protection and transfer of all compensation lands required in the conditions of certification listed above, as well as all funding requirements associated with those lands, within the time periods identified in those conditions of certification.

Additional requirements within the project's conditions of certification that are not expressly phased in this condition shall be phased as necessary to carry out the purpose of this condition, and to ensure that no project construction occurs in an area for which the project owner has not provided security and obtained permission to begin construction. Examples may include such activities as construction and location of desert tortoise exclusion fencing or timing of pre-construction clearance surveys for other species. The project owner shall first obtain approval from the CPM, acting in consultation with BLM, CDFG and USFWS, for the phasing of any requirements or deadlines that are not expressly phased in conditions of certification.

## Security Requirements

Security for phased construction shall be in the amounts as specified in Conditions of Certification BIO-17, -18 and -20, and may be adjusted by the CPM in consultation with DFG, BLM and USFWS based upon more accurate information provided by the project owner confirming the acreages described in this table, and on updates from the REAT agencies with more current guidance than the *Desert Renewable Energy REAT Biological Resource Compensation/Mitigation Cost Estimate Breakdown for use with the REAT-NFWF Mitigation Account, July 23, 2010*.

**Verification:** Prior to the start of desert tortoise clearance surveys for each phase, the Project owner shall submit a description of the proposed construction activities for that phase to CDFG, USFWS and BLM for review and to the CPM for review and approval. The description for each phase shall include the proposed construction schedule, a figure depicting the locations of proposed construction and number of acres of desert tortoise habitat, rare plant habitat, and state-jurisdictional streambeds to be disturbed.

If all mitigation requirements, including habitat acquisition and protection, are not completed for a Project phase prior to the start of ground-disturbing activities for that phase, the Project Owner shall provide verification to the CPM and CDFG that approved security as described in Conditions of Certification **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-18** (Special-Status Plant Impact Avoidance and Minimization), and **BIO-20** (Streambed Impact Minimization and Compensation Measures) has been established in accordance with these Conditions of Certification prior to beginning ground-disturbing activities for each Phase.

Prior to submitting verification regarding the security to the CPM, the project owner shall obtain the CPM's written approval of the dollar amount and form of the security and the CPM's written approval of the terms governing the security instrument.

Prior to initiating construction in each phase of the Project, the project owner shall comply with all pre-construction requirements in this and other Conditions of Certification and shall notify the CPM that it has obtained a Notice to Proceed for the particular phase from the BLM.

The Project Owner shall provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition, protection, and transfer requirements and satisfaction of associated funding requirements as set forth in **BIO-17**, **BIO-18** and **BIO-20** within the following time frames: (1) For Phase 1 mitigation, verification shall be provided no later than 18 months after the start of construction of Phase 1, and (2) for Phase 2 mitigation, such verification shall be

provided no later than 18 months after the start of construction of Phase 2. Other verification, notification and reporting requirements and other deadlines set forth in **BIO-17**, **BIO-18** and **BIO-20** that relate to compensation land requirements, to the option of funding mitigation through the NFWF account, or to use of approved third parties to carry out mitigation requirements also apply to Phase 1 and to Phase 2.

Within 90 days after completion of all project related ground disturbance for each project phase, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction.

**Attachment B**  
**Final Biological Opinion**

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# United States Department of the Interior



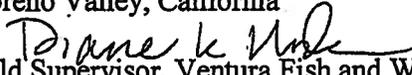
FISH AND WILDLIFE SERVICE  
Ventura Fish and Wildlife Office  
2493 Portola Road, Suite B  
Ventura, California 93003

IN REPLY REFER TO:  
81440-2010-F-0096  
8-8-10-F-24

October 1, 2010

## Memorandum

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

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

Subject: Biological Opinion on BrightSource Energy's Ivanpah Solar Electric Generating  
System Project, San Bernardino County, California [CACA-48668, 49502, 49503,  
49504] (8-8-10-F-24)

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 to Solar Partners I, LLC, Solar Partners II, LLC, and Solar Partners VIII, LLC for the Ivanpah Solar Electric Generating System (ISEGS) and its effects on the federally threatened desert tortoise (*Gopherus agassizii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Because BrightSource Energy is a parent company for all Solar Partner Companies, this biological opinion refers to the project proponents collectively as BrightSource. The proposed project involves construction, operation, maintenance, and decommissioning of a 370-megawatt solar thermal power plant and associated infrastructure and facilities on 3,582 acres of public land managed by the Bureau. Your December 7, 2009 request for formal consultation was received on December 8, 2009.

This biological opinion is based on information that accompanied your December 7, 2009 request for consultation and additional information regarding changes in the project description and translocation strategy obtained from Bureau staff during the formal consultation process. This information includes the biological assessment (CH2MHill 2009a), revised biological assessment (CH2MHill 2010a), draft environmental impact statement and final staff assessment (Bureau and California Energy Commission 2009), supplemental draft environmental impact statement (Bureau 2010), desert tortoise survey report for the project site (CH2MHill 2008a), biological survey report for the proposed desert tortoise translocation areas (SNEI 2009), desert tortoise translocation plan (CH2MHill 2009b), the management plan for common ravens (CH2MHill 2008b), project site reclamation plan (CH2MHill 2009c), the site plan for management of weeds (CH2MHill 2008c), and additional correspondences regarding modifications to the desert tortoise translocation strategy and mitigation framework (Fesnock

2010a and 2010b, CH2MHill 2010b). A complete record of this consultation is on file in the Ventura Fish and Wildlife Office.

Construction, operation, maintenance, and decommissioning of the ISEGS facility and translocation of desert tortoises do not require activities that would adversely affect the primary constituent elements of critical habitat for the desert tortoise because the actions will not take place within critical habitat or affect the primary constituent elements. Therefore, we do not address critical habitat in this biological opinion.

### **Consultation History**

On December 7, 2009, the Bureau initiated consultation for construction, operation, maintenance, and decommissioning of the ISEGS facility. Following public comment on the Bureau's draft environmental impact statement and the California Energy Commission's final staff assessment, BrightSource modified its project to reduce adverse effects to desert tortoises and rare plant species. On April 26, 2010, we issued a draft biological opinion to the Bureau (Service 2010c). We revised the draft biological opinion based on comments from the Bureau and BrightSource. On July 21, 2010, the Bureau provided us with a revised translocation strategy that required significant revisions to the draft biological opinion (Fesnock 2010c). On September 21, 2010, the Bureau provided additional changes to the translocation strategy, requiring further revisions of the draft biological opinion (Fesnock 2010a). This biological opinion analyzes the effects associated with the reduced project footprint, the revised translocation strategy, and the comments received from the Bureau and BrightSource.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

#### **Introduction**

BrightSource Energy is proposing to construct and operate a solar energy plant approximately 4.5 miles southwest of Primm, Nevada and 1.6 miles west of Ivanpah Dry Lake. The proposed site is 0.5 mile west of the Primm Valley Golf Club. The facility would consist of 3 solar electric generating plants, constructed over a 4-year period as follows: (1) Ivanpah 1 – construction of the Ivanpah 1 plant (southernmost site; 914 acres), construction of shared facilities (i.e., power substation, administrative facilities, water line, power lines, and construction logistics area), and improvement of Colosseum Road ; (2) Ivanpah 2 – construction of the Ivanpah 2 plant (middle site; 1,097 acres); and (3) Ivanpah 3 – construction of the Ivanpah 3 plant (northern site; 1,227 acres). BrightSource Energy would also install a 5.7-mile natural gas distribution line, install a 9.5-mile fiber optic line, and re-route several dirt roads/trails that currently cross the proposed ISEGS site. We summarized the description of the proposed action from your request for consultation, the revised biological assessment (CH2MHill 2010a), and the supplemental environmental impact statement (Bureau 2010).

## **Construction**

Construction of the ISEGS facility would require an average workforce of 474 and a peak workforce of 959. Below, we have provided a detailed description of each stage of project development for the three project sites, the construction logistics area, and other associated infrastructure (i.e., access roads, water wells, water line, gas line and tie-in facility, fiber optic line, etc.). We have described the measures that BrightSource will implement to avoid or minimize adverse effects to the desert tortoise in a later section.

### *Construction Logistics Area*

BrightSource would develop a construction logistics area (CLA) between the Ivanpah 1 and 2 project sites to accommodate construction support facilities (e.g., temporary construction trailers, construction tool sheds, construction lay down areas, and construction parking), the electrical tie-in substation, water wells, permanent facility parking areas, permanent administrative and warehouse facilities, and wheel wash areas. In addition, the CLA would accommodate a segment of Colosseum Road that BrightSource would re-route through the CLA to avoid the Ivanpah 2 project site.

CLA development would begin with surveying and staking the CLA boundaries and grading of a 10-foot-wide perimeter road along the boundary of the CLA to facilitate fence installation. BrightSource would then install an 8-foot high chain-link security fence with desert tortoise exclusion fencing attached to the bottom around the perimeter of the CLA. Alternatively, BrightSource may install desert tortoise exclusion and security fencing separately. Regardless of the method for fence installation, all site development and construction activities described for the CLA would occur within this fenced boundary. This includes grading of selected locations and construction or installation of all construction support facilities and permanent operational facilities.

### *Ivanpah 1, Ivanpah 2, and Ivanpah 3 Project Sites*

Each project site would consist of one heliostat (mirror) array constructed around a 459-foot-tall centralized solar power tower. Ivanpah 1 would contain approximately 53,500 heliostats and Ivanpah 2 and 3 would contain approximately 60,000 heliostats each. Each heliostat consists of two 75.8-square-foot mirrors. All three units (Ivanpah 1, 2, and 3) would have their own individual power block; the biological assessment describes the components of the power blocks.

Prior to site development and construction activities for each phase, BrightSource would install a desert tortoise exclusion fence or a combined exclusion fence and security fence around the entire perimeter of the phase. BrightSource would use the same methods described above for the CLA in installation of this fence. Following fence installation, BrightSource would mow all vegetation on the project sites to within 12 to 18 inches of the ground surface, grade a site for the power block, and grade additional areas within the project site for parking areas, construction lay down areas, building pads, and internal roads. During the construction stage, BrightSource

would improve internal project-site roads, construct the power block, install the heliostat field, install underground piping and wiring, install the generation tie-line, and erect fabrication shops and other construction and administrative buildings. In addition, BrightSource would re-route existing dirt roads/trails around the perimeter of the project site.

### *Gas Line*

In addition to the CLA and the three project sites, BrightSource would construct a 5.7-mile natural gas distribution pipeline. The pipeline would connect to the Kern River Gas Transmission line that traverses Ivanpah Valley 0.5 mile north of the Ivanpah 3 project site. At the point of connection with the Kern River Gas Transmission line, BrightSource would construct a permanent gas metering station (100 feet by 150 feet), requiring a 200-foot by 200-foot temporary construction area. From this metering station, the natural gas line and an 8- to 12-foot-wide access road would head south along the eastern edge of Ivanpah 3 to a metering station (10 feet by 40 feet) near the middle of its western side. From the metering station at Ivanpah 3, the gas line and access road would continue along the eastern edge of Ivanpah 2 to another metering station (20 feet by 40 feet) on the east side of Ivanpah 2. From the Ivanpah 2 metering station, the gas line would continue along the west side of Ivanpah 2 following the asphalt access road to Ivanpah 1. Gas line installation would require a 50-foot-wide construction corridor for access, storage of excavated soil, and pipefitting. In addition, construction of the Ivanpah 3 metering station would require a temporary lay down area within the Ivanpah 3 project site. The Ivanpah 1 and 2 metering stations would use a portion of the Ivanpah 2 solar field for construction lay down.

To allow for gas company access, BrightSource would construct the gas line, access road, and metering stations outside of the fenced project sites for Ivanpah 1, 2, and 3. A portion of the gas line to the Ivanpah 1 project site would be located within the fenced CLA. BrightSource would construct additional spur lines within the fenced project sites to carry gas from the edge of the respective project site to the main power block.

Construction activities related to the metering stations would include grading a pad and installing aboveground and underground gas piping, metering equipment, gas conditioning, pressure regulation, and pigging facilities. The construction contractor would determine which method to use to install the natural gas pipeline. The most common method of pipeline construction includes installation of the pipeline into an open trench approximately 36 inches wide and 3 to 10 feet deep.

### *Fiber Optic Line*

To allow for remote monitoring of the new electrical substation, Southern California Edison (SCE) would construct an 8-mile fiber optic line from the Ivanpah substation to an interface point designated by the local telecommunication carrier in Mountain Pass. SCE would use existing distribution line poles for installation. Installation would require use of a bucket truck, four people, and two pick-up trucks. SCE would string out fiber optic cable between the existing

poles. Every 10,000 to 20,000 feet, SCE would establish a 40-foot by 60-foot line stringing set. Crews would work within this area to raise the cable and string it tight over the existing poles. SCE estimates that approximately 20 poles are not accessible from the existing dirt service roads. Workers on foot would install the fiber optic line on these poles.

### **Operation**

The ISEGS facility would have an operating life of up to 45 years and would operate 7 days a week for up to 14 hours a day. During operation, approximately 90 full-time employees would work at the site. ISEGS would use a maximum of 100 acre-feet of water per year for operational purposes. Heliostat washing is the only identified activity that we have described in this section because it is the only operational activity with the potential to have some effects on desert tortoise.

To keep heliostats clean, BrightSource would wash some portion of the heliostat field on a nightly basis, so that every heliostat within the 3 project sites is washed once every 2 weeks. The application rate per heliostat would be about 2.5 gallons per washing for a total use of 10.97 acre-feet per year for Ivanpah 1 and about 12 acre-feet per year for Ivanpah 2 and 3. However, the application rate on Ivanpah 1 may double during construction of Ivanpah 3 due to increased amounts of construction-related dust. During each washing, approximately 0.17 gallon per linear foot of mirror would run off onto the ground beneath the mirror.

### **Maintenance**

In addition to regular, day-to-day operation of the ISEGS facility, BrightSource would need to perform a variety of maintenance actions. BrightSource has grouped these anticipated maintenance activities into three classes. Any maintenance activities that are outside the approved right-of-way boundary (i.e., the fenced boundary of the project site and the associated perimeter road) for the project will require additional authorizations from the Bureau and additional section 7 consultation.

Class I activities are those maintenance actions that do not result in new surface disturbance. BrightSource would perform these activities by hand or with the use of tools, equipment, and/or vehicles. Class I activities would take place on existing structures or would be staged from existing roads or other disturbed areas. These activities would not include off-road travel. Vehicles used during these activities might include low-boy tractor and trailer, flat bed, utility trucks, forklifts, scissor lifts, cherry pickers, and mechanical hoists. Labor may involve several workers confined to the area in need of maintenance. BrightSource may need to perform these activities on a daily basis.

Class II activities would result in minimal surface disturbance, but would likely require heavy earth-moving equipment including motor graders, bulldozers, front-end loaders, backhoes, water trucks, asphalt pavers, and dump trucks. Typical Class II activities would include: 1) underground utility (e.g., water, gas, sewage, electrical, communication, etc.) repairs, upgrades

and tie-ins to structures; 2) motor grading and repairs of existing dirt roads, shoulders, and berms; 3) cut or fill of soil surface to re-establish appropriate cover due to soil erosion after rainfall events; 4) maintenance of drainages, fords and culverts for proper flow of water runoff; 5) maintenance of asphalt roads, shoulders and parking lots; 6) security and desert tortoise exclusion fence repairs; and 7) minor natural gas pipeline repairs that require excavation.

Class III includes maintenance activities that result in major surface disturbance. Typical Class III activities would include: 1) installation of a new underground pipeline a distance of 1,000 feet or more and 2) disturbance of an acre or more for construction of new storm water drainage features.

### **Decommissioning and Restoration**

BrightSource would perform restoration work on all sites disturbed during construction, operation, maintenance, and decommissioning of the ISEGS facilities. For short-term disturbances, BrightSource would begin restoration following completion of ground disturbance and would implement the following general steps: 1) decompaction of soils, 2) spreading of topsoil salvaged prior to construction, and 3) seeding of the disturbed area with native plant species. BrightSource would time seeding to avoid drought periods to the extent possible.

Decommissioning of the facility would occur sequentially in the order of construction (i.e., Ivanpah 1, followed by Ivanpah 2, Ivanpah 3, and the shared facilities). Following decommissioning of the ISEGS facility, BrightSource would remove all structures from the project area and begin restoration of all long-term disturbances. Decommissioning and restoration/reclamation would involve the following general activities: 1) rehabilitate access roads by removing asphalt, decompacting soil, and revegetating, 2) remove all structures and foundations less than 6-feet deep from the project area, 3) remove all physical components of the generation facility except for the SCE substation, the diversion structure, and asphalt access road, 4) re-contour and decompact soils associated with disturbed areas, 5) implement revegetation procedures using native species, 6) remove all exclusion and security fencing, and 7) monitor revegetated areas for success and control non-native weeds.

### **Minimization Measures**

#### *General Protective Measures*

To minimize adverse effects to the desert tortoise, BrightSource will implement the following protective measures during construction, operation, maintenance, and decommissioning activities. The wording of some measures differs from those proposed by the Bureau and BrightSource. We have changed the wording of some measures to improve clarity, but we have not changed the substance of the measures that BrightSource and the Bureau have proposed.

1. BrightSource 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 and will be required for monitoring of any construction, operation, or maintenance activities that may result in take of the desert tortoise. The current guidance is entitled *Desert Tortoise – Authorized Biologist and Monitor Responsibilities and Qualifications* (Service 2008a).

2. BrightSource 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. BrightSource 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 until the violation is corrected.
4. Individuals approved to handle desert tortoises (i.e., authorized biologists and supervised desert tortoise monitors) will do so in compliance with the most up-to-date guidance from the Service. The Service is currently using the *Desert Tortoise Field Manual* (Service 2009a).
5. BrightSource 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) desert tortoise life history and threats, d) legal protections and penalties, and e) reporting requirements.
6. Bright Source will fence the boundaries of the Ivanpah 1, 2, and 3 project sites, the CLA, and Colosseum Road and clear these areas of all desert tortoises prior to construction. We have provided a description of the procedures for clearance, translocation, and monitoring of these animals below.
7. Authorized biologists will perform clearance surveys of unfenced work areas outside of the main project sites and CLA (e.g., gas distribution line, utility right-of way, etc.) immediately prior to the onset of construction, operation, or maintenance activities.
8. BrightSource will employ an appropriate number of authorized biologists and desert tortoise monitors to monitor 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.

9. BrightSource will confine all construction activities, project vehicles, and equipment within the delineated boundaries of construction areas that authorized biologists or designated desert tortoise monitors have identified and cleared of desert tortoises. BrightSource 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. BrightSource will use previously disturbed areas to the extent feasible.
10. Any non-emergency expansion of activities into areas outside of the areas considered in this biological opinion will require Bureau approval and desert tortoise clearance surveys. These expanded activities may require re-initiation of consultation with the Service.
11. BrightSource will prohibit project personnel from driving off road or performing ground-disturbing activities outside of designated areas during construction, operation, maintenance, or decommissioning except to deal with emergencies.
12. During operation and maintenance activities at the completed project site, BrightSource will confine all vehicle parking, material stockpiles, and construction-related materials to the permanently fenced project sites and CLA.
13. BrightSource will confine project access to Colosseum Road for construction, operation, maintenance, and decommissioning of the facility. BrightSource will permanently fence this road with desert tortoise exclusion fencing prior to the onset of construction. To reduce the potential for vehicle strikes of desert tortoise on unfenced access roads (i.e., gas line road, fiber optic right-of-way road, etc.), BrightSource will enforce a 20-mile-per-hour speed limit for project related travel (i.e., construction, operation, maintenance, and decommissioning) in these areas. BrightSource will post speed limit signs along all access routes.
14. With the exception of security personnel, BrightSource will prohibit firearms on the project site.
15. Project personnel who are working outside fenced areas will 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 excavations that are not within desert tortoise exclusion 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. BrightSource will cover or temporarily fence excavations that are

outside of the permanently fenced project areas at the end of each day to prevent entrapment of desert tortoises during non-work hours.

17. When outside of the fenced project areas, project personnel 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, BrightSource may cap all such structures before storing them outside of fenced area.

### *Management of Common Ravens*

BrightSource will implement the following project design features and protective measures to reduce the adverse effects associated with predation of desert tortoises by common ravens (*Corvus corax*). The draft management plan for common ravens (CH2MHill 2008b) contains more detailed information on the following actions:

1. BrightSource will contain all trash associated with the project that could provide subsidies to predators in secure, self-closing receptacles to prevent the introduction of subsidized food resources for common ravens.
2. BrightSource will promptly remove and dispose of all road-killed animals on the project site or its access roads.
3. BrightSource will use water for construction, operation, maintenance, and decommissioning (e.g., truck washing, dust suppression, heliostat washing, landscaping, etc.) in a manner that does not result in puddling.
4. BrightSource will use closed tanks to store water for all project site water needs to eliminate an open water source for common ravens.
5. BrightSource will use closed tanks to store water associated with boiler commissioning and emergency outfalls. BrightSource will not use storm-water detention basins in its project design.
6. BrightSource will install generation tie-lines on utility poles designed to be incompatible with nesting of common ravens in accordance with Avian Power Line Interaction Committee guidelines (2006) and will monitor the effectiveness of these deterrence measures. BrightSource will implement alternative measures if the current effort is unsuccessful.
7. All transmission lines associated with the ISEGS facility will be designed in a manner that will reduce the likelihood of nesting by common ravens. BrightSource will monitor all utility lines and other potential nesting structures and remove common raven nests that it identifies following authorization by the Bureau and the Service.

8. BrightSource will monitor the ISEGS facilities to identify frequently used perching locations for common ravens. If it identifies such locations, BrightSource will install bird barrier spikes or other functional equivalent following specific discussion with the Bureau and the Service.
9. BrightSource will coordinate with the Bureau and the Service to implement or fund hazing or lethal removal of problem common ravens. Problem common ravens are individuals that have been shown to prey on desert tortoises through monitoring.
10. BrightSource will monitor the effectiveness of its management plan for common ravens during all 3 phases of construction and for 2 years following completion of the final phase. BrightSource will implement adaptive management measures if monitoring shows that the management plan is not effective in controlling common raven use of the project site. BrightSource will consult with the Bureau and the Service prior to implementing adaptive management changes.

#### *Weed Management*

BrightSource will implement the following weed management measures to reduce adverse effects to desert tortoises and their habitat during construction operation and maintenance of the ISEGS facilities:

1. BrightSource will designate an environmental compliance manager to provide oversight of construction practices and ensure compliance with weed management provisions.
2. BrightSource will provide training to all personnel charged with environmental management responsibilities that will include the following: a) weed plant identification, b) impacts of noxious weeds on native vegetation, wildlife, and fire activity, and c) required measures to prevent the spread of noxious weeds on the site.
3. During construction, BrightSource will perform weekly inspections during the growing season of all construction areas, access routes, and equipment cleaning facilities for the presence of noxious weeds and weed seed. Following the completion of construction activities, from March through August, BrightSource will continue monitoring according to the following schedule: 1) once a month during the first 2 years of the revegetation, 2) quarterly for the third and fourth years, and 3) semi-annually for year 5 through 10.
4. During operation of completed facilities, BrightSource will perform general site monitoring according to the schedule described above (Measure 3) and perform weed control at least every other week during the growing season (March through August) and once a month during the remainder of the year. Weed control will consist of physical control methods (e.g., hand pulling, hoeing, etc.) or herbicide application.

5. BrightSource will apply all herbicides used in weed treatments according to a plan approved by the Bureau and in accordance with the herbicide labels. BrightSource will only use qualified individuals for herbicide application and will suspend herbicide use when any of the following conditions are met: a) wind velocity exceeds 6 miles per hour during application of liquids or 15 miles per hour during application of granular herbicides, b) snow or ice covers the foliage of noxious weeds, c) precipitation is occurring or is imminent, or d) air temperatures exceed 90 degrees Fahrenheit.
6. BrightSource will monitor all locations of weed treatment to ensure that treatments are effective.
7. BrightSource will limit disturbance areas during construction to the minimal required to perform work and will only use defined routes when accessing work areas.
8. BrightSource will use vehicle wash and inspection stations and closely monitor all material brought onto the site to minimize the potential for weed introductions.
9. BrightSource will identify and flag all areas of noxious weed infestation and minimize use of these areas by project personnel until weed treatment of the area has occurred.
10. BrightSource will preferentially perform native seed collection for restoration work from areas adjacent to the project site. When it is necessary to use native seeds from commercial vendors, BrightSource will only accept seed that is free of non-native weed seeds.

#### *Desert Tortoise Translocation*

The following description of the desert tortoise translocation strategy for the ISEGS project is taken from BrightSource's translocation plan (CH2MHill 2009b) and from modifications made by the Bureau during the formal consultation process (Fesnock 2010a).

#### Fencing and Clearance Surveys

To minimize adverse effects to the desert tortoise, BrightSource will fence the boundary of the Ivanpah 1, 2, and 3 project sites, the portions of the CLA where ground disturbance would occur, and Colosseum Road from the Primm Golf Club to the CLA with desert tortoise exclusion fencing. BrightSource will install desert tortoise guards, as described in attachment B of the biological assessment (CH2MHill 2009a), at gated entries to prevent desert tortoises from gaining entry to the project sites or CLA. BrightSource will also fence the construction area for the utility right-of-way (e.g., gas distribution line) with temporary desert tortoise fencing prior to clearance surveys and ground disturbance. BrightSource may choose to fence all phases of the ISEGS project and the CLA at one time, or it may fence each phase at the time of construction on a given phase.

Within 24 hours prior to the initiation of construction of the desert tortoise-exclusion fence, BrightSource will conduct 2 complete desert tortoise clearance surveys of the fence line segment and associated disturbance right-of-way that will be fenced that day. During these surveys, an authorized biologist will inspect all burrows to determine occupancy and collapse all unoccupied burrows. To the extent feasible, BrightSource will make modifications in fence line alignment to fence occupied burrows out of the ISEGS project areas. If the fence line cannot avoid a given burrow, an authorized biologist will remove the desert tortoise and place it in a sheltered location outside of the ISEGS project area being fenced. If BrightSource fences a given project phase and does not plan on immediate clearing of that phase, it will leave gaps in the fence in locations where desert tortoise burrows are found in the path of the fence line right-of-way. These gaps will buffer the burrow by a distance of 54.6 yards (i.e., 27.3 yards on each side) and will remain open until the time that BrightSource is ready to commence with clearance surveys. BrightSource will not excavate and clear these burrows until it is ready to perform clearance surveys.

Following construction of the desert tortoise exclusion fence around a given portion of the ISEGS projects site (i.e., Ivanpah 1, 2, and 3 project sites, the CLA, or Colosseum Road), BrightSource will perform a full clearance survey of the fenced area during the spring (i.e., April 1 to May 31) or fall (i.e., September 1 to October 15). For fall clearance surveys, BrightSource may extend this survey window until October 31 for phases in which all desert tortoises will be placed into a quarantine facility (e.g., Ivanpah1 and the CLA) rather than translocated. Regardless of the method used to fence project site boundaries (i.e., at one time versus phased), clearance surveys would proceed according to the schedule described below.

In the fall of 2010, BrightSource intends to clear all desert tortoises from the CLA and Ivanpah 1. In fall 2010, BrightSource also intends to construct temporary desert tortoise exclusion fencing around the Ivanpah 2 power block and the power block access road and clear desert tortoises from these areas. BrightSource would place desert tortoises moved from the Ivanpah 2 power block and power block access route into adjacent habitat on the remainder of Ivanpah 2. BrightSource would not clear desert tortoises from the remainder of Ivanpah 2 or from Ivanpah 3 until construction is ready to commence on those phases.

When performing clearance surveys, authorized biologists and supervised desert tortoise monitors will conduct at least 3 complete clearance sweeps over a given phase with transects no wider than 30 feet. Surveyors will conduct transects for each sweep in different directions to allow for opposing angles of observation. BrightSource will consider the site clear after two complete passes have discovered no new desert tortoises. Authorized biologists will excavate all potential desert tortoise burrows by hand to confirm occupancy status. BrightSource will collect data on all desert tortoises handled and examine all individuals for clinical signs of disease. A detailed list of data that BrightSource will collect on each desert tortoise is provided in its translocation plan.

Disease Testing, Quarantine, and Translocation*CLA and Ivanpah 1*

Desert tortoises that BrightSource locates during clearance surveys will undergo varying levels of disease testing and quarantine, depending on their location within the project site. In fall 2010, BrightSource intends to clear all desert tortoises from Ivanpah 1 and the CLA and quarantine them within a portion of the CLA that would not be disturbed by construction activities. BrightSource will collect blood, perform ELISA testing, and do visual health assessments on all project site desert tortoises quarantined at this facility.

The quarantine facility within the CLA will consist of a series of 65.6-foot by 65.6-foot) pens to allow separate quarantine of each individual cleared from the CLA and Ivanpah 1. BrightSource will construct each pen with permanent desert tortoise exclusion fencing or other materials that will prevent individuals from digging out or coming into direct contact with other quarantined or wild individuals. Each pen will contain at least two natural or artificially constructed burrows and should contain shrub cover that is similar to that found within the project site phases. In addition to the individual pens, BrightSource will construct a security fence around the entire quarantine facility and install netting over the facility or over the individual pens that contain juvenile desert tortoises to prevent access by desert tortoise predators. BrightSource will use a portable irrigation system and water all desert tortoise pens at a sufficient frequency, duration, intensity, and timing to mimic the rainfall patterns of a good rainfall year for this portion of the Mojave Desert. In addition, BrightSource will maintain a sufficient stock of supplemental feed to allow for additional feeding of quarantined animals, if necessary. BrightSource will develop an animal husbandry plan for the quarantine facility that the Service will review and authorize prior to placement of individuals in the quarantine facility.

Prior to release of the CLA and Ivanpah 1 desert tortoises from the quarantine facility, BrightSource will perform surveys of translocation areas west and north of the ISEGS project to determine density and disease prevalence within the resident population. Surveys would include full coverage surveys of a 500-meter buffer along the western and northern boundaries of the project site and full coverage surveys of the 4 translocation sites identified in the BrightSource's translocation plan (i.e., N1, N2, N3, and N4; CH2MHill 2009b). BrightSource will collect blood for ELISA testing and perform visual health assessments on all desert tortoises identified within these areas. In addition, BrightSource will perform sampling transects of a 3.7-mile buffer of contiguous desert tortoise habitat around these areas. All desert tortoises located during this sampling will be tested for disease using visual health assessments and ELISA testing. BrightSource will transmitter a subset (i.e., at least equal to the estimated project-site population) of the individuals located during these surveys to facilitate post-translocation monitoring of the resident population. Surveys of the 3.7-mile buffer will determine population density and disease prevalence. BrightSource will locate and test a sufficient number of individuals to predict, with a confidence interval of 95 percent, that 5 percent or less of the desert tortoises in this buffer are infected with upper respiratory tract disease. If BrightSource determines that this area has an upper respiratory tract disease prevalence of more than 5 percent among the resident

animals, it will not release individuals into the area west or north of the project site. If BrightSource determines through pre-translocation surveys that the post-translocation density in the translocation area would be more than 21 subadult and/or adult desert tortoises per square mile, it will not release individuals into the area west or north of the project site. If either of these scenarios occurs, BrightSource will contact the Service to address necessary changes in its translocation strategy prior to clearance surveys of additional phases.

Following receipt of ELISA testing results and completion of visual health assessments for the resident and quarantined population, BrightSource will contact the Service regarding the proposed release of each quarantined desert tortoise. The Service will work with BrightSource to identify an appropriate facility to house any quarantined desert tortoises that test ELISA-positive. In addition, the Service may require BrightSource to perform additional testing to confirm disease status of any ELISA-positive desert tortoises before final disposition. Prior to release of individuals into the translocation area, BrightSource will fence Interstate 15 between Nipton Road and Yates Well Road with desert tortoise exclusion fencing to prevent translocated desert tortoises from entering the roadway during long-distance, post-translocation movements.

BrightSource intends to translocate all ELISA-negative desert tortoises from quarantine to the translocation area in spring 2011, but timing of disease testing may push the translocation to the fall 2011. For Ivanpah 1 and the CLA, BrightSource will release all desert tortoises, originally located within 500 meters of the western fence, in areas adjacent to the western fence line. This release will be done in a manner that does not place a translocated individual more than 500 meters from its original capture location. In addition, BrightSource will not translocate a desert tortoise in this category within 1500 meters of a resident individual that has tested positive for disease through ELISA testing or visual health assessments. If BrightSource cannot comply with this buffer without moving the individual more than 500 meters from its original capture location, it will translocate the individual to the translocation area it has identified for Ivanpah 1 and CLA (i.e., N4; CH2MHill 2009b).

BrightSource will release all other desert tortoises into the translocation area that it identified for Ivanpah 1 and the CLA in its translocation plan (i.e., N4; CH2MHill 2009b). BrightSource will attach transmitters to all translocated desert tortoises to facilitate post-translocation monitoring. BrightSource will not translocate a desert tortoise in this category within 3.7 miles of a resident individual that has tested positive for disease through ELISA testing or visual health assessments.

#### *Ivanpah 2*

In fall 2010, BrightSource intends to construct a temporary desert tortoise exclusion fence around the Ivanpah 2 power block and the power block access. It will then move all desert tortoises that occupy this enclosure into adjacent habitat on the remainder of Ivanpah 2. BrightSource will ensure that it does not move these desert tortoises more than 500 meters during this clearance.

In spring 2010, BrightSource intends to clear all desert tortoises from Ivanpah 2 that are more than 500 meters from the western fence line and quarantine them within the facility described above for Ivanpah 1 and the CLA. If necessary, BrightSource will construct additional pens to facilitate the quarantine of these animals. BrightSource will collect blood, perform ELISA testing, and do visual health assessments on all project site desert tortoises quarantined at this facility.

Following visual health assessments, BrightSource will translocate all desert tortoises located within 500 meters of the western boundary fence of Ivanpah 2 to areas immediately outside the fence. BrightSource will not translocate a desert tortoise in this category within 1500 meters of a resident individual that has tested positive for disease through ELISA testing or visual health assessments. If BrightSource cannot comply with this buffer without moving the individual more than 500 meters from its original capture location, it will quarantine this individual. Following receipt of ELISA testing results and completion of visual health assessments for the quarantined population, BrightSource will contact the Service regarding the proposed release of each quarantined desert tortoise. The Service will work with BrightSource to identify an appropriate facility to house any quarantined desert tortoises that tests ELISA-positive. In addition, the Service may require BrightSource to perform additional testing to confirm disease status of any ELISA-positive desert tortoises before final disposition.

BrightSource will translocate all ELISA-negative, healthy desert tortoises from quarantine to the translocation area in spring or fall 2011 depending on the timing of ELISA test results. For Ivanpah 2, BrightSource will release all quarantined individuals in the translocation area it has identified for that phase of the project (i.e., N2 or N3; CH2MHill 2009b). BrightSource will attach transmitters to all translocated desert tortoises to facilitate post-translocation monitoring. BrightSource will not translocate a desert tortoise in this category within 3.7 miles of a resident individual that has tested positive for disease through ELISA testing or visual health assessments:

### *Ivanpah 3*

Following or concurrent with clearance of desert tortoises from Ivanpah 2, BrightSource will perform a clearance level survey of Ivanpah 3 and attach transmitters to all desert tortoises that it locates to facilitate post-translocation monitoring and to allow easy location of individuals prior to translocation. In addition, BrightSource will perform visual health assessments of all desert tortoises on Ivanpah 3. During this survey, BrightSource will translocate all healthy desert tortoises located within 500 meters of the western or northern boundary fences of Ivanpah 3 to areas immediately outside of these fence lines. It will collect blood from all desert tortoises that are more than 500 meters from the western or northern fence line for ELISA testing. BrightSource will quarantine desert tortoises that are more than 500 meters from the western or northern fence line at the CLA quarantine facility. Alternatively, BrightSource may choose to perform *in situ* quarantine with these individuals. If *in situ* quarantine is chosen, BrightSource would attach transmitters to the quarantined animals and leave them at the location of their initial capture to await ELISA test results.

Following receipt of ELISA testing results for the quarantined desert tortoises on Ivanpah 3, BrightSource will contact the Service regarding the proposed disposition of each desert tortoise. If BrightSource chooses to quarantine the individuals in the CLA quarantine facility, it would translocate all ELISA-negative individuals into the translocation area it has identified for this phase of the project (i.e., N1; CH2MHill 2009b) or into the solar exclusion zone north of the Ivanpah 3 project site according to the procedures discussed with the Service. If BrightSource chooses *in situ* quarantine, all desert tortoises that test ELISA negative and are not within 500 meters of an ELISA-positive individual at the time of final clearance will be released into the translocation area it has identified (i.e., N1; CH2MHill 2009b) or into the solar exclusion zone (i.e, portion of the right-of-way excluded from future solar development for rare plant concerns) north of the Ivanpah 3 project site. The Service will work with BrightSource to identify an appropriate facility to house any desert tortoises that test ELISA positive. The Service may require BrightSource to perform or fund additional testing to confirm disease status of any ELISA- positive desert tortoises before final disposition. In addition, BrightSource will quarantine any individual that is located within 500 meters of an ELISA-positive desert tortoise on the Ivanpah 3 project site. This quarantine would occur at the CLA quarantine facility. While in quarantine, BrightSource will conduct an additional ELISA test to confirm disease status prior to translocation. If these individuals test negative on the second ELISA test, BrightSource will release these animals into one of the translocation areas described above.

#### Monitoring

BrightSource will provide for the monitoring of desert tortoises cleared from a given phase of the IESGS project site for a period of 3 years following its initial clearance. As discussed above, BrightSource will attach transmitters to all desert tortoises translocated from the project site and to an equal number of resident desert tortoises to facilitate monitoring. Following the completion of the first 3 years of monitoring, BrightSource will perform an additional 2 years of monitoring if directed by the Service.

BrightSource will also attach transmitters to and monitor desert tortoises in a population that will serve as a control group for translocation monitoring. BrightSource would establish the control group prior to release of translocated individuals. When establishing this control group, BrightSource will collect blood samples from all desert tortoises that it transmitters in the control population for ELISA testing. The number of desert tortoises monitored in this population will be equal to the number of desert tortoises translocated from the project site. The location of the control population will be within the Bureau's Ivanpah Desert Wildlife Management Area. The final boundaries of the control population monitoring area will depend on the number of desert tortoises that BrightSource has to transmitter to match the translocated population. BrightSource will ensure that only qualified biologists, authorized by the Service, perform monitoring of these populations.

During monitoring, BrightSource will collect information on survivorship, mortality rates, health status, body condition, movement of individuals, and predation in all three populations (i.e.,

resident, translocated, and control) to inform adaptive management of the translocation effort on future phases. If monitoring shows a mortality rate of 10 percent or higher among the desert tortoises moved from the project site, BrightSource will review all data collected to develop a remedial action plan in coordination with the Bureau and the Service prior to further phased translocation activities.

To minimize adverse effects to the desert tortoise, BrightSource will implement the following protective measures when implementing clearance surveys and desert tortoise translocation:

1. BrightSource will design all permanent desert tortoise exclusion fencing in accordance with the most up-to-date Service guidance. The Service is currently using guidance provided in the *Desert Tortoise Field Manual* (Service 2009a).
2. BrightSource will comply with the most up-to-date guidance for performing clearance surveys and handling desert tortoises. The Service is currently using the *Desert Tortoise Field Manual* (Service 2009a).
3. BrightSource will use authorized biologists for the performance of clearance surveys and for any other activities that require the handling of desert tortoises. If BrightSource uses desert tortoise monitors during clearance surveys or for other activities that require identification of sign or handling of desert tortoises, they will do so under the direct supervision of an authorized biologist.
4. BrightSource will ensure that health assessments and blood collection for disease testing of desert tortoises are conducted by individuals authorized by the Service to perform these tasks.
5. Following clearance of desert tortoises from the fenced project sites, CLA, and utility right-of-way, an authorized biologist will be onsite during initial clearing and grading to move any desert tortoises missed during the initial clearance surveys. If a desert tortoise is identified and found to have clinical signs of disease, BrightSource will contact the Service to determine appropriate disposition of the animal.
6. BrightSource will not perform any clearance surveys or translocation activities when the ambient air temperature is above 95 degrees Fahrenheit or is anticipated to exceed 95 degrees Fahrenheit before handling or processing can be completed. BrightSource will not perform any clearance surveys or translocation activities when ambient air temperature are below 65 degrees Fahrenheit or are anticipated to go below 50 degrees Fahrenheit during the week after release. BrightSource will not release any desert tortoises at translocation sites if the ambient air temperature is above or are expected to reach 90 degrees Fahrenheit within 3 hours of release. Ambient air temperature will be measured in the shade, protected from wind, at a height of 2 inches above the ground surface.

7. An authorized biologist will hydrate all desert tortoises scheduled for translocation within 12 hours prior to release.
8. An authorized biologist will assess all desert tortoises on the project site for clinical signs of disease prior to translocation regardless of whether these animals will receive additional ELISA testing. The authorized biologist will remove and temporarily quarantine any desert tortoises with clinical signs of disease that are encountered on the ISEGS project sites. Authorized biologists will use the descriptions of clinical signs of disease described in the available scientific literature (Berry and Cristopher 2001, Origgi et al. 2004, Ritchie 2006; all in CH2MHill 2009a), unless the Service provides more appropriate guidance. BrightSource will contact the Ventura Fish and Wildlife Office within 24 hours of collection of an animal to determine the appropriate disposition of animals showing clinical signs of disease. These animals may require more extensive disease testing (e.g., ELISA, Western Blot) prior to determination of their final disposition.
9. BrightSource will only perform clearance surveys during the spring (April 1 to May 31) and fall (September 1 to October 15). If all desert tortoises from a given phase would be placed in a quarantine facility, BrightSource may extend its fall clearance window until October 31 if conditions (i.e., air temperatures) allow. BrightSource will only perform release of cleared desert tortoises into a translocation area during the spring (April 1 to May 31) or early-fall (September 1 and October 1).
10. BrightSource will consider ELISA testing results valid for a period of 1 year on any individual desert tortoise. BrightSource will coordinate with the Service to determine the necessity for re-testing of individuals based on the circumstances of their quarantine and their proposed plan for disposition of the individual. BrightSource will only draw blood for ELISA testing between May 15 and October 31 to ensure accurate ELISA testing results.
11. BrightSource will maintain a record of all desert tortoises encountered and translocated during project surveys and monitoring. The record will include the following information for each desert tortoise: the location (narrative, vegetation type, and maps) and dates of observations, burrow data, general conditions and health, measurements, any apparent injuries and state of healing, the location from which it was captured and the location in which it was released, whether animals voided their bladders, diagnostic markings (i.e., identification numbers), results of health assessments, and ELISA-test results.
12. During temporary quarantine (i.e., desert tortoises held for less than one week), an authorized biologist will provide adequate food and water and a temperature-controlled holding area away from other desert tortoises.

13. BrightSource will only use Service-authorized individuals that have experience identifying the clinical signs of upper respiratory tract disease, herpes virus, and cutaneous dyskeratosis for the performance of health assessments. BrightSource will provide the Service with the qualifications of any authorized biologists that it will use to perform health assessments or blood collection on desert tortoises during clearance and translocation activities. The Service should receive these qualifications at least 30 days prior to the need for the health assessment and blood collection.
14. BrightSource will send all samples for ELISA to a laboratory qualified to perform these tests.
15. For monitoring activities, an authorized biologist will attach radio transmitters to adult desert tortoises using methods described in Boarman et al. (1998).
16. BrightSource will develop an animal husbandry plan for management of the CLA quarantine facility for the Service's review and approval prior to release of individuals into this facility.
17. BrightSource will not release project-site desert tortoises into the translocation area if it determines that post-translocation density will exceed 21 subadult or adult desert tortoises per square mile.
18. BrightSource will not release desert tortoises moved more than 500 meters from their point of capture within 3.7 miles of a resident desert tortoise that has tested ELISA-positive or has shown clinical signs of disease.
19. BrightSource will not release desert tortoises moved less than 500 meters from their point of capture within 1500 meters of a resident desert tortoise that has tested ELISA-positive or has shown clinical signs of disease.

### **Compensation**

The following information was briefly discussed in the revised biological assessment (CH2MHill 2010a) and clarified with more detail in follow up communications with the Bureau (Fesnock 2010a and 2010b). The Bureau will require BrightSource to compensate for loss of desert tortoise habitat in accordance with the Northern and Eastern Mojave amendment to the California Desert Conservation Area (CDCA) Plan (Bureau 2002). The Bureau will apply a compensation ratio of 1:1, as described in this plan. This compensation will provide for acquisition of up to 3,582 acres of land in the Northeastern Mojave Recovery Unit, or desert tortoise habitat enhancement or rehabilitation activities on existing public land, or some combination of the two. The following is a list of potential habitat enhancement and rehabilitation actions, identified by the Bureau, that could be implemented solely or in combination with land acquisition to fulfill the Bureau's compensation requirements:

1. Install at least 50 miles of desert tortoise exclusion fencing along the following road segments: a) Interstate 15 between Nipton Road and Ivanpah Dry Lake, b) U.S. Highway 95 through Piute Valley from the California-Nevada state line to Goffs Road, c) Nipton Road, between the California-Nevada border and Interstate 15, and d) Ivanpah Road, from Nipton Road through portions of the Mojave National Preserve.
2. Restore habitat, including vertical mulching, of at least 50 routes that the Bureau has designated as closed in the Shadow Valley, Piute Valley, and Ivanpah Valley Desert Wildlife Management Areas.
3. Install three-strand fencing or other suitable fencing around the boundary of the towns of Nipton and Goffs.
4. Remove exotic plant species from areas important to desert tortoises.
5. Identify and clean up destroyed or damaged habitat areas, such as illegal dumpsites and illegal routes, in Shadow Valley, Piute Valley, Ivanpah Valley, and the critical habitat portions of Mojave National Preserve.
6. Fund desert tortoise head start research, if approved by the Service's Desert Tortoise Recovery Office.

The California Energy Commission has already approved the proposed action. In addition to the required compensation described above, the California Energy Commission will require compensation for loss of desert tortoise habitat at a ratio of 2:1. Lands acquired to meet the California Energy Commissions requirements would meet the following criteria:

1. must be as close as possible to the project site,
2. provide good quality habitat for desert tortoises with capacity to regenerate naturally when disturbances are removed,
3. be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation,
4. be connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover,
5. not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible,
6. not be characterized by high densities of invasive species, whether on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration, and
7. not contain hazardous wastes.

To meet land acquisition requirements, BrightSource will either directly purchase lands, or it will deposit funds with the National Fish and Wildlife Foundation (NFWF). If BrightSource chooses to deposit funds with NFWF, a compensation fee will be assessed based on current fair market appraised value for the specific geographic area in which the acquisition occurs. If BrightSource chooses to provide funds to NFWF, the following conditions will be met: 1) funds will be provided prior to project construction, 2) lands will be acquired prior to completion of project

construction, and 3) lands will be conserved in perpetuity by a legal mechanism agreed to by the Bureau and California Department of Fish and Game. If BrightSource directly acquires the lands rather than providing funds to NFWF, it will acquire the lands prior to completion of project construction and will conserve these lands in perpetuity through a legal mechanism approved by the Bureau and California Department of Fish and Game.

Regardless of the acquisition method (i.e., directly or through NFWF), BrightSource will establish a management fund for the acquired lands to comply with requirements of the California Endangered Species Act. The management fund will consist of an interest-bearing account (as described in the memorandum of agreement between the Renewable Energy Action Team Agencies and NFWF) with the amount of capital commensurate to generate sufficient interest to fund all monitoring, management, and protection of the acquired lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and other actions designed to protect or improve the habitat values of the acquired lands. A Property Analysis Record (PAR) analysis, or comparable method, will be conducted by BrightSource, the Bureau, and the California Department of Fish and Game to determine the management needs and costs described above, which then will be used to calculate the amount of capital needed for the management fund. The management fund will be held and managed by NFWF or another entity approved by the Bureau, Service, and California Department of Fish and Game.

To mitigate this project's portion of the cumulative effect of increasing the number of common ravens in the desert region, the California Energy Commission will also require BrightSource to contribute \$105.00 per acre for the 3,582 acres associated with the project site. These funds will contribute to an account established by the NFWF to carry out a regional management for the common raven. This account was established under a memorandum of agreement between Renewable Energy Action Team agencies (i.e., the Bureau, Service, the California Energy Commission, and the California Department of Fish and Game) and NFWF to manage funds to implement regional common raven management. Activities that would be carried out to reduce common raven predation on desert tortoises include reduction of human-provided subsidies (e.g., food, water, sheltering and nesting sites), education and outreach, removal of common ravens and their nests, and evaluation of effectiveness and adaptive management. The total fee for this project of \$376,110 will fund the project's portion of the regional raven management. BrightSource will make the payment within six months of final project approval.

Implementing control of common ravens and habitat enhancement and rehabilitation to fulfill some of the Bureau's compensation requirements may result in adverse effects to desert tortoises. These actions will require future site-specific Bureau authorizations and future project-specific consultation. Consequently, we will analyze the adverse effects of these actions in a general way, but cannot provide any site-specific analysis for these future actions in this biological opinion.

## ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

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 determines 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 evaluates 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.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the desert tortoise and the role of the action area in the survival and recovery of the desert tortoise as the context for evaluation of the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

## STATUS OF THE SPECIES

### **Basic Ecology of the Desert Tortoise**

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the Creosote, Shadscale, and Joshua Tree Series of Mojave Desert Scrub, and the Lower Colorado River Valley subdivision of Sonoran Desert Scrub. Optimal habitat has been characterized as creosote bush scrub in areas where precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally occur in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986). Recent range-wide monitoring efforts have consistently documented desert tortoises above 3,000 feet (Service 2006).

Desert tortoises may spend more time in washes than in flat areas outside of washes; Jennings (1997) notes that, between March 1 and April 30, desert tortoises "spent a disproportionately longer time within hill and washlet strata" and, from May 1 through May 31, hills, washlets, and washes "continued to be important." Jennings' paper does not differentiate between the time desert tortoises spent in hilly areas versus washes and washlets; however, he notes that, although washes and washlets comprised only 10.3 percent of the study area, more than 25 percent of the plant species on which desert tortoises fed were located in these areas. Luckenbach (1982) states that the "banks and berms of washes are preferred places for burrows;" he also recounts an incident in which 15 desert tortoises along 0.12 mile of wash were killed by a flash flood. Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend most of their time during the remainder of the year in burrows, escaping the extreme conditions of the desert; however, recent work has demonstrated that they can be active at any time of the year. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994a).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperatures, and wind (Beatley 1969, 1974, Congdon 1989, Karasov 1989, Polis 1991; all in Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet consists of a few species (Nagy and Medica 1986 and Jennings 1993 in Avery 1998). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring; they ate cacti and herbaceous perennials once the winter annuals began to disappear. Medica et al. (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable; Avery (1998) found that desert tortoises rarely ate perennial grasses.

Desert tortoise females typically produce one to two clutches of 1 to 7 eggs per year (Turner et al. 1986). On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), which, like the desert tortoise, is long lived and matures late, indicate that approximately 70 percent of the young animals survive each year until they reach adult size; after this time, annual survivorship exceeds 90 percent (Congdon et al. 1993). Research has indicated that 50 to 60 percent of young desert tortoises typically survive from year to year, even in the first and most vulnerable year of life. We do not have sufficient information on the demography of the desert tortoise to

determine whether this rate is sufficient to maintain viable populations; however, it does indicate that maintaining favorable habitat conditions for small desert tortoises is crucial for the continued viability of the species.

Desert tortoises typically hatch from late August through early October. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching; when food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter; these burrows are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Desert tortoises, both juveniles and adults, seem to selectively forage for particular species of plants with favorable ratios of water, nitrogen (protein), and potassium. The potassium excretion potential model (Oftedal 2001) predicts that, at favorable ratios, the water and nitrogen allow desert tortoises to excrete high concentrations of potentially toxic potassium, which is abundant in many desert plants. Oftedal (2001) also reports that variation in rainfall and temperatures cause the potassium excretion potential index to change annually and during the course of a plant's growing season. Therefore, the changing nutritive quality of plants, combined with their increase in size, further limits the forage available to small desert tortoises to sustain their survival and growth.

In summary, the ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different from those of subadults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adults. They are active earlier in the season. Finally, small desert tortoises rely on smaller annual plants with greater protein content; the smaller plant size allows them to gain access to food and the higher protein content promotes growth.

### **Status of the Desert Tortoise**

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326).

In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178).

The Service listed the desert tortoise in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the Service's listing of this species.

Before entering into a discussion of the status and trends of the desert tortoise in the Northeastern Mojave Recovery Unit where the proposed action is located, a brief discussion of the methods of estimating the numbers of desert tortoises would be useful. Three primary methods have been widely used: permanent study plots, triangular transects, and line distance sampling.

Generally, permanent study plots are defined areas that are visited at roughly 4-year intervals to determine the numbers of desert tortoises present. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Range-wide, 49 plots have been used at one time or another to attempt to monitor desert tortoises (Tracy et al. 2004).

Triangular transects are used to detect sign (i.e., scat, burrows, footprints, etc.) of desert tortoises. The number of sign is then correlated with standard reference sites, such as permanent study plots, to allow the determination of density estimates.

Finally, line distance sampling involves walking transects while trying to detect live desert tortoises. Based on the distance of the desert tortoise from the centerline of the transect, the length of the transect, and a calculation of what percentage of the animals in the area were likely to have been above ground and visible to surveyors during the time the transect was walked, an estimation of the density can be made. This density only represents an estimation of the number of desert tortoises that are greater than 180 millimeters in size. Desert tortoises that are larger than this size are typically classified as subadult or adult desert tortoises.

Each of these methods has various strengths and weaknesses. In general, permanent study plots have been used to estimate the status of desert tortoises across large areas over time. Triangular transects were used to assess the density of desert tortoises on specific sites at a point in time; this method was commonly used to determine how many desert tortoises may be affected by a specific proposed action. In 2001, the Service initiated line-distance sampling to estimate the density of desert tortoises in desert wildlife management areas and critical habitat throughout the range.

Note that, when reviewing the information presented in the following sections, determining the number of desert tortoises over large areas is extremely difficult. The report prepared by the Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) acknowledges as much. Desert tortoises spend much of their lives underground or concealed under shrubs, are not very active in years of low rainfall, and are distributed over a wide area in several different types of habitat. Other factors, such as the inability to sample on private lands and rugged terrain, further complicate sampling efforts. Consequently, the topic of determining the best way to estimate the abundance of desert tortoises has generated many discussions over the years. As a result of this difficulty, we cannot provide concise estimations of the density of desert tortoises in each recovery unit or desert wildlife management area that have been made in a consistent manner.

Given the difficulty in determining the density of desert tortoises over large areas, the reader needs to understand fully that the differences in density estimates in the recovery plan and those derived from subsequent sampling efforts may not accurately reflect on-the-ground conditions. Despite this statement, the reader should also be aware that the absence of live desert tortoises and the presence of carcasses over large areas of some desert wildlife management areas provide at least some evidence that desert tortoise populations seem to be in a downward trend in some regions.

The following paragraphs provide general information on the status and trends of the desert tortoise population in the Northeastern Mojave Recovery Unit, where the proposed action is located. We have not included detailed information on the status of the desert tortoise in the other recovery units throughout the range of the species in this biological opinion. This omission will not compromise the analysis in the biological opinion because our determination regarding whether a proposed action is likely to jeopardize the continued existence of a species must be conducted at the level of the listed taxon. When the range of the listed taxon is divided into recovery units, our level of analysis begins with the recovery unit; if the effects of the proposed action have the potential to compromise the ability of the species to survive and recover within the recovery unit, the next level of analysis considers how the compromised recovery unit would affect the listed taxon throughout its range (Service 2005a). Our analysis can therefore be conducted in a comprehensive manner through an iterative process. The Northeastern Mojave Recovery Unit comprises one of six recovery units for the desert tortoise; consequently, our level of analysis in this biological opinion will begin at this level.

The Northeastern Mojave Recovery Unit is located to the southwest of the Upper Virgin River Recovery Unit and extends through Nevada and into California in Ivanpah Valley. Several critical habitat units and four desert wildlife management areas are located within this recovery unit. Tracy et al. (2004) note that densities of adult desert tortoises for the overall region do not show a statistical trend over time.

The Beaver Dam Slope Desert Wildlife Management Area covers portions of Nevada, Utah, and Arizona. Based on various methods, the recovery plan estimates the density of desert tortoises in this desert wildlife management area as being from 5 to 56 animals per square mile (Service

1994). In 2007, the Desert Tortoise Recovery Office estimated a density for the Beaver Dam Slope Desert Wildlife Management Area of 3.11 desert tortoises per square mile based on line distance sampling transects (Service 2009b).

The Gold Butte-Pakoon Desert Wildlife Management Area covers portions of Nevada and Arizona, generally south of the Beaver Dam Slope Desert Wildlife Management Area. The recovery plan states that densities of desert tortoises in this recovery unit vary from 5 to 56 animals per square mile (Service 1994a). In 2007, the Desert Tortoise Recovery Office estimated a density for the Gold Butte-Pakoon Desert Wildlife Management Area of 3.11 desert tortoises per square mile based on line distance sampling transects (Service 2009b).

The Mormon Mesa Desert Wildlife Management Area is located entirely in Nevada, generally west and northwest of the Beaver Dam Slope and Gold Butte-Pakoon desert wildlife management areas, respectively. The recovery plan states that densities of desert tortoises in this recovery unit vary from 41 to 87 subadult and adult animals per square mile (Service 1994a). In 2007, the Desert Tortoise Recovery Office estimated a density for the Mormon Mesa Desert Wildlife Management Area of 8.55 desert tortoises per square mile based on line distance sampling transects (Service 2009b).

The Coyote Springs Desert Wildlife Management Area is located entirely in Nevada, generally west of the Mormon Mesa Desert Wildlife Management Area and east of the Desert National Wildlife Refuge. The recovery plan states that densities of desert tortoises in this recovery unit vary from 0 to 90 adult animals per square mile (Service 1994a). Kernel analysis for the Coyote Springs Desert Wildlife Management Area showed areas where the distributions of carcasses and living desert tortoises do not overlap (Tracy et al. 2004); this scenario is indicative of a higher than average rate of mortality. The Desert Tortoise Recovery Plan Assessment Committee used a kernel analysis to examine the distribution of live desert tortoises and carcasses over large areas of the range of the species (Tracy et al. 2004). The intent of this analysis is to determine where large areas with numerous carcasses do not overlap large areas with live animals. Regions where the areas of carcasses do not overlap areas of live animals likely represent recent die-offs or declines in desert tortoise populations. Because permanent study plots for this region were discontinued after 1996, recent declines in numbers would not be reflected in the kernel analysis if they had occurred. In 2007, the Desert Tortoise Recovery Office estimated a density for the Coyote Springs Desert Wildlife Management Area of 3.6 desert tortoises per square mile based on line distance sampling transects (Service 2009b).

The Ivanpah Desert Wildlife Management Area lies east of the Mojave National Preserve and covers approximately 36,795 acres. It is contiguous with National Park Service lands; note that the National Park Service did not designate desert wildlife management areas within the Mojave National Preserve because it considers that all of its lands are managed in a manner that is conducive to the recovery of the desert tortoise. The permanent study plot in the Ivanpah Valley is located within the Mojave National Preserve and provides information on the status of desert tortoises in this general region. Data on desert tortoises on this permanent study plot were collected in 1980, 1986, 1990, and 1994; the densities of desert tortoises of all sizes per square

mile were 368, 393, 249, and 164, respectively (Berry 1996). Numerous data sets are collected from the study plots and various statistical analyses conducted to provide information on various aspects of trends. We cannot, in this biological opinion, provide all of this information; therefore, we have selected the density of desert tortoises of all sizes per square mile to attempt to indicate trends. The number of juvenile and immature desert tortoises on the study plot declined, although the number of adult animals remained fairly constant. The notes accompanying this report indicated that the "ill juvenile and dead adult male (desert) tortoises salvaged for necropsy contained contaminants;" it also cited predation by common ravens and the effects of cattle grazing as causative factors in the decline in the number of juvenile and immature desert tortoises on the study plot (Berry 1996). In 2002, workers found 55 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005). In 2007, the Desert Tortoise Recovery Office estimated a density for the Ivanpah Desert Wildlife Management Area of 16.84 desert tortoises per square mile based on line distance sampling transects (Service 2009b). However, the area sampled to determine this estimate includes all portions of the Ivanpah Critical Habitat Unit, which is primarily within the Eastern Mojave Recovery Unit. Only a small portion of the sample area for this estimate is located within the Northeastern Mojave Recovery Unit.

In 2007, the Desert Tortoise Recovery Office estimated an average density of desert tortoises in this recovery unit of 4.4 desert tortoises per square mile, which was a 9 percent decrease from previous estimates in 2005 (Service 2009b). However, this decrease was expected based on a change in sampling design and may not represent a true decline in density for the Northeastern Mojave Recovery Unit.

### **Recovery Plan for the Desert Tortoise**

The recovery plan for the desert tortoise is the basis and key strategy for recovery and delisting of the desert tortoise. The recovery plan divides the range of the desert tortoise into 6 distinct population segments or recovery units and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve-level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The recovery plan also recommends that desert wildlife management areas be designed to follow the accepted concepts of reserve design and be managed to restrict human activities that negatively affect desert tortoises (Service 1994a). The delisting criteria established by the recovery plan are:

1. The population within a recovery unit must exhibit a statistically significant upward trend or remain stationary for at least 25 years;
2. Enough habitat must be protected within a recovery unit or the habitat and desert tortoises must be managed intensively enough to ensure long-term viability;

3. Populations of desert tortoises within each recovery unit must be managed so discrete population growth rates ( $\lambda$ s) are maintained at or above 1.0;
4. Regulatory mechanisms or land management commitments that provide for long-term protection of desert tortoises and their habitat must be implemented; and
5. The population of the recovery unit is unlikely to need protection under the Endangered Species Act in the foreseeable future.

The recovery plan based its descriptions of the six recovery units on differences in genetics, morphology, behavior, ecology, and habitat use over the range of the Mojave population of the desert tortoise. The recovery plan contains generalized descriptions of the variations in habitat parameters of the recovery units and the behavior and ecology of the desert tortoises that reside in these areas (pages 20 to 22 in Service 1994a). The recovery plan (pages 24 to 26 from Service 1994) describes the characteristics of desert tortoises and variances in their habitat, foods, burrow sites, and phenotypes across the range of the listed taxon. Consequently, to capture the full range of phenotypes, use of habitat, and range of behavior of the desert tortoise as a species, conservation of the species across its entire range is essential.

The Service has released a revised recovery plan for public review (Service 2008c). The revised recovery plan includes a discussion of reducing the number of recovery units to four, based on information that has been generated since the release of the original document.

#### **Relationship of Recovery Units, Distinct Population Segments, Desert Wildlife Management Areas, and Critical Habitat Units**

The recovery plan (Service 1994a) recognized six recovery units or evolutionarily significant units across the range of the listed taxon, based on differences in genetics, morphology, behavior, ecology, and habitat use of the desert tortoises found in these areas. The boundaries between these areas are vaguely defined. In some cases, such as where the Western Mojave Recovery Unit borders the Eastern Mojave Recovery Unit, a long, low-lying, arid valley provides a fairly substantial separation of recovery units. In other areas, such as where the Eastern Mojave Recovery Unit borders the Northern Colorado Recovery Unit, little natural separation exists. Because of the vague boundaries, the acreage of these areas has not been quantified. Over the years, the Service has commonly referred to the areas as "recovery units;" the term "distinct population segment" has not been in common use.

The recovery plan recommended that land management agencies establish one or more desert wildlife management areas within each recovery unit. As mentioned previously in the Recovery Plan for the Desert Tortoise section of this biological opinion, the recovery plan recommended that these areas receive reserve-level management to remove or mitigate the effects of the human activities responsible for declines in the number of desert tortoises. As was the case for the recovery units, the recovery plan did not determine precise boundaries for the desert wildlife management areas; the recovery team intended for land management agencies to establish these

boundaries, based on the site-specific needs of the desert tortoise. At this time, desert wildlife management areas have been established throughout the range of the desert tortoise.

Based on the recommendations contained in the draft recovery plan for the desert tortoise, the Service designated critical habitat units throughout the range of the desert tortoise (59 *Federal Register* 5820). The 14 critical habitat units have defined boundaries and cover specific areas throughout the 6 recovery units.

The Bureau used the boundaries of the critical habitat units and other considerations, such as conflicts in management objectives and more current information, to propose and designate desert wildlife management areas through its land use planning processes. In California, the Bureau also classified these desert wildlife management areas as areas of critical environmental concern, which allows the Bureau to establish management goals for specific resources in defined areas. Through the land use planning process, the Bureau established firm boundaries for the desert wildlife management areas.

Finally, we note that the Department of Defense installations and National Park Service units in the California desert did not establish desert wildlife management areas on their lands. Where the military mission is compatible with management of desert tortoises and their habitat, the Department of Defense has worked with the Service to conserve desert tortoises and their habitat. Examples of such overlap include the bombing ranges on the Navy's Mojave B and the Chocolate Mountains Aerial Gunnery Ranges; although the target areas are heavily disturbed, most of the surrounding land remains undisturbed. Additionally, the Army has established several areas along the boundaries of Fort Irwin where training with vehicles is prohibited; desert tortoises persist in these areas, which are contiguous with lands off-base. The National Park Service did not establish desert wildlife management areas within the Mojave National Preserve, because the entire preserve is managed at a level that is generally consistent with the spirit and intent of the recovery plan for the desert tortoise.

The following table depicts the relationship among recovery units, desert wildlife management areas, and critical habitat units through the range of the desert tortoise.

<b>Critical Habitat Unit</b>	<b>Desert Wildlife Management Area</b>	<b>Recovery Unit</b>	<b>State</b>	<b>Size of Critical Habitat Unit (acres)</b>
Chemehuevi	Chemehuevi	Northern Colorado	CA	937,400
Chuckwalla	Chuckwalla	Eastern Colorado	CA	1,020,600
Fremont-Kramer	Fremont-Kramer	Western Mojave	CA	518,000
Ivanpah Valley	Ivanpah Valley	Eastern Mojave/Northeastern Mojave	CA	632,400
Pinto Mountain	Joshua Tree	Western Mojave/	CA	171,700

Critical Habitat Unit	Desert Wildlife Management Area	Recovery Unit	State	Size of Critical Habitat Unit (acres)
		Eastern Colorado		
Ord-Rodman	Ord-Rodman	Western Mojave	CA	253,200
Piute-Eldorado- CA Piute-Eldorado- NV	Fenner Piute-Eldorado	Eastern Mojave Northeastern Mojave/ Eastern Mojave	CA NV	453,800 516,800
Superior-Cronese	Superior-Cronese Lakes	Western Mojave	CA	766,900
Beaver Dam: NV UT AZ	Beaver Dam Beaver Dam Beaver Dam	Northeastern Mojave (all)	NV UT AZ	87,400 74,500 42,700
Gold Butte-Pakoon NV AZ	Gold Butte-Pakoon Gold Butte-Pakoon	Northeastern Mojave (all)	NV AZ	192,300 296,000
Mormon Mesa	Mormon Mesa Coyote Spring	Northeastern Mojave	NV	427,900
Upper Virgin River	Upper Virgin River	Upper Virgin River	UT	54,600

Nussear et al. (2009) modeled desert tortoise habitat across the range of the desert tortoise. This model, which is based on 3,753 desert tortoise locations, uses 16 environmental variables, such as precipitation, geology, vegetation, and slope. In addition, Nussear et al. used 938 additional occurrence locations to test the model's accuracy. Using this model, we estimate that the Northern and Eastern Mojave Recovery Unit contains approximately 4,853,368 acres of potential desert tortoise habitat (Darst 2010). Although this analysis likely omits some marginal desert tortoise habitat, it explains the occurrence of 95 percent of the 938 test points used in the Nussear et al. (2009) model. This modeling and mapping analysis does not consider habitat loss, fragmentation, or degradation associated with human-caused impacts; however, it provides a reference point relative to the amount of desert tortoise habitat within the Northeastern Mojave Recovery Unit.

### Fire and Drought

Since December 2004, numerous wildfires have occurred in desert tortoise habitat across its range. Although we know that some desert tortoises were killed by the wildfires, mortality estimates are not available. We estimate that approximately 300,000 acres of potential desert tortoise habitat burned in the Northeastern Mojave Recovery Unit in 2005 (Burroughs 2005). This acreage includes approximately 109,000 acres of critical habitat (Clayton 2005). In total, approximately 136,447 acres of critical habitat in the Northeastern Mojave Recovery Unit burned in the 2005 fires (Clayton 2005). This loss of habitat has adversely affected the status of

the desert tortoise by reducing available habitat and likely reducing the distribution of individuals by eliminating them or greatly reducing their numbers in burned area.

In addition, drought has been implicated as a factor in reduced survival rates on desert tortoises in local areas (Longshore et al. 2003). In this 9-year study, researchers compared 2 “closely situated, but physiographically different, sites” in the Lake Mead National Recreation Area, Nevada. After a period during which survival rates were stable, the survival rate decreased on one of the sites that experienced drought conditions in 3 out of 4 years. The authors postulate that if such local incidents occur on a regular basis, “source-sink population dynamics may be an important factor” in determining the density of desert tortoise populations.

## ENVIRONMENTAL BASELINE

### Action Area

The implementing regulations for section 7(a)(2) of the Act define the “action area” as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include all areas of the proposed project, described in the Description of the Proposed Action, BrightSource’s proposed translocation and control areas, and all contiguous desert tortoise habitat north and west of Interstate 15, east of the Clark Mountains, and south of Primm, Nevada (Croft 2010). By including all contiguous desert tortoise habitat west of Interstate 15, we are accounting for all areas that desert tortoises could move to following translocation based on the presence of movement barriers and the post-translocation distances observed in previous studies (Berry 1986, Field et al. 2007, Nussear 2004). The action area defined for this biological opinion is approximately 66,688 acres (Croft 2010).

Within this action area, adverse effects will occur primarily in the following areas:

- 1) Project Site – this portion of the action area consists of Ivanpah 1 and the CLA (913.5 acres), Ivanpah 2 (1,097 acres), and Ivanpah 3 (1,227 acres) (CH2MHill 2009a).
- 2) Solar Exclusion Zone Translocation Area (SEZ translocation area) – this portion of the action area consists of the 433-acre solar exclusion zone immediately north of Ivanpah 3 (Croft 2010).
- 3) Long-distance Translocation Sites (i.e., N1, N2, N3, and N4) – this portion of the action area consists of the four translocation areas identified by BrightSource in their translocation plan (i.e., N1, N2, N3, and N4; CH2MHill 2009b) and will accommodate all desert tortoises translocated more than 500 meters. The combined area of these translocation sites is approximately 495 acres (Croft 2010).
- 4) Control Area – this portion of the action area comprises all desert tortoises habitat within the Bureau’s Ivanpah Desert Wildlife Management Area and is approximately 28,594 acres in size (Croft 2010). We have identified the entire Desert Wildlife Management Area within the action area because we do not know the precise size or location of the control population within this area. However, the final control area is likely to comprise

a small fraction of the total acreage identified here.

- 5) Short-distance Translocation Area – this portion of the action area consists of a 500-yard buffer strip, immediately west and north of the project site that will accommodate all short-distance translocations (i.e., less than 500 meters from capture site to release location). This portion of the action area is approximately 1,461 acres in size (Croft 2010).

In addition, some adverse effects are likely to occur along Colosseum Road and along the route of the fiber optic line. Of the approximately 66,688-acre action area, 4,741.5 acres would consist of areas that would be directly associated with aspects of the project or translocation release sites. The remaining 61,946.5 acres of the action area is composed of areas that have the potential for effects associated with desert tortoises that make long distance movements following translocation or effects associated with monitoring of the control population.

#### **Past Consultations in the Action Area**

The Service has issued numerous biological opinions for actions that have occurred or will occur within the action area for this consultation. In all cases, the Service determined that the proposed action was not likely to jeopardize the continued existence of the desert tortoise.

On December 2, 1992, the Service issued a biological opinion to the Bureau for leasing of oil and gas minerals at three sites in the Ivanpah Valley (1-6-92-F-58, Service 1992a). This biological opinion anticipated that project activities would kill or injure one desert tortoise due to use of access roads. One of the lease areas analyzed in the biological opinion is located within the action area covered in this biological opinion.

On July 13, 1993, the Service issued a biological opinion to the Bureau for cattle grazing on allotments in the Mojave Desert (1-6-92-F-19, Service 1993). This biological opinion anticipated the mortality of 3 desert tortoises and the harassment of 10 desert tortoises each year due to the development of range improvements on 25 cattle grazing allotments in the Mojave Desert. On March 19, 1994, the Service issued a new biological opinion on these allotments, in which it anticipated that 3 desert tortoises would be killed as a result of activities associated with cattle grazing on these allotments; the biological opinion also anticipated that range improvements would harass 10 desert tortoises (1-8-94-F-17, Service 1994b). This biological opinion superseded the 1993 biological opinion. The proposed project is located within the boundaries of the Clark Mountain Allotment, which was included in these consultations.

On February 9, 2001, the Service issued a biological opinion to the Bureau for issuance of a right-of-way for construction of the Level 3 fiber-optic line from Victorville to the California-Nevada state line (1-8-00-F-60, Service 2001). This biological opinion did not anticipate the amount of mortality associated with project activities, but it did require the Bureau to reinstate consultation if project implementation killed or injured any desert tortoises. A portion of the project passed through the action area considered in this biological opinion.

On January 17, 2002, the Service issued a biological opinion to the Bureau regarding the effects to the desert tortoise of the implementation of the CDCA Plan (1-8-01-F-16, Service 2002). The biological opinion contained an analysis of the general management direction described in the CDCA Plan and deferred more detailed analysis to the future when the Bureau proposed specific projects. The biological opinion also contained an incidental take statement for ongoing actions, such as management of burros, entrapment of desert tortoises in managed waters and guzzlers, and casual use associated with recreation and mining. Although the biological opinion did not anticipate a specific level of injury or mortality that would likely occur due to these activities, it required the Bureau to reinitiate consultation if more than 5 desert tortoises were killed or injured during any 12-month period. Due to a court challenge, the Service issued another biological opinion on the CDCA Plan on March 31, 2005 (1-8-04-F-43R, Service 2005b). The new biological opinion did not change the threshold for reinitiation of consultation identified in the 2002 biological opinion. The entire action area for the ISEGS project is located within the planning area considered in both CDCA consultations.

On December 21, 1990, the Service issued a biological opinion for the Kern River and Mojave Pipeline projects (1-1-87-F-36R, Service 1990 in Service 2002b). The biological opinion anticipated that pipeline installation would kill or injure 45 desert tortoises in several states. A portion of the Kern River pipeline crosses the northern edge of the ISEGS action area. On July 9, 2002, the Service issued a biological opinion for expansion of the Kern River pipeline (1-5-02-F-476, Service 2002b). This biological opinion did not anticipate the number of desert tortoises that project activities would kill or injure, but it directed the Bureau to reinitiate consultation if more than 2 desert tortoises were killed on any 25-mile section of the pipeline. The Kern River expansion project also crossed the northern portion of the ISEGS action area.

On March 31, 2006, the Service issued a biological opinion to the Federal Highway Administration for construction of a joint port of entry along Interstate 15 between Nipton Road and Yates Well Road (1-8-06-F-20, Service 2006c). This biological opinion did not quantify the anticipated level of injury or mortality associated with project implementation, but it indicated that the number was likely to be small. As of this date, construction of this project has not moved forward.

Cumulatively the biological opinions listed above have authorized a very small amount of take within the areas that they cover. In addition, the take associated with all but one of these biological opinions is associated with projects that have action areas many times the size of the ISEGS action area. Therefore, it is unlikely that all take associated with these larger projects would happen to occur entirely within the ISEGS action area. Consequently, we conclude that take associated with these projects has not substantially affected the environmental baseline within the ISEGS action area.

#### **Habitat Characteristics of the Action Area**

We used the U.S. Geological Survey's model of desert tortoise habitat potential (Nussear et al. 2009) to define desert tortoise habitat within the action area. Within the action area,

BrightSource provided specific information on vegetation types for the project site, natural gas distribution line, fiber optic line, Colosseum Road, SEZ translocation area, and long-distance translocation sites. We summarized the information in this paragraph from the biological assessment (CH2MHill 2009a). All features for which we have specific vegetation or habitat survey information are located on a large, alluvial fan that slopes eastward from the Clark Mountains to Ivanpah Dry Lake at a 3 to 5 percent grade. Numerous ephemeral washes dissect the ISEGS project site with active channels that range in width from 1 to 15 feet. Elevations within the ISEGS project site range from 2,850 to 3,150 feet above sea level. Elevations along the route of the fiber optic line range from 2,850 feet to 5,320 feet. Creosote bush scrub is the dominant vegetation type on the ISEGS project site, western translocation area, SEZ translocation area, natural gas distribution line, Colosseum Road, and the lower elevation portions of the fiber-optic line. Mojave wash scrub also occurs on the ISEGS project site. Vegetation at higher elevations along the fiber optic line is characterized by blackbrush (*Coleogyne ramosissima*), Joshua trees (*Yucca brevifolia*), Utah juniper (*Juniperus osteosperma*), single-leaf pinyon (*Pinus monophylla*), and Mormon tea (*Ephedra* sp.). We do not have specific vegetation survey information for the remaining portions of the action area. However, 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).

The portion of the action area west of Interstate 15 is within a Bureau-managed cattle grazing allotment (Clark Mountain) and a wild burro herd management area (Bureau and CEC 2009, Bureau 2002). In 2007, the Bureau removed most wild burros from the herd management area (Bureau and CEC 2009). However, given the recent nature of this removal and the persistence of some burros within the action area, adverse effects to habitat are likely to persist. The biological opinion for the CDCA Plan amendment for this area discussed the potential effects of cattle grazing on desert tortoises (Service 2005b). The remaining portions of the action area, south and east of Interstate 15, are within a desert wildlife management area managed for conservation of the desert tortoises.

During surveys of the project site, BrightSource identified numerous non-native plant species, such as Sahara mustard (*Brassica tournefortii*), salt cedar (*Tamarix ramosissima*), red brome (*Bromus madritensis*), Mediterranean grass (*Schismus* spp.), London rocket (*Sisymbrium irio*), and red-stemmed filaree (*Erodium cicutarium*) (CH2MHill 2009a, CH2MHill 2008c). Surveyors observed only one Sahara mustard and a few London rockets during assessment of the project site (CH2MHill 2008c). Surveyors located red brome, red-stemmed filaree, and Mediterranean grass throughout the project site with Mediterranean grass having a patchy distribution (CH2MHill 2008c). These species likely occur throughout the remainder of the action area. However, we expect the abundance of these species to be lower in portions of the action area that have not experienced cattle grazing in recent years (i.e., the Ivanpah DWMA).

In addition to cattle grazing, wild burro use, and non-native species, the habitat within the action area has also been affected by indirect effects associated with mining, a 640-acre golf course, various highways, electrical transmission lines, a natural gas transmission line, a fiber optic line, a railroad line, and private development along Nipton Road (CH2MHill 2009a, Bureau 1998,

1999, 2002). The remainder of the action area is crisscrossed by unpaved vehicle routes (Bureau 2002).

### **Status of the Desert Tortoise in the Action Area**

From April 9 to June 5, 2007, CH2MHill conducted desert tortoise surveys over a 3,870-acre area that included the 3 project sites, CLA, natural gas distribution line, and the zone of influence (CH2MHill 2009a, CH2MHill 2008a). Because of a change in the project description, they surveyed an additional 726 acres from May 20 to May 25, 2008. The 2008 surveys also covered the proposed access route for the ISEGS facility. During the 2007 and 2008 surveys, CH2MHill located 25 live desert tortoises, 97 carcasses, and 214 burrows, with the greatest density of sign occurring on the Ivanpah 1 project site. Of the 25 desert tortoises identified, 7 were within Ivanpah 1 and the CLA, 3 were within Ivanpah 2, 6 were within Ivanpah 3, 4 were within the SEZ translocation area, and 2 were in the area of the natural gas distribution line. The remaining desert tortoises were found on zone-of-influence transects that were outside of the proposed project footprint. The surveys were 100 percent coverage surveys in accordance with the pre-project survey protocols developed by the Service (1992b). BrightSource did not perform protocol level surveys of the fiber-optic line for desert tortoises, but it confirmed the presence of desert tortoise habitat along the entire route and incidentally found three individuals along the line (CH2MHill 2009a).

Based on the survey results and the Service's revised pre-project survey protocol (Service 2010), we estimate that Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3 contain approximately 14, 6, and 12 subadult and/or adult desert tortoises, respectively. In addition, we estimate that the SEZ translocation area contains approximately 8 adult/subadult desert tortoises. We emphasize that, although our estimate of the number of subadult and adult desert tortoises on the project site is based on the best available information, these numbers represent only an estimate; the overall number of individuals on site may be different. For example, based on the desert tortoise densities estimated through line-distance sampling for other portions of Ivanpah Valley (16.84 per square mile, Service 2009b), the actual number of subadult and/or adult desert tortoises on Ivanpah 1 and the CLA, Ivanpah 2, Ivanpah 3, and the SEZ translocation area could be as high as 24, 29, 33, and 12, respectively. Because the pre-project survey data represents the best available data and because the data collected through line-distance sampling were collected in areas that are currently managed for desert tortoise conservation (i.e., Bureau-designated desert wildlife management areas and the Mojave National Preserve), we do not expect that the actual number of subadult and adult desert tortoises will be as high in these portions of the action area.

In addition to subadult and adult desert tortoises, the ISEGS project site is likely to contain juvenile desert tortoises and desert tortoise eggs. Based on studies performed in Ivanpah Valley and the Goffs study site that identified a sex ratio of 1:1 (Turner et al. 1984, Turner et al. 1987) and the anticipated number of adult desert tortoises on the site, we estimate that Ivanpah 1 and the CLA, Ivanpah 2, Ivanpah 3, and the SEZ translocation area contain approximately 7, 3, 6, and 4 female desert tortoises of reproductive age, respectively. Based on a mean number of clutches of 1.6 per female per year, observed in a 2-year study in Ivanpah Valley (Turner et al.

1984), and a mean clutch size of 5.38 eggs per clutch observed at the Goffs study site (Turner et al. 1986 in Service 1994), we estimate that reproductive females on Ivanpah 1 and the CLA, Ivanpah 2, Ivanpah 3, and the SEZ translocation area produce approximately 61, 26, 52, and 35 eggs per year, respectively. Turner et al. (1987) observed that the proportion of the population composed of juvenile desert tortoises at the Goffs study site ranged as high as 51.2 percent over the course of 4 years. Based on this information and the anticipated population of subadults and adults on the project site, we estimate that Ivanpah 1 and the CLA, Ivanpah 2, Ivanpah 3, and the SEZ translocation area may contain as many as 15, 7, 13, and 9 juvenile desert tortoises, respectively.

We do not have desert tortoise survey information for the remainder of the action area described in this biological opinion. Given the proximity of the short-distance translocation area and the long-distance translocation sites to the surveyed areas, described above, the density of desert tortoises is likely similar (i.e., approximately 7 subadult and/or adult desert tortoises per square mile). This estimate is supported by a survey immediately east of the ISEGS project site that found 27 desert tortoises on a 5.75 square mile survey area (Ironwood 2009). Using these data and the Service's revised pre-project survey protocol (Service 2010b), we estimate a population density of approximately 6 desert tortoises per square mile for that survey area. Applying the higher of these density estimates to BrightSource's translocation sites, we estimate a population size of 15 desert tortoises within the combined area of the proposed translocation sites (i.e., short-distance, long-distance, and SEZ translocation areas). Using the same method described above for estimation of eggs and juveniles, we estimate that the reproductive females in the western translocation area produce approximately 65 desert tortoise eggs per year and the western translocation area population contains approximately 17 juvenile desert tortoises at any given time.

Because the Service has estimated the density of desert tortoises within the Ivanpah Desert Wildlife Management Area through line-distance sampling (i.e., 16.84 per square mile; Service 2009b), we have applied that density estimate to the control population areas. Using this density, we estimate that this 28,594-acre portion of the action area contains 753 subadult and/or adult desert tortoises. Using the same method described previously for estimation of eggs and juveniles, we estimate that the reproductive females in the control population area produce approximately 3,239 desert tortoise eggs per year and the population within this area may contain as many as 816 juvenile desert tortoises at any given time.

For the remaining portions of the action area (i.e., areas west of Interstate 15 that desert tortoises may move to following translocation), we estimate that densities are likely similar to those identified for the three phases of the project site and the translocation areas (i.e., seven desert tortoises per square mile). Consequently, we estimate that this portion of the action area, which include the project site areas and translocation areas discussed above, contain approximately 330 subadult and/or adult desert tortoises. We also estimate that these areas contain approximately 358 juveniles and produce approximately 1,421 eggs per year.

We emphasize that, although our estimates of the number of subadult and adult desert tortoises, eggs, and juveniles on the project site phases, translocation areas, control area, and remainder of the action area are based on the best available information, these numbers represent only an estimate; the overall number of animals and eggs on site may be different. We recognize that the survey data used for these estimates represents a single point in time and the number of individuals in these areas may change by the onset of construction. For example, some desert tortoises may leave or die. Alternatively, the number of desert tortoises present on the site may increase or decrease by the time construction commences. For example, one or more desert tortoises may not have been detected during the initial survey; other desert tortoises may have moved on to the site since the time of the surveys. Desert tortoises may have emerged from a nest on the site; this scenario could increase the overall number of individuals. For example, if a clutch of seven eggs (i.e., the number of eggs in a clutch that would be considered large) hatched, this increase would be much more than we would expect from individuals moving on to the site. In addition, the studies used to estimate juveniles and eggs are based on a single study site that may or may not have similar productivity and juvenile survival rates to that of our action area.

## EFFECTS OF THE ACTION

The estimates of the number of desert tortoises and eggs derived from the pre-project survey data constitute the best available information regarding the number of desert tortoises in the action area. For this reason, we have used the estimates from the Environmental Baseline section of this biological opinion, which are based on these surveys, in the following analysis.

### **Effects of the Translocation Strategy**

The primary effects of the proposed action on desert tortoise will result from the capture and translocation of desert tortoises prior to all ground disturbance associated with the proposed construction activities. We anticipate that BrightSource will capture and translocate all subadult and adult desert tortoises from the fenced project areas, and any other portion of the action area that is in harm's way due to project-related activities. Because of the difficulty in locating juvenile desert tortoises, BrightSource is likely to move some but not all juvenile desert tortoises from the project site.

Prior to translocation of individuals, BrightSource will perform surveys of the resident populations in each translocation area (i.e., short-distance, long-distance, and SEZ translocation areas). Within all portions of the translocation areas that are more than 500 meters from the western or northern fence lines of the project site, BrightSource will only perform visual health assessments. It will perform visual health assessments and ELISA testing in all other portions of the translocation areas and disease sampling (i.e., ELISA testing and visual health assessments) in the remaining portions of the action area north and west of Interstate 15 to assess population density and disease prevalence prior to translocation. In addition, BrightSource will perform surveys of the control area to identify and attach transmitters to control desert tortoises and to assess disease prevalence of the population to be monitored. During these surveys, BrightSource

will attach transmitters to an equal number of individuals in the resident and control areas to the estimated number that they will clear from the project site. We have analyzed the effects associated with attaching transmitters to these animals in a later section of this document. We cannot precisely predict how many desert tortoises that BrightSource would draw blood from in these areas, but we know that it would be at least 32 each in the resident, control, and project-site populations. However, BrightSource will need to draw blood from additional resident animals that are located in portions of the action area west and north of Interstate 15 to assess whether this area has disease prevalence above five percent. To determine whether this threshold has been reached, with a sufficient level of confidence (i.e., 95 percent confidence), we estimate that BrightSource may have to draw blood from as many as 98 desert tortoises (Averil-Murray 2010). Some potential exists that a subset of the animals tested could suffer mortality as a result of improper blood collection techniques. Because BrightSource will use experienced biologists, authorized by the Service, we expect that this number will be a small fraction of the total animals tested.

BrightSource has proposed numerous measures to minimize injury or mortality of desert tortoises and ensure success of the translocation effort. Because the project would be built in phases over several years, during which time desert tortoise numbers on the project site will likely change, we cannot predict exactly how many desert tortoises will be removed from the project site and other related work areas. However, based on current surveys that cover the project site, CLA, natural gas line, and Colosseum Road, we estimate that BrightSource will have to capture and translocate approximately 32 subadult and/or adult desert tortoises (14, 6, and 12 from Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3, respectively) from these areas. Although BrightSource would move some desert tortoises a relatively short distance (i.e., less than 500 meters), other desert tortoises are likely to be translocated outside of their existing home ranges. We have estimated that the project site may contain approximately 35 juvenile desert tortoises (15, 7, and 13 from Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3, respectively) and produces as many as 139 desert tortoise eggs (61, 26, and 52 from Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3, respectively) per year. However, because of the difficulty in finding desert tortoise eggs and juvenile desert tortoises, we anticipate that BrightSource will translocate few, if any, eggs or juveniles from the project site. Effects to juvenile desert tortoises and eggs that are missed on the project site are discussed later in this section.

Based on our current estimates of the resident population density in the translocation areas (i.e., 7 subadult and/or adult desert tortoises per square mile), the combined size of the translocation areas (i.e., 2.74 square miles), and the post-translocation density threshold identified in the project description (i.e., 21 subadult and/or adult desert tortoises per square mile), we anticipate that the proposed translocation areas can accommodate approximately 38 additional subadult and/or adult desert tortoises. Consequently, the proposed translocation areas appear to be large enough to accommodate all 32 subadult and/or adult desert tortoises that BrightSource needs to move. However, we will not be able to determine this until surveys of the translocation areas and the project sites are performed. At that point, we will know the precise number of individuals on the project site and have a more precise estimate of the number of individuals

within the translocation areas. If the translocation areas prove to be too small, BrightSource would have to identify a new translocation area for the additional desert tortoises. This action would constitute a significant change in the project description and would likely require re-initiation of consultation.

BrightSource has indicated that the 8-mile line to Mountain Pass will use existing poles and would require a 40-foot by 60-foot area of disturbance for every 10,000 feet of line. Consequently, we estimate that project work areas for installation of the fiber optic line would total 0.28 acre in size. Based on this estimate and the estimated density for this portion of the action area of approximately 7 subadult and/or adult desert tortoises per square mile, we anticipate that few, if any, desert tortoises or eggs are likely to be moved during installation of the fiber optic line. Because of the small size of work areas and the difficulty in locating juvenile desert tortoises and eggs, we do not anticipate the movement of any juvenile desert tortoises or eggs.

To prevent translocated desert tortoises from entering roadways following translocation, BrightSource will fence approximately 7 miles of Interstate 15 between Nipton Road and Yates Wells Road. BrightSource has indicated that it would require a 10-foot-wide area of disturbance to install desert tortoise exclusion fencing around the 3 phases of its project. We anticipate that it would require a similar disturbance right-of-way to install desert tortoise exclusion fencing along Interstate 15. Therefore, we estimate that fence installation will directly affect up to 9.1 acres (0.01 square mile). Boarman and Sazaki (2006) found that desert tortoise populations are depressed next to major roadways out to a distance of at least 400 meters (437.5 yards). Because the fence installation would occur along a major roadway and considering the estimated density of desert tortoises in this portion of the action area (i.e., 7 subadult and/or adult desert tortoises per square mile) and the small area of direct effects, we expect that fence installation will affect few desert tortoises or eggs.

Some potential exists that handling of desert tortoises may cause elevated levels of stress that may render these animals more susceptible to disease or dehydration from loss of fluids. Because BrightSource will use experienced biologists that are approved by the Service and approved handling techniques, collected desert tortoises are unlikely to suffer substantially elevated stress levels during handling.

Following release, we cannot predict the movement patterns that all translocated animals are likely to exhibit. Translocation studies, including a study performed in the Ivanpah Valley, have shown that straight-line movement distances following release can be over 3.73 miles in the first year for some desert tortoises (Berry 1986, Field et al. 2007, Nussear 2004). Mean dispersal distances observed on 3 study plots south of Fort Irwin ranged from 153.1 to 6,168 yards, with maximum dispersal distances of between 13,795 to 25,155.3 yards (Walde et al. 2008). For short distance translocations, data appear to indicate shorter post-translocation dispersal distances (79.8 to 1610.9 yards) (Walde et al. 2008). Translocated populations can also significantly expand the area they occupy in the first year following translocation (e.g., from 3.9 to 6.9 square miles at a Nevada site; from 0.2 to 10.3 square miles at a Utah site). The degree to which these

animals expand the area they use depends on whether the translocated animals are released into typical or atypical habitat; that is, if the translocation area supports habitat that is similar to that of the source area, desert tortoises are likely to move less (Nussear 2004).

Translocated animals appear to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations (Field et al. 2007, Nussear 2004). 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).

We cannot predict the direction that translocated animals are likely to move. In some studies, translocated desert tortoises have exhibited a tendency to orient toward the location of their capture and attempt to move in that direction (Berry 1986), but in other instances, no discernible homing tendency has been observed in translocated animals (Field et al. 2007). Information specific to short-distance translocations indicates that at least some individuals will attempt to return to their former home ranges after release (Stitt et al. 2003, Rakestraw 1997).

Based on this information, at least a portion of the translocated animals are likely to make extensive, long-distance movements during the first year following translocation and the area that the translocated population occupies is likely to increase significantly. Animals translocated more than 500 meters to the long-distance translocation areas or to the SEZ translocation area are most likely to exhibit this pattern. However, desert tortoises moved into the short-distance translocation area are more likely to move distances similar to that observed by Walde et al. (2008) because they will be translocated a relatively short distance. Some of the translocated desert tortoises are likely to attempt to return to the project site, where they would encounter the project site fence and either turn around or walk the fence line. Following the first hibernation period after translocation, individuals are likely to significantly reduce movement distances and establish new home ranges.

In one study, the majority of the dispersal movement away from the release site occurred during the first 2 weeks after translocation (Field et al. 2007). Desert tortoises that make long-distance movements following translocation can travel for 5 to 10 days and average 671.5 yards per day (Berry 1986). During this time and over the period prior to home range establishment, desert tortoises may suffer a higher potential for mortality because they are moving great distances through unfamiliar territory and are less likely to have established cover sites for protection. Studies have documented various sources of mortality for translocated individuals, including predation, exposure, fire, disease, crushing by cattle, and flooding (Nussear 2004, Field et al. 2007, Berry 1986, U.S. Army 2009, 2010). Of these, predation appears to be the primary source of mortality in most translocation studies (Nussear 2004, Field et al. 2007, U.S. Army 2009, 2010).

Based on the description of the action area in the Environmental Baseline section of this biological opinion, the potential exists for all six sources of mortality within the action area. However, fire is likely to be localized and highly dependent on the abundance of non-native

grasses and other weeds. The potential also exists for desert tortoises to die on roads during the period when translocated individuals are seeking new home range locations. However, because BrightSource will fence Interstate 15 prior to translocation, road kills are less likely to occur at this translocation site.

BrightSource has selected translocation areas in desert tortoise habitat that should serve as suitable recipient sites for these animals. It has also identified post-translocation density thresholds to ensure that the final translocation areas are large enough to accommodate all desert tortoises from the site. It has proposed numerous protective measures in its translocation plan that are likely to reduce the potential for mortality of translocated individuals. In addition, because construction and translocation will occur in phases and BrightSource has identified a 10 percent mortality threshold for the translocation effort, some potential exists that it can reduce the level of translocation-related effects through adaptive management. However, adaptive management measures are not available for our evaluation, so we cannot predict their effectiveness in this biological opinion.

Translocating desert tortoises may also adversely affect resident desert tortoises within the action area due to local increases in population density. Increased densities may result in an increased spread of upper respiratory tract disease or other diseases, an increased incidence of aggressive interactions between individuals, and an increased incidence of predation that may not have occurred in the absence of translocation. Saethre et al. (2003) evaluated the effects of density on desert tortoises in nine semi-natural enclosures at the Desert Tortoise Conservation Center in Nevada. The enclosures housed from approximately 289 to 2,890 desert tortoises per square mile. Saethre et al. (2003) observed a greater incidence of fighting during the first year of the experiment but did not detect any trends in body condition index, reproduction, or presence of the symptoms of upper respiratory tract disease among the enclosures. Body condition index and reproduction are important indicators of how translocation may affect resident desert tortoises; generally, stress suppresses body condition index and reproduction in desert tortoises. This study did not draw any conclusions regarding density-dependent effects on predation of desert tortoises. Additionally, as discussed previously in this section, desert tortoises tend to move substantial distances from the release sites; this behavior reduces the likelihood of overcrowding in smaller areas.

We anticipate that density-dependent effects on resident populations are likely to be minor for the following reasons: 1) current densities in the translocation areas are likely to be low based on our population estimates for the action area, 2) translocation will result in a dispersed release of individuals, 3) the translocation areas are not confined spaces, so released individuals would be able to disperse into other areas, and 4) BrightSource has identified a post-translocation density threshold for the translocation areas that is significantly lower than densities at which adverse effects were observed in previous studies.

Translocation has the potential to increase the prevalence of diseases, such as upper respiratory tract disease, in a resident population. Stress associated with handling and movement or due to density dependent effects could exacerbate this threat if translocated individuals with subclinical upper respiratory tract disease or other diseases begin to exhibit clinical signs of disease due to

the stress associated with handling and movement. This potential conversion of translocated desert tortoises from a non-contagious to contagious state may increase the potential for infection in the resident population above pre-translocation levels.

We cannot reasonably predict the increase in disease prevalence within the resident population that may occur due to translocation. However, the following mitigating circumstances are likely to reduce the magnitude of this threat: 1) BrightSource will use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals, 2) desert tortoises on the project site are currently part of a continuous population with the resident populations of the translocation areas and are likely to share similar pathogens and immunities, 3) BrightSource will move some of the translocated desert tortoises a relatively short distance into the SEZ and western translocation areas, which is likely to reduce post-translocation stress associated with long-distance movements, 4) density dependent stress is unlikely to occur for the reasons discussed above, 5) BrightSource will not translocate any animal that either has clinical signs of disease or tests ELISA-positive, and 6) BrightSource has identified specific translocation buffers to prevent release of individuals within proximity of diseased resident animals.

Because ELISA testing can result in false positive results (i.e., an animal may test positive even though it is not a carrier of the disease) the potential exists for removal of healthy individuals from the translocated population due to concern over disease. These individuals would not be released into the wild and would no longer contribute to the environmental baseline for the action area. Because BrightSource would coordinate with the Service and perform follow-up testing of ELISA-positive individuals, the potential for removing false-positive individuals from the translocated population is low. Consequently, we conclude that few, if any, desert tortoises will be incorrectly removed from the population due to false positive results.

In a study conducted in Ivanpah Valley, 21.4 percent of 28 translocated desert tortoises died (Field et al. 2007). Other studies have documented mortality rates of 0, 15, and 21 percent in other areas (Nussear 2004, Cook et al. 1978 in Nussear 2004). Esque et al. (2010) observed mortality of 89 of 357 translocated desert tortoises (24.9 percent). Esque et al. (2010) and Nussear (2004) found that mortality among translocated animals was not statistically different from mortality observed in resident populations. In addition, Esque et al. (2010) found that mortality rates in resident (29 of 140 desert tortoises; 20.7 percent mortality), control (28 of 149 desert tortoises; 18.8 percent mortality), and translocated populations did not differ statistically and concluded that the translocation was not the cause of the observed mortality. With the exception of the Esque et al. (2010) study, none of the studies cited in this paragraph used controls to compare mortality rates in resident and translocated populations to the mortality rate experienced in populations not affected by translocation.

Based on the information that we have gathered and considering the uncertainty of site-specific applicability, we estimate that translocated, resident, and control desert tortoises are likely to experience mortality rates of approximately 30 percent due to predation, exposure, fire, disease, crushing by cattle and vehicles, and flooding. (We based our estimate of overall mortality in the

three populations on the work of Esque et al. (2010) and then buffered it to 30 percent to accommodate the additional mortality that would be likely to occur if all or most of the monitoring period occurs during years of low rainfall.) Consequently, we estimate that approximately 10, 87, and 226 translocated, resident, and control desert tortoises, respectively, may die during the 3-year post-translocation monitoring period. We conclude that mortality rates in the resident and translocated populations are unlikely to be elevated above levels that these populations would experience in the absence of translocation, based on the information provided in Esque et al. (2010). Therefore, we do not anticipate this mortality will be the result of translocation. The monitoring of a nearby control population will assist us in determining whether this prediction is realized. If monitoring shows this conclusion to be incorrect, this will constitute new information and require the re-initiation of consultation. One shortcoming of the proposed monitoring program is that, while it includes the observation of a control population that will not be affected in any manner by the translocation, it omits a mechanism to prompt the implementation of corrective actions if significant differences in mortality rates among the populations can be attributed to the translocation.

We have estimated that few, if any, desert tortoises are likely to be moved during installation of the fiber optic line. Because disturbance areas on this portion of the project are small, movement of desert tortoises immediately outside of the work area is not likely to remove them from their current home ranges. Consequently, any desert tortoise moved from the fiber optic line will likely continue to occupy familiar territory and use known shelter sites and is unlikely to suffer post-translocation mortality associated with displacement from the work area.

Many translocated juveniles will likely die due to their greater susceptibility to predation. Because we anticipate that BrightSource will move few, if any, juvenile desert tortoises, we do not anticipate a large amount of juvenile mortality associated with translocation because surveyors will miss most juvenile desert tortoises during clearance surveys. Consequently, most juveniles will likely die during construction. We have discussed this effect below.

#### **Effects of Post-translocation Monitoring**

Based on the description of the post translocation monitoring program and our estimate of the number of desert tortoises on the project site, we anticipate that BrightSource will attach transmitters to 96 desert tortoises to facilitate monitoring of the translocated, resident, and control populations. As a result, desert tortoises will carry transmitters and be monitored and handled periodically for visual health assessments. Some potential exists that handling of desert tortoises may cause elevated levels of stress that may render these animals more susceptible to disease or dehydration from loss of fluids. Because BrightSource will use experienced biologists, approved by the Service, and approved handling techniques, these desert tortoises are unlikely to suffer substantially elevated stress levels resulting from handling and monitoring activities.

**Effects of Construction of the ISEGS Facilities**

BrightSource will permanently fence all three project phases, Colosseum Road, and the CLA with desert tortoise exclusion fencing and clear all desert tortoises from the project site prior to ground disturbance. During construction of the permanent perimeter fencing and during other ground-disturbing activities that are outside of the permanently fenced facilities (i.e., fiber optic line, highway fence, natural gas distribution line), Bright Source 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, including construction access, is unlikely to kill subadult and adult desert tortoises. Some potential always exists that surveyors may miss an individual during clearance surveys and construction monitoring. We cannot predict how many subadult and adult desert tortoises that clearance surveys and construction monitoring would miss. However, because BrightSource will use qualified biologists, authorized by the Service for clearance surveys, we anticipate that the number is likely to be small.

In addition, juvenile desert tortoises and eggs are difficult to detect during clearance surveys and construction monitoring; therefore, the potential exists that surveyors may miss most of them and they are likely to remain in the work areas during construction. Juvenile desert tortoises and eggs that surveyors miss during clearance surveys or project monitoring are likely to be killed during construction. Based on the estimates in the Environmental Baseline section of this biological opinion, we estimate that as many as 35 juvenile desert tortoises (15, 7, and 13 from Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3, respectively) may be killed during construction. We have estimated that the reproductive females on the project site collectively produce as many as 139 desert tortoise eggs (61, 26, and 52 from Ivanpah 1 and the CLA, Ivanpah 2, and Ivanpah 3, respectively) per year. However, we cannot estimate how many of these eggs that construction activities would destroy because this number covers the entire year's total production, and we do not know what portion of this total will be present on site when construction activities are occurring on a given phase. In the Summary of Effects section (below) we discuss the significance of the loss of these individuals and eggs to the overall status of the species within the Northeastern Mojave Recovery Unit and range wide.

**Effects of Operations and Maintenance Activities**

Following fencing, operation and maintenance activities within permanently fenced areas are unlikely to directly injure or kill any desert tortoises. However, we have discussed additional indirect effects associated with operation and maintenance of this facility in the Miscellaneous Effects section later in this biological opinion.

Over the 45-year life of this project, BrightSource may conduct some ground-disturbing maintenance activities outside of fenced areas. These activities have the potential to injure or kill desert tortoises primarily as a result of vehicle strikes, as workers travel to and from work sites outside of the fenced areas; a limited possibility exists that desert tortoises could be injured or killed by equipment or workers moving around a work site. Because Class I maintenance

activities would not result in surface disturbance or loss of habitat and BrightSource would implement protective measures to reduce the potential for effects to desert tortoises, Class I maintenance activities would kill few, if any, desert tortoises.

Class II maintenance activities associated with repair of desert tortoise exclusion fencing would likely kill or injure few, if any, desert tortoises for the following reasons: 1) fence repairs are likely to result in minimal ground disturbance in localized areas, 2) at least a portion of the work area would be on disturbed areas within the fenced project site, 3) perimeter roads would exist that would allow access to most repair locations with minimal off-road travel, and 4) BrightSource would implement numerous protective measures to reduce the potential for injury or mortality of desert tortoises.

Because we do not have sufficient detail regarding the other types of maintenance activities discussed in the Description of the Proposed Action, we cannot adequately analyze the potential for injury or mortality of desert tortoises. Consequently, we are not analyzing Class III maintenance activities or any Class II maintenance activities that would occur outside of the fence and not be associated with repair of fencing. The Bureau has indicated that these actions would require future site-specific authorizations. At the time the Bureau considers authorization of these future activities, it will need to determine whether these future activities may affect desert tortoises. Some of these actions may require future site-specific consultation under section 7.

#### **Effects of Restoration/Reclamation Activities**

Decommissioning or restoration activities within the permanently fenced project area are unlikely to result in injury or mortality of desert tortoises. BrightSource will also need to perform restoration of long-term and short-term disturbance associated with the natural gas distribution line and fiber optic line. BrightSource would implement pre-activity clearance surveys and employ desert tortoise monitors to ensure that desert tortoises do not enter restoration work areas. Consequently, restoration activities will injure or kill few, if any, desert tortoises. These actions are likely to reduce the amount of time required to return disturbed areas to habitat suitable for desert tortoise occupancy. However, this process is likely to take several decades.

#### **Effects of Accessing Worksites**

BrightSource will fence the primary access road for the ISEGS facility (Colosseum Road) with desert tortoise exclusion fencing, so accessing the main fenced facilities is unlikely to result in injury or mortality of desert tortoises. In the event that the fence is damaged, a small number of desert tortoises could enter the roadway and be injured or killed. In addition, access of project work areas outside of the fenced facilities (i.e., natural gas pipeline, fiber optic line, highway fence) has the potential to injure or kill desert tortoises due to elevated use of existing routes. Because all workers will have undergone an education program about desert tortoises, workers may be less likely to strike desert tortoises than a casual user. We cannot predict how many

individuals will be killed or injured because of the variables involved, such as weather conditions, the nature and condition of the road, and activity patterns of desert tortoises at the time the roads are being used. However, we expect the number that would be injured or killed to be small and does not substantially change the number of desert tortoises that we anticipate may be killed or injured by the overall effects of the project.

### Effects of Loss of Habitat

The biological assessment has defined permanent, long-term, and short-term disturbance as follows:

- **Permanent Disturbance:** project disturbance that would remain after the project's lifespan.
- **Long-term Disturbance:** project disturbance that would remain in place for the lifespan of the project, but would be restored following closure.
- **Short-term disturbance:** project disturbance restored within 5 years of the time of the disturbance.

Based on these definitions and the project description provided in the biological assessment, construction of the 3 project phases and the CLA, including installation of exclusion fencing, and improvements to Colosseum Road would result in 3,391.9 and 94 acres of permanent/long-term and short-term disturbance, respectively (CH2MHill 2009a). Installation of the natural gas distribution line and associated facilities will result in an additional 1.7 and 6 acres of new permanent/long-term and short-term disturbance. We anticipate that installation of fencing along Interstate 15 would temporarily disturb approximately 9.1 acres of desert tortoise habitat.

The following table, adapted from table 2.1-1 of the revised biological assessment (CH2MHill 2010a), provides details regarding the disturbance associated with each project feature.

<b>Permanent and Long-term Disturbance</b>	<b>Acres</b>
Ivanpah 1	913.5
Ivanpah 2	1,097
Ivanpah 3	1,227
CLA and SCE Substation	68.4
Gas Line	1.7
Colosseum Road	14.3
<b>Total</b>	<b>3,321.9</b>
<b>Short-term disturbance</b>	
CLA and SCE Substation	115.6
Gas Line	6.0
Construction areas for linear corridors	10.4
Credit for existing roads within project area	-9.9
<b>Total</b>	<b>122.1</b>

Based on the definitions above, we estimate that installation of the fiber optic line would result in approximately 0.28 acre of new short-term disturbance. In addition to the disturbances associated with construction of the ISEGS facility, Class II and III maintenance activities are likely to result in additional habitat disturbance over the 45-year life of the project. Based on the information provided, we cannot estimate the amount of disturbance associated with Class II and III maintenance activities over the life of the project. We are not analyzing these activities in the biological opinion because they will require future authorizations from the Bureau.

These disturbances are likely to result in desert tortoise habitat loss that will persist for various periods. Following extensive disturbance and compaction, Mojave Desert soils 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). Although 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, 3,321.9 acres, currently characterized as permanent/long-term disturbance, are likely to be permanently lost or unsuitable as habitat for several decades following decommissioning of the facilities and commencement of restoration work. Because active restoration will occur, we estimate that BrightSource will restore 132 acres of short-term disturbance to desert tortoise habitat prior to decommissioning of the facility. Based on the information provided, we cannot estimate the amount or duration of habitat loss associated with Class II and III maintenance activities. Consequently, we are not analyzing the effects of these activities in this biological opinion. The Bureau has indicated that these actions will require future Bureau authorizations.

Based on the work by Nussear et al. (2009), we calculated that the Northeastern Mojave Recovery Unit contains approximately 7,583 square miles of modeled desert tortoise habitat. Because the model does not take into account existing human disturbance, we used a more conservative estimate in which we considered half of the modeled habitat was no longer suitable for desert tortoises because of development or degradation resulting from human activities; we also removed the 300,000 acres lost to fire in 2005. Therefore, based on this estimate, approximately 3,323 square miles of modeled desert tortoise habitat remain in the recovery unit. The habitat that would be disturbed on a long-term basis (i.e., approximately 3,322 acres) constitutes approximately 0.07 percent of the modeled habitat in the Northeastern Mojave Recovery Unit and approximately 0.15 percent of the modeled habitat if we use the conservative estimate. Although this percentage does not constitute a numerically substantial portion of the Northeastern Mojave Recovery Unit, we do not have the ability to place a numerical value on edge effects and overall fragmentation that the proposed action may cause or that occurs in the recovery unit as a whole. Given that, this low percentage of the recovery unit that would be lost likely underestimates the biological value of the area. However, the area where the ISEGS project is located is already substantially cut off from the remainder of the Northeastern Mojave Recovery Unit by Interstate 15, Ivanpah Lake, Primm, Nevada, and the Clark Mountains. Although the construction of the ISEGS facility will increase fragmentation and edge effect in

the area bounded by Interstate 15 and the Clark Mountains, it is unlikely to greatly increase fragmentation and edge effect when considered in the larger context of the recovery unit.

### **Effects of Compensation**

The Bureau is proposing to require compensation for loss of habitat associated with this project at a ratio of 1:1 per the provisions of the Northern and Eastern Mojave Plan. Compensation will include acquisition of private lands containing desert tortoise habitat that will be placed under Bureau management and/or implementation of habitat enhancement and rehabilitation projects on public land. All acquisitions and habitat enhancements or rehabilitation actions associated with the Bureau's compensation requirements would be performed within the Northeastern Mojave Recovery Unit.

Potential habitat enhancement and rehabilitation actions that the Bureau has proposed, include highway fencing, fencing the boundary of two desert residential communities, non-native plant control, rehabilitation of closed routes, and identification and clean up of degraded sites (i.e., illegal dumps, illegal routes). All actions would occur within or would benefit Desert Wildlife Management Areas or other areas that are important to desert tortoise conservation in the Northeastern Mojave Recovery Unit or in nearby areas in the Eastern Mojave Recovery Unit. The mitigation that is ultimately implemented for the ISEGS project will involve implementation of some, if not all, of these actions solely or in some combination with land acquisition.

In addition to the Bureau's compensation strategy, the California Energy Commission has required BrightSource to compensate for the loss of desert tortoise habitat at a ratio of 2:1. Although these funds may be spent in locations outside of the Northeastern Mojave Recovery Unit, at least some funds are likely to be expended within the unit; we expect that these funds would be used to implement actions similar to those implemented by the Bureau and would also result in actions that would promote the conservation of the species. The California Energy Commission will also require BrightSource to provide funding for the implementation of regional management programs for the common raven.

Although acquisition of suitable desert tortoise habitat through these compensation requirements will not create new habitat within the Northeastern Mojave Recovery Unit, it will result in a net increase in the amount of desert tortoise habitat managed for the conservation of this species. In addition, the funding of management actions and regional management of common ravens 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 actions proposed for compensation are identified in the original and draft revised recovery plans (Service 1994, 2008) as being necessary for the recovery of the desert tortoise. These actions will increase the quantity and/or quality of habitat for the desert tortoise and reduce the number of existing threats and mortality sources in the areas where they occur. We cannot quantify the level of effects that these actions will have, but they are likely to reduce mortality of desert tortoises and improve habitat quality with the Northeastern and Eastern Mojave Recovery Units. 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 offset loss of habitat and other adverse effects associated with the project.

Implementation of some 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 will address their adverse effects to the desert tortoise in future project-specific section 7 consultations.

### **Miscellaneous Effects**

Indirect effects associated with construction, operation, maintenance, and decommissioning of the ISEGS facility 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. Ivanpah Valley currently supports numerous facilities that subsidize common ravens (e.g., water sources, trash, road-killed animals, nest and roost sites, etc.); these facilities are associated with established communities (i.e., Primm, Nevada and Nipton, California), golf courses, an interstate highway, and utility lines that are likely to elevate the level of predation of desert tortoises by common ravens within the action area. Construction and operation of the ISEGS facility has the potential to attract additional common ravens and increase predation in the action area. BrightSource has proposed numerous measures to address predation by common ravens associated with the project site. These measures include subsidy control, a monitoring program, and contingencies for removal of problem common ravens. In addition, BrightSource will provide funds for implementation of regional management actions for common ravens.

We cannot reasonably predict the amount of predation by common ravens that construction and operation of this project is likely to add to baseline levels within the action area, but we anticipate that the program proposed by BrightSource is likely to be effective in eliminating some, but not all, common raven use of the project site. 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.

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 Ivanpah Valley, numerous features serve as vectors for infestation of the action area by non-native plant species (e.g., highways, cattle allotment). However, construction and operation of the ISEGS 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 operations personnel is likely to increase the volume and distribution of non-native seed carried into the action area. The

increased abundance in non-native species associated with this project may result in an increased fire risk, which may result in future habitat loss.

BrightSource has proposed numerous measures to address control of non-native plant species within the project site. We cannot reasonably predict the increase in non-native species abundance that this project will create within the action area, but we anticipate that the program proposed by BrightSource will be reasonably effective in reducing the increase in some species. However, BrightSource has not proposed any measures to control species, such as red brome, that are ubiquitous in the area. Increases in the abundance of this species elevate the risk of fire, which, in turn, heightens the risk of future habitat loss, which could reduce the number and distribution of desert tortoises within the action area. We anticipate that BrightSource's use of herbicides in control of weeds would have minimal effects because these herbicides would be used within fenced areas that do not contain desert tortoises.

### **Summary of Effects**

Prior to construction of the ISEGS facility, we estimate that BrightSource would capture and translocate approximately 32 subadult and/or adult desert tortoises from project worksites. We anticipate that they will translocate few, if any, juvenile desert tortoises. Because BrightSource will implement a variety of measures to reduce stress to these animals, we do not anticipate that injury or mortality will result from handling of these animals. We anticipate that disease screening associated with the translocation effort will result in the improper removal of few, if any, desert tortoises with false positive ELISA test results. Following release of translocated animals, we anticipate that approximately 30 percent (i.e., 10 subadult and/or adult desert tortoises) will die due to predation, exposure, fire, disease, crushing by cattle, road kills, or flooding. Most of this mortality is likely to occur in the first year after release, during the period that translocated animals are making long-distance movements and attempting to establish new home ranges. In addition, some resident desert tortoises in the translocation areas are likely to die due to the same causes of mortality. We have concluded that mortality rates within the resident and translocated populations are unlikely to be above what they would experience in the absence of translocation, and we do not anticipate that post-translocation mortality will actually be caused by the act of moving desert tortoises. If post-translocation monitoring indicates elevated levels of mortality in resident and translocated populations, re-initiation of consultation may be required to address this unanticipated effect.

We also anticipate that BrightSource may have to quarantine and collect blood from the 32 translocated animals and collect additional blood samples from 32 control animals and up to 98 resident desert tortoises to assess disease. Some potential exists that collection of blood from some of these individuals could result in injury, if done improperly. However, we anticipate that the number of desert tortoises that may be injured would be minimal because BrightSource would use experienced biologists authorized by the Service to perform these activities.

In addition to the 32 translocated desert tortoises that BrightSource would attach transmitters to and monitor following release, we estimate that they will attach transmitters to and monitor an

additional 32 resident and 32 control animals. We do not anticipate that placing transmitters on these animals or periodic handling for the purposes of monitoring will result in substantial adverse effects because BrightSource will use experienced biologists, approved by the Service, and approved handling techniques.

Because BrightSource will surround the majority of its work areas with desert tortoise exclusion fencing, perform clearance surveys on all work areas, and implement numerous measures to prevent injury and mortality of desert tortoises, we anticipate that construction of the ISEGS project site, including use of access routes, is likely to kill or injure few subadult and adult desert tortoises. Because of the difficulty detecting them, we estimate that project implementation may kill or injure up to 35 juvenile desert tortoises. We also anticipate that project construction will destroy any desert tortoise eggs within work areas; some eggs may be detected and moved to a translocation area, but most are unlikely to be found. Given the numerous variables discussed in this section, we cannot predict the precise number of eggs with any certainty.

Following construction, we do not anticipate that operations, maintenance, or restoration and reclamation activities within the permanently fenced portions of the ISEGS facility or regular access to the ISEGS facility along Colosseum Road will injure or kill desert tortoises. Because BrightSource would implement numerous protective measures, restoration activities in unfenced work areas are unlikely to injure or kill desert tortoises. We cannot accurately predict the number of desert tortoises that most Class II maintenance activities would kill or injure outside of the fenced project site because we do not have sufficient information to predict the location, frequency, or magnitude of these actions. However, Class I activities and Class II maintenance activities associated with fence repair would kill or injure few, if any, desert tortoises because of the nature of these activities and the protective measures that BrightSource would implement.

Project development will result in 3,297.03 acres of long-term/permanent disturbance to desert tortoise habitat. Although all of this area, except for the permanent facilities (i.e., SCE substation and gas metering stations), will undergo restoration/reclamation work, it is unlikely to serve as suitable desert tortoise habitat for many years following facility closure. We cannot predict the amount of time required to return areas of long-term disturbance to suitable desert tortoise habitat because of numerous variables associated with restoration success, including the timing and amount of rainfall. We estimate that BrightSource will return an additional 285.4 acres of short-term disturbance to suitable desert tortoise habitat by the end of the 45-year project lifespan.

Construction, operation, maintenance, and decommissioning of the ISEGS facility have the potential to increase common raven predation on desert tortoises within the action area. In addition, this project is likely to result in an increased abundance of non-native plant species and a subsequent increase in fire frequency within the action area. The measures proposed by BrightSource to address these threats will reduce the magnitude of these effects, but some level of adverse effect will likely persist. We cannot reasonably predict the number of desert tortoises that these threats will adversely affect.

The compensation required by the Bureau would, to some degree, offset the adverse effects of the proposed solar power facility. All of the actions that would be undertaken as compensation are consistent with recommendations for recovery of the desert tortoise. However, the lack of specificity with regard to which actions will be implemented, the uncertainty of success of the actions, and the time lag between implementation of the conservation actions and a substantive effect on recovery of the desert tortoise prohibit us from concluding that the compensation measures would completely offset the adverse effects of the solar facility. Because of the long term or permanent loss of approximately 3,297 acres of desert tortoise habitat, the project will likely result in a net decrease in desert tortoise habitat.

To conclude, areas disturbed by the proposed solar facility and its ancillary features would no longer support reproduction of desert tortoises. Most of the desert tortoises that currently reside within these areas will likely continue to reproduce after translocation. Consequently, we anticipate that the proposed action will not appreciably diminish the reproductive capacity of the species.

Implementation of the proposed action would not appreciably reduce the number of desert tortoises in the Northeastern Mojave Recovery Unit. Based on the amount of modeled desert tortoise habitat (7,583.39 square miles) and the average density (4.4 desert tortoises per square mile) that the Service has estimated for this recovery unit, we estimate that approximately 33,367 subadult and/or adult desert tortoises occur in the Northeastern Mojave Recovery Unit. Using the conservative estimate of the amount of remaining modeled habitat (i.e., 3,323 square miles; see the Effects of the Action - Effects of Loss of Habitat section of this biological opinion), we estimate that approximately 15,652 subadult and/or adult desert tortoises reside within the Northeastern Mojave Recovery Unit. Using this estimate and the information and methods described above for estimating the number of juvenile desert tortoises and eggs within the project site, action area, and translocation area, we estimate that the Northeastern Mojave Recovery Unit may contain approximately 16,422 juvenile desert tortoises in at any given time. Reproductive females within the Northeastern Mojave Recovery Unit may produce as many as 134,733 desert tortoise eggs over the course of a year. Consequently, we conclude that the number of desert tortoises and eggs that are likely to be lost as a result of the ISEGS project comprises a relatively small portion of the overall population in the Northeastern Mojave Recovery Unit.

In previous consultations, we estimated the number of desert tortoises found in the desert wildlife management areas and critical habitat by multiplying the average density of animals found in these areas by their total size. For the numbers of desert tortoises outside of those areas, we used a density value of one-tenth of that estimated within desert wildlife management areas and critical habitat, which we multiplied by the estimated area of available desert tortoise habitat. We did not correct for areas that were unsuitable habitat in either case in these past consultation estimates. Because the method of estimating the number of desert tortoises we use in this biological opinion takes into account a conservative estimate of modeled desert tortoise habitat, we used the same average density across all areas of desert tortoise habitat for our estimate.

The distribution of the desert tortoise would be reduced by approximately 5 square miles, based on the amount of long-term and permanent disturbance associated with the proposed action. As we mentioned previously in the biological opinion, this loss comprises approximately 0.07 percent of the modeled habitat in the Northeastern Mojave Recovery Unit and approximately 0.15 percent of the modeled habitat if we use the conservative estimate discussed previously in this section. Although this loss of habitat is likely to increase fragmentation of habitat and decrease the overall sustainability of the portion of the recovery unit that is isolated by Interstate 15, Ivanpah Lake, Primm, Nevada, and the Clark Mountains, it will not appreciably reduce the amount of habitat available to the desert tortoise when considered in the context of the entire Northeastern Mojave Recovery Unit.

Although the effects of this project on desert tortoises are substantial, we do not anticipate that it will result in effects that appreciably reduce the current distribution, numbers, or reproduction of the overall population within the Northeastern Mojave Recovery Unit or range wide. We anticipate that the compensation programs (i.e., one proposed by the Bureau and the other approved by the California Energy Commission) will result in an increase in the amount of habitat that is managed for the conservation of this species and will result in many advances in the implementation of recovery actions. We anticipate that this compensation will offset many adverse effects associated with this project. Taking into consideration the compensation that is proposed, the lack of statistical trends in population size in this recovery unit, and considering the relative scale of the adverse effects in context with our current estimates of the species' status in the Northeastern Mojave Recovery Unit and range wide, we do not anticipate that construction of this project would appreciably reduce our ability to recover the desert tortoise.

#### 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 all of the land in the action area with the exception of two 640-acre sections owned by the State of California. There are no proposed, non-federal actions within these parcels.

#### CONCLUSION

After reviewing its status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise. We have reached this conclusion because:

1. Project activities are likely to directly kill few subadult and adult desert tortoises because BrightSource will implement numerous measures to reduce the potential that desert tortoises will occupy project work sites (i.e., clearance surveys, exclusion fencing, translocation, qualified biologists, desert tortoise monitors).

2. The number of desert tortoises injured and killed as a result of translocation will likely be small relative to the number of desert tortoises that occur within the Northeastern Mojave Recovery Unit and across the range of the species.
3. BrightSource will implement numerous measures to reduce the potential for increased predation by common ravens and spread of non-native plant species.
4. Current information from permanent study plots and line distance sampling does not document a statistical trend in adult desert tortoise densities in this recovery unit. Therefore, we have no information to indicate that the loss of a small number of individuals as a result of this project would appreciably reduce our ability to reach population recovery objectives for the desert tortoise in the Northeastern Mojave Recovery Unit.
5. This project would not result in loss of desert tortoise habitat in areas that the Bureau or other agencies have designated for intensive management to achieve conservation of desert tortoises.
6. Compensation requirements through the Bureau and California Energy Commission will result in an increase in the amount of existing habitat that is managed for the conservation of the desert tortoise and will likely lead to restoration of lost or degraded habitat within these areas.
7. Regional management actions are likely to aid in reducing common raven predation in a portion of the desert tortoise's range.

As we noted previously in this biological opinion, the analysis we conduct under section 79a)(2) of the Endangered Species Act must be conducted in relation to the status of the entire listed taxon. We based the analysis in this biological opinion within the context of the Northeastern Mojave Recovery Unit because of the wide range of the desert tortoises. Because we have determined that the effects of this action would not compromise the integrity of the Northeastern Mojave Recovery Unit or impede the survival or recovery of the desert tortoises in a measurable manner in this portion of its range, we have not extended the analysis of the effects of this proposed action to the remainder of the range of the Mojave population of the desert tortoise.

#### 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 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 intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior 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 intended as part 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 an incidental take statement.

The measures described in this document are non-discretionary. The Bureau has a continuing duty to regulate the activities covered by the incidental take statement in the biological opinion. If the Bureau fails to include the terms and conditions of this incidental take statement as enforceable conditions of its 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 its action and its impact on the desert tortoise to the Service as specified in the incidental take statement [50 *Code of Federal Regulations* 402.14(i)(3)].

#### *Translocation of Desert Tortoises*

We anticipate that the translocation of approximately 32 subadult /adult desert tortoises from project facilities (i.e., Ivanpah 1, 2, and 3 project sites, the CLA, and natural gas distribution line) would involve take, in the form of capture and harassment, of all of these individuals. We anticipate the translocation of few, if any, desert tortoises from the fiber-optic line or highway fence project sites. We emphasize that these numbers are estimates, based on the best available information. The number of individuals translocated may be somewhat higher or lower. We anticipate that few, if any, of these individuals will be injured or killed due to handling.

We cannot precisely quantify how many juvenile desert tortoises eggs that project activities would take because we do not know how successful surveyors will be in locating them. However, we have estimated that as many as 35 juvenile desert tortoises may be on the project site, based on the number of adults detected during pre-project surveys and information on desert tortoise demographics. We have also estimated that as many as 139 desert tortoise eggs may be produced on the project site each year. Based on our estimate that few, if any, subadult and adult desert tortoises would be in project work sites on the fiber-optic line and highway fence, we anticipate that these portions of the action area will contain few, if any, juveniles or eggs. We emphasize that these numbers are estimates, based on the best available information; the number of individuals may be somewhat higher or lower. Because of the difficulty in locating juvenile desert tortoises and desert tortoise eggs and because of the difficulty in determining what proportion of the total number of eggs might be on site at the time that construction occurs, we anticipate that the total number taken in the form of capture for translocation will be a small fraction of these numbers. Any individuals and eggs that are not captured would likely be killed or injured by construction activities. We have discussed injury and mortality of these individuals later in this section.

We do not anticipate that the post-translocation mortality rates for the resident and translocated population will be statistically greater than that of the control population. Consequently, we do not anticipate take associated with translocation aside from what we have described in this incidental take statement.

### *Disease Testing*

We anticipate that as many as 162 subadult and/or adult desert tortoises (i.e., 98, 32, and 32 in the resident, control, and translocated populations, respectively) will be taken, in the form of capture and harassment, when BrightSource collects blood to assess disease prevalence. Although such an invasive procedure presents some likelihood that individuals could be injured or killed, we do not anticipate that blood collection will result in the mortality of any individuals because BrightSource would use experienced biologists, authorized by the Service.

### *Post-translocation Monitoring*

We anticipate the take, in the form of capture, of approximately 64 desert tortoises each in the resident and control population for monitoring. As discussed above, because the project site population may increase between now and the time of translocation, a somewhat larger number of desert tortoises may require monitoring depending on the final number of desert tortoises translocated. Although these animals and the 32 desert tortoises from the translocated population would be captured multiple times over the course of the post-translocation monitoring effort, we do not anticipate injury or mortality of these individuals as a result of the post-translocation monitoring.

### *Construction of ISEGS Facilities*

We anticipate that construction of the ISEGS project site, including use of access routes, is likely to take, in the form of mortality or injury, few, if any, subadult or adult desert tortoises because BrightSource will fence the majority of its work areas with desert tortoise exclusion fencing, perform clearance surveys on all work areas, and implement numerous measures to prevent adverse effects to desert tortoises

We anticipate that construction of the ISEGS facilities is likely to take, in the form of mortality or injury, many of the juvenile desert tortoises and destroy eggs that occur within this area; because of the difficulty detecting them, these individuals and eggs are likely to be missed during clearance surveys. We have estimated that as many as 35 juvenile desert tortoises may be on the project site and that as many as 139 desert tortoise eggs may be produced on the project site each year. Because of the difficulty in locating juvenile desert tortoises and eggs, we cannot determine a precise number because we do not know how successful surveyors will be at locating these individuals.

### *Compensation*

All enhancement actions associated with the Bureau's compensation requirements will require future Bureau authorizations. Consequently, we have not provided incidental take exemptions for these actions in this biological opinion. These actions will require future project-specific consultation if they may affect the desert tortoise or other listed species.

*Operation and Maintenance of ISEGS Facilities*

We anticipate that operation and maintenance activities, including site access, within permanently fenced areas are likely to take few desert tortoises. A limited potential exists that a very small number of desert tortoises may find their way into a fenced area. Most of these individuals are likely to be taken in the form of capture as they are removed to offsite habitat; a small fraction of these individuals may be taken, in the form of injury or mortality, if they are exposed to adverse weather conditions or crushed by vehicles before they are detected.

We anticipate that Class I maintenance activities that are outside of fenced work areas and Class II maintenance activities associated with fence repair are likely to take, in the form of injury or mortality, few, if any, desert tortoises because Class I activities would not result in ground disturbance, Class II activities would be localized and infrequent, and access to repair sites would require little, if any, off-road travel. In addition, for all maintenance work, BrightSource would implement numerous protective measures to avoid killing or injuring desert tortoises. We anticipate that these maintenance activities may result in the take, in the form of capture, of a small number of desert tortoises if they are encountered during work activities and moved from harm's way.

Because we do not have sufficient information regarding the location or extent of other Class II and Class III maintenance activities that may occur outside of the permanently fenced work areas, we cannot determine the level of take associated with these activities. Consequently, we cannot provide an exemption from the prohibitions against take for these activities. These actions will require further site-specific or programmatic consultation.

*Decommissioning and Restoration of ISEGS Facilities*

We anticipate that restoration of temporary disturbance within fenced facilities during operation and maintenance or following decommissioning is unlikely to result in take of desert tortoises because BrightSource will clear all fenced areas of desert tortoises prior to construction of facilities. After facility closure, decommissioning activities and restoration of long-term disturbance within fenced areas are unlikely to take desert tortoises for the same reason. We anticipate that restoration of temporary disturbances and long-term disturbances outside of fenced work areas is likely to take, in the form of injury or mortality, few, if any, desert tortoises for the following reasons: 1) desert tortoise habitat will either be absent from restoration sites or will be of a substantially degraded nature that it will not attract desert tortoises; 2) BrightSource will implement clearance surveys of any restoration sites where ground-disturbing activities are likely to occur, 3) BrightSource will implement numerous measures to reduce the potential for take on restoration sites (e.g., worker education, desert tortoise monitors, etc.). We anticipate that a few desert tortoises are likely to be taken, in the form of capture as they are moved out of harm's way, during these activities. Because much of this work would occur many years from now, we cannot quantify the number of animals that are likely to be taken.

## REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of desert tortoises during the implementation of the ISEGS project:

1. The Bureau must ensure that desert tortoises do not enter fenced project facilities.
2. The Bureau must ensure that the level of incidental take anticipated in this biological opinion is commensurate with the analysis contained herein.
3. The Bureau must ensure that translocation of desert tortoises does not result in injury or mortality of translocated or resident desert tortoises that is substantially elevated above natural injury and mortality rates within the action area.
4. The Bureau must ensure that desert tortoises carrying transmitters are routinely monitored to prevent loss of these animals prior to the removal of transmitters.
5. The Bureau must ensure that the ISEGS facility does not serve as a subsidy to common ravens.
6. The Bureau must ensure that desert tortoises that exhibit clinical signs of disease are not translocated.
7. The Bureau must ensure the proper implementation of health assessments and disease testing to ensure the accuracy of results and to minimize the injury of desert tortoises.
8. The Bureau must ensure that translocation does not result in density-dependent effects or disease related effects to the resident or translocated populations.

Our evaluation of the proposed action includes consideration of the protective measures described 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 comply with the following terms and conditions, which implement the reasonable and prudent measures described in the previous section, or make them enforceable conditions of its right-of-way grant, and must comply with the reporting and monitoring requirements. These conditions are non-discretionary.

1. The following term and condition implements reasonable and prudent measure 1:

The Bureau must ensure that BrightSource monitors the integrity of all desert tortoise exclusion fencing at least once a month and following any rain events that result in surface flow of water in washes within the action area. The Bureau must ensure that BrightSource promptly repairs any damage identified during monitoring.

2. The following terms and conditions implement reasonable and prudent measure 2:

- a. To ensure that the measures proposed by the Bureau and BrightSource are effective and are being properly implemented, the Bureau must contact the Service immediately if it becomes aware that a desert tortoise has been killed or injured by project activities. At that time, the Service and the Bureau must review the circumstances surrounding the incident to determine whether additional protective measures are required. Project activities may continue pending the outcome of the review, provided that the proposed protective measures and any appropriate terms and conditions of this biological opinion have been and continue to be fully implemented.
- b. If more than 38 subadult or adult desert tortoises are identified for translocation during clearance surveys of the project site, the Bureau must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action. This condition only applies to clearance of the project site for construction and does not apply to the short distance movement of desert tortoises out of harm's way during activities that occur outside of the fenced project site. Because we do not expect that capturing and removing desert tortoises from work areas outside of the project site is likely to result in injury or mortality of desert tortoises, we are not establishing a re-initiation criterion for that activity.
- c. If 9 desert tortoises are killed or injured as a result of any construction, operation, maintenance, decommissioning, or restoration activities covered by this biological opinion over the life of the ISEGS project, the Bureau must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action. This term and condition also applies to direct mortality and injury of desert tortoises during translocation and post-translocation monitoring on the resident, control, and translocated populations (i.e., due to handling, road kills, or other effects caused by personnel working on the project). However, it does not apply to post-translocation mortality within these populations that is not connected directly to an action required to carry out the translocation and monitoring effort.
- d. If 3 desert tortoises are killed or injured in any 1 year as a result of any construction, operation, maintenance, decommissioning, or restoration activities covered by this biological opinion, the Bureau must re-initiate consultation, pursuant to the implementing

regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action. This term and condition also applies to direct mortality and injury of desert tortoises during translocation and post-translocation monitoring on the resident, control, and translocated populations (i.e., due to handling, road kills caused by personnel working on the project). However, it does not apply to post-translocation mortality within these populations that is not connected directly to an action required to carry out the translocation and monitoring effort.

3. The following term and condition implements reasonable and prudent measure 3:

If monitoring of translocated and resident desert tortoises indicates a statistically significant elevation in mortality rates above that observed in control populations, the Bureau must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16, on the proposed action.

4. The following terms and conditions implement reasonable and prudent measure 4:

- a. The Bureau must ensure that BrightSource monitors all translocated desert tortoises according to the following schedule: 1) within 24 hours of release, 2) twice weekly for the first 2 weeks after release, 3) starting the third week after release, at least once a week from March 1 to October 31 and once every other week from November 1 to February 28.
- b. The Bureau must ensure that BrightSource monitors all desert tortoises that carry transmitters in the resident and control populations at least once a week from March 1 to October 31 and once every other week from November 1 to February 28.

5. The following term and condition implements reasonable and prudent measure 5:

The Bureau must meet with the Service to review data and reports associated with BrightSource's monitoring and adaptive management program for common ravens prior to the cessation of these activities. If the agencies determine that further monitoring and adaptive management are warranted, the Bureau must require BrightSource to extend these activities.

6. The following term and condition implements reasonable and prudent measure 6:

After performance of visual health assessments on project-site desert tortoises, the Bureau must ensure that BrightSource contacts the Service with the results of the health assessments and the proposed disposition of each individual. The Bureau must ensure that BrightSource receives authorization for translocation of these individuals from the Service prior to commencement of translocation.

7. The following term and condition implements reasonable and prudent measure 7:

The Bureau must ensure that all individuals that will perform visual health assessments and blood collection have been specifically authorized or trained for that activity by the Service. The Service must receive the credentials for all individuals seeking approval at least 30 days prior to the need for visual health assessments and blood collection.

8. The following terms and conditions implement reasonable and prudent measure 8:

- a. If pre-translocation surveys of the translocation area indicate that it cannot accommodate all desert tortoises from the ISEGS project under the threshold established in the description of the proposed action, the Bureau must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16 to address modifications to the translocation plan.
- b. If pre-translocation surveys of the translocation areas indicate a disease prevalence of more than 5 percent or indicates that additional translocation areas will be required to accommodate the disease buffering requirements identified in the description of the proposed action, the Bureau must re-initiate consultation, pursuant to the implementing regulations for section 7(a)(2) of the Endangered Species Act at 50 Code of Federal Regulations 402.16 to address modifications to the translocation plan.
- c. The Bureau must ensure that BrightSource performs disease sampling of all areas that desert tortoises may move to following translocation as described in the Environmental Baseline section of this biological opinion (i.e., area bounded by Interstate 15, the Clark Mountains, Ivanpah Lake, and Primm, Nevada), as opposed to the 6 kilometer buffer identified in the project description.

Because of the complex nature of this incidental take statement, we have attached a summary of the levels of incidental take that would necessitate re-initiation of formal consultation.

#### REPORTING REQUIREMENTS

Within 60 days of the completion of the proposed action, the Bureau must provide a report to the Service that provides details on the effects of the action on the desert tortoise. The Bureau must also provide an annual report by December 31 of each year during construction of each phase and during the subsequent translocation monitoring. Specifically, these reports must include information on the effectiveness and practicality of minimization measures, any instances when desert tortoises were killed, injured, or handled; the circumstances of such incidents and the specific information for each animal; and any actions undertaken to prevent similar instances from re-occurring. In addition, these reports should provide detailed information on the results of translocation monitoring to include the following: 1) location of all desert tortoises carrying transmitters, 2) mortality rate from each population, 3) statistical analysis of mortality rate between all three populations, and 4) health status and body condition of all desert tortoises that

carry transmitters. These reports should also provide an estimate of the actual acreage disturbed by various aspects of the construction and operation up to the time of the report. We recommend that the Bureau provide us with any recommendations that would facilitate the implementation of the protective measures while maintaining protection of the desert tortoise. We also request that the Bureau provide us with the names of any monitors who assisted the authorized biologist and an evaluation of the experience they gained on the project; the qualifications form on our website ([http://www.fws.gov/ventura/sppinfo/protocols/deserttortoise\\_monitor-qualifications-statement.pdf](http://www.fws.gov/ventura/sppinfo/protocols/deserttortoise_monitor-qualifications-statement.pdf)), filled out for this 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.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act 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 work with BrightSource and the Service to determine if the desert tortoises associated with the resident, control, and translocated populations can be used to answer additional research questions related to translocation or desert tortoise biology.
2. We recommend that the Bureau amend the California Desert Conservation Area Plan to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within the area bounded by Interstate 15, the State line, and Clark Mountains. We offer this recommendation because this area will have been used as a recipient site for translocated desert tortoises from the ISEGS project. Additionally, three other projects, the Joint Port of Entry, DesertXpress, and a pipeline extension from the Kern River Gas Transmission Company's line may be built in this valley. Given these activities, the potential exists that this portion of the Ivanpah Valley may be disturbed and fragmented to the extent that desert tortoises and other wildlife populations may be severely compromised.
3. We recommend that the Bureau perform additional wild burro gathers in the former Clark Mountain Herd Management Area to remove remaining burros that may adversely affect habitat within translocation areas.
4. Based upon our review, certain aspects of the weed management plan may result in an inefficient use of resources. We recommend that the Bureau and BrightSource work with the Mojave Resource Conservation District to develop a site-specific weed management plan that would be effective and efficient.

5. We recommend that the Bureau consider alternative configurations for this project that would focus ground disturbance on lands next to Interstate 15 that are likely to have very low desert tortoise densities.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

#### DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Within 3 days of locating any dead or injured desert tortoises, you must notify the Ventura Fish and Wildlife Office by telephone (805 644-1766) and by facsimile (805 644-3958) or electronic mail. The report must include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

We will advise you on the appropriate means of disposing of the carcass when you contact us. We may advise you to provide it to a laboratory for analysis. Until we provide information on the disposition of the carcass, you must handle it such that the biological material is preserved in the best possible state for later analysis. If possible, the carcass should be kept on ice or refrigerated (not frozen) until we provide further direction.

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

#### REINITIATION NOTICE

This concludes formal consultation on the Bureau's proposal to issue a right-of-way grant to BrightSource Energy for construction of the ISEGS facility in San Bernardino County, California. Reinitiation of formal consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 Code of Federal Regulations 402.16).

If you have any questions regarding this biological opinion, please contact Brian Croft of my staff at (951) 697-5365.

Attachment

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## Summary of Levels of Take that Necessitate Re-initiation of Formal Consultation

The following table summarizes the incidental take that we anticipate for the ISEGS project and identifies re-initiation thresholds for capture, harassment, injury, and mortality as defined in the body of the incidental take statement or in the terms and conditions of this biological opinion.

Source of Take	Age Class	Anticipated Take		Re-initiation Thresholds based on Incidental Take Statement or Terms and Conditions	
		Captured and/or Harassed	Killed or Injured	Captured and/or Harassed <sub>1</sub>	Killed or Injured
Translocation and Disease Testing of Project Site Desert Tortoises	Subadult/Adult	~32	few, if any	38 <sub>2</sub>	9 desert tortoises over the life of the project or 3 in any given year <sub>5</sub>
	Juveniles	few, if any	few, if any	35 <sub>2</sub>	
	Eggs	few, if any	few, if any	139 <sub>2</sub>	
Movement of desert tortoises off of the fiber-optic line and Interstate 15 fence alignment	Subadult/Adult	few, if any	few, if any	None established <sub>3</sub>	
	Juveniles	few, if any	few, if any	None established <sub>3</sub>	
	Eggs	few, if any	few, if any	NA	
Survey and Disease Testing of Control and Resident Population	Subadult/Adult	130 <sub>4</sub>	few, if any	130	
	Juveniles	0	0	NA	
	Eggs	0	0	NA	
Construction of ISEGS Facility	Subadult/Adult	few, if any	few, if any <sub>6</sub>	38 <sub>2</sub>	
	Juveniles	few, if any	Most <sub>6</sub>	35 <sub>2</sub>	
	Eggs	few, if any	Most <sub>6</sub>	13 <sub>2</sub>	
Operation and Maintenance	Subadult/Adult	few, if any	few, if any	None established <sub>7</sub>	
	Juveniles	few, if any	few, if any	None established <sub>7</sub>	
	Eggs	few, if any	few, if any	None established <sub>7</sub>	
Post-translocation Monitoring	Subadult/Adult	96 <sub>8</sub>	few, if any	None established <sub>3</sub>	
	Juveniles	0	0	NA	
	Eggs	0	0	NA	
Effects of Translocation itself on Residents and Translocated desert tortoises	NA	NA	NA	NA	A statistically significant difference in mortality between the control and resident or translocated populations <sub>10</sub>
	NA	NA	NA	NA	
	NA	NA	NA	NA	
Decommissioning	Subadult/Adult	few, if any	few, if any	None established <sub>2</sub>	9 desert tortoises over the life of the project or 3 in any given year <sub>5</sub>
	Juveniles	few, if any	few, if any	None established <sub>2</sub>	
	Eggs	few, if any	few, if any	NA	

Table Notes:

1. By 'capture,' we mean the act, by authorized biologists (and monitors working under their supervision), of removing desert tortoises from their home ranges to be placed in a quarantine facility, translocated, or moved a short distance from harm's way. By 'harassment,' we mean the act, by authorized biologists, of collecting blood or conducting other invasive health assessments that may result in the likelihood of injury or mortality; see the regulatory definition of harassment in the Incidental Take Statement section of this biological opinion.
2. The re-initiation thresholds identified are the totals for both sources of take and do not represent separate take thresholds for each activity. For example, although we anticipate that 32 subadult and adult desert tortoises are likely to be captured for translocation at the project site, we have established a re-initiation trigger of 38 because we have determined this is the maximum number of subadult and adult desert tortoises that the recipient site is likely to be able to hold. If 38 or more subadult and adult desert tortoises are found onsite, re-initiation of formal consultation would be warranted.
3. No re-initiation trigger is set because this movement not likely to result in injury or mortality, given that these animals will remain within their home ranges. Also, a very small number of desert tortoises may need to be moved more than once to remove them from unfenced work areas and constraining the number of times the animal can be captured and moved would reduce the effectiveness of biological monitoring as a take minimization measure on these actions.
4. The 130 subadults and adults include 98 resident individuals and 32 control individuals.
5. Does not apply to post-translocation mortality that is not directly associated with an action required to carry out the translocation (e.g., handling, disease testing, accessing the translocation areas by vehicle, etc.).
6. We anticipate that any desert tortoises and eggs that are not translocated will be killed or injured by construction. We anticipate that few, if any, subadults and adults will be killed or injured because most will have been translocated. Because of their small size, juveniles and eggs are difficult to detect, so we anticipate that most will be killed or injured.
7. No re-initiation trigger because we only anticipate the capture of desert tortoises during operation and maintenance in instances where desert tortoise exclusion fencing has been washed out. In such rare situation, the biologically preferable option is to move the desert tortoises out of harm's way rather than leave them in place and in danger, while awaiting re-initiation of consultation.
8. Includes all control and translocated individuals identified above for capture and harassment associated with disease testing and translocation and a subset (32 individuals) of the resident population identified above. These individuals would be captured multiple times over the course of the post-translocation monitoring period, but we do not anticipate that these individuals would suffer harassment.
9. No re-initiation threshold set because multiple captures of the same individuals will be required to facilitate post-translocation monitoring.
10. For post-translocation monitoring only.

**Attachment C**  
**BLM Right-of-Way Grant Conditions**

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The BLM Right-of-Way Grant Conditions will be inserted once they are finalized.



**Attachment D**  
**Best Management Practices (BMPs) from the**  
**Stormwater Pollution Prevention Plan (SWPPP)**

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The SWPPP BMPs will be inserted once the SWPPP is approved and finalized.



**Attachment E**  
**High-resolution Aerial Photos (Pre-construction)**



A CD of pre-construction aerial photos has been included in this document. They are at 0.5-foot pixel resolution.



**Attachment BIO-1**  
**Resumes of Designated Biologists, Approved**  
**Biologists and Biological Monitors**

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Resumes of the Designated Biologists, Approved Biologists and Biological Monitors will be inserted once approved by the resource agencies.

Included is a chart showing which resumes have been approved by which agencies. It is current as of October 6, 2010.



**Ivanpah SEGS BIO-1 and BIO-3  
BIOLOGIST RESUMES SUBMITTED 9-27-2010**

Approval of these biologists is critical to being able to perform tortoise clearances in the window designated in the Ivanpah BO

	Name	Proposed as:			Approved by:			
		Designated Biologist	Authorized Biologist	Biological Monitor	CEC	BLM	USFWS	CDFG
1	Peter Woodman		X	X	X	X	X	X
2	Mercy Vaughn		X	X	X	X	X	X
3	Steve Boland		X	X	X	X	X	X
4	Leslie Backus			X	X	X		X
5	Wayne Ball			X	X	X		X
6	John Barratt			X	X	X		X
7	Mike Bassett			X	X	X		X
8	Angie Bates			X	X	X		X
9	Bret Blosser			X	X	X		X
10	Bill Boarman			X	X	X		X
11	James Borgemeyer			X	X	X		X
12	Jim Buffington			X	X	X		X
13	Sage Clegg-Haman			X	X	X		X
14	Crystal Cogar			X	X	X		X
15	Rich Crawford			X	X	X		X
16	Imogen Daly			X	X	X		X
17	Jennie Dear			X	X	X		X
18	Gene Drollinger			X	X	X		X
19	DeVon Eckenstam			X	X	X		X
20	David Focardi			X	X	X		X
21	Paul Fuchs			X	X	X		X
22	Cynthia Furman		X	X	X	X	X	X
23	Gilbert Goodlett			X	X	X		X
24	Glen Goodlett			X	X	X		X
25	Bill Hasskamp		X	X	X	X	X	X
26	Mary Ann Hasskamp		X	X	X	X	X	X
27	Craig Himmelwright			X	X	X		X
28	Josh Holloway			X	X	X		X
29	Thomas G. Jackson, Jr.			X	X	X		X
30	Nathan Jones			X	X	X		X
31	George Keyes Jr.			X	X	X		X
32	Shawn Lindey			X	X	X		
33	Chandra Llewellyn			X	X	X		X
34	Colden McClurg			X	X	X		X
35	Theresa Magart			X				
36	Jay Meyers			X	X	X		X
37	Wendy Middleton			X	X	X		X
38	Leif Mjos			X				
39	Gerald Monks			X	X	X		X

**Ivanpah SEGS BIO-1 and BIO-3  
BIOLOGIST RESUMES SUBMITTED 9-27-2010**

Approval of these biologists is critical to being able to perform tortoise clearances in the window designated in the Ivanpah BO

	Name	Proposed as:			Approved by:			
		Designated Biologist	Authorized Biologist	Biological Monitor	CEC	BLM	USFWS	CDFG
40	Brenden Nosratbakhsh			X	X	X		X
41	Laura Pavliscak			X	X	X		X
42	Dave Prival			X	X	X		X
43	Bryan Reiley		X	X	X	X	X	X
44	Jessica Reilly			X	X	X		X
45	Lorinda Rose			X	X	X		X
46	Amanda Scheib			X	X	X		X
47	Tracy Scott			X	X	X		X
48	Barrett Scurlock			X	X	X		X
49	Gretchen See			X	X	X		X
50	Jacquelyn Smith		X	X	X	X	X	X
51	Ashley Spenceley			X	X	X		X
52	Lindsay Spenceley			X	X	X		X
53	Nicole Stephens			X	X	X		X
54	Melinda Stevens			X	X	X		X
55	Myles Traphagen			X	X	X		X
56	Jeff Valentine			X	X	X		X
57	Randall Watkins			X	X	X		X
58	Jennifer C. Weidensee			X	X	X		X
59	Bruce Weise			X	X	X		X
60	Nancy Wiley			X	X	X		X
61	Elizabeth (Betsy) Wirt			X	X	X		X
62	Rachel Woodard			X	X	X		X
63	Erin Zylstra			X	X	X		X
64	Tom Bartels			X	X	X		X
65	Jennifer Brouwer			X		X		X
66	Mark Brouwer			X		X		X
67	LaDeana Jean			X				
68	Christine Stirling			X	X	X		X

**Ivanpah SEGS BIO-1 and BIO-3  
BIOLOGIST RESUMES SUBMITTED 9-27-2010**

Approval of these biologists is critical to being able to perform tortoise clearances in the window designated in the Ivanpah BO

	Name	Proposed as:			Approved by:			
		Designated Biologist	Authorized Biologist	Biological Monitor	CEC	BLM	USFWS	CDFG
<b>Newly Added Resumes</b>								
69	Ed Larue ?			x	x	x		x
70	Robin Llewellyn ?			x	x	x		x
71	Danna Hinderle?			x		x		x
72	Brett DeGregorio?			x		x		x
73	Scott Hillard?			x		x		x
74	Alain d-Epremesnil?			x		x		x
75	Chris Halley?			x		x		x
76	Cathy Halley?			x		x		x
77	Max Pavelka?			x		x		x

**BACK UP BIOLOGISTS**

	Name	Proposed as:			Approved by:			
		Designated Biologist	Authorized Biologist	Biological Monitor	CEC	BLM	USFWS	CDFG
1	Mobraaten, Kristen			x	x	x		
2	Whitfield, Erin			x	x	x		x
3	Edwards, Jennifer			x	x	x		
4	Frost, Alana	x						
4	Schuster, Sara			x	x	x		
5	Garlinger, Bruce			x	x	x		x
6	LaBerteaux, Denise			x	x	x		x
7	Hart, Brooks			x	x	x		x
8	Young, Ryan			x	x	x		x



**Attachment BIO-6  
Worker Environmental Awareness Program  
(WEAP)**

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The WEAP booklet covering biological activities will be inserted once it is approved by the CEC.



**Attachment BIO-9**  
**Desert Tortoise Translocation Plan**

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The Desert Tortoise Translocation Plan will be inserted once it is approved by the resource agencies

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**Attachment BIO-12**  
**Raven Management Plan**

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The Raven Management Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-13**  
**Weed Management Plan**

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The Weed Management Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-14**  
**Closure, Revegetation, and Rehabilitation Plan**

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The Closure, Revegetation, and Rehabilitation Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-16**  
**Burrowing Owl Mitigation and Monitoring Plan**



The Burrowing Owl Mitigation and Monitoring Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-18A  
Special-status Plant Protection  
and Monitoring Plan**

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The Special-status Plant Protection and Monitoring Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-18B**  
**Special-status Plant Remedial Action Plan**

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The Special-status Plant Remedial Action Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-19**  
**Bighorn Sheep Mitigation Plan**

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The Bighorn Sheep Mitigation Plan will be inserted once it is approved by the resource agencies.



**Attachment BIO-21**  
**Avian & Bat Monitoring and Mitigation Plan**

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The Avian and Bat Monitoring and Mitigation Plan will be inserted once it is approved by the resource agencies.

