



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

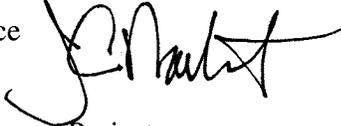
Ecological Services  
Carlsbad Fish and Wildlife Office  
6010 Hidden Valley Road, Suite 101  
Carlsbad, California 92011

In Reply Refer To:  
FWS-ERIV-09B0187-11F0244

JUN 02 2011

### Memorandum

To: Field Manager, Palm Springs-South Coast Field Office,  
Bureau of Land Management, Palm Springs, California

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

Subject: Section 7 Biological Opinion on the Palen Solar Power Project,  
Riverside County, California

This memorandum transmits our, the U.S. Fish and Wildlife Service (Service), biological opinion on the construction, operation, and maintenance of the proposed Palen Solar Power Project (project or PSPP) in Riverside County, California, and its effects on the federally threatened desert tortoise (*Gopherus agassizii*, "tortoise") and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation dated January 11, 2011, was received on January 14, 2011.

This biological opinion is primarily based on information provided in the following documents and communications: (1) the Bureau of Land Management/California Energy Commission's (BLM/CEC) joint *Staff Assessment and Draft Environmental Impact Statement* (DEIS), *Palen Solar Power Project* (BLM and CEC 2010); (2) the CEC's *Palen Solar Power Project Revised Staff Assessment* (CEC 2010a); (3) the Draft *Biological Assessment, Palen Solar Energy Project* (AECOM 2010a); (4) the CEC's *Palen Solar Power Project Commission Decision* (CEC 2010b); (5) pre-project desert tortoise survey reports (AECOM 2010b); (6) final and draft revised desert tortoise recovery plans (Service 1994a, 2008); (7) supplemental materials provided during the consultation process; (8) electronic transmissions from BLM and Palen Solar I (applicant); and (9) pertinent literature contained in our files. The project file for this consultation is located at the Carlsbad Fish and Wildlife Office (CFWO).

### Consultation History

The Service received a request from the applicant for information on endangered and threatened species near the proposed project on March 2, 2009, and began early informal consultation on this project. Between March 2009 and December 2010, the Service, BLM, CEC, California Department of Fish and Game (CDFG), and/or the applicant participated in numerous meetings



and conference calls regarding this project, including participating in CEC public workshops. The Service coordinated early with BLM, CEC, and CDFG on the development of measures in the CEC/BLM staff assessment/draft environmental impact statement to avoid, minimize, and offset impacts to the desert tortoise.

In preparing this biological opinion, we provided a draft project description to the BLM and applicant on January 14, and February 15, 2011, and we provided a draft biological opinion to the BLM on March 30, 2011. All comments received from the BLM and applicant were incorporated into this biological opinion as appropriate.

## **BIOLOGICAL OPINION**

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

The proposed action is the BLM's issuance of a right-of-way (ROW) grant to the applicant that will authorize construction, operation, maintenance, and decommission of a 500-megawatt (MW) commercial solar thermal electric power-generating facility within an approximately 2,109-hectare (ha) [5,212-acre (ac)] ROW managed by the BLM. The proposed project in Riverside County is approximately 16 kilometers (km) [10 miles (mi)] east of Desert Center and 0.80 km (0.5 mi) north of the Interstate 10 (I-10) corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar power plant site (plant site) and support facilities, an access road/utility corridor, and a generation-tie (gen-tie) transmission line.

The project includes a single alternative containing two possible solar field layouts (Layout 1 and Layout 2, see Figures 2a and 2b in AECOM 2010a). We are analyzing these two layouts in this biological opinion. The final layout will be dependent upon the ability of the applicant to acquire private land. Layout 1 consists of public land managed by BLM as well as 97 ha (240 ac) of private land that lies along the southern border of the project site, and that the project applicant does not own but may acquire and is referred to as Reconfigured Alternative 2 by the CEC (2010b). Layout 2 consists of public land managed by the BLM with the exception of approximately 16 ha (40 ac) of private land already controlled by the applicant, and is referred to as Reconfigured Alternative 3 by the CEC (2010b). Layout 1 will destroy approximately 1,764 ha (4,360 ac), of which approximately 1,698 ha (4,195 ac) is desert tortoise habitat. Layout 2 will destroy approximately 1,750 ha (4,324 ac) of which approximately 1,670 ha (4,127 ac) is desert tortoise habitat. The extent of tortoise habitat impacted by each layout and phase of construction is detailed in Table 1. Any non-emergency expansion of construction, operation, or maintenance activities into areas outside of the areas considered in this biological opinion will require BLM approval and tortoise clearance surveys, and may require reinitiation of consultation with the Service.

Figure 1. Palen Solar Energy Project location

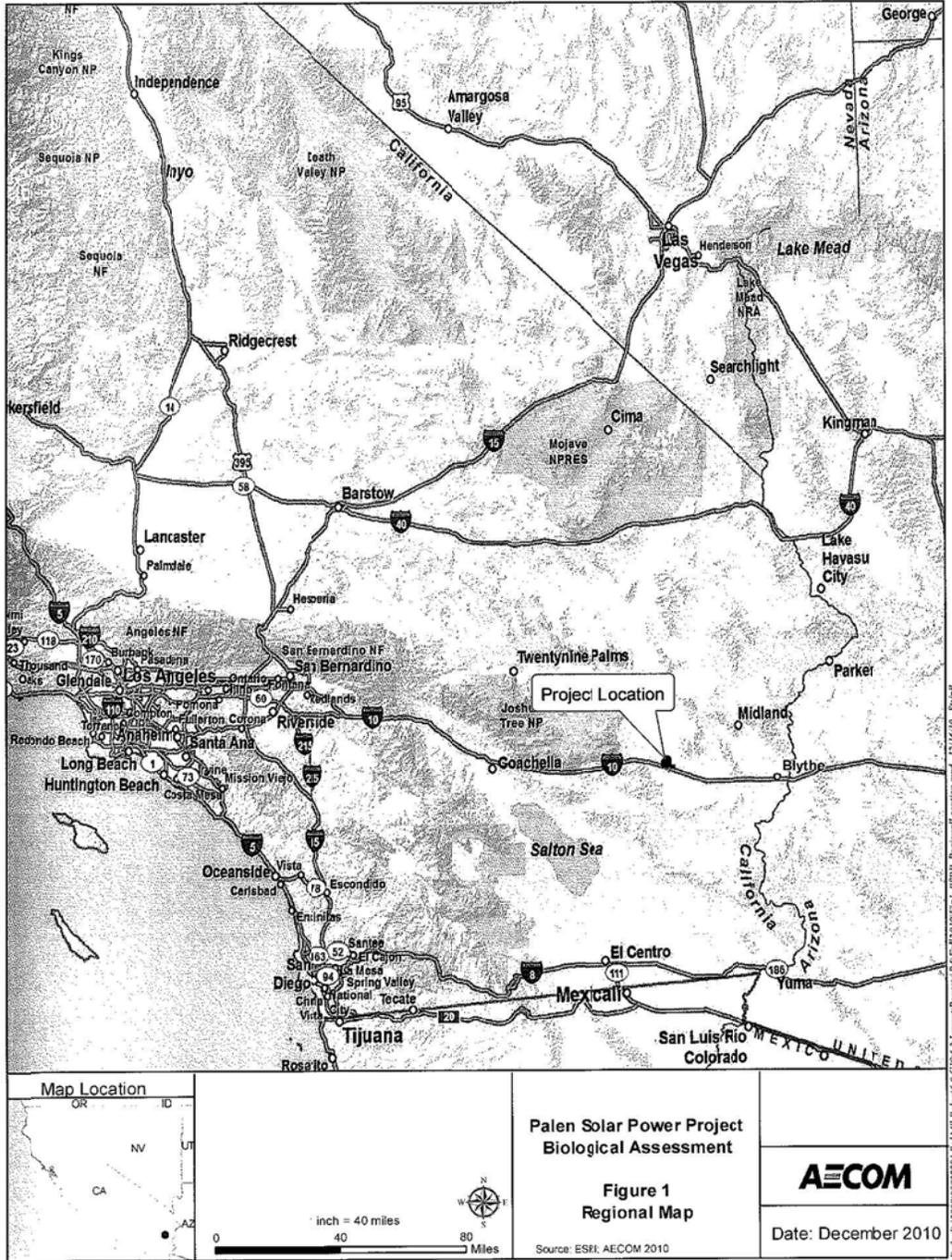


Table 1. Extent of desert tortoise habitat impacted by each layout and phase of construction of the Palen Solar Power Project.

	Layout 1		Layout 2	
	Phase 1	Phase 2	Phase 1	Phase 2
desert tortoise critical habitat	91 ha (225 ac)	0	91 ha (225 ac)	0
desert tortoise habitat (outside critical habitat)	856 ha (2,115 ac)	751 ha (1,855 ac)	797 ha (1,969 ac)	782 ha (1,933 ac)
Phase 1 and 2 totals	947 ha (2,340 ac)	751 ha (1,855 ac)	888 ha (2,194 ac)	782 ha (1,933 ac)
Layout 1 and 2 totals	1,698 ha (4,195 ac)		1,670 ha (4,127 ac)	

Note: Values based on "BIO-29 Table 1" in CEC (2010b) and rounded to nearest whole number.

### *Construction*

Project construction is expected to occur over a total of 39 months. Project construction will require an average of 566 employees over the entire construction period, with work force requirements peaking at approximately 1,145 workers in month 17 of construction.

The proposed project will use solar parabolic trough technology to generate a nominal output of 500 MW of electricity. Arrays of parabolic mirrors will collect heat from the sun then warm the heat transfer fluid (HTF) in the solar field piping. Through a series of heat exchangers, heat is released to generate high-pressure steam that will then be fed to a steam turbine generator to generate electricity. The units will be developed in phases, with construction scheduled to begin in 2011 on a portion of the first unit (see phasing discussion below). See CEC (2010b) and AECOM (2010a) for a detailed project description.

### Solar Power Plant and Support Facilities

The plant site will consist of two independent 250-MW power units (Units 1 and 2; see Figures 2a and 2b in AECOM 2010a). Each unit will have its own solar field, composed of piping loops arranged in parallel groups, and its own power block, centrally located within the solar field. Each unit will also have its own HTF pumping and freeze-protection system, liquid propane gas storage tank, solar steam generator, steam turbine generator, an air-cooled condenser for cooling, transmission lines and related electrical system, support equipment, including water treatment system, emergency generators, and two 2-ha (4-ac) evaporation ponds. The plant site will also include office and warehouse/maintenance buildings, concrete batch plant, enclosed water storage tanks, fuel depot, assembly hall, parking areas, and equipment/materials laydown areas. The entire plant site, including support facilities, will be secured with a combination of chain link and wind fencing. Chain-link metal fabric security fencing will consist of 2-meter (m) [8-foot (ft)] tall fencing with 0.3 m (1 ft) barbed wire or razor wire on top. Desert tortoise exclusion fencing will also be installed along the outside of the entire perimeter security fence.

Additionally, 9-m (30-ft)-high wind fences will be placed along the northern, eastern, and western boundaries. Laydown and staging of equipment and materials needed for construction of plant site and support facilities will be located within the plant site.

Only a small portion of the overall site will be paved, primarily, the onsite access road, the service roads to the two power blocks, and portions of each of the power blocks. The remaining portions of each power block will be graded and leveled. The solar fields will remain unpaved and without a gravel surface to prevent rock damage from mirror-wash vehicle traffic; a dust suppression coating will be applied on the dirt roadways within and around the solar field.

Groundwater wells will be drilled within the plant site to supply water for facility construction, operation, and maintenance. Total water consumption for the facility is estimated to be approximately 19 ha-m (150 ac-ft) per year per unit. Because the PSPP project will use dry cooling, the primary water uses will be solar mirror washing, feedwater makeup, fire water supply, onsite domestic use, and cooling water for auxiliary equipment heat rejection (auxiliary cooling tower and auxiliary boiler). Sanitary wastewater will be collected for treatment in septic tanks and disposed of via leach fields.

The development of the plant site also will include channelizing and rerouting existing natural drainages or washes to convey storm flows around and through the site and then return the flows to their sheet flow regime on the north side of the site (see Figures 2a and 2b in AECOM 2010a). The 46-m (150-ft) wide rerouted washes will be directed through three main channels that will intercept flows prior to their entry to the site and convey them in realigned channels to approximately the same locations where they exit the site under existing conditions. Outlets for each channel will end in diffusers. The drainage channels traversing the solar units will be located inside and outside of the plant site's permanent security fence. Tortoise-exclusion fencing or similar structure sufficient to exclude tortoise from rerouted channels passing through the project site (central channels) will be installed across the inflow and outflow points of the respective channels to keep tortoise from entering. The channels will be constructed with scour protection in critical areas. Scour protection will consist of soil cement made with native material and native soils to the extent practicable, and will be placed on the channel sides and bottoms in stress areas such as curves and slope transitions. No scour protection is proposed for the channel bottom in the straight sections of the channels. This is to allow the low flows to meander across the bottom, replicating as nearly as possible the flow regimes under current conditions. Channels will also collect onsite storm water flows and direct them off site to the east and southeast.

To avoid increases in vehicular-related mortality and disruption of local movement patterns along the existing wash systems that extend underneath I-10, permanent tortoise-exclusion fencing will be installed along the existing I-10 ROW fencing on both sides of the interstate between the wash on the westernmost end of the project site, and the wash on the easternmost end of the project site (labeled as #10 and #13 on Figure 8 in AECOM 2010a). The applicant will secure approval from California Department of Transportation for the installation and maintenance of tortoise-exclusion fencing prior to its construction and prior to any repairs

needed during the life of the PSPP. The tortoise-exclusion fencing along I-10 will be designed to direct tortoises to existing under-crossings under I-10, and will be inspected and maintained regularly by the applicant for the life of the project (see BIO-9 in CEC 2010b).

### Gen-tie Transmission Line

The proposed project will require a new gen-tie line to interconnect to the regional transmission grid. The gen-tie line will extend approximately 10 km (6 mi) north/ northwest from the proposed project area, then turn south 90 degrees for approximately 2 km (1 mi) to connect to the Red Bluff East Substation proposed by Southern California Edison (SCE) (see Figures 2a and 2b in AECOM 2010a). Final placement and development of the proposed substation will be the responsibility of SCE. The BLM and SCE will undergo section 7 consultation with the Service on the Red Bluff East Substation in the future. Therefore, this substation is not part of the project description for the PSPP project. Construction, and operations and maintenance (O&M) of the gen-tie will require construction of a new access road directly adjacent to the gen-tie line from the plant site to the future substation. Laydown and staging of equipment and materials needed for construction of the gen-tie line will be located within the plant site or within the impact area associated construction of the new road to access the gen-tie line.

### Access Road/Utility Corridor

Using an existing interstate exit near the southwest boundary of the proposed project site, access to the site will be via a new approximately 411-m (1,350-ft) long, 7-m (24-ft) wide paved access road starting at the existing Corn Springs Road north of I-10 (see Figures 2a and 2b in AECOM 2010a). A concrete box culvert, no less than 1.2 m (4 ft) high and 1.8m (6 ft) wide with 3:1 side slopes, will be constructed under the project site access road. A minimum of 0.4 m (18 in) of native material will be maintained on the floor of the culvert at all times to facilitate wildlife, including tortoise, movement under the access road. A secondary gravel access route will be constructed from I-10 north to the project site. This road will be restricted to emergency response personnel. Gates will restrict other vehicle access at both ends.

Voice and data communications will be provided by a new twisted pair telecommunications cable that will follow the routing of the redundant telecommunications line from the project to the Red Bluff East Substation. The routing for both of these lines will exit the project site in the ROW for the site access road, cross under I-10 west of the Corn Springs Road interchange and proceed to the microwave-repeating tower approximately 213 m (700 ft) south of the interstate. The routing of the redundant telecommunications line to the SCE Red Bluff East Substation will then be hung on the existing 12.47-kilovolt (kV) SCE line that feeds the microwave tower and carried- to the proposed Red Bluff Substation. Laydown and staging of equipment and materials needed for construction of the access road and utility corridor will be located within the plant site or within the impact area associated with the access road/utility corridor.

Two alternative sources of construction power are being investigated. The first alternative would be to take construction power off the existing SCE 161-kV transmission line that would be

located within the disturbance area of Phase 1. The second alternative would be a new 12.47-kV line built within the surveyed 230-kV gen-tie ROW from Rice Road back to the project site. This line would consist of a combination of new 12.47-kV line or hung on the new 230-kV gen-tie towers that bring the single circuit 230-kV line back to the project site.

#### *Construction Phasing Relative to Desert Tortoise Clearance Surveys*

Project construction will occur in two phases (Table 1) that generally follow development of the solar units. Phase 1 will include construction of all linear features (access road/utility corridor, construction power line, and gen-tie line and associated access road), the portion of the perimeter security fence and associated tortoise exclusion fencing around Unit 2, a portion of the rerouted drainage channels, and the Unit 2 power unit and associated support facilities within the fenced plant site. Phase 2 will include construction of the remaining rerouted drainage channels, the Unit 1 power unit and associated support facilities, and the portion of the perimeter security fence and associated tortoise exclusion fencing around Unit 1. Phases 1 and 2 will also include the installation of temporary tortoise exclusion fencing.

Prior to the onset of tortoise clearance surveys, the portions of the plant site and rerouted drainage channels that will be constructed during either phase will be enclosed with permanent or temporary tortoise exclusion fencing to prevent tortoises in habitat adjacent to the plant site from entering during construction. If a biological monitor is not in the immediate vicinity of construction activities, temporary tortoise exclusion fencing will be installed around linear features (i.e., access road/utility corridor, construction power line, and gen-tie line and associated access road).

Phase 1 construction is anticipated to begin in 2011, after tortoise clearance surveys are completed, and Phase 2 construction is anticipated to begin as early as 2012. Clearance surveys associated with construction of linear features off the plant site (access road/utility corridor or gen-tie line), the perimeter security fence, permanent or temporary tortoise exclusion fencing, and/or re-routed drainage channels during Phases 1 and 2 may be conducted during any season. However, clearance surveys on the plant site during either phase will only be conducted during the desert tortoise's most active season (April to May, September to October). Surveys outside of these periods require approval by CFWO. Clearance surveys will be conducted in accordance with the Service's *Desert Tortoise Field Manual* (Service 2009a).

Any tortoises found during clearance surveys of linear facilities (i.e., access road/utility corridor or gen-tie line) off the plant site will be moved out of harm's way within 500 m (1,650 ft) of the disturbance area in accordance with the Service's *Desert Tortoise Field Manual* (Service 2009a), or more recent Service guidance. Any tortoises found during clearance surveys on the plant site, in rerouted drainage channels off the plant site, or along the perimeter security fencing will be considered a translocatee<sup>1</sup> (see "Desert Tortoise Relocation and Translocation" section).

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<sup>1</sup> "Translocatee" refers to tortoises that will have transmitters attached to them, given health assessments, including blood draw, moved to the designated recipient site during the active season, and monitored in accordance with the final Desert Tortoise Relocation/Translocation Plan.

### *Operations and Maintenance*

Commercial operation is expected to begin as early as late-2013 for the first unit and as early as late-2014 for the second unit. O&M will occur within the plant site during the 30-year life of the project. While electrical power will be generated only during daylight hours, the plant site will be staffed 24 hours a day, 7 days per week. A total estimated workforce of 84 full-time employees will be needed to staff the first phase of the project. When the second unit comes online, the full-time staff will increase to 134 employees.

Within the fenced plant site, routine O&M will include such activities as maintenance and repair of the perimeter fence, access gates, solar array components, support facilities, and evaporation ponds, mirror washing, vehicle and equipment movement, and vegetation removal. Solar mirrors will be sprayed with treated water once or twice per week, determined by the reflectivity-monitoring program. Washing will generally be done at night and will involve a water truck spraying treated (i.e., demineralized) water on the mirrors in a drive-by fashion. Because the mirrors will be angled down for washing, water will not accumulate on the mirrors; instead, it will fall from the mirrors to the ground. Due to the small volume, the applicant anticipates the water will soak into the soil with no appreciable runoff. Any remaining rinse water from the washing operation is expected to evaporate on the mirror surface.

Outside of the fenced plant site, O&M activities will be conducted within the access road/utility corridor, gen-tie line ROW, rerouted drainage channels, and along the outer side of the perimeter security fence. Routine O&M activities associated with the gen-tie line, access road, and utility corridor will include periodic cleaning of the line conductors and replacement and/or repair of equipment damaged by wind, dust, or accident, road grading and drainage structure repairs to maintain a drivable surface along the access roads, and repair of the perimeter security fence. Such activities are anticipated to occur throughout the year as needed. The newly constructed access roads to the plant site and the gen-tie line ROW will provide O&M access to those features. The dirt road created during construction will provide O&M access to rerouted drainage channels and the outer side of the perimeter security fence.

O&M of the rerouted channels will occur to reduce the hydraulic roughness, improve flood conveyance capacity, and maintain adequate protection of the stream banks from erosion, and will include vegetation management to maintain cover at less than 38 centimeters (cm) [15 inches (in)] in height, periodic debris removal, and erosion repairs. Maintenance will occur predominantly by hand crews and pickup truck; however, it may be necessary to use heavy equipment (e.g., loader, excavator, wheel dump trucks) to repair structural features and clean out debris following large storm events.

According to information provided by the applicant, routine O&M activities are expected to occur along existing access roads, access roads created for the project, and areas previously disturbed during construction-related activities. Therefore, we do not expect routine O&M activities will result in additional direct habitat disturbance above what will be disturbed during construction activities.

### *Decommissioning*

The planned operational life of the proposed project is 30 years, but the facility conceivably could operate for a longer or shorter period depending on economic or other circumstances. However, if the facility were to become economically non-viable before 30 years of operation, permanent closure could occur sooner. Regardless, BLM will require a decommissioning plan be prepared and put into effect when permanent closure occurs. The procedures provided in the decommissioning plan will be developed to ensure compliance with applicable laws and regulations, and to ensure public health and safety, and protection of the environment. The decommissioning plan will be submitted to the BLM for review and approval prior to a planned closure. When the BLM begins to consider decommissioning, the Service will be contacted to determine if additional consultation, pursuant to section 7(a)(2) of the Act, is appropriate. Consequently, we will not analyze the potential effects of decommissioning on the desert tortoise in this biological opinion.

### *Desert Tortoise Relocation and Translocation*

The applicant will develop a final Desert Tortoise Relocation/Translocation Plan (Relocation/Translocation Plan) that requires approval by the Service prior to the initiation of any ground-disturbing construction activities. For the purposes of this biological opinion, relocation and translocation are defined as follows: relocation refers to moving a tortoise a short distance up to 500 m (1,650 ft) out of harm's way, and translocation refers to moving a tortoise out of harm's way to a point distant from the tortoise's home range, over 500 m (1,650 ft). Any tortoise found on the plant site, rerouted drainage channels off the plant site, or along the perimeter security fenceline will be considered a translocatee<sup>1</sup>. Tortoise found along linear facilities (i.e., along the access road/utility corridor or gen-tie line) off the plant site will be relocated; these tortoises are not required to be transmittered but will undergo short-term monitoring as outlined in the Plan.

The Relocation/Translocation Plan will incorporate the Service's desert tortoise translocation guidance (Service 2010a) or more recent Service guidance, as appropriate for the PSPP project. The Relocation/Translocation Plan will include detailed descriptions of such information as: (1) how and where tortoises found on the PSPP during each phase of construction will be relocated or translocated; (2) the mapped location of the translocation recipient and control sites; (3) how and where quarantine pens will be constructed if necessary for the translocation process; and (4) how translocated tortoises that will be cared for (e.g., provided supplemental food and/or water) and monitored while in quarantine pending the receipt of blood test results. The Relocation/Translocation Plan will also outline how disease prevalence of relocated, translocated, recipient-site, and control-site tortoises will be documented and how transmittered tortoises will be monitored, and will include but not be limited to the following procedures.

Translocated tortoises will be moved to a recipient site in the Desert Wildlife Management Area (DWMA), referred to as the "Palen recipient site" for the purposes of this biological opinion. The "Environmental Baseline" section below includes a description of the general area where this recipient site will be located. The exact location of this site will be defined in the final Plan.

Prior to relocation or translocation, tortoises will undergo varying levels of health assessments, depending on where they are found on the PSPP. For tortoises that will be relocated, only visual health assessments will be conducted prior to their release. For tortoises that will be translocated, visual health assessments and blood draw for enzyme-linked immunosorbent assay (ELISA) testing for *Mycoplasma testudineum* or *M. agassizii* will be conducted prior to their release at the recipient site. All blood samples will be drawn between May 15 and October 31. If the Service guidance related to this time period changes, then tortoises will be sampled as early as permitted. Tortoises to be translocated will remain in quarantine pens on or adjacent to the plant site or on the recipient site pending the receipt of ELISA test results.

The BLM has identified a roughly 11,129-ha (27,500-ac) area on BLM-managed lands in the Chuckwalla DWMA along the upper bajadas on the north side of the Chuckwalla and Little Chuckwalla Mountains in which the primary and secondary recipient sites will be located. To determine disease prevalence in the resident population at the recipient site, the applicant will perform health assessments, including disease testing via blood samples for ELISA testing, on all resident desert tortoises within contiguous tortoise habitat 1.5 km (0.9 mi) from the point of release of each translocated tortoise prior to their release. Translocated tortoises will not be released within 1.5 km (0.9 mi) of a diseased [documented seropositive or clinically ill (showing signs of disease)] resident tortoise at the recipient site. Therefore, if a diseased tortoise is found within this 1.5 km (0.9 mi) area and the recipient site is not large enough to release translocated tortoises at least 1.5 km (0.9 mi) from diseased resident tortoises, then tortoises will be translocated to an alternate recipient site. If the Palen recipient site cannot be used for translocation purposes, the applicant will identify an alternative recipient site and contact the Service and BLM for approval of the alternative site prior to its use. If the alternative recipient site is determined to be outside of the action area analyzed in this biological opinion, the BLM will contact the Service prior to any translocation activities to determine if reinitiation of consultation is necessary. Prior to release of translocated tortoises to an alternate recipient site, the applicant will perform surveys to determine disease prevalence in the resident population by performing visual health assessments and collecting blood for ELISA testing on all resident tortoises within contiguous tortoise habitat 1.5 km (0.9 mi) of the point of release of each translocated tortoise.

The applicant will attach transmitters to all translocated tortoises prior to their release at the recipient site, and monitor all transmittered tortoises for 5 years (starting from the date of release) as described in the Service's translocation guidance (Service 2010a). If five or more tortoises are translocated from the PSPP, the applicant will also monitor an equivalent number of resident tortoises at the recipient and a control site for five years (starting from the date of release of the fifth tortoise translocated from the PSPP). The "Environmental Baseline" section below includes a description of the general area where this control site will be located, the exact location of which will be defined in the final Plan. During monitoring, the applicant will collect, at a minimum, information annually on survivorship, mortality rates, health status, body condition, movement of individuals, and predation of each translocated tortoise. The applicant will also collect blood for ELISA testing annually from each transmittered tortoise at the recipient and control sites.

*Conservation Measures*

The proposed project includes conservation measures that will be implemented to avoid, minimize, and offset potential adverse effects to the tortoise. These measures were developed in coordination with the BLM, CEC, CDFG, and applicant, and correspond directly to the CEC's conditions of certification BIO-1 thru BIO-14, BIO-28, and BIO-29 described in the CEC's Final Decision on the PSPP (CEC 2010b). Therefore, we are incorporating by reference into this biological opinion, the CEC's conditions of certification BIO-1 thru BIO-14, BIO-28, and BIO-29 as described in the CEC's Final Decision, as the conservation measures that will be implemented by the applicant and BLM, to avoid, minimize, and offset the impacts to the tortoise associated with the PSPP project. We have provided additional clarification of the requirements outlined in BIO-8, BIO-9, BIO-10, BIO-12, and BIO-13 below. The project description, including the CEC's conditions of certification BIO-1 thru BIO-14, BIO-28, and BIO-29 and the additional clarifications provided below, provide the basis of the effects analysis provided in this biological opinion. The CEC's Final Decision (CEC 2010b) includes additional measures to offset proposed project impacts on rare and sensitive species, and natural communities that will be implemented to further reduce impacts to biological resources. The measures that will be implemented include those associated with reducing impacts associated with dust, light, and noise, resulting from the proposed project.

**BIO-8: Impact Avoidance and Minimization Measures -** CEC's condition of certification BIO-8 specifies the measures that will be implemented to manage the project site and related facilities in a manner to avoid or minimize impacts to biological resources, including the desert tortoise. To clarify, these measures will also be implemented during all ground-disturbing construction and O&M activities.

**BIO-9: Desert Tortoise Clearance Surveys and Fencing -** CEC's condition of certification BIO-9 specifies the procedures, including seasonal restrictions, for conducting tortoise clearance surveys and handling and moving tortoise out of the disturbance area during construction activities. BIO-9 also specifies that temporary tortoise exclusion fencing will be installed along linear features unless a biological monitor is present during construction activities. To clarify, these procedures for conducting tortoise clearance surveys, handling and moving tortoises out of the disturbance area, and ensuring tortoises do not re-enter the disturbance area will also be implemented in areas not enclosed with tortoise-exclusion fencing during any new ground-disturbing activities associated with O&M of the access road, utility corridor, rerouted drainage channels off the plant site, and perimeter security fence.

**BIO-10: Desert Tortoise Relocation/Translocation Plan -** CEC's condition of certification BIO-10 specifies that the Relocation/Translocation Plan will be consistent with Service-approved guidelines, and that the final Relocation/Translocation Plan will include all revisions deemed necessary by BLM, Service, CDFG, and CEC, and be approved by the CEC in consultation with the BLM, Service, and CDFG prior to site mobilization. To clarify, the final Relocation/Translocation Plan will incorporate the Service's desert tortoise translocation guidance (Service 2010a) and subsequent Service guidance, as appropriate for the PSPP project. The final

Relocation/Translocation Plan requires approval by the Service prior to initiation of any ground-disturbing construction activities.

BIO-12: Desert Tortoise Compensatory Mitigation - CEC's condition of certification BIO-12 specifies that the applicant will provide compensatory habitat acquisition at a 1:1 ratio for impacts to up to approximately 1,670 ha (4,127 ac) of desert tortoise habitat, depending on the final layout, and at a 5:1 ratio for impacts to approximately 91 ha (225 ac) of tortoise critical habitat. According to BIO-12, these lands will be acquired to benefit tortoise habitat linkages and population connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands in the Colorado Desert Recovery Unit. To clarify, the priority for acquisition of these lands will be along the I-10 corridor in the Eastern Colorado Recovery Unit (as identified in Service 1994a) with the objective of assembling habitat linkages across the I-10 corridor to provide population connectivity between the Chuckwalla, Pinto Mountain, and Chemehuevi DWMA/critical habitat units. The applicant will provide compensatory habitat acquisition at a 1:1 ratio for impacts up to approximately 1,698 ha (4,195 ac) or 1,670 ha (4,127 ac) of desert tortoise habitat associated with Layout 1 or Layout 2, respectively. The applicant also will provide within the same critical habitat unit approximately 455 ha (1,125 ac) of compensatory habitat acquisition for impacts to approximately 91 ha (225 ac) in the Chuckwalla Critical Habitat Unit [91 ha (225 ac) of impact  $\times$  5 = 455 ha (1,125 ac)]. The BLM, Service, CEC, and CDFG will coordinate to reach mutual agreement on the selection of land, primarily located between Desert Center and Cactus City.

BIO-13: Raven Management Plan - As stated in the CEC's condition of certification BIO-13, the applicant will submit payment to the project sub-account of the Renewable Energy Action Team (REAT) account held by the National Fish and Wildlife Foundation (NFWF) to support the Service's Regional Raven Management Program. The amount will be a one-time payment of \$105 per acre of permanent disturbance. To clarify, the applicant will contribute a one-time fee of \$105 per acre<sup>2</sup> of disturbance of desert tortoise habitat prior to the initiation of construction activities in each phase (Phases 1 and 2). The exact amount of the fee will depend on the final layout (Layouts 1 or 2) chosen for the project but will be consistent with "BIO-29 Table 3" in CEC (2010b). Documentation for payment of this fee will be submitted to the Service prior to the initiation of ground-disturbing construction activities for each phase.

### *Action Area*

The implementing regulations to section 7(a)(2) of the Act describe the action area to be all areas affected directly or indirectly by the Federal action and not merely the immediate area affected by the proposed project (50 CFR §402.02). The action area is the area of potential direct or indirect effects of the proposed action and any interrelated or interdependent human activities; the direct and indirect effects of these activities include associated physical, chemical, and/or biological effects of considerable likelihood (Service and NMFS 1998). Indirect effects are

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<sup>2</sup> Based on the cost allocation methodology described in *Renewable Energy Development And Common Raven Predation on the Desert Tortoise –Summary* (May 2010) and *Cost Allocation Methodology for Implementation of the Regional Raven Management Plan* (July 9, 2010).

those that are caused by the proposed action and are later in time but are still reasonably certain to occur (Service and NMFS 1986). Analyses of the environmental baseline, effects of the action on the species and designated critical habitat, cumulative effects, and the impacts of the incidental taking, are based upon the action area as determined by the Service (Service and NMFS 1998).

The action area for the proposed project includes the area of desert tortoise habitat that will be impacted by the project footprint/site resulting from either Layout 1 [1,698 ha (4,195 ac)] or Layout 2 [1,670 ha (4,127 ac)]. For the purposes of this biological opinion, the project footprint/site is defined as the area inside and outside of the permanent fence line that will be disturbed due to construction and O&M activities on the plant site, perimeter security fence, rerouted drainage channels on and off the plant site, and linear facilities (access roads, utility corridor and gen-tie line). Along the linear facilities off the plant site, the action area also includes a distance of up to 500 m (1,650 ft) where any tortoises will be moved out of harm's way to avoid injury from construction or O&M-related activities. The action area also includes, the applicant's proposed desert tortoise recipient (translocation) and control sites that will be identified in the Plan, and all contiguous tortoise habitat within 6.5 km (4.0 mi) of the release point of each tortoise translocated at the recipient site. By including habitat within 6.5 km (4.0 mi) of the release points, we are including the areas where tortoises may move following translocation<sup>3</sup>.

Finally, the action area encompasses conservation areas that will be acquired to offset the destruction of desert tortoise habitat resulting from construction and O&M of the proposed project. The acquisition, management, and monitoring of these conservation areas are expected to have only beneficial effects to tortoises. Though the locations of these conservation areas are currently unknown, the Service has determined that a sufficient amount of privately owned desert tortoise habitat exists within the Eastern Colorado Recovery Unit that will be available for such acquisition. The Service is also aware of private lands that have been identified by private conservation organizations as available for potential acquisition to offset impacts to desert tortoise habitat in the Eastern Colorado Recovery Unit, including the Chuckwalla Critical Habitat Unit. As discussed in the "Conservation Measures" section above, lands selected for acquisition will be along the I-10 corridor in the Eastern Colorado Recovery Unit and contribute to desert tortoise habitat linkages and population connectivity within and between desert tortoise critical habitat, known populations of tortoises, and/or other preserve lands. The REAT agencies have agreed that improved connectivity along the I-10 corridor is the priority habitat acquisition objective. Prior to the initiation of ground-disturbing construction activities in either phase (Phases 1 or 2), either conservation lands will be acquired directly by the applicant or the applicant will provide a security to guarantee an adequate level of funding is available for acquisition and management of conservation lands [see BIO-12 and BIO-28 in CEC 2010b].

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<sup>3</sup> See "Effects of the Action" section for a discussion on post-translocation dispersal.

## STATUS OF THE SPECIES/CRITICAL HABITAT

The following section summarizes information about the desert tortoise on the legal/listing status, distribution and population trends, current threats, and status of critical habitat as discussed in the Service's biological opinion on the California Desert Conservation Area Plan Amendment for the Coachella Valley (Service 2010b). Please refer to that document and the approved recovery plan (Service 1994a), draft revised recovery plan (Service 2008), and desert tortoise 5-year review for additional detailed information about these topics and the species' description, life history, and habitat affinities.

*Legal/Listing Status:* The Mojave population of the desert tortoise was proposed for listing by the Service on October 13, 1989, and listed as a threatened species on April 2, 1990 (Service 1989, 1990). The tortoise is also listed as a threatened species under the California Endangered Species Act. The Service designated about 2.6 million ha (6.5 million ac) of critical habitat for the tortoise in portions of California, Nevada, Arizona, and Utah on February 8, 1994 (Service 1994b). The recovery plan was developed for this species in 1994 (Service 1994a). The draft revision to the recovery plan was developed in 2008 (Service 2008), but the plan has not yet been finalized.

*Distribution and Population Trends:* Typical desert tortoise habitat in the Mojave Desert is characterized as creosote bush scrub below 1,676 m (5,500 ft) in which precipitation ranges from 5 cm to 20 cm (2 in to 8 in), where a diversity of perennial plants is relatively high, and production of annual plants is high. 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 Sonoran (Colorado) Desert in California.

The best available information indicates the Mojave population of the desert tortoise is declining in abundance in most areas throughout its range. Line distance sampling is now being used as part of a long-term monitoring strategy to detect population trends. This program was put into place in 2001, but detecting population trends is expected to be a gradual process and surveys conducted over short periods of time (e.g., 2001 to 2007) would only reveal catastrophic declines or significant changes. However, these data do provide some information on variability in annual and regional densities between recovery units. In general, over the first 6 years of rangewide monitoring (2001-2005, 2007), tortoises were least abundant in the Northeast Mojave Desert Recovery Unit, the highest reported densities occurred in the Upper Virgin River Recovery Unit, and considerable decreases in density were reported in 2003 in the Eastern Colorado and Western Mojave Recovery Units (Service 2008). The proposed project occurs in the Eastern Colorado Recovery Unit per the species recovery plan (Service 1994a), which was merged with the Northern Colorado Desert Recovery Unit in the draft revised recovery plan (Service 2008) and referred to simply as the Colorado Desert Recovery Unit.

*Current Threats:* The majority of threats to the tortoise and its habitat are associated with human land uses including urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens and domestic and feral dogs, unauthorized off-highway vehicle

(OHV) activity, authorized vehicular activity, illegal collecting, mortality on paved roads, vandalism, drought, livestock grazing, feral burros, nonnative plants, changes to natural fire regimes, and environmental contaminants.

*Status of Critical Habitat:* The Service designated about 2.6 million ha (6.5 million ac) of critical habitat for the tortoise in portions of California, Nevada, Arizona, and Utah. The primary constituent elements (PCEs) of desert tortoise critical habitat were identified as sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Threats to critical habitat include urban development, military operations, and multiple-uses of public lands such as OHV activities and livestock grazing (Service 1994b). The introduction and spread of invasive nonnative plants, changes to natural fire regimes, and environmental contaminants also threaten critical habitat areas. In addition, threats from long-term climate trends, such as recurrent and prolonged drought, and ecological processes, such as invasive nonnative plant infestations and consequent wildfire risk, are widespread in some areas. These threats have potentially degraded the PCEs of desert tortoise critical habitat over some areas, which if continued, would threaten the viability of populations in affected areas, including habitat linkages between core populations.

The southwestern portion of the plant site and the access road/utility corridor (for Layouts 1 and 2) would affect approximately 91 ha (225 ac) of the Chuckwalla Critical Habitat Unit. While most critical habitat areas are relatively unaffected by human uses, the critical habitat area that would be affected by the proposed project has been previously affected by ongoing O&M activities associated with existing transmission lines and the recent construction of a new transmission line. This area will also be affected by anticipated construction of approved transmission lines and the associated O&M activities along those lines.

## ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress.

As discussed in the “Action Area” section above, the action area for this project includes: (1) the project area, defined as the up to 1,698-ha (4,195-ac) project footprint/site [includes the plant site, perimeter security fence line, rerouted drainage channels on and off the plant site, and linear

facilities (access road, utility corridor, gen-tie line)], and a distance of up to 500 m (1,650 ft) from linear facilities off the plant site where any tortoises will be moved out of harm's way; (2) the proposed desert tortoise recipient (translocation) site, and all contiguous tortoise habitat within 6.5 km (4.0 mi) of the release point of translocated tortoises; and (3) conservation areas. The environmental baseline of each of these components of the action area is described below.

### *Status of the Species in the Action Area*

#### Project Area

The proposed project is within the Chuckwalla Valley, a region of active aeolian (wind-blown) sand migration and deposition. Sand migration in the Chuckwalla Valley region occurs primarily in three distinct corridors, including two corridors that merge just east of the PSPP. Specifically, these include the Palen Valley Corridor, which trends north-south near the eastern edge of the PSPP, and the Palen Dry Lake-Chuckwalla Valley Corridor, which runs northwest-southeast through the northeastern corner of the PSPP.

The project area is in the Eastern Colorado Recovery Unit per the species recovery plan (Service 1994a), which was merged with the Northern Colorado Desert Recovery Unit in the draft revised recovery plan (Service 2008) and referred to simply as the Colorado Desert Recovery Unit. The proposed project is located within two areas designated in the Northern and Eastern Colorado Desert (NECO) Coordinated Management Plan as Wildlife Habitat Management Areas (WHMAs): Palen-Ford WHMA and DWMA Continuity WHMA (see Volume II, Appendix A, Map 2-21 in BLM 2002). Management emphasis for the Palen-Ford WHMA is on the management of the dunes and playas within the Palen-Ford dune system. Management emphasis for the DWMA Continuity WHMA is on providing for connectivity of tortoises between conservation areas north and south of I-10 (i.e., the Chuckwalla DWMA and Chemehuevi DWMA). The Palen-McCoy Wilderness is approximately 5 km (3 mi) to the northeast of the project, the Chuckwalla DWMA is located approximately 3 km (2 mi) to the south, and the Palen Dry Lake Area of Critical Environmental Concern borders the project site to the east.

The proposed project is located primarily on BLM-managed land. Layout 1 includes 97 ha (240 ac) of private land that lies along the southern border of the project site, and that the project applicant does not own but may acquire. Layout 2 includes 16 ha (40 ac) of private land controlled by the applicant. Land in the project area is relatively undisturbed although past uses in the vicinity include military training, agriculture, and OHV recreation. During World War II, the area was part of the General George S. Patton Desert Training Center, officially the California-Arizona Maneuver Area, a simulated theater of operations heavily used by tanks and other military vehicles. Previous agricultural land use is evident in the form of furrows within reestablishing Sonoran creosote bush scrub near the established agriculture areas in the northwestern portion of the project area.

The topography of the site is generally flat, with elevations ranging from approximately 130 m to 198 m (425 ft to 650 ft). The existing topographic conditions of the site show an average slope

of approximately 0.30 percent toward the northeast, with a series of desert washes traversing the site (e.g., a primary wash and a few secondary washes). At least three sizeable washes pass underneath the I-10 interstate via culverts adjacent to the project site. Drainage across the undeveloped project area is concentrated in these washes, until the drainage features disappear and flows fan out across the landscape as sheet flow. During infrequent large precipitation events, runoff through sheet flow may reach Palen Dry Lake.

The project area is dominated by creosote bush scrub, desert dry wash woodland, and stabilized to partially stabilized sand dunes [see Table 3 in AECOM (2010a) for acreages of each vegetation type occurring in the action area]. Four invasive plant species, Russian thistle (*Salsola tragus*), Sahara mustard (*Brassica tournefortii*), Mediterranean grass (*Schismus arabicus*), and Mediterranean tamarisk (*Tamarix ramosissima*) occur in the project area (CEC 2010b).

According to California Natural Diversity Database (CNDDDB) reports, desert tortoise occurrences surround but do not occur within the propose project area. The nearest documented occurrence of tortoise based on CNDDDB records (from 1987) was found approximately 5.6 km (3.5 mi) south of the project area near the Chuckwalla Mountains (CDFG 2009 cited in AECOM 2010a). Other known occurrences are 11 km (7 mi) northwest and 16 km (10 mi) west of the of the project area (CDFG 2009 cited in AECOM 2010a). CNDDDB record data do not provide an accurate depiction of the actual population size and distribution within the area. However, these data can provide some insight into the distribution of tortoise in the vicinity. Tortoises were incidentally observed west of the project area on an existing dirt road near Desert Center, California (AECOM 2010a).

Pre-project surveys of the project footprint were conducted in spring and fall 2009 and in spring 2010 (AECOM 2010b) following the Service's pre-project survey protocol (Service 1992), with the exception of the zone-of-influence<sup>4</sup> surveys. Protocol surveys (100 percent coverage surveys) were conducted throughout the project footprint, including the proposed gen-tie line corridor and the proposed Red Bluff East Substation. In addition, to comply with CEC requirements, surveys were also conducted at 1.2 km (0.75 mi) and 1.6 km (1 mi) from and parallel to the project footprint boundary and 305 m (1,000 ft) from and parallel to the gen-tie line. This area surveyed to meet CEC requirement is referred to as the buffer area for the purposes of this biological opinion. Because the project was redesigned subsequent to the 2009 and 2010 surveys to reduce impacts to sand dune habitats and the sand transport corridor, approximately 148 ha (366 ac) (Layout 1) and 106 ha (262 ac) (Layout 2) were not subject to 100 percent coverage surveys for tortoise. These areas were, however, within the buffer area in the original project footprint and therefore, surveyed to some extent.

As a result of all project-related surveys conducted during 2009 and 2010, six tortoises were detected in the buffer area south of I-10 and in the buffer area at the west end of the gen-tie line (see Table 4 and Figures 4a and 4b in AECOM 2010a). During 2009 surveys, one tortoise was

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<sup>4</sup> With Service approval, zone-of-influence (ZOI) surveys associated with the project footprint were not conducted on the PSPP site.

observed in the buffer for Layout 2 in the southeastern portion of the buffer area. During spring 2010 surveys, five adult tortoises (four males and one female) were encountered in the buffer area associated with the plant site and gen-tie line. Of the five tortoises found in the buffer area, two were found approximately 0.32 km (0.2 mi) from the gen-tie line footprint and three were found approximately 1.6 km (1 mi) south of the plant site. While no tortoises were found in the project footprint, tortoise sign was observed scattered throughout the project footprint, and fresh/recent sign (scat) was found in the gen-tie line footprint (see Figures 4a and 4b in AECOM 2010a).

The concentration of recent tortoise sign (i.e., Class 1 or 2 burrows/pallets, scat, carcasses, and tracks) in the western and southern portions of the project area is consistent with the assessment of generally higher quality habitat on the west and south sides of the action area (due to the proximity to mountains and greater availability of water and forage associated with related drainages). The relatively low amount of tortoise sign found in the project footprint and the surrounding survey area indicate that the current tortoise population level in the project area is very low. However, desert tortoises are likely present to the north and west of the project area. Northeast of the project area, the fine soils, few vegetated washes and sparse vegetation that characterize the habitat nearer the playa are apparently less suitable for tortoises.

While no live tortoises were found in the project footprint, the pre-project surveys represent single points in time, onsite tortoises may have remained undetected, and tortoises may have moved on to the site from surrounding areas after surveys were conducted, especially from the higher quality habitat north of the project area. As a result, we anticipate that a few tortoises may occur in the project footprint. To estimate the number of tortoises, we applied the method for estimating tortoises described in the 2010 survey protocol (Service 2010c). Since the calculation is based on the observation of live tortoises during pre-project surveys, and none were found, we based our calculation on the assumption that at least one tortoise may have been present in the project footprint during pre-project surveys, as indicated by the presence of two tortoises found within approximately 0.32 km (0.2 mi) of the gen-tie footprint. Based on this assumption, our calculation yields an estimate of two subadult or adult tortoises (tortoises with a midline carapace length greater than 160 mm) in the project footprint. This estimate is based on an 80 percent probability that a tortoise is above ground based on the previous winter rainfall and a 63 percent probability of detecting a tortoise if above ground (see Service 2010c). The Service method for estimating tortoise numbers (Service 2010c) also allows us to calculate a 95 percent confidence interval used to indicate the reliability of the data. However, since no live tortoises were found in the project footprint, we are unable to calculate the 95 percent confidence interval associated with the estimate and therefore, cannot determine the reliability of the estimate.

We also estimated the number of subadult and adult tortoises in the project footprint by applying density estimates for areas outside of DWMA and critical habitat within the Eastern Colorado Recovery Unit, as determined in our amended biological opinion for the California Desert Conservation Area (CDCA) Plan for NECO Coordinated Management Plan amendment (Service 2007). As discussed in our amended biological opinion, we multiplied the average density of tortoises in the recovery unit by 0.1, resulting in a density estimate of 0.7 tortoises per

square km (1.8 tortoises per square mi). We estimated the density of tortoises within the DWMA and critical habitat in the recovery unit based on an average of the densities for the recovery unit from line-distance sampling conducted between 2001 and 2005 (Service 2006). We considered areas outside of DWMA and critical habitat to generally support substantially lower densities of tortoises based on numerous factors, including elevation, rainfall, vegetation community composition, and other geographic variables that naturally support fewer animals where habitat conditions are not as favorable as with DWMA and critical habitat. While a portion of the project footprint [approximately 91 ha (225 ac)] is within the Chuckwalla Critical Habitat Unit, we conclude the 0.7 tortoises per square km (1.8 tortoises per square mi) density estimate is a reasonable approximation for the project footprint and constitutes the best available information. Our conclusion is based on the relatively low habitat quality of the entire project footprint and the fact that few live tortoises and relatively little sign was found in the 2,109-ha (5,212-ac) ROW application area (which includes the project footprint). Applying this density of 0.7 tortoises per square km (1.8 tortoises per square mi) to the up to 1,698-ha (4,195-ac) project footprint yields an estimate of 12 subadult and adult tortoises in the project footprint.

Applying these two methods, we anticipate that from 2 to 12 subadult and adult tortoises may occur in the project footprint. We acknowledge that the estimate of 12 tortoises likely is an overestimate because the estimate is based on our assumptions of tortoise densities in the recovery unit and outside of DWMA and critical habitat. The estimate is likely an overestimate given the lack of live tortoise and the relatively low amount of tortoise sign found in the project footprint and surrounding survey area. However, applying the estimate of 12 tortoises in the project footprint would provide a biologically conservative approach based on the best data available to establish a baseline for analysis of the potential impacts of the proposed project.

In addition to subadult and adult tortoises, the project footprint is likely to contain juvenile tortoises. Estimating densities of juvenile tortoises is difficult because they are extremely difficult to detect due to their small size and cryptic nature. However, based on a 4-year study of their population ecology, Turner *et al.* (1987) determined that juveniles accounted for 31 to 51 percent of the overall population. Using this range and the estimated 12 subadult and adult tortoises in the project footprint, we estimate that the project footprint may support from four to six juveniles. We recognize that the survey data used for these estimates come from a limited number of studies and that population levels are constantly changing. We also recognize that since our estimate of the number of subadult and adult tortoises in the project footprint is likely an overestimate (as discussed above), this estimate of juveniles in the project footprint is likely an overestimate as well, but provides the best available data available to establish a baseline for analysis.

We also expect the proposed project footprint contains tortoise eggs. Estimating the number of tortoise eggs is also extremely difficult given that the eggs are buried beneath the soil surface. To estimate the number of eggs that could be present, we used the average number of eggs found in a clutch (i.e., 5.8, see Service 1994a). Assuming a 1:1 sex ratio, 6 of the 12 tortoises estimated in the project footprint may be reproductive females that together could produce approximately 35 eggs per year. However, estimating the number of females or eggs within the project

footprint is difficult based on the low number of tortoises found during the pre-project surveys. Given the number of assumptions and extrapolations used to estimate the number of eggs [i.e., that 12 tortoises may occur on site and that 6 of those may be female and equally reproductive as the tortoises in the Turner *et al.* (1984) study area], the estimate of 35 eggs on the project site has an unknown but high level of uncertainty, and therefore, does not provide a useful measure for analyzing the effects of the proposed project. Therefore, we cannot calculate a reliable estimate for the number of eggs that may be impacted by the proposed project.

Despite the presence of lower-quality habitat in the project footprint, any portion of the project footprint may be used by tortoise for dispersal from surrounding habitat. Desert tortoises are known to use lower-quality intermountain habitat at low densities that function as dispersal routes, providing passage between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray 2005). Historically, tortoise populations in the Sonoran Desert have exchanged individuals at a rate of one migrant per generation (Averill-Murray and Averill-Murray 2005).

#### Desert Tortoise Critical Habitat

The southern portion of the plant site and the access road/utility corridor would be in and impact approximately 91 ha (225 ac) of the Chuckwalla Critical Habitat Unit. Desert tortoise sign and five of the six tortoises found in the survey buffer area were found in critical habitat.

Desert tortoise critical habitat includes the following six PCEs (Service 1994b): (1) sufficient space to support-viable-populations within each of the six recovery units to provide for movement, dispersal, and gene flow; (2) sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; (3) suitable substrates for burrowing, nesting, and overwintering; (4) burrows, caliche caves, and other shelter sites; (5) sufficient vegetation for shelter from temperature extremes and predators; and (6) habitat protected from disturbance and human-caused mortality.

Based on the characteristics on site relative to the six PCEs, the critical habitat area overlapping the project site provides at least three of the PCEs; of these, the PCE of dispersal and gene flow is most important from a regional perspective. The critical habitat area overlapping the project footprint contains at least three sizable washes with major underpasses that provide for dispersal and long-term gene flow across I-10, which function in helping maintain population connectivity between the Chuckwalla and Chemehuevi critical habitat units. The presence of desert tortoise sign found within and adjacent to critical habitat on site provides further evidence that the area contains the PCEs necessary for nesting and foraging. Though I-10 has disrupted the hydrology and associated microphyll woodland components of the lesser washes, the shrub and herbaceous annual vegetative components between the washes apparently remain unaffected by altered hydrology and support comparable community characteristics with areas south of I-10. Since desert tortoise forage predominantly on annual plants, the hydrologic effects on the tree canopy do not affect foraging habitat characteristics. Therefore, while the habitat in this area may be considered low quality for some PCEs, the general area is occupied (based on the presence of

sign) by a low density population and provides a vital role and function of the critical habitat designation, as reflected in the PCE for maintaining inter-DWMA population connectivity espoused in the species' recovery plan (Service 1994a).

The role and function of critical habitat overlapping the proposed project also is recognized through the designation of the project area within a DWMA Continuity WHMA in the BLM's NECO plan (BLM 2002). As discussed in the previous subsection, the management emphasis of the DWMA Continuity WHMA is on providing connectivity of tortoises between conservation areas north and south of I-10 (i.e., the Chuckwalla DWMA and Chemehuevi DWMA).

#### Proposed Recipient (Translocation) Site

As described in the Service's translocation guidance, recipient sites must be sufficiently large to accommodate and maintain resident (if present) and translocated desert tortoises, as well as be free of disease (Service 2010a). In addition, the Service recommends that at least two recipient sites be identified in case resident tortoises at the primary site are determined to be infectious.

As described in the "Desert Tortoise Relocation and Translocation" section above, tortoises from the plant site, the perimeter security fence line, and rerouted drainage channels off the plant site will be translocated to an area referred to as the Palen recipient site. The BLM has identified a roughly 11,129 ha (27,500 ac) area on BLM-managed lands in the Chuckwalla DWMA along the upper bajadas on the north side of the Chuckwalla and Little Chuckwalla Mountains in which the primary and secondary recipient sites will be located. The majority of the Chuckwalla DWMA is also designated critical habitat for tortoise. The exact location of the recipient site will be identified in the final Relocation/Translocation Plan that requires approval by the Service (see "Conservation Measures" section above). If a suitable recipient site within the Chuckwalla DWMA cannot be identified for translocation purposes due to disease prevalence, the applicant will identify an alternative recipient site and contact the Service and BLM for approval of the alternative site prior to its use. If the alternative recipient site is outside of the action area analyzed in the biological opinion, the BLM will contact the Service prior to any translocation activities to determine if reinitiation of consultation is necessary.

No ROW or utility corridors now exist in this roughly 11,129-ha (27,500-ac) general recipient area in the Chuckwalla DWMA and future demand is not anticipated. Though several BLM-designated open routes of travel occur in this area of the Chuckwalla DWMA, tortoises will be released at sufficient distances from these routes to minimize the likelihood of vehicle and human access related sources of mortality; the exact location of release points will be identified in the final Relocation/Translocation Plan. This area historically has received lower levels of recreational use, and such use is not anticipated to increase substantially in the future. Based on recent habitat modeling, habitat value for desert tortoises in this area is similar, or better, to that of the project area (Nussear *et al.* 2009), and therefore is expected to fulfill the feeding, breeding, and sheltering requirements of translocated tortoises. In addition, a large portion of the 11,129 ha (27,500 ac) general recipient area is designated as wilderness, and none of the general

recipient area is within a BLM-proposed solar study area per the Solar Energy Development Programmatic EIS.

The recipient site will include the locations where tortoises translocated from the plant site, the perimeter security fence line, and rerouted drainage channels off the plant site will be released (referred to as release points) and the area to which translocated tortoises may disperse after translocation. The boundaries of the recipient site will be delineated by applying the distance that each translocated tortoise is anticipated to disperse from the release point following translocation. For the purposes of the PSPP, we will delineate the boundaries based on a 1.5 km (0.9 mi) dispersal distance (see “Effects of the Action” section for a discussion of post-translocation dispersal). The recipient area also represents the area in which health assessments will be conducted on resident tortoises to ensure that translocated tortoises are not released within 1.5 km (0.9 mi) of a diseased (documented seropositive or clinically ill resident tortoise). We anticipate that based on a dispersal distance of 1.5 km (0.9 mi), the Palen recipient site will be at least 1,457 ha (3,600 ac). However, the actual size of the recipient site will depend on the number of tortoises translocated, the locations of the release points, and the presence and location of any diseased resident tortoises. As stated above, our estimate that 12 subadult and adult tortoises may occur on the plant site and require translocation is likely an overestimate. Since, in the absence of disease-related issues, release points can be relatively close to one another, a recipient site of approximately 1,450 ha (3,600 ac) will likely accommodate the up to 12 tortoises that may be translocated from the PSPP, and provides the best available data to establish a baseline for analysis.

Tortoise density at the recipient site will be estimated prior to the initiation of translocation activities. However, to estimate tortoise densities at the recipient site for the purposes of this biological opinion, we applied the mean density of five desert tortoises per square km (thirteen desert tortoises per square mi) based on line-distance sampling in the Eastern Colorado Recovery Unit (Service 2009b). We did not apply the same 0.7 tortoises per square km (1.8 tortoises per square mi) density to estimate tortoise density at the Palen recipient site as we did to estimate the density of tortoises on the project footprint because the Palen recipient site is within the Chuckwalla DWMA, an area of higher quality habitat than the project site. Applying this density yields an estimate of 73 subadult and adult tortoises at the approximately 1,457 ha (3,600 ac) Palen recipient site.

#### Proposed Control Site

To provide control baseline data from which to compare the effectiveness of translocation as a project minimization measure, the same number of translocated tortoises monitored will also be monitored at a control site. The exact location of the control site will be identified in the final Relocation/Translocation Plan that will be approved by the Service before the initiation of any ground-disturbing construction activities (see “Conservation Measures” section above). The control site will be selected within the roughly 11,129 ha (27,500 ac) recipient area described above. Per the Service’s translocation guidance (Service 2010a), the control site will; (1) be equivalent in habitat type/quality and tortoise population size/structure as its respective recipient

site, (2) not have previously received translocated tortoises, and (3) be at least 10 km (6 mi) from the recipient site to prevent the interaction of control, resident, and translocated tortoises. Tortoise density at the control site will be estimated prior to the initiation of translocation activities to ensure that the control site contains the appropriate number of tortoises for monitoring purposes. The control site will be used to monitor resident tortoises only; no tortoises from the project footprint will be translocated to the control site.

### Conservation Lands

Habitat acquisition is proposed to offset impacts to tortoise habitat resulting from the proposed project. While the location of these lands has not yet been determined, the REAT agencies have agreed that the priority for acquisition will be along the I-10 corridor in the Eastern Colorado Recovery Unit, and that these lands will be acquired to benefit tortoise habitat linkages and population connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands (see “Conservation Measures” section above). These conservation lands will be conserved and managed in perpetuity for tortoises. Using available data on landownership and willing sellers, the Service has determined that a sufficient amount of privately owned desert tortoise habitat exists within the Eastern Colorado Recovery Unit that will be available for acquisition. The Service is also aware of private lands that have been identified by private conservation organizations as available for potential acquisition to offset impacts to desert tortoise habitat in the Eastern Colorado Recovery Unit.

The abundance of tortoises in conservation areas is unknown since the specific areas have not yet been identified. However, because acquisition will focus on areas connected to lands with tortoise habitat equal to or better quality than the project footprint (see BIO-12 in CEC 2010b), we anticipate that these conservation lands will contain suitable habitat that is currently occupied or likely to be occupied in the future.

### *Factors Affecting the Species Environment within the Action Area*

#### Project Area

Due to the lack of development, tortoises in the majority of the action area (particularly the plant site north of I-10) are not impacted by extensive habitat destruction or degradation. However, the tortoises are affected to some extent by several unmaintained roads, invasive nonnative plants, and potentially by predation from common ravens foraging, nesting, and roosting along existing transmission lines south of the action area (south of I-10) and from common ravens nesting elsewhere in the vicinity.

The southern portion of the action area includes the gen-tie transmission line that crosses I-10 and then runs along an existing utility corridor that contains several proposed, existing, or authorized transmission lines. Existing transmission lines include the Devers to Palo Verde No. 1 and Blythe Energy lines. The Service issued biological opinions exempting take of several species, including the tortoise, associated with the Blythe Energy line in 2005, the Desert

Southwest line in 2006, and the DPV2 line in 2011. The Blythe Energy line was recently completed but construction on the Desert Southwest and DPV2 lines have not yet been initiated. While issuance of biological opinions for the Blythe, Desert Southwest, and DPV2 transmission line projects allowed for additional take of desert tortoises and additional degradation of habitat in the project area, these biological opinions also included avoidance, minimization, and conservation measures that largely maintained the environmental baseline of the species.

The Service issued a programmatic biological opinion evaluating the effects of BLM's CDCA plan amendment for the NECO plan area on tortoises in 2002 and as amended in 2005 and 2007. The programmatic biological opinion exempted take for causal uses (recreation, mining, and vehicle use), livestock grazing, and removal of burros that BLM authorizes through approval of the CDCA Plan. Projects outside of these activity categories require separate consultation. Ongoing land uses covered under these previously issued biological opinions have allowed for additional habitat degradation in the project area, primarily along the proposed gen-tie line, due to factors such as introduction and spread of invasive plant species and predators associated with disturbed habitats.

#### Proposed Recipient (Translocation) and Control Sites

The general area of the Palen recipient and control sites are undeveloped and, therefore, not affected by extensive habitat destruction or degradation. However, the recipient site may be currently impacted to some extent by invasive nonnative plants and predation from common ravens foraging, nesting, and roosting along existing transmission lines to the north.

#### Conservation Areas

While the location of these lands has not yet been determined, the BLM and Service have agreed that the priority for acquisition will be along the I-10 corridor in the Eastern Colorado Recovery Unit, and that these lands will be acquired to assemble tortoise habitat linkages to provide connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands (see "Conservation Measures" section above). Lands acquired to offset impacts to designated critical habitat will be located in the Chuckwalla Critical Habitat Unit between Desert Center and Cactus City. These acquired lands will be conserved and managed in perpetuity for tortoises.

#### EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat that would be added to the environmental baseline, along with the effects of other activities that are interrelated or interdependent with that action. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. In contrast to direct effects, indirect effects can

often be more subtle, and may affect species and habitat quality over an extended period of time, long after project activities have been completed. Indirect effects are of particular concern for long-lived species such as the tortoise, because project-related effects may not become evident in individuals or populations until years later.

This biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR § 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

### *Methodology*

#### Permanent versus Temporary Impacts

Since full recovery of desert vegetation can take several decades, we consider all ground-disturbing impacts associated with the PSPP project to be effectively permanent. Vasek *et al.* (1975) found that in the Mojave Desert transmission line construction and O&M activities result in a permanently devegetated maintenance road, enhanced vegetation along the road edge and between tower sites, and reduced vegetation cover under the towers, which recovered significantly but not completely in about 33 years. Based on a quantitative review of studies evaluating post-disturbance plant recovery and success in the Mojave and Sonoran deserts, Abella (2010) found that reestablishment of perennial shrub cover (to amounts found on undisturbed areas) generally occurs within 100 years, but fewer than 40 years, in some situations. He also found that vegetation recovery times are likely impacted by a number of variables, including but not limited to climate, invasion nonnative plants, and level of ongoing disturbance. Based on these factors, we consider temporary impacts to be equivalent to permanent impacts for the purposes of our effects analysis relative to the 30-year life of the project.

Up to approximately 1,698 ha (4,195 ac) of tortoise habitat would be directly impacted by construction of Layout 1 or Layout 2 and O&M activities associated with the proposed project. As discussed in the “Description of the Proposed Action” section above, we do not anticipate additional impacts to habitat during O&M activities outside of what would be impacted during construction. The conservation measures included as part of the project description would help avoid, minimize, and offset impacts to tortoises resulting from construction and O&M activities.

### *Direct Effects*

#### Death and Injury

##### Construction, and Operations and Maintenance

Death or injury of tortoises could result from collisions with or crushing by vehicles or heavy equipment, including crushing of individuals that take shelter under parked vehicles and are

killed or injured when the vehicle is moved. Desert tortoises could also be injured or killed after being trapped in pipes or construction excavations. Other direct effects could include individual tortoises or their eggs being crushed or buried in burrows during construction and O&M-related activities. Because of increased human presence in the area, tortoise may be injured or killed due to collection or vandalism associated with increased encounters with workers' or visitors' pets. Desert tortoises may also be attracted to the construction area by application of water to control dust, placing them at higher risk of death or injury.

To minimize the death and injury of tortoises residing in or entering the construction or O&M disturbance areas (e.g., plant site, linear facilities, rerouted channels), the applicant would implement the general and species-specific conservation measures proposed as part of the project. Accordingly, take of tortoises, would be minimized by the presence of a Designated Biologist during ground-disturbing construction and O&M activities in the project footprint (BIO-2 and BIO-11). As specified in the CEC's condition of certification BIO-1, the Designated Biologist must meet the Service's authorized biologist qualifications and be approved by the Service prior to the initiation of ground-disturbing construction activities. Death or injury of tortoises during construction would also be minimized by demarcation of all sensitive biological resource areas by the Designated Biologist (BIO-2). Death or injury of tortoises would be further minimized during construction and O&M activities by demarcation of all work area boundaries prior to ground-disturbing activities, limiting vehicular and equipment traffic to existing routes of travel, and designing and installing all project components off the plant site (e.g., access roads, storage and parking areas, pulling sites, and rerouted channels) to minimize impacts to native plant communities and sensitive biological resources (BIO-8).

Construction activities on the up to 1,698 ha (4,195 ac) project site would be conducted during the more active period of the species as described in the project description and as would be described in the Relocation/Translocation Plan, thereby maximizing the potential to locate and move tortoises out of the disturbance area during construction. Death or injury of tortoises due to construction would be minimized by the requirement for the Designated Biologist to conduct preconstruction clearance surveys of the project area prior to construction and either relocate individuals out of harm's way or translocate individuals to the recipient site, as would be outlined in the Service-approved Relocation/Translocation Plan, following Service-approved methods (BIO-9 and BIO-10).

Construction and O&M disturbance areas cleared of tortoises would be either enclosed with tortoise exclusion fencing or monitored by the Designated Biologist or biological monitors trained by the Designated Biologist to prevent individuals from re-entering the disturbance area (BIO-3, BIO-8, and BIO-9). Installation of the tortoise exclusion fencing around the plant site would preclude tortoises from re-entering or leaving if not found and removed during clearance surveys. During construction and O&M, breaches in the exclusionary fencing may allow tortoises to pass through the barrier and be affected by project-related activities. However, these potential effects would be minimized by the requirement to conduct at least two clearance surveys of the project footprint prior to construction, and to regularly inspect all permanent and

temporary tortoise exclusion fencing, and repair damage to all temporary and permanent fencing immediately (BIO-9).

Any tortoises overlooked by the initial clearance surveys may be detected during construction activities by routine site inspections by the Designated Biologist (BIO-2) or incidental observations by construction workers. The worker environmental awareness program would be administered to all onsite personnel and be repeated annually for all permanent personnel and within 1 week of arrival to any new construction personnel (BIO-6). This training would enhance the effectiveness of onsite personnel detecting tortoises during construction and O&M activities, and either avoiding them or ensuring they are properly relocated.

The posting and enforcement of specified speed limits and inspections underneath parked vehicles (BIO-8) would further reduce the risk to any tortoises that inadvertently venture onto the roadway during construction or O&M activities. To reduce the likelihood of tortoises in construction areas being trapped in pipes, trenches, or other excavations and being injured or killed, all pipes greater than 8 cm (3 in) stored close to the ground and all excavations would be covered, fenced, or backfilled, and inspected by the Designated Biologist (BIO-2 and BIO-8). To reduce the likelihood of tortoises being attracted to construction areas by application of water to control dust, the minimal amount of water needed would be applied to dirt roads and construction areas, and a biological monitor would patrol those areas to ensure water does not puddle (BIO-8).

Overall, we expect that death and injury of most subadult and adult tortoises would be avoided during construction and O&M activities through compliance with the conservation measures. However, since tortoise eggs and juveniles are difficult to detect, we anticipate that an unknown number of eggs and two to three juveniles occurring in the project footprint would be killed or injured due to construction and O&M activities. We do not expect loss of eggs or juveniles in the project footprint would affect the species local population level because early life stages naturally suffer higher mortality rates and are not as important to the long-term conservation of the species as are breeding adults.

#### Capture, Handling, and Relocation/Translocation

In addition to construction and O&M-related activities, accidental death and injury could result from capturing, handling, and moving tortoises for the purposes of relocating or translocating them out of the project footprint. Accidental death and injury could result from (1) stress or disease transmission associated with handling tortoises; (2) stress associated with moving individuals outside of their established home range; (3) stress associated with artificially increasing the density of tortoises in an area and thereby increasing competition for resources; and (4) disease transmission between translocated and resident tortoises. Capture and handling of translocated and resident tortoises for the purposes of assessing health and monitoring could also result in accidental death or injury from handling to conduct visual health assessments, draw blood for ELISA testing, and secure transmitters.

We anticipate that the applicant would capture and relocate or translocate most subadult and adult desert tortoises from harm's way in the project footprint. Because of the difficulty in detecting juvenile desert tortoises or eggs, the applicant may find and move some but not all juvenile desert tortoises or eggs from the project footprint. Tortoises found on the plant site, perimeter security fence line, or rerouted drainage channels off the plant site would be moved more than 500 m (1,650 ft), outside of their existing home range.

Capturing, handling, and moving tortoises for the purposes of relocating or translocating them out of the project footprint may result in accidental death or injury if these methods are performed improperly, such as during extreme temperatures, or if tortoises void their bladders and are not rehydrated. Averill-Murray (2001) determined tortoises that voided their bladders during handling had lower overall survival rates (0.81–0.88) than those that did not void (0.96). If multiple tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among individuals. Walde *et al.* (2008) found that the differences in reproduction among translocated, resident, and control desert tortoises were “not likely to be statistically significant” in a study of tortoises at Fort Irwin.

Translocated tortoises may suffer a higher potential for mortality following release when they are moved into unfamiliar territory, and are less likely to have established cover sites for protection prior to home range establishment. Studies have documented various sources of mortality for translocated individuals, including predation, exposure, fire, disease, and flooding (Nussear 2004; Field *et al.* 2007; Berry 1986; U.S. Army 2009, 2010). The degree to which tortoises move after translocation depends on whether they are released into typical or atypical habitat; that is, if the recipient area supports habitat similar to that of the source area, tortoises are likely to move less (Nussear 2004). In one study, the majority of dispersal movement away from the release site occurred during the first 2 weeks after translocation (Field *et al.* 2007). However, Field *et al.* (2007) and Nussear (2004) showed translocated tortoises appear to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations.

Following release, we cannot predict the movement patterns that all translocated animals are likely to exhibit. Previous translocation studies have shown that tortoises released in spring, move variable straight-line distances from their release points during the first year. While the mean straight-line distances reported for several studies are close to or less than 2.5 km (1.6 mi), some individuals move much farther (Nussear 2004; Field *et al.* 2007; Berry *et al.* 2009; Drake *et al.* 2009; Boarman *et al.* 2010). An individual at Fort Irwin was reported to move 23.0 km (14.3 mi) (Boarman *et al.* 2010). Based on our analysis of available data, we expect the movements of most tortoises translocated more than 500 m (1,650 ft) to fall within 6.5 km (4.0 mi) of their release points. This distance was estimated by examining the upper limits on the 95 percent confidence intervals for available data. Translocated populations can also significantly expand the area they occupy in the first year following translocation [e.g., 10.1 to 17.9 square km (3.9 to 6.9 square mi) at a Nevada site; from 0.5 to 26.7 square km (0.2 to 10.3 square mi) at a Utah site].

Tortoises translocated shorter distances [i.e., less than 500 m (1,650 ft)] are not likely to move as far following release as tortoises moved longer distances. Walde *et al.* (2008) found that maximum straight-line dispersal distance for male tortoises was approximately 1.5 km (0.9 mi) in the first year following translocation. 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).

In a study conducted in Ivanpah Valley, 21.4 percent of 28 translocated tortoises died (Field *et al.* 2007). Nussear (2004) documented mortality rates of 0, 15, and 21 percent in other areas, though this study found that mortality rates among translocated desert tortoises was not statistically different from that observed in resident populations. Because Nussear (2004) did not compare mortality rates in resident populations to those in control groups, we cannot determine if the translocation caused increased mortality rates in the resident population. Recent work on translocation associated with the expansion of Fort Irwin (U.S. Army 2009 and 2010) compared the mortality rates associated with resident and translocated populations with that of the control populations and indicated translocation did not increase mortality above natural levels (Esque *et al.* 2010). This and other fieldwork indicate that tortoise mortality is most likely to occur in the first year after release. After the first year, translocated individuals are likely to settle into new home ranges and mortality is likely to decrease.

Desert tortoises from the PSPP site would be moved into areas now supporting resident tortoises, which may result in increased competition for forage, especially during drought years. Increased tortoise densities may lead to increased inter-specific encounters and thereby increase the potential for spread of disease, potentially reducing the health of the overall population. Increased tortoise densities also may lead to increased competition for shelter sites and other limited resources or increased incidence of aggressive interactions between individuals (Saethre *et al.* 2003). Therefore, recipient sites must be sufficiently large to accommodate and maintain the resident and translocated desert tortoises (Service 2010a). Based on our estimate of the resident population in the recipient site as discussed in the “Environmental Baseline” section, we calculated the maximum allowable final density<sup>5</sup> at the recipient site. Based on this calculation, the tortoise population (resident plus translocatees) at the Palen recipient site should not exceed 95<sup>6</sup> tortoises, respectively, after translocation. Since we estimate the population at the Palen recipient site to be up to 73 subadult and adult tortoises, we do not anticipate that translocation of up to 12 subadult and adult tortoises (from the plant site perimeter security fence line or rerouted drainage channels off the plant site) to the recipient site would impact the currently estimated population at the recipient site. However, if the density of resident tortoises at the recipient site is determined to be higher, then the size of the recipient site may need to be

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<sup>5</sup> Defined as 130 percent of the mean density detected in the respective recovery unit (Service 2010a). Mean density in the Eastern Colorado Recovery Unit is estimated to be 5 desert tortoises per square km (13 desert tortoises per square mi) based on line-distance sampling (Service 2009b).

<sup>6</sup> Calculated as 14.6 square km Palen recipient site multiplied by 6.5 desert tortoises per square km [130 percent multiplied by the mean density of the recovery unit (5 desert tortoises per square km)].

expanded to ensure tortoise density following translocation does not exceed the maximum allowable density.

Translocation has the potential to increase the prevalence of diseases, such as upper respiratory tract disease, in a resident population. Physiological stresses associated with handling and movement or from 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 stresses 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.

Following the Service's translocation guidance (Service 2010a), health assessments would be conducted on all tortoises to be translocated prior to being released. For tortoises that would be translocated less than 500 m (1,650 ft), visual health assessments (without blood draw for ELISA testing) would be conducted. For tortoises that would be moved greater than 500 m (1,650 ft) to the recipient site, visual health assessments and blood draw for ELISA testing would be conducted.

In addition, to minimize the risk associated with potential contact between healthy translocated tortoises and diseased [documented seropositive or clinically ill (showing signs of disease)] resident tortoises, the translocation guidance recommends that health assessments be performed on resident tortoises within the translocated tortoises' dispersal area to determine disease prevalence within the population. As discussed above, the extent to which tortoises disperse following translocation appears to be influenced by the distance they are moved from their home range and the availability of resources in the area to which they are moved. Tortoises translocated relatively short distances [up to 500 m (1,650 ft)] have been found to disperse up to 1.5 km (0.9 mi) and we expect the movements of most tortoises translocated more than 500 m (1,650 ft) to fall within 6.5 km (4.0 mi) of their release points. Therefore, for recipient sites that would be receiving tortoises translocated less than 500 m (1,650 ft), Service guidance mandates that visual health assessments (without blood draw for ELISA testing) be conducted on resident tortoises within 1.5 km (0.9 mi) from translocation release points. For recipient sites that would be receiving tortoises translocated over 500 m (1,650 ft), the guidance mandates that visual health assessments with blood draw for ELISA testing be conducted on resident tortoises within 6.5 km (4.0 mi) from translocation release points.

However, for the purposes of the proposed project, we have determined that for recipient sites that would be receiving tortoises translocated over 500 m (1,650 ft), visual health assessments and blood draw for ELISA testing is only necessary for resident tortoises within 1.5 km (0.9 mi) of translocation release points. Our determination is based on the assumption that tortoises translocated greater than 500 m (1,650 ft) are likely to remain closer to their release point in either recipient site due to the presence of better quality habitat than that on the project site. Therefore, tortoises are likely to remain in contact with resident tortoises on the recipient site that previously underwent health assessments as part of the translocation process. As discussed in the "Environmental Baseline" section, the recipient sites will be located within areas of similar

or better quality, habitat to that of the project area. Availability of water, forage, and cover sites is anticipated to be higher in the recipient sites due to their proximity to higher value alluvial fans. However, if post-translocation monitoring reveals that tortoises translocated over 500 m (1,650 ft) to either recipient site become diseased, additional resident tortoises within the 6.5 km (4.0 mi) dispersal area would be tested to determine disease prevalence before additional tortoises would be translocated to that recipient site.

We cannot precisely predict how many tortoises would require blood draw since the final number depends on the total number of tortoises translocated, the number of tortoises translocated greater than 500 m (1,650 ft), and the number of resident tortoises at the recipient site within 1.5 km (0.93 mi) of the release point of each translocated tortoise. Based on the estimated numbers of tortoise that may occur in the project footprint and recipient and control sites, a maximum of 97 tortoises may require blood draw as part of the translocation process (up to 12 translocated tortoises from the from the plant site, security fence line, or rerouted drainage channels off the plant site, up to 73 resident tortoises from the Palen recipient site, and up to 12 tortoises at the control site). Since it is unlikely that all the tortoises at the recipient site will occur within 1.5 km (0.93 mi) of the release points of translocated tortoises, and that 12 tortoises will require translocation from the PSPP site, the estimate that 97 tortoises may require blood draw is likely an overestimate. However, this estimate provides the best available data available to establish a baseline for analysis.

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) the applicant would use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals; (2) desert tortoises in the project footprint are currently part of a continuous population with the resident populations of the recipient site and are likely to share similar pathogens and immunities; (3) some of the translocated desert tortoises would be moved a relatively short distance, which is likely to reduce post-translocation stress associated with long-distance movements; (4) density-dependent stresses are unlikely to occur; (5) any animal that has clinical signs of disease or tests ELISA-positive would not be translocated; and (6) monitoring of translocated individuals would be implemented to determine the prevalence of disease transmission.

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 the applicant 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 would be incorrectly removed from the population due to false positive results. Similarly, some of the animals that test positive may have survived past disease infections and are healthy. Though our understanding of disease ecology is not complete and removal of these individuals

from the wild population could eliminate individuals with superior fitness and genetic adaptations for surviving disease from the gene pool, the low numbers of tortoises involved likely would not be large enough to affect population genetics in the wild.

Following the Service's translocation guidance (Service 2010a), an equal number of translocated, resident, and control tortoises would be monitored for at least 5 years. Therefore, 36 tortoises (12 each from the project, recipient, and control sites) will carry transmitters and be regularly monitored and handled annually for health assessments and blood draw for ELISA testing. Some potential exists that handling of desert tortoises for the purposes of conducting health assessments and monitoring may cause elevated levels of stress that may render these animals more susceptible to disease or dehydration from loss of fluids.

In conclusion, we do not anticipate that relocating tortoises out of harm's way, but less than 500 m (1,650 ft) from the point of capture, would result in death or injury because these individuals would be moved a relatively short distance and they would remain near or within their home range. Since relocated tortoises typically remain within their home range, we do not anticipate additional significant social or competitive impacts to resident tortoises in the area. Following release of tortoises translocated outside of their home range, a small number may die due to predation, exposure, disease, or competition. We anticipate most of this mortality is likely to occur in the first year after release, during the period that translocated animals are attempting to establish new home ranges. In addition, we anticipate that a small number of resident tortoises at the recipient site may die from natural causes due to predation, exposure, disease, or competition. However, we cannot determine if mortality rates in the resident or translocated populations would be above natural mortality levels for the recipient site. In addition, the potential impacts of capturing, handling, and moving tortoises for the purposes of relocation or translocation would be minimized by the requirement for experienced biologists to handle all tortoises following Service-approved guidelines and relocate individuals out of harm's way or translocate individuals to the recipient site as will be outlined in the Relocation/Translocation Plan (BIO-9 and BIO-10). Lastly, as will be outlined in the final Relocation/Translocation Plan, translocated tortoises would be monitored, findings reported to the Service, and adaptive management strategies implemented, as needed.

#### Habitat Destruction/Degradation

To offset permanent destruction or degradation of tortoise habitat, the applicant would provide compensatory habitat acquisition at a 1:1 ratio for impacts on up to approximately 1,698 ha (4,195 ac) and at a 5:1 ratio for impacts to approximately 91 ha (225 ac) of critical habitat. The quality of acquired habitat would be equivalent or better than that of the project footprint and benefit tortoise habitat connectivity and habitat linkages within/between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands along the I-10 corridor in the Eastern Colorado Recovery Unit (see "Conservation Measures" section above). Consistent with CEC's conditions of certification (CEC 2010b), these acquired lands would be conserved through legal protections in perpetuity for the benefit of desert tortoise and a management endowment provided to enable effective monitoring and management through the long term.

Using available data on landownership and willing sellers, the Service has determined that a sufficient amount of privately owned desert tortoise habitat exists within the Eastern Colorado Recovery Unit that would be available for acquisition. We are also aware of private lands that have been identified by private conservation organizations as available for potential acquisition to offset impacts to desert tortoise habitat in the Eastern Colorado Recovery Unit.

Native shrubs and annual plants used by tortoises for sheltering and feeding adjacent to the project footprint also may be adversely affected by introduced or previously naturalized invasive nonnative plants (also referred to as weeds) that respond positively to ground-disturbing activities. Project equipment may transport invasive nonnative plants into the project area where they may become established. Additionally, the potential introduction of noxious weeds may lead to increased wildfire risk (Brooks *et al.* 2003). However, potential degradation of habitat due to spread of invasive nonnative plants would be avoided and minimized by measures outlined in the Weed Management Plan designed to prevent the introduction of any new weeds and the spread of existing weeds as a result of project construction and O&M (BIO-14).

### *Indirect Effects*

Human activities may provide food in the form of trash and litter or water that attracts tortoise predators such as the common raven. Ravens capitalize on human encroachment and 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 nearby Blythe airport and other urban areas provide food, water features, and roosting/nesting substrates (buildings, signs, lamps, and utility poles) that otherwise would be unavailable. Small mammal, fox, coyote, rabbit, lizard, snake, and tortoise road kill along I-10 and other roads provide additional attractants and subsidies for opportunistic predators/scavengers. Road-killed wildlife would increase with project construction and O&M traffic, further exacerbating the raven/predator attractions and increasing tortoise predation levels.

Facility infrastructure, such as power poles, fence lines, buildings, and other structures on the project site, may provide perching, roosting, and nesting opportunities for ravens. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the existing level of raven predation on juvenile tortoises is considered an unnatural occurrence (BLM 1990). In addition to ravens, feral dogs have emerged as significant predators of tortoises in rural residential areas. Though feral dogs may range several miles into the desert and have been found digging up and killing tortoises (Service 1994a, Evans 2001), we are not aware of any reports of feral dogs in the project area.

To minimize the generation of food and water subsidies from construction and O&M-related activities, all trash materials would be disposed of in self-closing containers and removed daily

to prevent the attraction of tortoise predators to the project footprint, road-killed animals would be immediately removed from the project footprint, and the minimal amount of water needed would be applied to dirt roads and construction areas to avoid standing water, with a biological monitor patrolling those areas to ensure water does not puddle (BIO-8). Also, increases in raven abundance in the project area would be minimized by measures outlined in the Raven Monitoring, Management, and Control Plan (Raven Plan) which include a program to monitor raven presence in the project vicinity, would determine if raven numbers are increasing, and would implement raven control as needed based on monitoring (BIO-13).

In addition, desert tortoise behavior may be impacted by increased noise levels and the presence of full-time facility lighting during construction and operation of the facility over a 30-year period. While we do not have data demonstrating the effect of increased noise levels and artificial lighting to desert tortoise behavior, several measures proposed to minimize these potential impacts on other sensitive species (BIO-8) would also benefit tortoises.

The proposed project may also create a barrier to long-term tortoise movement between areas on either side of I-10. As stated in the “Environmental Baseline” section above, the project is within the DWMA Continuity WHMA, an area designated to provide for connectivity of tortoises between conservation areas north and south of I-10 (i.e., the Chuckwalla DWMA and Chemehuevi DWMA) (BLM 2002). For gene flow to occur across the range, populations of tortoises need to be connected by occupied areas of habitat that contain sustainable numbers of tortoises. Desert tortoise distribution and population genetic studies provide evidence that individual tortoises breed with their neighbors and those tortoises breed with their neighbors on the other side in a continuum.

Although the three major underpasses that occur under I-10 adjacent to the project site would remain open to desert tortoise movement, construction of the project would disrupt local occupancy and movement patterns by forcing tortoises to walk long distances around the project site. In addition, the engineered channels through the center of the project site would be fenced to exclude tortoises from entering. Even if left unfenced, the channels would not provide a safe movement corridor since the absence of vegetative cover would expose tortoises to predators and thermal extremes without requisite shrub cover. Thus, tortoises north of the project site attempting to move in a southward direction would be diverted to the east or west, and the permanent perimeter fencing around the project site would direct tortoises towards I-10 on the traffic surface. Tortoise-proof fencing has not been installed along this segment of I-10, so the desert tortoise moving around the project site, rather than moving through washes under the interstate would potentially experience increased rates of vehicular-related mortality. Increased mortality would further reduce local population levels and increase the adverse effects of genetic/habitat fragmentation by reducing or preventing occupancy/dispersal between populations on either side of I-10.

To minimize impacts to tortoises because of decreased connectivity and increased vehicular-related mortality, permanent tortoise-exclusion fencing would be installed along the existing I-10 ROW fencing, on both sides of the interstate to direct tortoises to existing under-crossings under

I-10 (see BIO-9 in CEC 2010b). This fencing would be inspected and maintained regularly for the life of the project. A culvert will also be constructed underneath the project access road to facilitate movement of tortoises underneath the road.

In addition to the three underpasses that occur adjacent to the project site, an additional 21 underpasses occur along the existing washes in the 36-mile-long stretch on either side of the proposed project, between Wiley Wells Road and Desert Center (see Figure 8 in AECOM 2010a). AECOM surveyed these underpasses and determined that all are suitable for tortoise use and provide passage under I-10 in a north-south direction to allow tortoise passage. Therefore, the proposed project would reduce the amount of available tortoise habitat and thereby result in reduced habitat connectivity; habitat would remain to the west and east of the proposed project to provide connectivity of tortoises in the long term. To offset impacts to connectivity, the applicant would provide compensatory habitat acquisition at a 1:1 ratio for impacts on up to approximately 1,670 ha (4,127 ac) and at a 5:1 ratio for impacts to approximately 91 ha (225 ac) of critical habitat (see BIO-12 in CEC 2010b). The REAT agencies have agreed that privately-owned lands will be acquired to benefit tortoise habitat linkages and connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands along the I-10 corridor in the Eastern Colorado Recovery Unit (see “Conservation Measures” section above). The loss of designated critical habitat would be replaced at a 5:1 ratio through acquisition of private lands in the Chuckwalla Critical Habitat Unit along the I-10 corridor.

#### *Desert Tortoise Critical Habitat*

Approximately 91 ha (225 ac) of the 413,022 ha (1,020,600 ac), or less than 0.0002 percent, of designated critical habitat in the Chuckwalla Critical Habitat Unit would be permanently and temporarily impacted by the construction of the plant site and associated linear facilities.

Based on characteristics of the project site relative to the six critical habitat PCEs recognized for desert tortoise (see the Environmental Baseline section above), the designated critical habitat overlapping the project site supports at least three of the PCEs. The presence of desert tortoise sign (e.g., burrows and bone fragments) found within and adjacent to critical habitat on site provides evidence that the area contains the PCEs necessary for nesting and foraging, and therefore, occupancy and dispersal/movement of individuals and gene flow across time. Though I-10 has disrupted the hydrology and associated microphyll woodland components of the lesser washes, the shrub and herbaceous annual vegetative components between the washes apparently remain relatively unaffected by altered hydrology and support comparable community characteristics with areas south of I-10. Since desert tortoises forage predominantly on annual plants, the hydrologic effects on the tree canopy likely do not measurably affect foraging habitat characteristics. Therefore, while habitat in the project area may be considered low quality for the nesting and foraging PCEs, based on the currently low population densities the area is occupied (at least at times, based on the presence of tortoise sign found on and adjacent to the project site) and maintains the potential for the inter-DWMA population connectivity objective in the final recovery plan (Service 1994a), the dispersal and gene flow PCE specified in the final critical

habitat rule (59 FR 5822), and BLM's designation of the DWMA Connectivity WHMA in the NECO Plan (BLM 2002) to maintain population connectivity between the Chuckwalla and Chemehuevi DWMAs/critical habitat units.

Of the three PCEs on the proposed project site, dispersal and gene flow is most important from a regional conservation perspective. The critical habitat designation overlapping the project footprint contains at least three sizable washes with wide bridges/underpasses that are conducive to tortoise movement and provide for potential tortoise dispersal and gene flow across I-10. However, the proposed project would disrupt the opportunity for tortoise occupancy/movement by constricting the configuration of usable habitat between the project site/flood control channels along the south side of the project and the I-10 embankment/road surface into a pinch point that would obstruct potential tortoise occupancy in the project area north of the freeway and associated movement through the three large bridges/under-crossings (AECOM 2010a, Figure 3).

Desert tortoise population-genetic structure is characterized by "isolation by distance." That is, genetic diversity occurs in small steps from one end of the range to the other. Furthermore, the distribution of desert tortoises [per desert tortoise habitat modeling, e.g., Nussear *et al.* (2009)] is relatively continuous across the species' range, broken only by major topographic barriers, such as major mountain ranges and the Colorado River. This suggests that gene flow generally occurred/occurs according to a continuous-distribution model, as opposed to something like a metapopulation or stepping-stone model, where individuals move from one patch of suitable habitat across less suitable or non-habitat to another patch of suitable habitat.

We do know that individual desert tortoises can make long-distance movements (e.g., on the scale of skirting along a several-km-long development project), and this probably does contribute a limited amount of gene flow. However, such movements may be rare events and we do not know the extent to which individual tortoises will traverse narrow corridors of relatively intact or artificially constrained habitat, or how they are affected by the edge effects of anthropogenic features that constrain habitat linkages. Under the continuous-distribution model of gene flow, we do not necessarily expect desert tortoises in one population to decide to traverse a long, narrow band of "corridor" habitat to another population several kilometers on the other side. As discussed in the draft revised recovery plan (Service 2008), the underpinning of this model, and the evidence from desert tortoise population genetic studies and distribution, is that individual desert tortoises breed with their neighbors, those tortoises breed with their neighbors on the other side, and so on. Thus, for gene flow to reliably extend across the range, populations of tortoises must be connected across the range by overlapping home ranges. As such, functional corridors need to be designed to allow continuously overlapping home ranges along the length of the corridor. This corridor concept would allow resident tortoises to inhabit the corridor and interact with their neighbors within and outside the corridor, rather than expecting that a narrower band of habitat would allow an individual tortoise to "shoot" through it to the other side, breed with other tortoises on that side, and produce viable offspring.

The proposed project was not designed to provide contiguous occupied habitat associated with the three large under-crossings that span I-10 between the large blocks of tortoise habitat to the north and south of the project site. Instead, the project proponent contended and the REAT agencies agreed that the loss of tortoise connectivity from the proposed project could be offset by acquiring and protecting unsecured private lands associated with other I-10 under-crossings to the west of the project site. Acquisition of equivalent or better quality tortoise habitat in the Chuckwalla Critical Habitat Unit, would help maintain the role and function of critical habitat, including its role in providing for connectivity, by offsetting adverse effects to the PCEs of critical habitat on the proposed project site. Thus, the proposed acquisition of 455 ha (1,125 ac) of desert tortoise habitat between Desert Center and Cactus City within the Chuckwalla Critical Habitat Unit along the I-10 corridor would replace at a 5:1 ratio the loss of 91 ha (225 ac) of critical habitat on the project site. This strategy would replace lower function habitat on the project site with higher function habitat (higher elevation and precipitation levels); thereby, maintaining the role and function of the nesting, foraging, and dispersal/gene flow PCEs within the critical habitat unit, and intends to prevent desert tortoise conservation areas (critical habitat units and DWMAs) from becoming conservation islands on either side of the I-10 corridor.

Though BLM policy allows the acceptance of compensation lands under BLM ownership with conservation encumbrances on the land title, BLM has not committed to conserve existing BLM lands needed to assemble functional habitat linkages crossing I-10. We have discussed this matter with BLM and their staff intends to discourage future incompatible land uses surrounding the conservation lands acquired for the proposed project through such means as requiring advanced habitat replacement ratios during an interim period before more solid protections could be provided through an amendment to the CDCA Plan as part of the Desert Renewable Energy Conservation Plan process. As such, the BLM and Service assume the habitat linkages partially created by acquisition of private parcels in the Chuckwalla Critical Habitat Unit will remain intact until the DRECP is completed. At that time and through BLM's participation in that process, BLM would amend the CDCA Plan to afford long-term protection of BLM lands surrounding these acquired parcels to create habitat-scale linkages across the I-10 corridor to be designated through the State's Natural Community Conservation Plan process.

As discussed in BIO-12 in CEC (2010b), the REAT agencies would have approval authority over the parcels acquired through the NFWF account or by other means. Therefore, the BLM and Service would ensure that impacts to critical habitat would be offset through the purchase of suitable habitat within Chuckwalla Critical Habitat Unit to be consistent with BIO-12 and the conservation measures included as part of the proposed project description. As such, the proposed project would maintain the habitat base for supporting viable desert tortoise populations in critical habitat and prevent erosion of the environmental baseline on BLM lands in the highest value habitat areas that provide the primary focus for recovery efforts.

The proposed recipient and control sites would be located in critical habitat; however, only monitoring activities associated with tortoise translocation would be conducted at these sites. Therefore, no impacts to the role and function or PCEs of critical habitat are anticipated to occur due to monitoring activities associated with the proposed project.

*Effect on Recovery*

Per section 2(b), the primary purposes of the Act are to provide a means whereby the ecosystems upon which listed species depend may be conserved, and to provide a program for the recovery of listed species. Per section 2(c), Congress established a policy requiring all Federal agencies to use their authorities in seeking to recover listed species in furtherance of the purposes of the Act. Consistent with these purposes and Congressional policy, sections 3(5), 4(f), 7(a)(1), and the implementing regulations (50 CFR § 402.02) to section 7(a)(2), and related preamble at 51 FR 19926, generally require Federal agencies to further the survival and recovery of listed species in the use of their authorities. Pursuant to these mandates, our analysis below assesses (1) whether the proposed action adequately offsets its adverse effects to the species' environmental baseline, and (2) the extent to which the proposed action would cause "significant impairment of recovery efforts" or adversely affect the "species' chances for survival to the point that recovery is not attainable" (51 FR 19934).

The applicant would implement numerous measures to avoid, minimize, reduce, and offset the adverse effects to the relatively few tortoises in the project footprint (see "Conservation Measures" section above). Overall, we expect that two or fewer desert tortoises per year would be injured or killed during construction and O&M of the solar facility, and that a relatively small but unquantifiable number of eggs may be moved or destroyed during construction and O&M. Few tortoises would be killed or injured during O&M of the facility. We expect that most subadult and adult tortoises encountered during work activities would be either moved short distances out of harm's way or translocated. Because the BLM and applicant would implement a variety of measures to reduce stress to these animals, we do not anticipate that injury or mortality would result from the handling and relocation of these animals.

We do not anticipate that destruction or degradation of habitat in the project footprint would substantially reduce the ability of the tortoise to survive and recover in the wild because the project site lies in an area with relatively low desert tortoise densities. Further, the final recovery plan (Service 1994a) and final rule for designation of critical habitat for the species (Service 1994b) primarily focused long-term conservation priorities in higher density habitat areas. The proposed acquisition of up to 2,062 ha (5,095 ac) of desert tortoise habitat (depending on the final layout) would benefit habitat connectivity and habitat linkages within and between tortoise critical habitat, known populations of tortoises, and/or other preserve lands along the I-10 corridor in the Eastern Colorado Recovery Unit, with the conservation located in equal or higher value habitat, and the impact to critical habitat offset with conservation of critical habitat in the Chuckwalla Critical Habitat Unit.

Based on the results of studies discussed above, most of the subadult and adult tortoises moved from the project footprint likely would continue to survive and reproduce at the location to which they are moved (i.e., in adjacent habitat or the recipient site). Consequently, we anticipate that the proposed project would not appreciably diminish the reproductive capacity of the species, particularly in light of the relatively few tortoises that would be affected.

The overall distribution of desert tortoise would not be reduced significantly by the proposed action because only a small percentage of the habitat in the Eastern Colorado Recovery Unit [which includes the 413,022-ha (1,020,600-ac) Chuckwalla Critical Habitat Unit, a majority of the approximately 404,686-ha (1,000,000-ac) Joshua Tree National Park, and additional lands] would be destroyed. This percentage does not constitute a substantial portion of the recovery unit or the species' range.

## CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, tribal, 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 Service is not aware of any future State, local, private, or certain tribal actions that are reasonably certain to occur in the action area.

## CONCLUSION

After reviewing the current status, environmental baseline for the action area, effects of the proposed action, and cumulative effects of the desert tortoise, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify designated critical habitat. We base this decision on the following:

1. The applicant will implement numerous measures to ensure that most tortoises are moved out of the project footprint and injury and death of tortoises is minimized (i.e., clearance surveys, exclusion fencing, relocation, translocation, and qualified tortoise biologists).
2. The applicant will implement measures to reduce the potential for increased predation by common ravens, both in the vicinity of the project footprint and regionally, and to reduce the spread of invasive nonnative plants in the project area.
3. Given the small number of tortoises potentially affected by the proposed project, we have no information to indicate that development of the proposed project would appreciably reduce the tortoise population levels in the Eastern Colorado Recovery Unit.
4. Few, if any, tortoises are likely to be injured and killed as a result of relocation or translocation.
5. Though the proposed project would reduce the amount of available tortoise habitat and thereby result in a loss of habitat connectivity, habitat would remain to the west and east of the proposed project to provide connectivity of tortoises in the long term.

6. Relocation of some tortoises into habitat adjacent to the project area, and translocation of some tortoises to a recipient site will increase tortoise numbers in those areas. Successful translocation would minimize these effects by allowing those tortoises to remain in the population and contribute towards recovery of the species.
7. Compensation requirements through the BLM, CDFG, and CEC will result in an increase in the quantity and quality of habitat managed for the conservation of the tortoise.
8. With implementation of the conservation measures, the impacts of the proposed project are expected to be effectively minimized and offset, and are not likely to diminish appreciably the conservation role and function of designated critical habitat for desert tortoise in the project area or the species' ranges.

### **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 as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not 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 this incidental take statement.

The measures described below for desert tortoises are non-discretionary and must be undertaken by the BLM so that they become binding conditions of any grant or permit issued to the applicant/permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant/permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

### **AMOUNT AND EXTENT OF TAKE**

We anticipate that the number of desert tortoises that may be taken would be low due to the small number of individuals estimated to occur within the project footprint and the anticipated

effectiveness of conservation measures described as part of the proposed action. However, quantifying the precise number of individuals that may be incidentally taken is not possible because this species is cryptically colored to avoid predation, and spends the majority of its life inhabiting burrows to avoid environmental extremes or predation, making the observation or detection of death or injury difficult. In addition, population numbers fluctuate in response to weather patterns and other biotic and abiotic factors, and population levels and the distribution of individual animals have changed since the species surveys were completed and are anticipated to continue changing over the 30-year life of the project. The number of tortoise eggs and juveniles is even more difficult to quantify because of small size, in addition to the other reasons discussed above. As a result, finding dead or injured individuals within the project area is difficult as individuals may be crushed or buried underground in burrows that were not found or inspected, and otherwise hard to recognize/detect for the reasons discussed above. Because eggs and juveniles are almost never found during clearance surveys, we assume virtually all these early life forms will be killed or injured by construction and O&M activities within the project footprint.

While we cannot provide the precise number of desert tortoises that may be taken, we have estimated the number of subadult and adult tortoises (tortoises with a midline carapace length greater than 160 mm) in the project footprint based on the best available information, and based on this estimate have established take thresholds that, if exceeded, will trigger reinitiation of consultation.

Take of desert tortoises is anticipated and exempted as follows:

- The disturbance of up to 1,698 ha (4,195 ac) of habitat from construction and O&M-related activities may result in accidental death or injury of tortoise eggs, juveniles, subadults or adults from crushing, trampling, or burial. If the project impacts more than this acreage of tortoise habitat, the take threshold will be exceeded.
- As discussed in the “Environmental Baseline” section above, we estimate that up to 12 subadult and adult tortoises, up to 6 juveniles, and a relatively small but unquantifiable number of eggs could occur in the project footprint. While we cannot quantify the precise numbers of tortoises that may be killed or injured as a result of construction or O&M activities for the reasons discussed above, we anticipate the number of subadult and adult tortoises that may be killed or injured will be small because no tortoises were found in the project footprint during surveys, which indicates an apparently small population, and because most tortoises will be found during pre-project clearance surveys. Therefore, using our best professional judgment and in light of best available information, we anticipate that construction of the proposed project will result in the incidental take of two individuals per year, and that O&M activities will result in incidental take of two individuals per year. However, based on the difficulty of detecting individual tortoises, we anticipate each report of incidental taking could represent the actual death or injury of two tortoises. As a result, we anticipate no more than one tortoise per year may be reported dead or injured from construction and no more than one

tortoise per year may be reported dead or injured from O&M activities. Thus, if more than one tortoise per calendar year is found injured or dead during construction activities, and more than one tortoise per calendar year is found injured or dead during O&M activities, the take threshold will be exceeded.

- Take, in the form of capture or collection, of up to 12 subadult and adult tortoises, up to 6 juveniles, and a relatively small but unquantifiable number of eggs for the purposes of relocation or translocation from the project footprint during construction and O&M activities. However, because the capture or collection, relocation/translocation, and release will be conducted by a Service-approved biologist, we do not expect these activities to result in direct injury or death of any relocated/translocated tortoises. Therefore, we do not want to limit the ability of the Service-approved Biologist to avoid and minimize the direct injury or death of tortoises by relocating/translocating tortoises found during preconstruction clearance surveys. Thus, all take in the form of trapping, capture, or collection for the purposes of relocation is exempted for any eggs, juveniles, or subadult or adult tortoises found during clearance surveys, monitoring activities, or other incidental observations, subject to the reasonable and prudent measures and terms and conditions below. If any tortoises are directly injured or killed during relocation or translocation, the take threshold will be exceeded.
- Take, in the form of capture or collection, of up to 36 subadult and adult tortoises (up to 12 each from the project footprint, recipient and control sites) for the purposes of attaching transmitters to tortoises and monitoring activities. Although transmitted tortoises may be captured multiple times over the course of the post-translocation monitoring effort, we do not anticipate injury or mortality of these individuals due to post-translocation monitoring. However, if any tortoises are directly injured or killed during monitoring activities, the take threshold will be exceeded.
- Take, in the form of capture or collection, of up to 97 subadult and adult tortoises (up to 12 from the project footprint, up to 73 resident tortoises from the recipient site, and up to 12 tortoises at the control site) for the purposes of blood draw for ELISA testing 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 draw will result in the death or injury of any individuals because blood draw will be conducted by Service-approved Biologists, following Service-approved methods. If any tortoises are directly injured or killed as a result of blood draw, the take threshold will be exceeded.

## IMPACT OF THE INCIDENTAL TAKING OF THE SPECIES

In the accompanying biological opinion, the Service determined that these levels of anticipated take are not likely to result in jeopardy or adversely affect the recovery of the tortoise.

## REASONABLE AND PRUDENT MEASURES

The BLM and applicant are implementing conservation measures for this project as part of the proposed action to minimize the taking of desert tortoises. The Service's evaluation in the biological opinion includes consideration of the conservation measures developed by the BLM and applicant to reduce the adverse effects of the proposed project on this species. Any subsequent changes in the conservation measures proposed by BLM or applicant or in the conditions under which these activities currently occur may constitute a modification of the proposed action and may warrant reinitiation of formal consultation, as specified at 50 CFR § 402.16. These reasonable and prudent measures are intended to supplement the protective measures that were proposed by BLM and applicant as part of the proposed action, and are necessary and appropriate to minimize the impact of the taking on desert tortoises.

- The BLM and applicant shall monitor and report the level of incidental take of desert tortoises to the CFWO throughout the life of the project and report on the effectiveness of the project minimization measures to reduce the impact of incidental take of tortoises.

## TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the BLM and applicant, and all agents/contractors, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and are intended to minimize the impact of the incidental taking. These terms and conditions are non-discretionary.

The following term and condition implements the reasonable and prudent measure above.

The applicant shall prepare and provide to the Service and BLM an annual report by January 31 of each year of the project. The annual report shall document but not be limited to, the following:

- Compliance with project-specifications and conservation measures outlined in this biological opinion, including BIO-1 thru BIO-14, and BIO-29 outlined in the CEC's Commission Decision on the PSPP project (CEC 2010b), as they relate specifically to desert tortoises.
- Any activities determined by the Designated Biologist or biological monitors to be out of compliance with project-specifications and conservation measures outlined in this biological opinion and the corrective measures implemented to bring the project back into compliance.
- The total amount and location of desert tortoise habitat disturbed by construction and O&M activities during the reporting year.

- The number and location of desert tortoises killed or injured during project construction or O&M activities during the reporting year and a description of the circumstances leading to the death or injury of individuals of the species.
- Activities conducted under the Plan (BIO-10) during the reporting year. These activities include but are not limited to: 1) the number and location of desert tortoise eggs, juveniles, subadults, or adults located during project activities and relocated or translocated during preconstruction; 2) construction, and/or O&M activities during the reporting year; 3) a detailed description of the relocation/translocation activities; and 4) a detailed description of monitoring activities conducted at the recipient and control sites during the reporting year.

If more than 12 adult desert tortoises, or any eggs, juveniles or subadults are found within the project footprint, the Designated Biologist shall immediately report the observation to the CFWO, prior to any relocation/translocation activities. The CFWO will review the information to determine its consistency with the effects analysis above and if relocation/translocation of additional desert tortoises would benefit their survival and be consistent with our assumptions in the biological opinion, and if reinitiation of consultation is warranted.

- Activities conducted under the Raven Management Plan (BIO-13) during the reporting year, including but not limited to, the results of raven nest monitoring and removal of raven nests and offending ravens.
- Activities conducted under the Weed Management Plan (BIO-14), including but not limited to, invasive plant species control activities conducted during construction or O&M activities in the project disturbance area during the reporting year and the status of control activities conducted the previous year.

#### *Disposition of Sick, Injured, or Dead Specimens*

Pursuant to 50 CFR § 402.14(i)(1)(v), the CFWO is to be notified immediately at 760- 431-9440 if any desert tortoises are found sick, injured, or dead in the action area. Immediate notification means verbal (if possible) and written notice within 1 workday, and must include the date, time, and location of the carcass, and any other pertinent information. Care must be taken in handling sick or injured individuals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.

The CFWO should also be notified immediately at 760-431-9440 if any endangered or threatened species not addressed in this biological opinion is found dead or injured in the project footprint during the life of the project. The same reporting requirements also shall pertain to any healthy individual(s) of any threatened or endangered species found in the action area and

handled to remove the animal to a more secure location. Refer to the “Terms and Conditions” section above for details on reporting procedures.

### **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 BLM work with the applicant and Service to determine if the translocated desert tortoises associated with the translocated populations can be used to answer additional research questions related to translocation or desert tortoise biology.
2. We recommend that the BLM prohibit additional renewable energy development (e.g., solar energy facilities, wind development) within the unused portion of the 2,109-ha (5,212-ac) ROW granted for construction and O&M of the PSPP project.
3. We recommend that the BLM amend the California Desert Conservation Area Plan to prohibit additional renewable energy development (e.g., solar energy facilities, wind development) within the upper bajadas (mapped as “dissected fans” on the NECO Map 3-4, Landforms) in the mountains of northeastern Riverside County. This recommendation is intended to protect higher quality tortoise habitat in the recovery unit.
4. We recommend that the BLM protect its existing lands from incompatible land uses that surround the parcels acquired to offset the adverse effects of the proposed project, as part of a strategy to assemble functional habitat linkages across the I-10 corridor to maintain desert tortoise population connectivity.

### **REINITIATION NOTICE**

This concludes formal consultation on the proposed project for the desert tortoise. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (4) a new species is listed or critical habitat designated that may be affected by the action; or (5) any of the stated assumptions in our analysis are invalidated.

If you have any questions regarding this document, please contact Tannika Engelhard of this office at 760-431-9440, extension 202.

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