BIOLOGICAL ASSESSMENT

DESERT SUNLIGHT SOLAR FARM PROJECT

BLM CASE FILE NUMBER CACA-48649

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:
BUREAU OF LAND MANAGEMENT
Palm Springs South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262

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Table of Contents

1.0 Background/History 1
2.0 Description of the Action and Action Area 3
2.1 Construction Timeline 3
2.2 Summary of Project Impacts 6
2.3 Solar Farm and Support Facilities 8
2.4 Red Bluff Substation and Support Facilities 12
2.5 Conservation Measures 14
2.6 Desert Tortoise-Specific Protection Measures 16
2.7 Compensatory Mitigation for Impacts to Desert Tortoise and Other Biological Resources 16
2.8 Action Area 19
3.0 Listed Species and Critical Habitat in the Action Area 19
4.0 Other Species in the Action Area 30
5.0 Environmental Baseline Conditions 31
5.1 Vegetation Communities 31
5.2 Soils in the Action Area 38
5.3 Climate Change and Desert Tortoise 38
6.0 Effects of the Action on Desert Tortoise 42
6.1 Direct Effects 42
6.2 Indirect Effects 42
6.3 Effects to Mojave Desert Tortoise Critical Habitat 43
7.0 Cumulative Effects 48
8.0 Conclusions 48
9.0 References 49
10.0 List of Preparers 52

Appendices

- Appendix A Desert Tortoise Translocation Plan
- Appendix B Site Plan
- Appendix C Common Raven Management Plan
- Appendix D Habitat Compensation Plan
- Appendix E Integrated Weed Management Plan

List of Tables

Table 1 Disturbance Acreage for the Desert Sunlight Project Areas 6
Table 2 Proposed Mitigation for Desert Sunlight Solar Farm Site and Gen-Tie Line 17
Table 3 Proposed Mitigation for Desert Sunlight Project Components 18
Table 4 Proposed Mitigation for SCE Project Components 18
Table 5 Active Tortoise Sign and Estimated Number of Tortoises 27

List of Figures

Figure 1 Regional Location 4
Figure 2 Project Components 5
Figure 3 Direct Effect Areas 7
Figure 4 Preliminary Construction Staging Plan 22
Figure 5 Solar Farm Site Plan 23
Figure 6 Gen-Tie Impacted Areas 24
Figure 9 Desert Tortoise Survey Periods 26
Figure 7 USGS Desert Tortoise Habitat Model 28
Figure 8 Desert Tortoise Carcasses 29
Figure 10 Desert Tortoise Sign - Solar Farm Site 32
Figure 11 Desert Tortoise Sign - Gen Tie Line 33
Figure 12 Desert Tortoise Sign - SCE Components 34
Figure 13 Golden Eagle Observations 35
Figure 14 Vegetation Mapping - Solar Farm 36
Figure 15 Vegetation Mapping for Gen-Ties 37
Figure 16 Vegetation Communities - SCE Components 39
Figure 17 Topographical Map 40

LIST OF ACRONYMS

AC	Alternating Current
ACEC	Area of Critical Environmental Concern
amsl	above mean sea level
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CAISO	California Independent System Operator
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CHU	Critical Habitat Unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CPUC	California Public Utility Commission
DPV I	SCE's Devers to Palo Verde I transmission line
DWMA	Desert Wildlife Management Area
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act

FPL	Florida Power and Light
I-10	Interstate 10
JTNP	Joshua Tree National Park
kV	Kilovolt
MW	Megawatt
MWD	Metropolitan Water District
NECO	Northern and Eastern Colorado Plan and EIS
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
O&M	Operations and Maintenance
OHV	Off-Highway Vehicle
PCE	Primary Constituent Elements
PCS	Power Conversion Structures
PV	Photovoltaic
PVCS	PV Combining Switchgear
ROW	Right of Way
RPS	Renewable Portfolio Standards
SBBM	San Bernardino Base and Meridian
SCE	Southern California Edison
SPCC	Spill Prevention and Control and Countermeasure
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRI	Wildlife Research Institute

1.0 Background/History

The purpose of this Biological Assessment (BA) is to address the effect of the Desert Sunlight Solar Farm (Project or Proposed Action) on species listed as endangered or threatened under the Endangered Species Act (ESA), or their designated critical habitat. Desert Sunlight Holdings, LLC (Sunlight), a wholly owned subsidiary of First Solar Development, Inc. has requested a right-of-way grant from the U.S. Bureau of Land Management (BLM) to construct and operate a new solar photovoltaic (PV) energy generating facility in an unincorporated part of Riverside County, California near the community of Desert Center (BLM Case File Number CACA-48649). As part of the project, Southern California Edison (SCE) is construction the red Bluff Substation and related components, which will be wholly owned and operated by SCE. When discussions in this document refer to both Sunlight and SCE they are referred to as the applicants. The Project has the potential to impact the Mojave population of the desert tortoise (*Gopherus agassizii*) and its designated critical habitat. One additional species, the Coachella Valley milkvetch (*Astragalus lentiginosus* var. *coachellae*), was considered for consultation for this Project but excluded from further consideration because no suitable sandy habitats are found within the action area and this species was not observed during focused botanical biological surveys conducted for the Project.

Because Sunlight is seeking a Consistency Determination from the California Department of Fish and Game (CDFG) for the Biological Opinion (BO) issued for this project by the U.S. Fish and Wildlife Service (USFWS or Service), two species with state status were also considered in this BA: the golden eagle (*Aquila chrysaetos*) a fully protected species, and the Swainson's hawk (*Buteo swainsonii*) listed as threatened.

Early coordination and pre-consultation with USFWS and CDFG was conducted during a series of site visits, meetings, and phone consultations including:

January 2007	Original contacts made by phone with Peggy Bartels (Service) and Kim Nicol (CDFG) regarding the proposed Desert Sunlight Solar Farm Project.
June-October 2007	Discussions Brian Croft (Service), and Alice Karl, recognized desert tortoise expert, regarding survey methods for proposed solar sites.
March 2008	E-mails with maps and discussion of focused survey methods for spring 2008 surveys, including details of timing, personnel and training, with Peggy Bartels, Jody Fraser, Brian Croft and Pete Sorensen (Service).
September 2008	E-mails with maps and discussion of focused survey methods for fall 2008 surveys, including details of timing, personnel and training, with Peggy Bartels, Jody Fraser, Brian Croft and Pete Sorensen (Service).
October 2009	Discussions with Tannika Engelhard (Service) and Alice Karl regarding survey methods and personnel for fall 2009 surveys.

December 2009-February 2010	Ongoing discussions with Roy Averill-Murray and Jody Fraser (Service) regarding direction for desert tortoise translocation.
March 2010	E-mails with maps and discussion of focused survey methods for spring 2010 surveys, including details of timing, personnel and training, with Jody Fraser (Service), and Magdalena Rodriguez (CDFG).
April 2010	Submittal of *Draft Desert Tortoise Translocation Plan* and *Draft Common Raven Management Plan* to Jody Fraser (Service) and Magdalena Rodriguez (CDFG) for review. Appendix A presents a revised plan incorporating comments from these drafts.
April-December 2010	Regularly scheduled calls between Sunlight, BLM, and USFWS and CDFG to discuss issues related to desert tortoise effects and translocation, schedules for consultation and construction, avoidance, minimization and mitigation measures, habitat compensation, and long-term monitoring.

This BA addresses the proposed action in compliance with Section 7 of the ESA. Section 7 assures that, through consultation with USFWS, federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat.

This BA has also been prepared in coordination with the CDFG because the applicants intend to seek authorization from CDFG under California Fish and Game Code Section 2080.1 that the incidental take statement resulting from this Section 7 consultation is consistent with the applicable provisions of the California Endangered Species Act (CESA). Moreover, certain key aspects of the mitigation for the Mojave desert tortoise identified herein have been formulated pursuant to the recently enacted Senate Bill 34, and the resulting regulatory, guidance and memoranda of understanding by and among federal and state agencies, including the BLM and USFWS.

The purpose and need of this Project is to create a clean, renewable source of electricity that helps meet California's growing demand for power and helps fulfill national and State renewable energy and green house gas emission goals.

2.0 Description of the Action and Action Area

The Proposed Action is the BLM's issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility and new substation facility on over 7,600 hectares (19,000 acres) of BLM-managed lands. The proposed project is located in Riverside County, California, approximately 9.7 kilometers (km) [6 miles (mi)] north of the rural community of Desert Center and approximately 10.3 km (6.5 mi) north of the Interstate 10 (I-10) corridor (Figure 1). Project components generally include construction, operation, and maintenance of the solar farm site, a gen-tie transmission line, and construction, operation and maintenance of the Southern California Edison (SCE) Red Bluff Substation and related components (Figure 2). While the Red Bluff Substation is included as part of this project description for planning and environmental considerations, it would be constructed, owned, and operated by SCE, not by Sunlight.

The proposed project will permanently disturb an estimated 1,686 hectares (4,165 acres) (Figure 3) all of which is considered desert tortoise habitat, albeit a mixture of high and low habitat value according to the U.S. Geological Survey (USGS) draft habitat potential model for desert tortoise (Nussear et al. 2009; Figure4). This acreage is the direct effects area for the proposed Project and assumes that the Gen-Tie alternative to be constructed would be the A-1 route as depicted in Figure 2 and 3. This acreage also represents a reduction in the overall acreage for the Solar Farm Site as represented in the DEIS. As a result of our review of comments on the project, a desire to reduce environmental impacts, and to optimize facility performance, First Solar has refined the layout of the Solar Farm to reduce the overall footprint of the Project from approximately 4,245 acres inside the Solar Farm boundary, as evaluated in the DEIS, to approximately 3,912 acres.

Gen-Tie alternative A-2 may be chosen by the BLM as the ultimate Gen-Tie route for the project (Figure 2 and 3 provide the route for Gen-Tie alternative A-2). If the Gen-Tie Alternative A-2 is ultimately constructed the Project would disturb an estimated 1,683 hectares (4,159 acres) all of which is considered desert tortoise habitat with the exception of where Gen-Tie A-2 passes through abandoned agricultural fields.

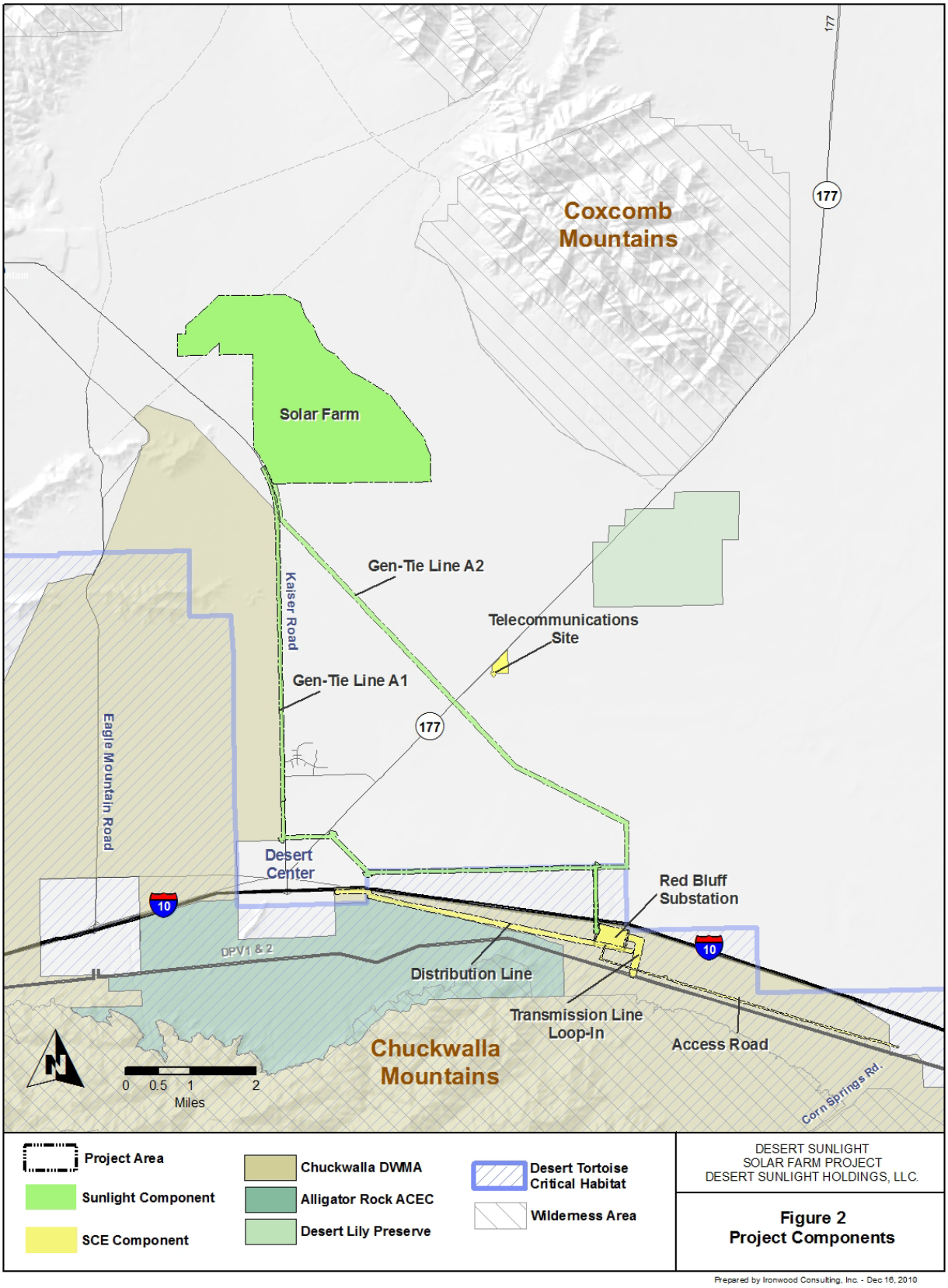
At the completion of the Final EIS and selection of the final Proposed Action, final compensation will be calculated based on the footprint and acreage of the components of the final Proposed Action. Any non-emergency expansion of construction, operation, or maintenance activities into areas outside of the areas considered in this BO will require BLM approval and tortoise clearance surveys, and may require re-initiation of consultation with USFWS.USFWS

2.1 Construction Timeline

The construction of the Project is estimated to begin after all applicable approvals and permits have been obtained, which is expected to be no sooner than April 2011. Project construction is expected to take at least 26 months from the commencement of the construction process to completion of construction of the solar farm and Gen-Tie Line. Construction of the Red Bluff Substation is expected to take approximately two years. The Red Bluff Substation would be constructed on a schedule that allows interconnection and partial energization of the solar farm before overall project construction is complete.

Figure 1 Regional Location

Figure 2 Project Components



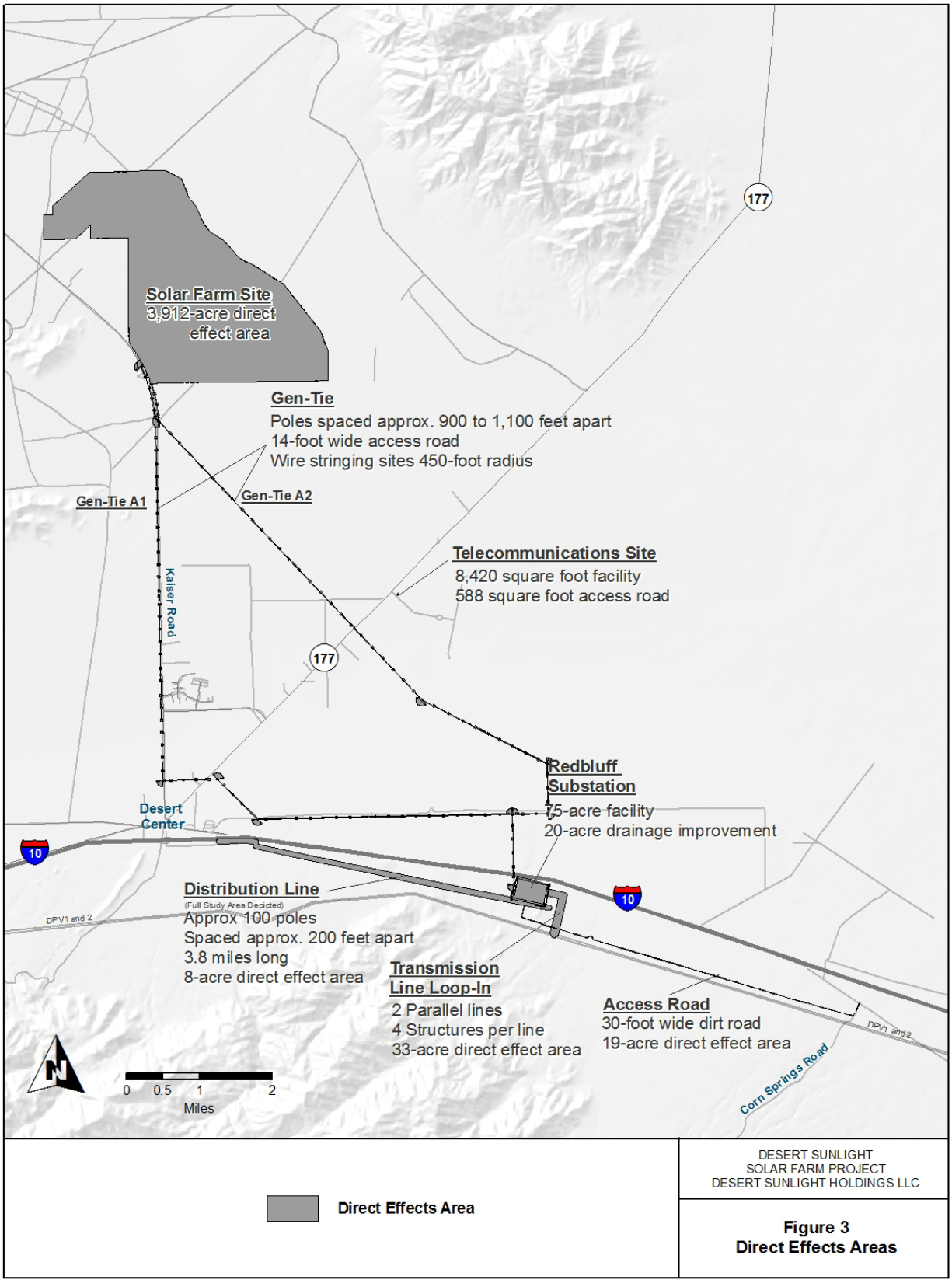
2.2 Summary of Project Impacts

The number of acres of permanent disturbance associated with the proposed project is shown below in Table 1 for the entire Project with separate calculations for Gen-Tie alternative A-1 and A-2.

Table 1 Disturbance Acreage for the Desert Sunlight Project Areas

Area	Gen-Tie A-1	Gen-Tie A-2
Sunlight Components	**4,016**	**4,010**
Solar farm site	3,912	3,912
Total Gen-Tie line	104	98
Transmission erection and structure areas	42	35
Access Roads	22	18
Splicing Areas	6	5
Stringing Areas	31	38
Guard Structure Areas	2	2
SCE Components	**149**	**149**
Red Bluff Substation and staging areas	75	75
Drainage/side slopes	30	30
Access road	15	15
Transmission loop-in	10	10
Distribution line	8.5	8.5
Telecommunications site	0.5	0.5
Laydown Yard (temporary use area)	10	10
Total Project	**4,165**	**4,159**

Figure 3 Direct Effect Areas



2.3 Solar Farm and Support Facilities

The project includes construction of a 550-megawatt (MW) commercial solar photovoltaic (PV) power-generating facility using First Solar's technology for thin film cadmium telluride (CdTe) PV modules. The Project site will include operations, monitoring and maintenance facilities, enclosed water tank, security kiosk, visitor center, parking areas, and equipment/materials laydown areas. Also, an onsite substation would step up the voltage of the solar farm-generated electricity to 220 kV to match the voltage of the gen-tie transmission line that would interconnect the solar farm output with the Red Bluff Substation.

The Project will consist of arrays of PV modules. Each array would occupy approximately eight acres and consist of PV modules, a power conversion station (PCS), and a transformer. Arrays would be supported by vertical steel posts. The PV modules would be electrically connected by wire harnesses and combiner boxes that would collect power from several rows of modules and feed the PCS via direct current cables placed in underground covered trenches. High-capacity 34.5 kV collection system lines would connect the power output from the PV combining switchgear (PVCS) to the onsite substation via overhead lines supported by wooden poles approximately 52 feet above finished grade. There will be approximately 350 poles, all of which would be located within the fence line for the Solar Farm site. In response to comments on the DEIS, Sunlight has also made modifications to the site preparation approach for the Project site. The revised construction approach involves the use of innovative site preparation techniques that reduce the required volume of earth movement, including: (1) a "disc and roll" technique that uses farm tractors to till the soil over much of the Solar Farm site and then roll it for compaction, and (2) "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. These techniques greatly reduce the area of the Project site over which conventional mass cut and fill grading will occur. This change does not affect the total overall acreage impacts for the project. The entire Project site, including support facilities, will be surrounded by a six-foot tall chain link fence topped with barbed wire. Desert tortoise exclusion fencing will also be installed along the outside of the entire perimeter fence. Controlled access gates will be installed at roads entering or exiting the solar farm site. The Project site will be designed, operated, and maintained so that channelization of surface water flow will not undermine the integrity of the perimeter fence or the desert tortoise exclusion fencing.

The Project is designed to require no water for electricity generation or PV module cleaning. Water for construction, operation, and maintenance of the solar farm would be obtained from wells constructed within the direct effects area associated with the solar farm site. Alternatively, Sunlight may explore acquiring water from existing wells. The existing well locations are located within previously disturbed areas along an existing road. If the existing wells are to be used, the Project would install piping within the disturbed area along the existing roads; no additional area would be disturbed. Figure 4, Preliminary Construction Staging Plan, provides a depiction of the planned groundwater well locations as well as the existing well locations.

The construction water storage and supply system would include conveying water from the wells to stand tanks, bladders, or temporary water supply ponds. The stand tanks or bladders may be located at the well sites. The temporary storage ponds are planned to be responsive to a concern raised during the public comment period for the DEIS about potential for high wind events that could represent an increase in fugitive dust emissions.

The temporary water supply ponds will reduce the amount of vehicle travel around the site by water trucks (and associated exhaust, dust, etc), reduce the rate of groundwater extraction during construction,

and also improve capability to respond quickly and effectively to dust emissions caused by unexpected high wind events. A total of seven temporary one-acre water supply ponds are planned around the Project site (Figure 4). The ponds would be connected to the groundwater wells via 6-inch HDPE pipe runs along onsite access roads or within the Solar Farm Site perimeter from the wells to the ponds. No more than two or three ponds would be operating at any one time.

The temporary construction ponds may attract ravens and other avian species protected under the Migratory Bird Treaty Act (MBTA). In consideration of these potential risks, Sunlight will implement avian deterrence measures, including lining the ponds, maintaining two feet of freeboard in the ponds, designing the ponds with interior side slopes at a 33 percent slope, and covering the ponds with netting, as necessary, These Applicant measures will make it difficult for perching birds and/or shorebirds to access the water and minimize the attraction of the ponds to fowl.

Upon completion of construction, one of the groundwater wells used during construction would be closed the other would remain in use during operations. This water would be used for domestic purposes only for the operations and maintenance facility and the Visitor Center and stored in an enclosed above-ground 5,000-gallon potable water storage tank. A septic system and leach field would serve the project's sanitary wastewater treatment needs and would be sited south of the O&M facility and Visitor Center (Figure 5) Because of the site's small operating workforce, water use is estimated at 0.2 acre-feet per year.

The Project will be designed to include retention basins during construction and operations to minimize surface water erosion and sedimentation. The retention basins will be located within the fence line of the Project site along the upstream western boundary and on the downstream southeastern boundary of the Project. The locations of the retention basins are depicted in Figure 5. The basins would be designed to minimize concentration and channelization of flows within the project site and to prevent downstream erosion and channelization. The basins will be designed so that retained water would either infiltrate or evaporate and so that water would not be allowed to pond; thereby, minimizing the potential for raven or other avian species to be attracted to these areas.

Construction, operation and maintenance activities will be limited to daylight hours to the extent possible. However, if needed for worker safety, lighting during construction would be limited to specific work areas, focused downward, and shielded and directed toward the interior of the site to minimize light exposure to areas outside the construction area. During operations, lighting would be limited to shielded, area-specific lighting for security purposes for the O&M facility and the onsite substation. Power for solar farm site construction will be provided by connection to the existing distribution line located adjacent to the fence line of the Project along Kaiser Road. No area outside of the fence line would be disturbed associated with the connection to the distribution line. Additionally, the project may utilize an onsite portable generator.

Access to the solar farm site will be provided via the existing paved Kaiser Road that adjoins I-10 at Desert Center. The Solar Farm Site fence line would abut Kaiser Road, so no additional area of impact outside of the fence line would occur associated with these access roads.

Gen-Tie Transmission Line

The Project site would interconnect with the regional transmission system via a new 220-kV single-circuit gen-tie transmission line that would exit the southwestern portion of the solar farm site. The proposed project would utilize Gen-Tie A-1. Gen-tie A-1 would follow a 160-foot-wide transmission ROW for an approximate distance of 19-kilometers (12-miles) to SCE's planned Red Bluff Substation to be located southeast of the solar farm site just south of I-10. Gen-Tie A-1 is expected to be constructed with approximately 73 steel vertical configuration monopoles that are approximately 135-feet tall and are spaced approximately 900 to 1,100 feet apart. Access and construction of the gen-tie will include disturbance of areas for access roads (overland travel), transmission structure erection areas and footprints, splicing, stringing, and guard structures.[1] Figure 6, Gen-Tie Impacted Areas, provides a basic diagram of these areas. The expected disturbance of Gen-Tie Line A-1 is 104 acres and is comprised of the erection areas and footprints of the transmission line structures (42 acres), access roads (22 acres), splicing areas (6 acres), guard structure areas (2 acres), and stringing areas (31 acres).

Gen-Tie A-1 route crosses small portions of the designated Chuckwalla Critical Habitat Unit (CHU) and BLM's Chuckwalla Desert Wildlife Management Area (DWMA), both of which are special management areas for desert tortoise.

Alternatively, the project would utilize Gen-Tie A-2. Gen-tie A-2 would follow a 160-foot-wide transmission ROW for an approximate distance of 16.9-kilometers (10.5-miles) to the Red Bluff Substation. Gen-Tie A-2 is expected to be constructed with approximately 59 steel monopoles of the same height and spacing as with Gen-Tie A-1. The expected disturbance of Gen-Tie Line A-1 is 98 acres and is comprised of the erection areas and footprints of the transmission line structures (35 acres), access roads (18 acres), splicing areas (5 acres), guard structure areas (2 acres), and stringing areas (38 acres).

Solar Farm Construction

Pre-construction construction work will consist of staking and flagging the following: 1) ROW and construction area boundaries, 2) construction laydown, parking, and work areas, 3) final grade, 4) access and roads, and 5) foundation structures for facilities. Staking and flagging will be maintained until final site cleanup. The Solar Farm Site would be fenced with security and desert tortoise exclusion fencing and clearance surveys and desert tortoise translocation completed according to the Project's Desert *Tortoise Translocation Plan* (Appendix A, Ironwood 2010). The entire Project would be graded to provide a level surface for installation of the solar PV arrays. Five temporary construction staging areas will be utilized in phases throughout the 26-month Project construction period (Figure 4). Each staging area will be approximately 8.1 acres, for a total of 32.4 acres. The staging areas within the Solar Farm Site will include material laydown and storage areas and an equipment assembly area. The staging areas will be un-paved and un-graveled but will be treated with dust palliative and water periodically to control dust. The staging areas within the Solar Farm Site, except Staging Area #2, will be replaced with PV arrays once the areas are no longer needed for staging.

Operations and Maintenance

1 The following assumptions were used to calculate disturbance for each Gen-Tie alternative. Access roads (overland travel areas) are assumed to be 14 feet wide. Approach areas to the access roads would be 14 feet wide by 25 feet long with 20-foot radii on each side. Tangent structures were assumed to have a 6-foot diameter permanent foundation footprint with a foundation up to 7 feet in diameter. Angle and dead-end structures were assumed to have a 12-foot diameter permanent footprint. A structure erection area of 160 feet by 160 feet was assumed surround each proposed transmission structure. The splicing area would typically be 100 feet by 450 feet. A 450-foot radius area and a 75-foot by 200-foot area were assumed for each stringing areas. Guard structures would require the use of a 50-foot by 100-foot area.

Operations and maintenance (O&M) will occur within the Project site during the 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 a week by a total estimate of 10-15 full time employees.

Within the fenced solar farm site, routine O&M activities are expected to be limited to maintenance and repair of the perimeter fence, access gates, all-weather roads, solar arrays/ module components, support facilities, vehicle and equipment movement, and vegetation removal.

The proposed onsite substation would be unmanned and the electrical equipment within the substation would be monitored and controlled remotely by a power management system from the solar farm site control room or a centrally located operation control center. Personnel would generally visit for electrical switching and routine maintenance two to three times per week.

Outside of the fenced solar farm site, O&M activities will be conducted within the access road/utility corridor, gen-tie transmission line ROW, rerouted drainage channels, and the outer side of the perimeter security fence.

Routine O&M activities associated with the gen-tie transmission line would involve periodic inspection via helicopter or truck. Maintenance of the transmission lines would be performed on an as-needed basis throughout the year and periodic cleaning of 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.

Decommissioning

Conditions are likely to change over the course of a solar farm site and a final Decommissioning Plan would be developed in the future prior to facility closure based on conditions as they occur at that time. The reclamation measures provided in the Decommissioning Plan would be developed to ensure protection of the environment and public health and safety and to comply with applicable laws, ordinances, regulations, and standards. The Decommissioning Plan will be submitted to the BLM for review and approval prior to final closure. When the BLM begins to consider decommissioning, they will contact USFWS to determine if additional consultation, pursuant to section 7(a)(2) of the federal ESA, would be appropriate. Impacts to the desert tortoise with decommissioning will be analyzed at that time.

2.4 Red Bluff Substation and Support Facilities

The Red Bluff Substation project would consist of the following components:

- Red Bluff Substation
- Transmission lines (to connect the substation to DPV1)
- Gen-tie line connection
- Modification of existing 220-kV structures
- Distribution line for substation light and power
- Telecommunications facilities
- Drainage facilities
- Access road
- Laydown yard

The Red Bluff Substation would be a 1,120 mega-volt ampere (MVA), 500/220-kV substation measuring approximately 1,500 feet by 2,200 feet and occupying approximately 30 hectares (75 acres). It would loop the DPV1 500-kV transmission line into the substation and provide connection for the Desert Sunlight 220-kV Gen-Tie line for the Project (10 acres). The entire 75-acre substation site would be graded and leveled and be surrounded by an eight-foot-high concrete wall with two 24-foot wide rolling gates installed at access points. A temporary laydown yard will provide space for materials during construction of the substation (10 acres). An additional 30 acres would be needed for drainage improvements and 15 acres for improvements of the access road off of Corn Springs Road. In addition, the project includes an upgrade of an electric distribution line for substation light and power (8.5 acres) and the installation of a telecommunications facility associated with the substation, bringing the total disturbance area to 149 acres.

The new 500-kV loop-in line segment would be constructed using eight transmission poles. Of these, six will be lattice steel towers. The total impact for the access roads and transmission structures will not exceed 10 acres. The new single-circuit transmission structures would require a 590 foot-wide right-of-way between the SCE existing DPV1 right-of-way and the new Red Bluff Substation site. Other transmission structures would be within SCE's existing right-of-way. Three dead-end structures and one suspension structure would be required for each line segment (a total of eight structures for both lines), to reach the edge of the Red Bluff Substation site. The entire loop-in line segment including structures and access roads would occupy approximately 10 acres. Although some modification to the existing 220-kV structures would likely be required with the new 550-kV loop-in line segments crossing over FPL's Buck-Julian Hinds 220-kV transmission line, any tower modification would most likely be encompassed within the 10-acre loop-in line disturbance.

<u>Gen-Tie Line Connection</u>

The proposed Red Bluff Substation design includes bringing the final span from the Project 220-kV Gen-Tie line into the switchrack, just west of the Red Bluff Substation. There would be one LST or one tubular steel pole (TSP) structure just west (or north) of the Red Bluff Substation site for the connection of Project's Gen-Tie Line to a 220-kV position inside Red Bluff Substation. The last gen-tie structure constructed for Project would be located just off the Red Bluff Substation property within other areas already disturbed for the Proposed Action and would be a dead end structure; SCE would work with Sunlight to integrate final design. If the LST design is used the impact would be 0.22 acre; if the TSP design is used, the impact would be 0.1 acre. SCE would construct, own, operate, and maintain the final

span of the circuit from the substation dead end structure to the tower connection at the last Project structure.

Distribution Line for Substation Light and Power

An upgrade of the existing, SCE-owned, Desert Center 12-kV circuit from single phase to three phase construction would be required to provide light and power for the Red Bluff Substation. This line is located on BLM-administered land. The rebuild would require replacement of 100 wooden poles approximately 29 to 39 feet tall. In addition, the power route will be extended from these poles approximately 1,000 feet underground (south) towards the substation. Total impacts for this portion of the project include 8.5 acres.

Telecommunications Facilities

A telecommunication system would also be required in order to provide: (1) monitoring and remote operation capabilities of the electrical equipment at Red Bluff Substation, and (2) for transmission line protection. This system includes electrical equipment that would be installed at the Project onsite substation, along Gen-Tie Line A-1, at the Red Bluff Substation, and at the existing Chuckwalla Mountain Communications Site. The new Desert Center Communications Site (Telecom site) would be located on the north side of Airport Access Road approximately 600 feet east of Rice Road, and west of the former Desert Center Airport (Figure2). Construction of a 20-foot-wide by 30-foot-long road would be required to access the Telecom site from Rice Road. The disturbance footprint of the Telecom site, including access road and other features described below would equal approximately 0.5 acre.

The permanently disturbed area for the Telecom site, including an 8-foot-high by 10-foot-wide berm around three sides of the facility and an access road, would consist of an area approximately 150 feet by 70 feet. Enclosed within the disturbed area would be a fenced in area of 100 feet by 50 feet. Within the fenced area there would be a 12-foot by 36-foot communication room and the 185-foot-tall microwave tower and two 10-foot-diameter microwave antennas. Power would be provided from a tap into the nearest 12-kV line and would require the installation of about seven wooden poles to span about 750 feet..

Drainage Facilities

Surface stormwater runoff would need to be redirected around the Red Bluff Substation. Alterations to existing natural drainage channels within the substation footprint would be considerable and require extensive rerouting of three deep channels. The drainage systems may include structures, channels (earthen, concrete, rip rap), pipes, and ponds. The system will be designed to convey runoff away from the Substation and into approved facilities. The erosion protection measures at all potential discharge locations will be designed, at a minimum, to meet the Best Management Practices as outlined in the California State Water Resources Control Board. Drainage improvements and related grading needed would require approximately 20 acres outside of the block wall.

Drainage facilities around the Telecom site include construction of an eight-foot high berm on three sides to prevent the site from flooding. The berm is included in the 0.5 acre disturbance footprint.

Access Road

Access would be provided from the Corn Springs exit off I-10 via Chuckwalla Valley Road, heading east along the southern frontage of the freeway. From this point the access would head south along a 300-foot-long section of Corn Springs Road, then would turn west through roadway improvements to approximately 24,000 feet of the existing dirt pipeline patrol road to the substation site. Approximately 19 acres would be adversely affected with these road improvements.

Lighting and Perimeter Features

Lighting at the proposed Red Bluff Substation would consist of high-pressure sodium, low intensity lights located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours for emergency/scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The lights would be directed downward, and shielded to reduce glare outside the facility.

Operations and Maintenance

Once constructed, the Red Bluff Substation would be unmanned, and electrical equipment within the substation would be remotely monitored. SCE personnel would visit the substation three to four times a month for routine maintenance purposes. Routine maintenance would include equipment testing, monitoring, and repair.

The SCE transmission lines would be maintained in a manner consistent with CPUC General Order No. 165. SCE maintains an inspection frequency of the energized overhead facilities a minimum of once per year via ground and/or aerial observation. Maintenance would include activities such as repairing conductors, replacing insulators, and access road maintenance as needed to correct wash out from storm flows.

2.5 Conservation Measures

The proposed project includes conservation measures that will be implemented to avoid, minimize, and offset potential adverse effects to the tortoise and other biological resources. These measures were developed in coordination with BLM, USFWS, CDFG, and the Applicants (Sunlight and SCE).

1. The applicants shall assign at least one Designated Biologist (DB) to the project that meets or exceeds minimum qualifications set forth by the USFWS for handling and monitoring desert tortoise and has gone through an official approval process with the BLM, USFWS and CDFG that is completed at least 45 days prior to beginning of ground-disturbing activities.

2. The applicants shall ensure that the DB performs the duties that comprise compliance with the conservation measures outlined in the project Biological Opinion. The DB will be responsible for all aspects of desert tortoise clearance surveys, monitoring, translocation, the development and implementation of the Worker Environmental Awareness Program (WEAP), contacts with agency personnel, reporting, and long-term monitoring and reporting and be present, along with approved Biological Monitors during construction and operation and maintenance activities that could affect biological resources.

3. Biological Monitors shall meet or exceed minimum qualifications as set forth by the USFWS and be selected, trained and supervised by the Designated Biologist, and who has been officially approved by the BLM, Service, and CDFG.

4. The DB and Biological Monitors shall have the authority to halt any project activity that is not in compliance with project conservation measures outlined in the Project BO, or other project approvals or permits.

5. In coordination with the BLM, the project owner shall designate a project Environmental Compliance Manager (ECM). The ECM and the DB would work closely together to ensure compliance with the various conditions and requirements of project permits and approvals set forth in the BO, the Final Environmental Impact Statement (FEIS), and other supporting project documents appended to this BA. The ECM will be responsible for the all project reporting required by the BLM, USFWS and CDFG.

6. The applicants shall develop a project-specific WEAP and secure approval for the WEAP from the BLM, USFWS, and CDFG prior to implementation. The DB will be responsible for overseeing the WEAP training for all personnel associated with project construction, operations and maintenance, and decommissioning.

7. During construction and operations the applicants shall undertake appropriate measures to manage the project site and related facilities in a manner to avoid or minimize impacts to biological resources, including:

    a. Limiting disturbance by delineating all areas to be disturbed (including new and existing roads and turn-around areas) with stakes or flagging and using previously disturbed areas as staging and material sites whenever possible.
    b. Minimizing traffic impacts by prohibiting cross country vehicle traffic and enforcing a 25 miles per hour speed limit on all roads used during construction.
    c. Having the DB or Biological Monitors monitoring all ground disturbing construction activities that have the potential to disturb soil, vegetation, and wildlife when necessary.
    d. Minimizing light and noise impacts.
    e. Avoiding use of toxic substances.
    f. Avoiding vehicle impacts to desert tortoise.
    g. Avoiding wildlife pitfalls by backfilling trenches.
    h. Avoiding desert tortoise entrapment outside the perimeter fence by storing construction materials and piping inside the perimeter fence.
    i. Minimizing standing water.
    j. Disposing of road-killed animals.
    k. Minimizing hazardous material spills.
    l. Containing all trash and food-related waste in self-closing containers and removing them from the site on a daily basis.
    m. Implementing erosion control measures.
    n. Monitoring ground disturbing activities during preconstruction site mobilization.

8. The Applicants shall provide BLM, USFWS, and CDFG staff with reasonable access to the Project site and compensation lands under the owner’s control and shall otherwise fully cooperate with the agencies’ efforts to verify the Project owner’s compliance with, or the effectiveness of, the conservation and mitigation measures set forth in the project Biological Opinion and FEIS.

2.6 Desert Tortoise-Specific Protection Measures

Desert tortoise-specific protection measures include, but are not limited to:

- Desert tortoise exclusion fencing surrounding the Project and Red Bluff Substation
- Preconstruction desert tortoise clearance surveys
- Avoidance measures during construction of linear project components
- Impact avoidance during operations and maintenance of project facilities.

The details of these measures are provided in body of this Biological Assessment, the Desert Sunlight Desert Tortoise Translocation Plan (Appendix A) and the Common Raven Management Plan (Appendix C).

The applicants shall ensure that the final Desert Tortoise Translocation Plan is consistent with USFWS-approved guidelines and includes all revisions deemed necessary by the BLM, USFWS, and CDFG. The final Desert Tortoise Translocation Plan will incorporate USFWS's most up to date translocation guidance (USFWS 2010b), as appropriate for the Desert Sunlight project, and must be approved by USFWS prior to the initiation of any ground-disturbing construction activities and translocation of any desert tortoises.

Preconstruction Clearance Surveys

Although the desert tortoise active season is generally between April 1 and May 31 or September 1 and October 15, preconstruction clearance surveys and construction of Project linear components (perimeter fencing, Gen-Tie Line, etc.) can be conducted at any time of year with prior approval from BLM, USFWS, and CDFG. No construction within the interior of the Solar Farm Site would occur in any area of the Project until the entire fenced area for each construction unit has been fully cleared of desert tortoise.. If clearance for the construction of the perimeter fence is conducted outside of the desert tortoise active season, any desert tortoises located along the alignment would be treated as translocatees by moving them out of harm's way to the inside of the fence onto the Project site, fitting them with a transmitter, blocking them into an artificial or empty natural burrow, and monitoring them until they can be translocated to the recipient site during the active season. Any desert tortoises found during clearance and/or construction of linear facilities will be moved out of harm's way following clearance and handling procedures outlined in the current USFWS Desert Tortoise Field Manual.

2.7 Compensatory Mitigation for Impacts to Desert Tortoise and Other Biological Resources

The total acreage for mitigation is calculated as 6,423 acres, based on the ratios above, as shown on Table 2 for the Solar Farm Site and Gen-Tie Line, assuming the Proposed Action will be represent the reduced Solar Farm footprint of 3,912 acres and Gen-Tie alternative A-1. At the completion of the Final EIS and selection of the final Proposed Action, final compensation will be calculated based on the footprint and acreage of the components of the final Proposed Action. If Gen-Tie alternative A-2 is chosen, impacts to the DWMA, CHU, drainages and desert tortoise habitat will be slightly less (totaling approximately 6,124 acres) because (1) Gen-Tie alternative A-2 is slightly shorter than A-1, and (2) portions of Gen-Tie A-2 cross areas that do not support habitat for desert tortoise or many other native species (abandoned agriculture).

Table 2. Proposed Mitigation for Desert Sunlight Solar Farm Site and Gen-Tie Line

Resource	Acres of Impact	Ratio	Acres of Mitigation
DWMA CHU	50 37	5:1	250 185
Desert dry wash woodland CDFG jurisdictional drainage areas	73 200	3:1	219 600
Occupied burrows of burrowing owls	2 occupied burrows	2:1 for 6.5 acres each	26
Areas of moderate desert tortoise density	1,214	2:1	2,428
Areas of low desert tortoise density – within the Solar Farm	2,698	1:1	2,698
Areas of low desert tortoise density – within the Other Project Components	17	1:1	17
TOTAL PROPOSED MITIGATION REQUIREMENT			**6,423 acres**

Consistent with BLM and CDFG requirements, Sunlight and SCE will compensate for the adverse effects of the project for the loss of desert tortoise habitat and for project impacts to other sensitive biological resources by acquiring mitigation land in areas agreed to and approved by the relevant agencies, or by providing funding for land acquisition, endowment, restoration, enhancement, and/or management actions under one of several programs approved by the relevant agencies for renewable energy projects. These mitigation options are discussed in more detail in the Habitat Compensation Plan for the project, which is included as Appendix D.

Compensatory mitigation was developed in close coordination with CDFG to meet the fully mitigated standard for project impacts and to allow CDFG to provide project approvals via a Consistency Determination with the USFWS' Biological Opinion as set forth in Section 2081.1 of the Fish and Game Code. The compensatory mitigation also meets BLM standards outlined in the NECO Plan (2003). Total acres required to compensate for impacts to biological resources are listed below in Tables 3 and 4.

Table 3 Proposed Mitigation for Desert Sunlight Project Components

Resource	Acres of Impact	Ratio	Mitigation Acres
DWMA and CHU-desert tortoise habitat	37	5:1	185
Desert dry wash woodland	73	3:1	219
CDFG jurisdictional drainage areas	200	3:1	600
Burrowing owls	2 occupied burrows	2:1 for 6.5 acres each	26
Moderate desert tortoise habitat	1,214	2:1	2,428
Lower-quality desert tortoise habitat on Project	2,698	1:1	2,698
Total			**6,156**

Table 4 Proposed Mitigation for SCE Project Components

Resource	Acres of Impact	Ratio	Mitigation Acres
DWMA and CHU	149	5:1	745
Telecom site (disturbed creosote bush scrub)	0.5	1:1	0.5
Total			**746**

Compensatory mitigation for both the Desert Sunlight and SCE project components will be accomplished either by: (1) payment of an in lieu fee or use of the "advance mitigation" option, which are the two closely related, but distinct, mitigation pathways contained in Senate Bill 34 (SB 34), (2) acquiring mitigation land or conservation easements, or (3) a combination of the two. Adequate funding will be provided by Sunlight and SCE to accomplish the required mitigation. Sunlight and SCE will provide letters of credit or other appropriate security to the CDFG to ensure the availability of funds for the required mitigation measures. The actual mitigation will be based on either the final acreage provided for the project in the FEIS or the actual amount of permanent disturbance of the Solar Farm Site, Gen-Tie Line, and Red Bluff Substation components as measured by the DB post-construction and confirmed by BLM..

In addition to the compensatory mitigation requirements for the project Sunlight and SCE 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 implement a regional management plan for common ravens for the reduction of predation by the common raven on the desert tortoise in the California desert. Payment of this one-time fee is intended to mitigate for the proposed project's portion of the cumulative and indirect effects of contributing to the population increase of common ravens in the desert region. The account was established by the REAT agencies (BLM, CDFG, Service, and CEC) in coordination with NFWF to manage the funds that will be used to implement the regional management plan.

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), the Sunlight will contribute a one-time fee of $105 per acre of disturbance to 1,625 hectares (4,016 acres) of desert tortoise habitat that

will be adversely affected by Sunlight portion of the proposed project and 60 hectares (149 acres) of desert tortoise habitat adversely affected by the SCE portion of the project. Accordingly, a fee of $421,680 will be assessed for the Sunlight project impacts and $15,645 will be assessed for the SCE project impacts to fund the project's portion of the regional management plan for the 30-year ROW grant by the BLM. Documentation for payment of this fee will be submitted to USFWS no less than 10 days prior to the initiation of ground-disturbing construction activities.

2.8 Action Area

The implementing regulations to section 7(a)(2) of the federal ESA 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 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 USFWS (Service and NMFS 1998).

The action area for the proposed project consists of the 1,686 hectares (4,165 acres) of desert tortoise habitat that will be adversely affected by the project site/footprint, including the solar farm site, the associated linear facilities (i.e., access roads, utility corridor, Gen-Tie transmission line, and construction power line) and the Red Bluff Substation and related facilities.

Finally, the action area encompasses future conservation areas that will be acquired to offset the loss 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; however, the locations of these conservation areas are currently unknown.

3.0 Listed Species and Critical Habitat in the Action Area

Individuals of the Mojave population of desert tortoise, listed as threatened under both the Federal ESA and the CESA, were present during field surveys of the action area. Additionally, the proposed action may affect designated critical habitat for the desert tortoise.

Desert tortoises are well adapted to living in a highly variable, and often harsh, desert environment. They spend much of their lives in burrows, even during their seasons of activity. In late winter or early spring, desert tortoises emerge from over-wintering burrows and typically remain active through fall. Activity does decrease in summer, but tortoises often emerge after summer rain storms. Mating occurs both during spring and fall. The size of desert tortoise home ranges varies with respect to location and factors such as substrate and topography, and year depending on climate factors such as rainfall and temperature. Tortoises are long-lived and grow slowly, requiring 13 to 20 years to reach sexual maturity.

Desert tortoises inhabit a variety of habitats from flats and slopes dominated by creosote-white bursage communities, where a diversity of perennial plants is relatively high, to a variety of habitats in higher elevations. Throughout most of the Colorado Desert in California, tortoises are found most often on gentle slopes with sandy-gravel soils. Soils must be appropriately soft for digging burrows, but firm

enough so that burrows do not collapse. The U.S. Geological Survey (USGS) has developed a draft habitat potential model for desert tortoise (Nussear et al. 2009; Figure 7). The model is based on desert tortoise occurrence data and 15 additional factors from sources spanning more than 80 years.

Prior to surveys conducted in the proposed project action area in 2008, few surveys had been done in the northern part of the Chuckwalla Valley and outside BLM's Chuckwalla Desert Wildlife Management Area (DWMA) and USFWS's desert tortoise Critical Habitat Unit (CHU) (BLM, pers. comm.) and little biological data was available. Range-wide surveys for desert tortoise provided limited information on the larger region surrounding the action area, but no site-specific information was available with the exception of the limited portion of the action area found south of I-10 where numerous projects have been completed or are currently in the later stages of the environmental review process. Focused desert tortoise surveys conducted for the proposed action suggest that, at least in recent history, desert tortoise were found in the same portions of the action area where they are currently found, based on the presence and distribution of tortoise carcasses (Figure 8), which can persist in the environment for a number of years (USFWS 2010).

Habitat trends are summarized from the 2003 *Desert Tortoise Recovery Plan Assessment* (USFWS 2004). This assessment determined that estimating accurate long-term trends of desert tortoise populations, habitat, and/or threats across the range was not currently feasible based on the scarcity of existing data and analyses (USFWS 2004). Currently available data provide general insight into the range-wide status of the species and show appreciable declines at the local level in many areas, although the trends in the Chuckwalla Valley area do not appear to show a statistical decline. Trend in population densities for the Chuckwalla Valley were determined from a larger analysis of the Eastern Colorado Recovery Unit which showed a statistical decline, mostly due to more severe declines southeast of the action area at the Chuckwalla Bench. Trends in threats to the desert tortoise increased between 1994 and 2003 in all DWMAs except the Chuckwalla DWMA.

Analyses indicate that the Chuckwalla DWMA has distributions of live and dead animals that are more like "normal" tortoise populations, in that carcasses occurred in the same areas as live animals and not in extensive areas absent of live animals (USFWS 2004), similar to what was shown in the action area. The Solar Farm Site is located in Category III desert tortoise habitat as classified by BLM in the NECO Plan, which generally includes lands in the Chuckwalla Valley north of I-10. This area is also classified as a BLM Moderate Use Class. Category III habitat is defined as areas not essential to maintenance of viable desert tortoise populations, contain low to medium densities, are not contiguous with medium- or high-density areas, and in which the population is stable or decreasing (Federal Register Vol. 68, No. 143, p. 44095). The Chuckwalla DWMA and Chuckwalla CHU, both protected management areas for desert tortoise, are located west of Kaiser Road, and immediately north and south of I-10. Portions of Gen-Tie Line A-1 intersect the Chuckwalla DWMA and CHU (Figure 2). The Red Bluff Substation and related components are entirely within the Chuckwalla DWMA and CHU (BLM Category I desert tortoise habitat and Limited Use Class), with the exception of the telecommunication site which is not within a protected management area. Category I habitat is defined as areas that are essential to the maintenance of viable tortoise populations, that contain medium to high density habitat (BLM 1992).

The USGS habitat model described above provides a methodology for assessing the relative value of an area's potential as habitat for desert tortoise (Figure 7). The USGS model uses 16 environmental data layers that define or influence desert tortoise habitat, including soil characteristics, perennial and annual vegetation, elevation and topographic variables, and seasonality and variability of precipitation. The model does not account for anthropogenic changes that may have decreased habitat suitability. The USGS model shows most of the solar farm site as having low to medium habitat potential, Gen-Tie Line A-1 as having low to medium-high habitat potential and the SCE components as having medium-low to medium-high potential.

Figure 4 Preliminary Construction Staging Plan

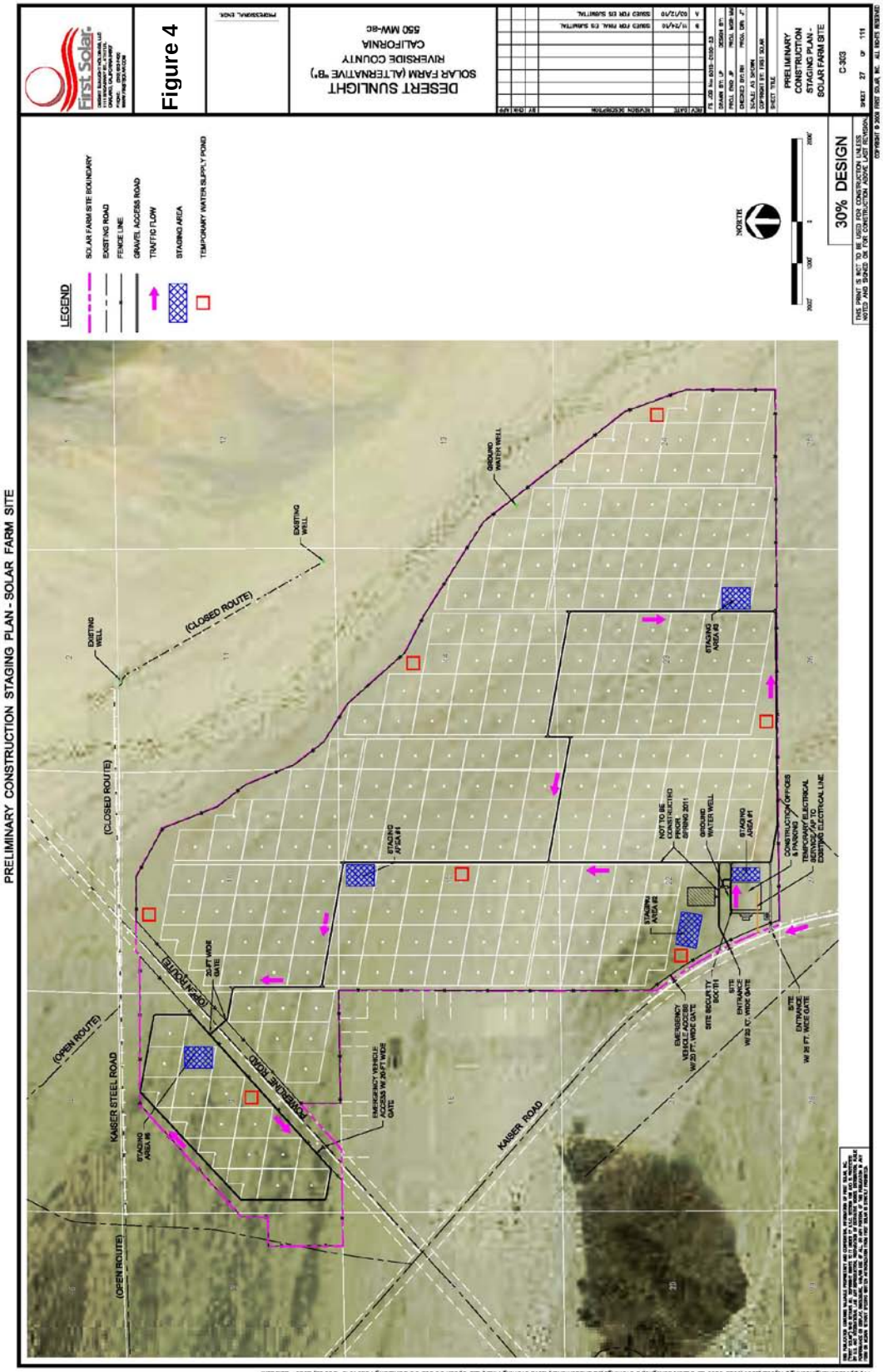


Figure 5 Solar Farm Site Plan

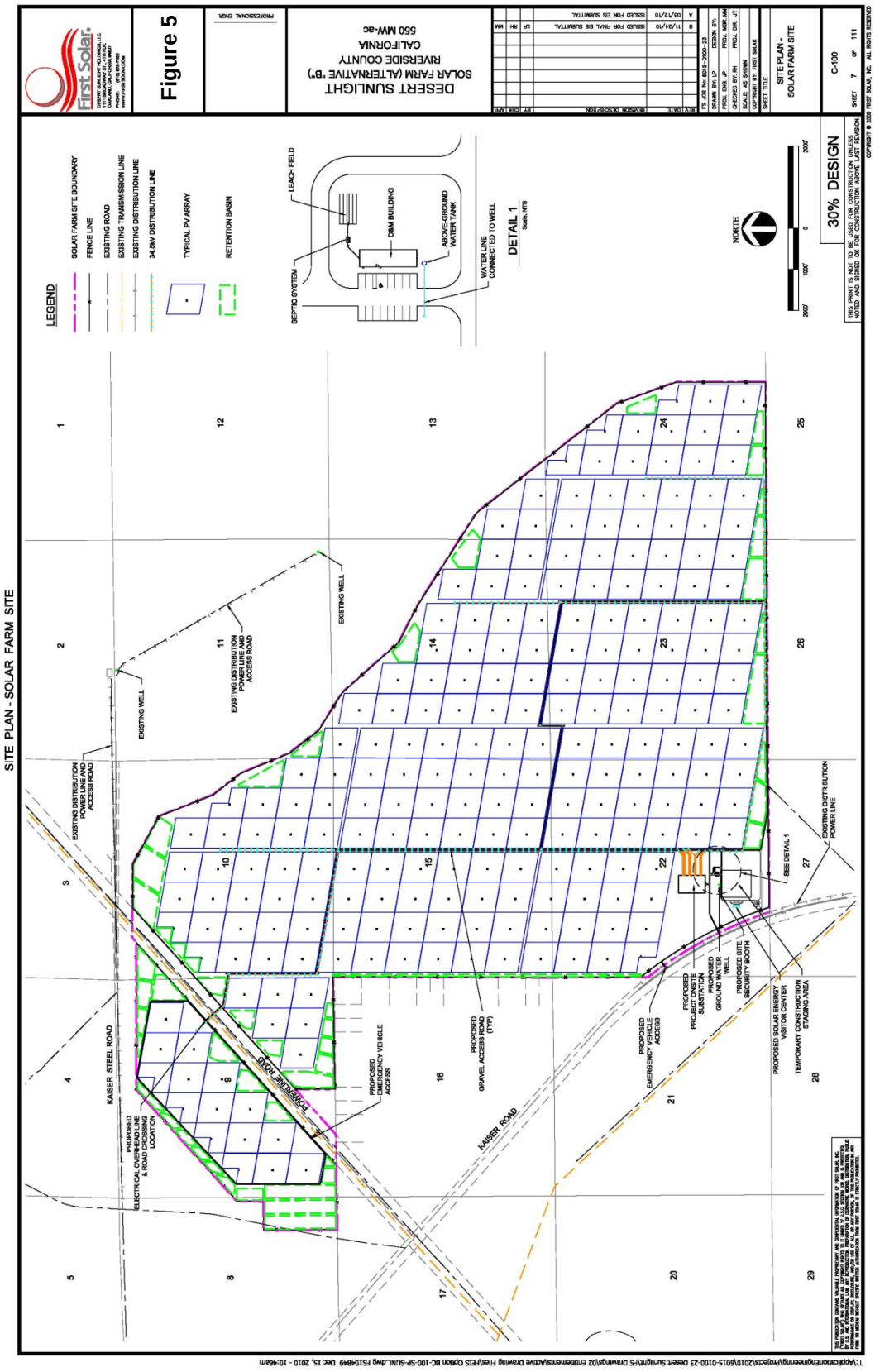
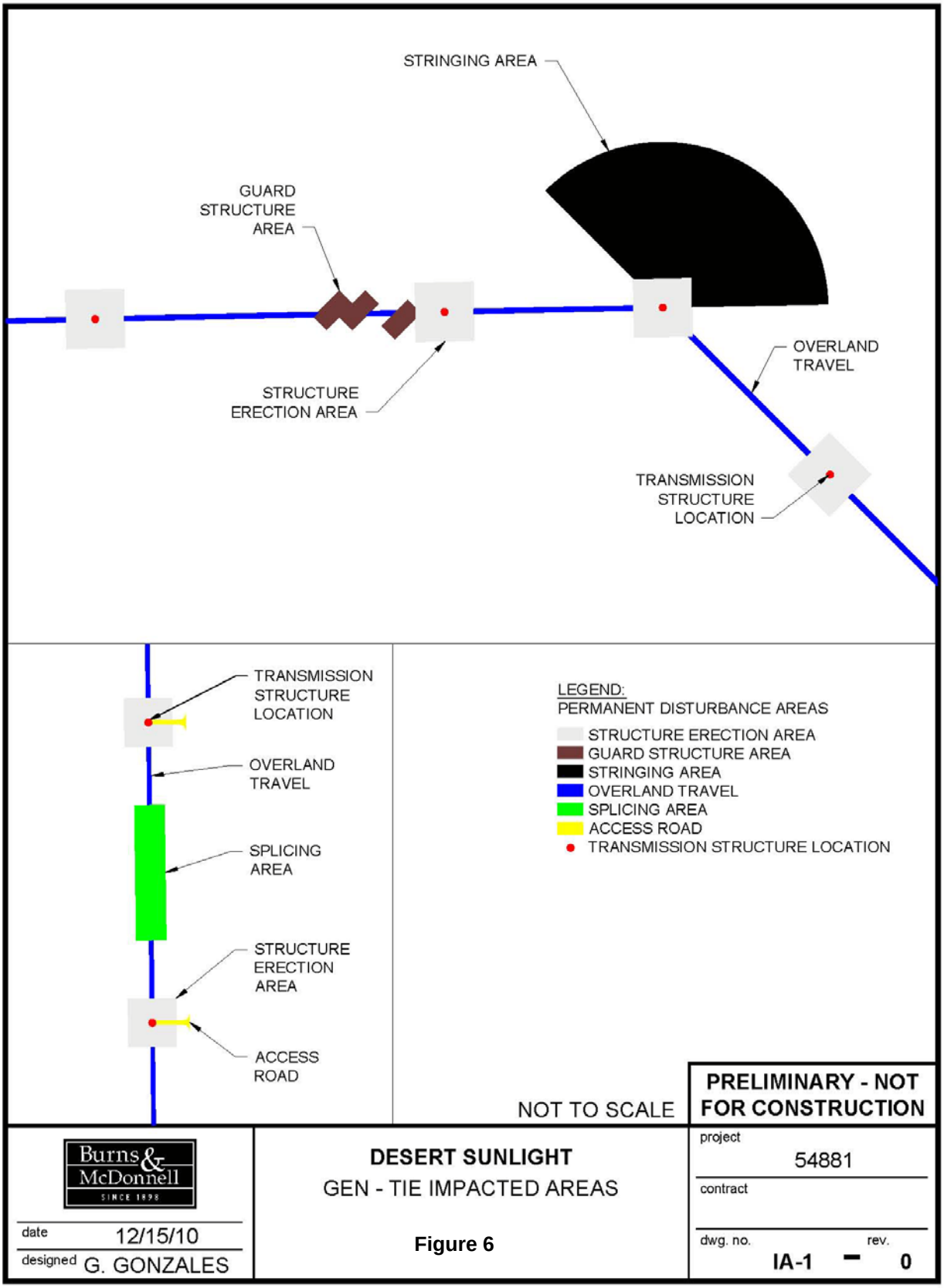


Figure 6 Gen-Tie Impacted Areas



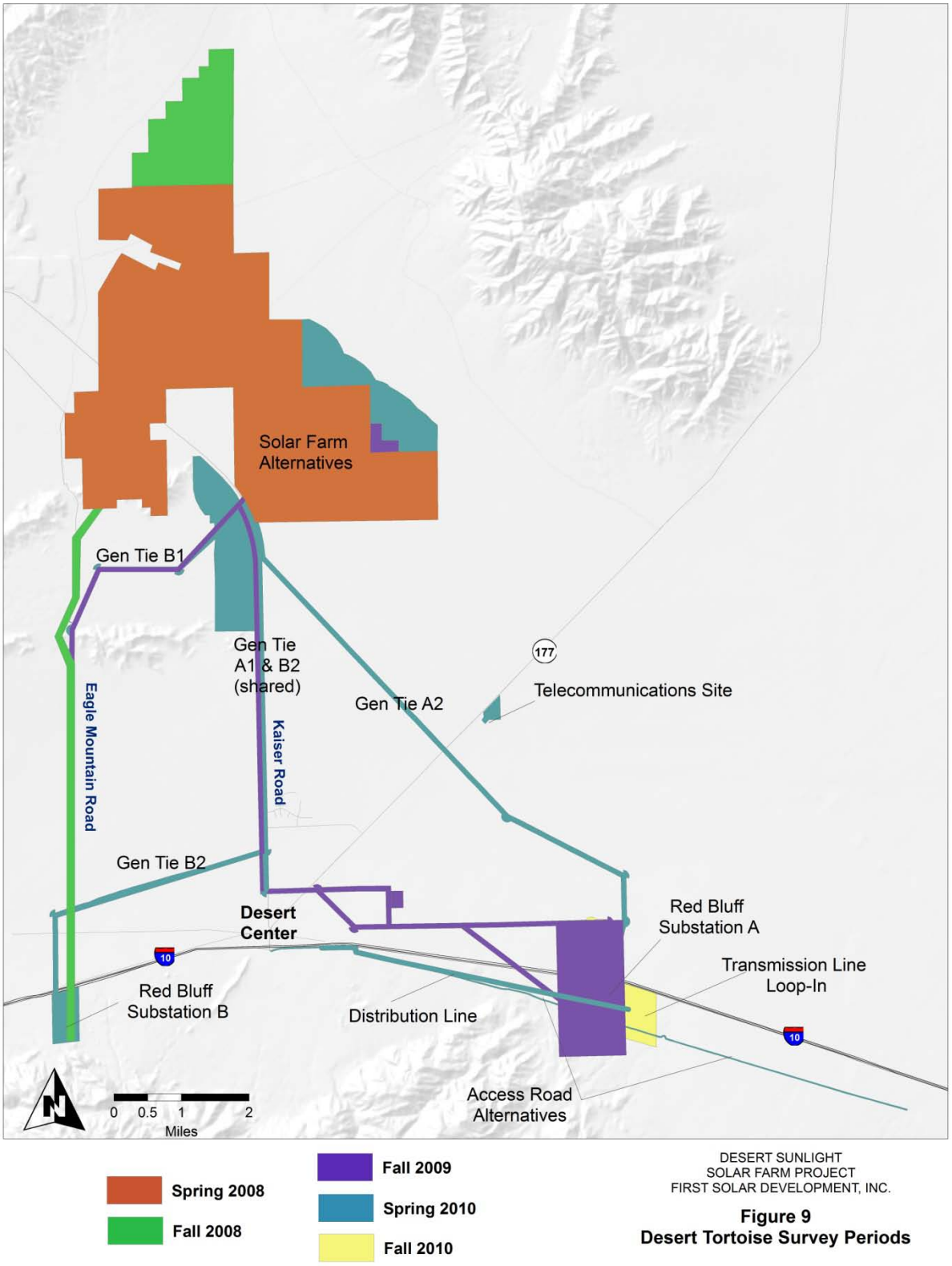
Sonoran creosote bush scrub on the solar farm site supports two distinct areas of differing habitat potential for desert tortoise. Areas of moderate habitat potential are found in the northwest and southwest areas of the solar farm site. The USGS model indicates that the moderate potential areas contain abiotic factors favorable to desert tortoise such as friable soils found in washes between areas of desert pavement. These areas also support a higher diversity of perennial plant species, which provide cover for desert tortoise. Areas of very low habitat potential (found in the remainder of the solar farm site), have a lower diversity of plant species and soils that are extremely hard packed and covered with a thin layer of alluvium not deep enough for burrowing.

Focused desert tortoise surveys were conducted in 2008 that followed the presence-absence survey protocols described in the *Field Survey Protocol for Any Federal Action that May Occur within the Range of the Desert Tortoise* (USFWS 1992). In the spring of 2009 and 2010, the USFWS issued revised survey protocols (USFWS 2009a and 2010), and subsequent surveys followed these revised protocols. The revised protocols were used to estimate the abundance and distribution of tortoises occurring within the survey area. All surveys employed belt transects approximately 10 meters (32.8 feet) wide in order to provide 100 percent (full) coverage of the entire action area. In addition, per the 1992 protocol, zone of influence transects (buffer transects in the indirect effects area) were conducted at 100, 300, 600, 1200, and 2400-foot intervals from and parallel to the surveyed area. Desert tortoise focused surveys were conducted by Ironwood Consulting, Inc. and associated contractors during five survey periods (Figure 9): March 18 to April 5, 2008; October 1 to 12, 2008; October 26 to 31, 2009; March 15 to April 17, 2010; and July 8 to July 13, 2010.

All biologists in every survey were either highly-experienced desert tortoise surveyors or field technicians who attended field and classroom training sessions prior to conducting surveys. A summary of the surveyor's experience is provided in Appendix G. The BLM reviewed the resumes of all survey personnel in advance of the surveys, and approved them to conduct these surveys. The larger survey crew was divided into smaller crews of 4-6 people, with a greater number of highly-experienced people than field technicians on each crew. Each smaller group typically surveyed one square-mile section, or two linear miles of proposed transmission line ROW, until the entire survey area was covered.

All tortoise sign (e.g., live tortoises, shell/bone/scutes, scats, burrows/pallets, tracks, egg shell fragments, and courtship rings) was recorded on a GPS unit using a unique identification code and on standardized paper datasheets (Table 11). All data were entered from these data sheets into a Microsoft Access database, compared with GPS data and reviewed for consistency before inputting data into GIS to determine approximate abundance and distribution of desert tortoise.

Figure 9 Desert Tortoise Survey Periods



Survey Results

Desert tortoise sign were found throughout the Action Area during each survey, but were not uniformly distributed (Figure 11). Total active sign included 4 tortoises and 14 burrows within the Solar Farm Site, and three tortoises near Gen-Tie Line A-1. Figure 12 shows active desert tortoise sign along the Gen-Tie and Figure 13 at the Red Bluff Substation and related components.

The number of active burrows and live tortoises observed during surveys were totaled for each component of the Proposed Action (Table 9). The estimated number of tortoises was subsequently calculated using the formula described in the revised protocol (USFWS 2010):

$$\begin{pmatrix}\text{Estimated number of tortoises}\\ \text{within action area}\end{pmatrix} = \frac{\begin{pmatrix}\text{Number of tortoises}\\ \text{observed above ground}\end{pmatrix}}{\begin{pmatrix}\text{Probability that}\\ \text{a tortoise is}\\ \text{above ground } (P_a)\end{pmatrix}\begin{pmatrix}\text{Probability of}\\ \text{detecting a tortoise,}\\ \text{if above ground } (P_d)\end{pmatrix}}\begin{pmatrix}\dfrac{\text{Size of action area}}{\text{Size of area surveyed}}\end{pmatrix}$$

A value of 0.80 was used for the P_a (probability that a tortoise is above ground) because annual winter rainfall averages were above 1.5 inches from 2008 to 2010. P_d (probability of detecting a tortoise, if above ground) is a constant value of 0.63 based on regional sampling data (USFWS 2010). The size of the action area for the desert tortoise estimate was equivalent to the size of the area surveyed. The resulting equation is the number of observed tortoise inside the action area multiplied by a factor of two.

Table 5 Active Tortoise Sign and Estimated Number of Tortoises

Project Component	Active Burrows	Live Tortoises Observed	Estimated Live Tortoises	Range of 95% confidence interval (USFWS 2010)
Solar Farm and Gen-Tie Line	14	4	8	2-31
Red Bluff Substation, Access Road, Distribution Line, and Telecommunications Site	1	0	up to 1	NA

Figure 7 USGS Desert Tortoise Habitat Model

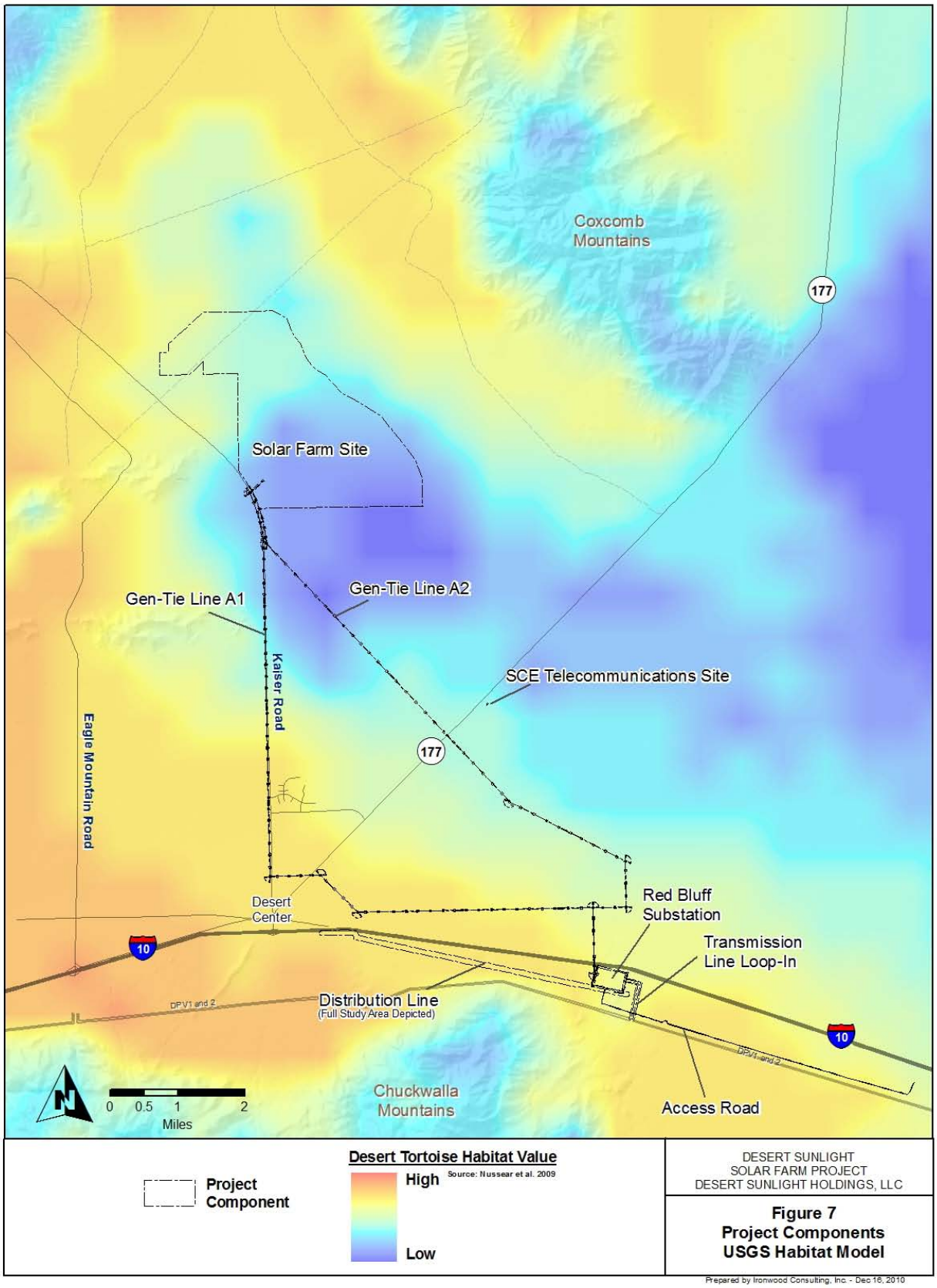
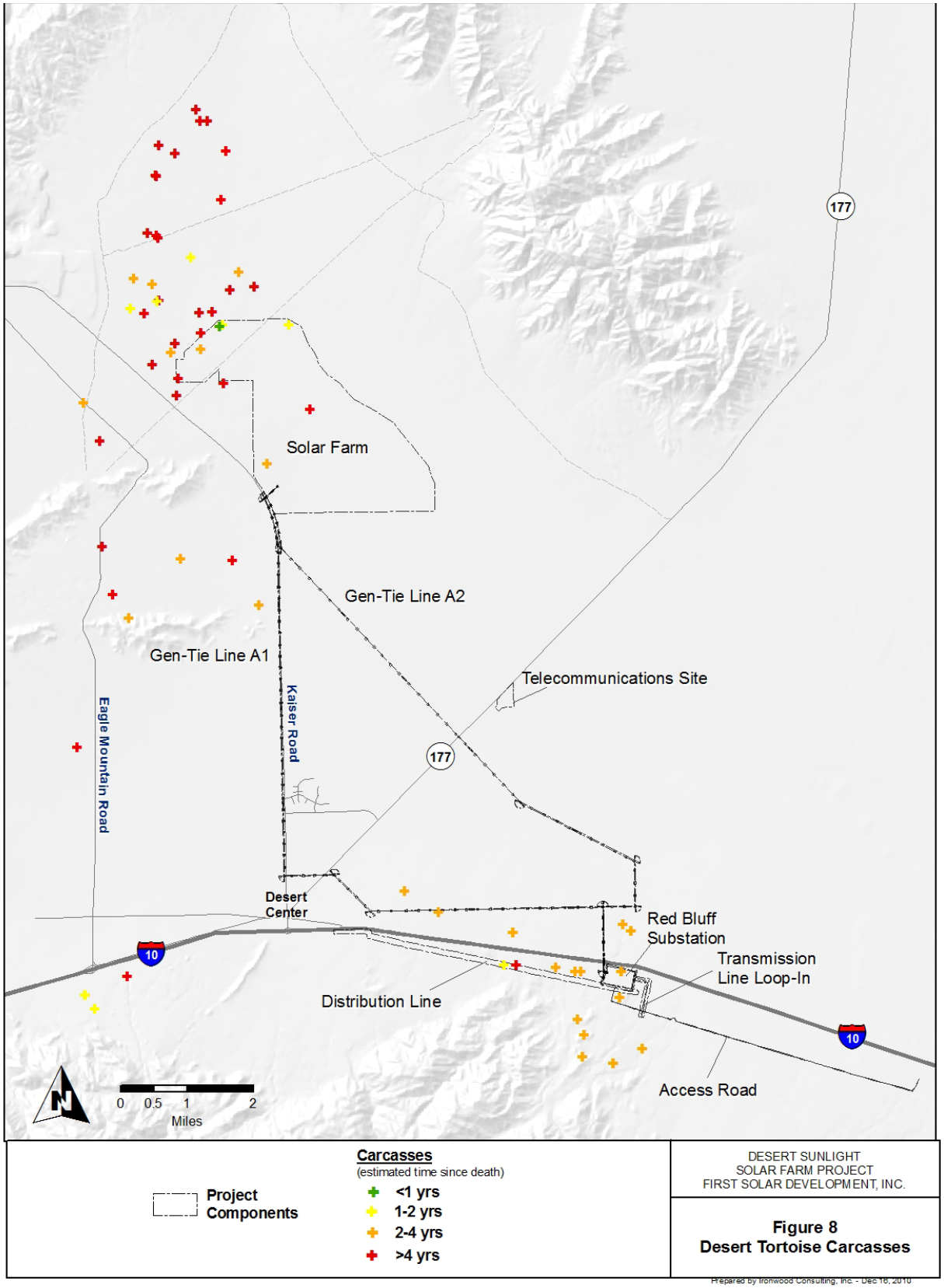


Figure 8 Desert Tortoise Carcasses



4.0 Other Species in the Action Area

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is a California Fully Protected Species and Species of Special Concern. Golden eagles and their primary prey species, jackrabbits, have declined in the California desert regions due to prolonged drought conditions that have persisted since 1998 (WRI 2010).

Sunlight participated in a joint program to conduct aerial surveys for golden eagles in and around Blythe and Desert Center, California. These surveys were conducted in two phases, with Phase 1 occurring on April 2-3, 2010 and Phase 2 occurring on May 14, 2010 according to the *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (USFWS 2010). These surveys were designed to record and report occupancy (Phase 1) and productivity (Phase 2) of golden eagle nests within a ten-mile radius of four solar projects, including Sunlight's Solar Farm Site.

The data and results from these surveys are found in the *Final Report, Golden Eagle Surveys Surrounding Four Proposed Energy Developments in the Mojave Desert Region, California* (Wildlife Research Institute 2010), which concluded that no golden eagle nests were found on or adjacent to the action area. Phase 1 occupancy surveys conducted in April 2010 detected 13 potentially active nests within a ten mile radius of the Solar Farm Site and Red Bluff Substation, as shown on Figure 13. No reproductive nests were located within the 10-mile radius of the Solar Farm Site and Red Bluff Substation (WRI 2010). Phase 2 productivity surveys determined that 12 of the 13 nests were inactive, with one active but non-reproductive nest located in the Joshua Tree Wilderness Area approximately five miles from the Solar Farm Site boundary (Figure 14). One observation of a golden eagle flyover of the Chuckwalla Valley was recorded during these surveys (WRI 2010).

Based on the report and survey conclusions, the project will not adversely affect this species' nesting or roosting habitat and will not cause significant effects to its foraging habitat.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsonii*) is a state-threatened species that breeds in much of western North America. Within California, nesting occurs primarily in the Central Valley and northern territories; however, regular nesting occurs in the high desert between the Tehachapi Mountains and Lancaster. This species is not known to nest or overwinter within the action area. This species was observed flying over the action area during migration. Three incidental records were documented on April 9, 2010 during botanical and baseline surveys. Two observations were of individual Swainson's hawks and the third observation consisted of a group of over ten birds. Additionally, Swainson's hawks were observed during golden eagle surveys near the Chuckwalla and Coxcomb Mountains (WRI 2010), approximately 3 miles south of the proposed Red Bluff Substation and 10 miles north from the Solar Farm Site, respectively.

5.0 Environmental Baseline Conditions

5.1 Vegetation Communities

This discussion of environmental baseline covers the action area for both Sunlight and SCE Project components. More detailed information on vegetation communities is found in Appendix D; general environmental baseline for biological resources can be found in the Biological Resources Technical Report (Ironwood Consulting 2010) and the Desert Sunlight Solar Farm Project EIS (BLM /Tetra Tech 2010).

Vegetation communities mapped within the action area of the Sunlight components are shown in Figures 15 and 16.Two native vegetation communities occur within the action area: Sonoran Creosote Bush Scrub [(Holland 1986); analogous to Creosote Bush-White Bursage Series (Sawyer and Keeler-Wolf 1995)] and Desert Dry Wash Woodland [Holland 1986; analogous to Blue Palo Verde-Ironwood-Smoke Tree Series (Sawyer and Keeler-Wolf 1995)]. Areas of disturbed, developed, and agricultural land also occur within the action area, mostly on and adjacent to roads such as I-10 and State Route 177 (Rice Road). A complete list of plant species occurring in these communities has been summarized by Project component (Appendix E).

The majority of the action area supports a Creosote Bush Scrub community. Dominant plant species associated with this community include creosote bush (*Larrea tridentata*), burro bush (*Ambrosia dumosa*), boxthorn (*Lycium* sp.), brittlebush (*Encelia farinosa*), indigo bush (*Psorothamnus* spp.), and cheesebush (*Hymenoclea salsola*). Local diversity of creosote bush scrub varied throughout the action area. This community is relatively more structurally diverse within the stable, older alluvial fan systems located in the northwestern and southwestern portions of the solar farm site than in active alluvial fan systems located in the middle and southern extent of the solar farm site.

The Desert Dry Wash Woodland community consists of drought-deciduous, often leguminous, small-leaved (microphyllous) trees in association with sandy or gravelly washes with braided channels in active alluvial fans. Dominant plants species associated with this community include ironwood (*Olneya tesota*), blue palo verde (*Cercidium floridum*), and smoke tree (*Psorothamnus spinosa*). This community is considered sensitive by the California Resource Agency due its limited distribution, value to wildlife, and susceptibility to disturbance (BLM 2002 and CDFG/CWHRS 2010). The presence of water at least on a seasonal flow regime is vital for this community to persist. Dead ironwood trees can be found in the action area where previous disturbances, such as paved or dirt roads, have altered the natural surface flow regime. Disturbed and developed areas either unvegetated or dominated by ruderal vegetation, are found in association with Kaiser Road, Eagle Mountain Road, State Route 177, and the I-10. Agricultural areas, mostly fallow jojoba farms, are located southeast of the solar farm site.

The major alluvial systems associated with the Upper Chuckwalla Valley, Big Wash, and Dragon Wash support broad floodplains dominated by desert dry wash woodland (primarily *Olneya tesota*), which are crossed by the northern extents of Gen-Tie Line A-1. Pinto Wash supports dense, mature Desert Dry Wash Woodland (primarily *Cercidium floridum*), which is located outside the Solar Farm Site's eastern boundary.

Figure 10 Desert Tortoise Sign - Solar Farm Site

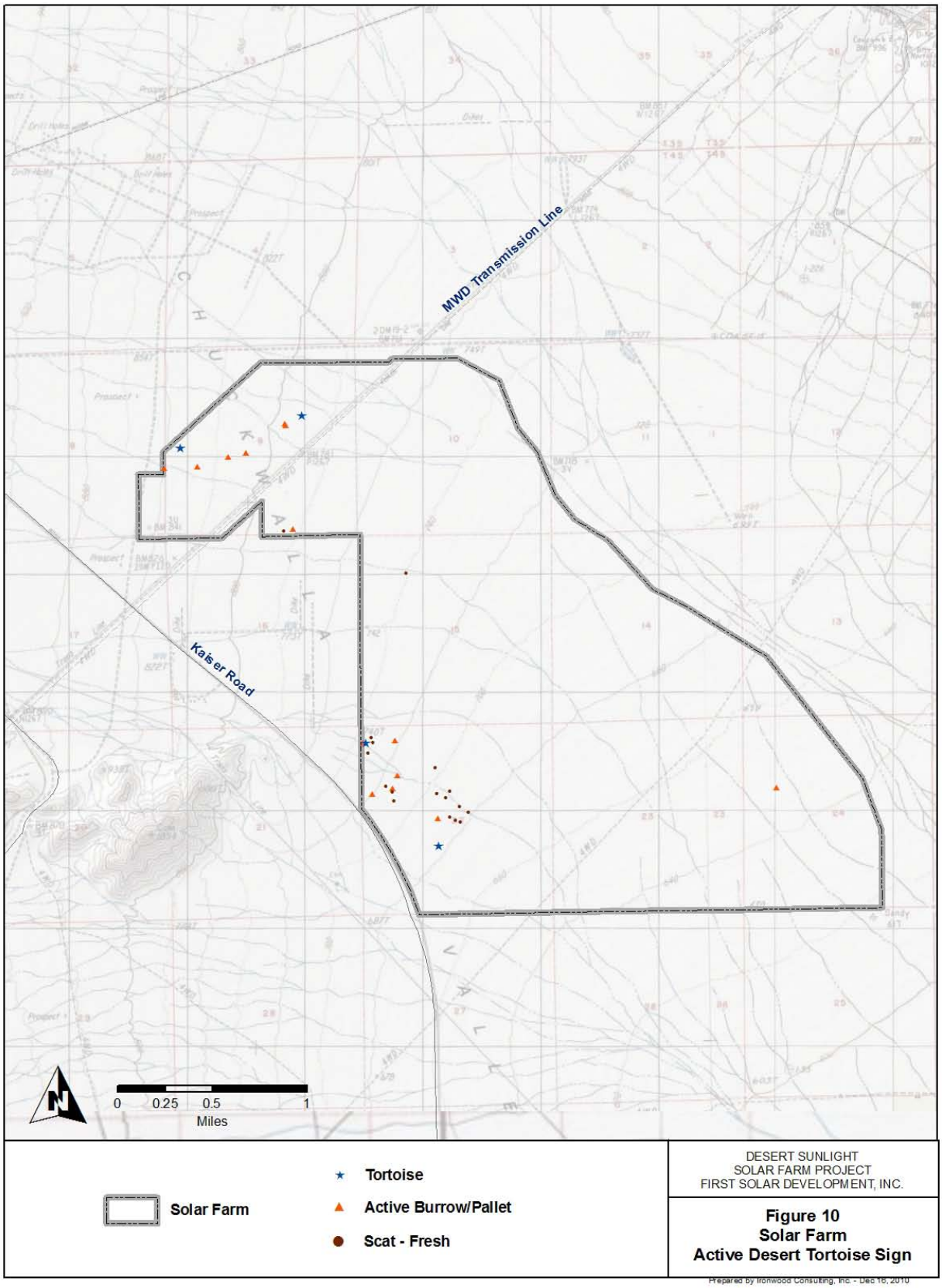


Figure 11 Desert Tortoise Sign - Gen Tie Line

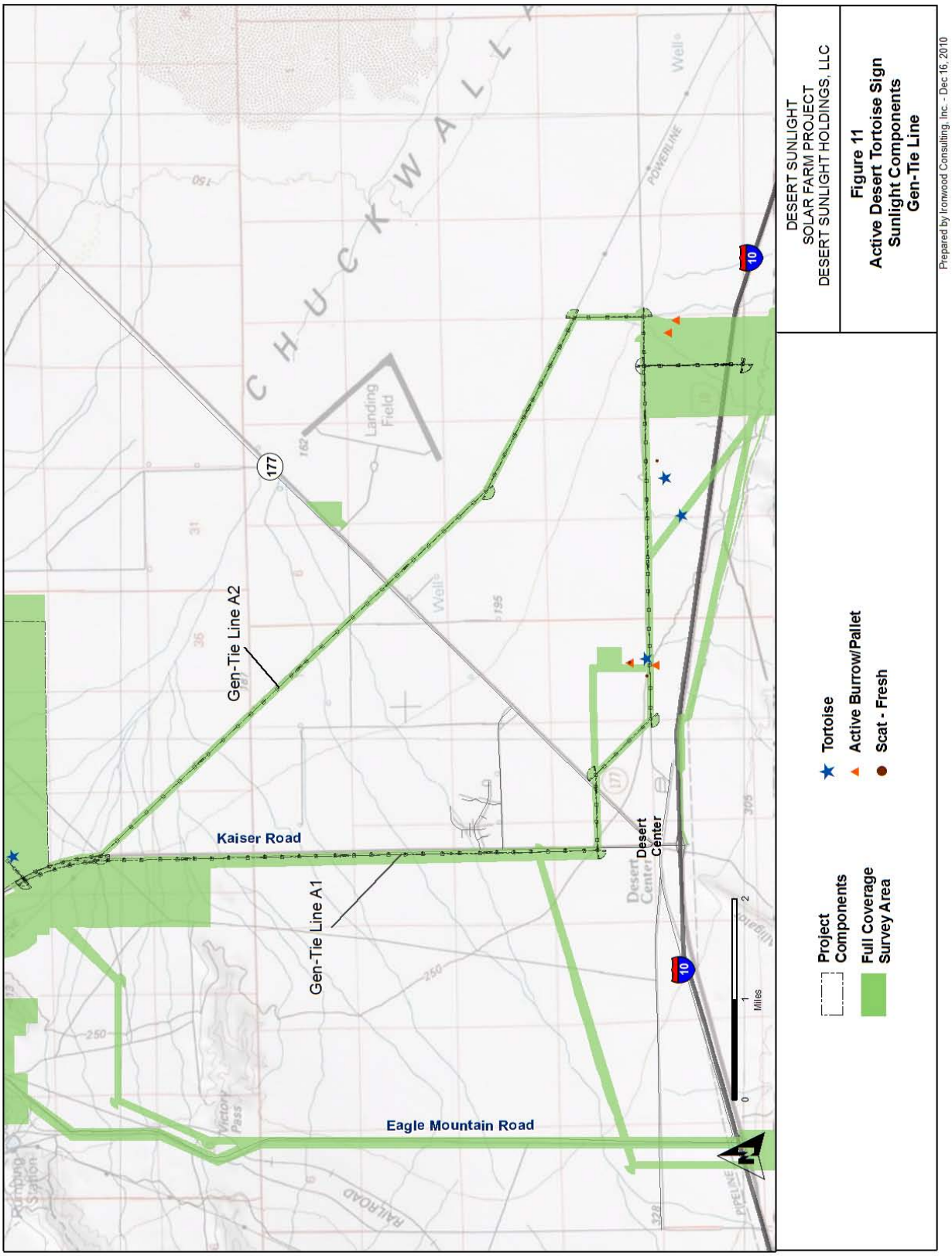


Figure 12 Desert Tortoise Sign - SCE Components

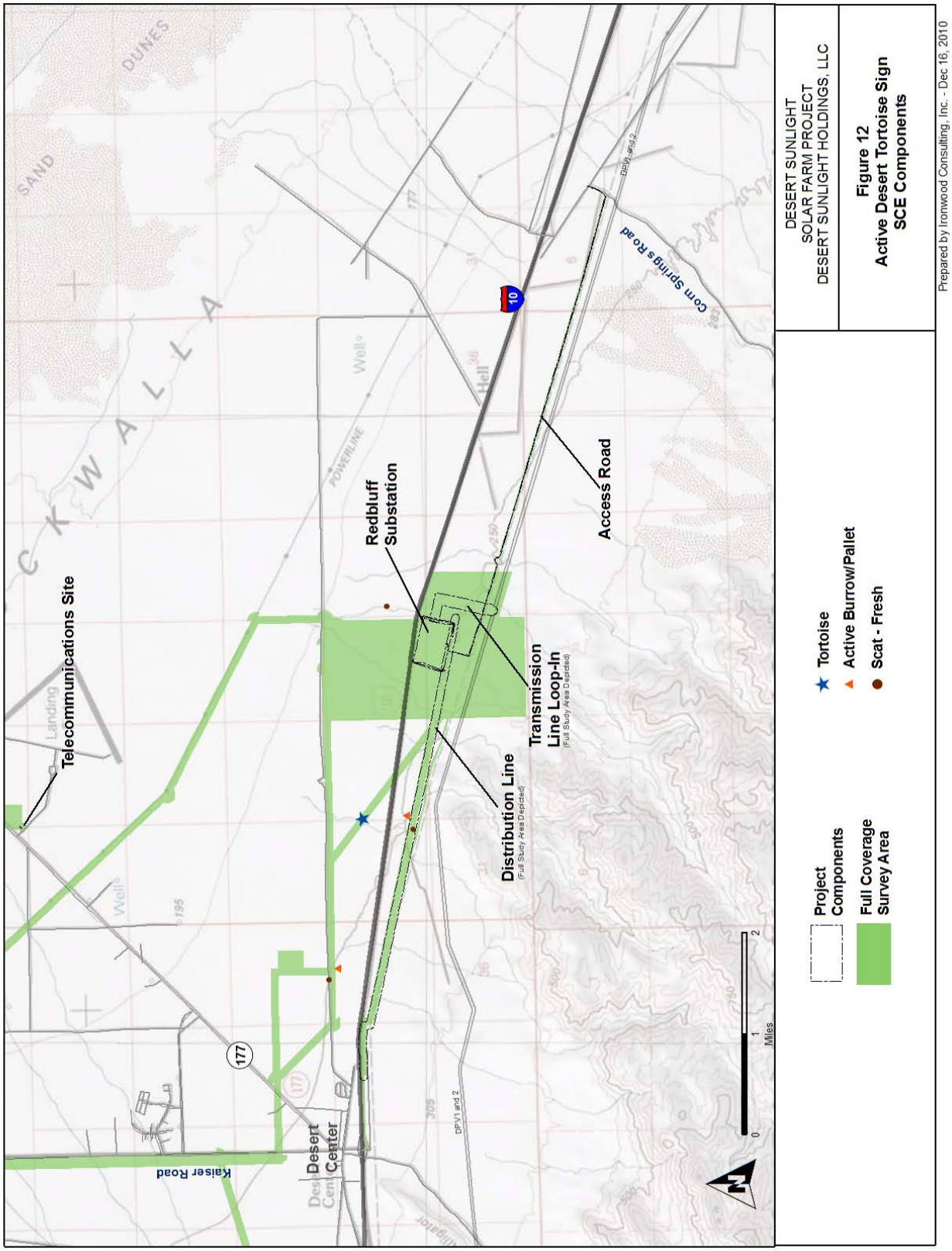


Figure 13 Golden Eagle Observations

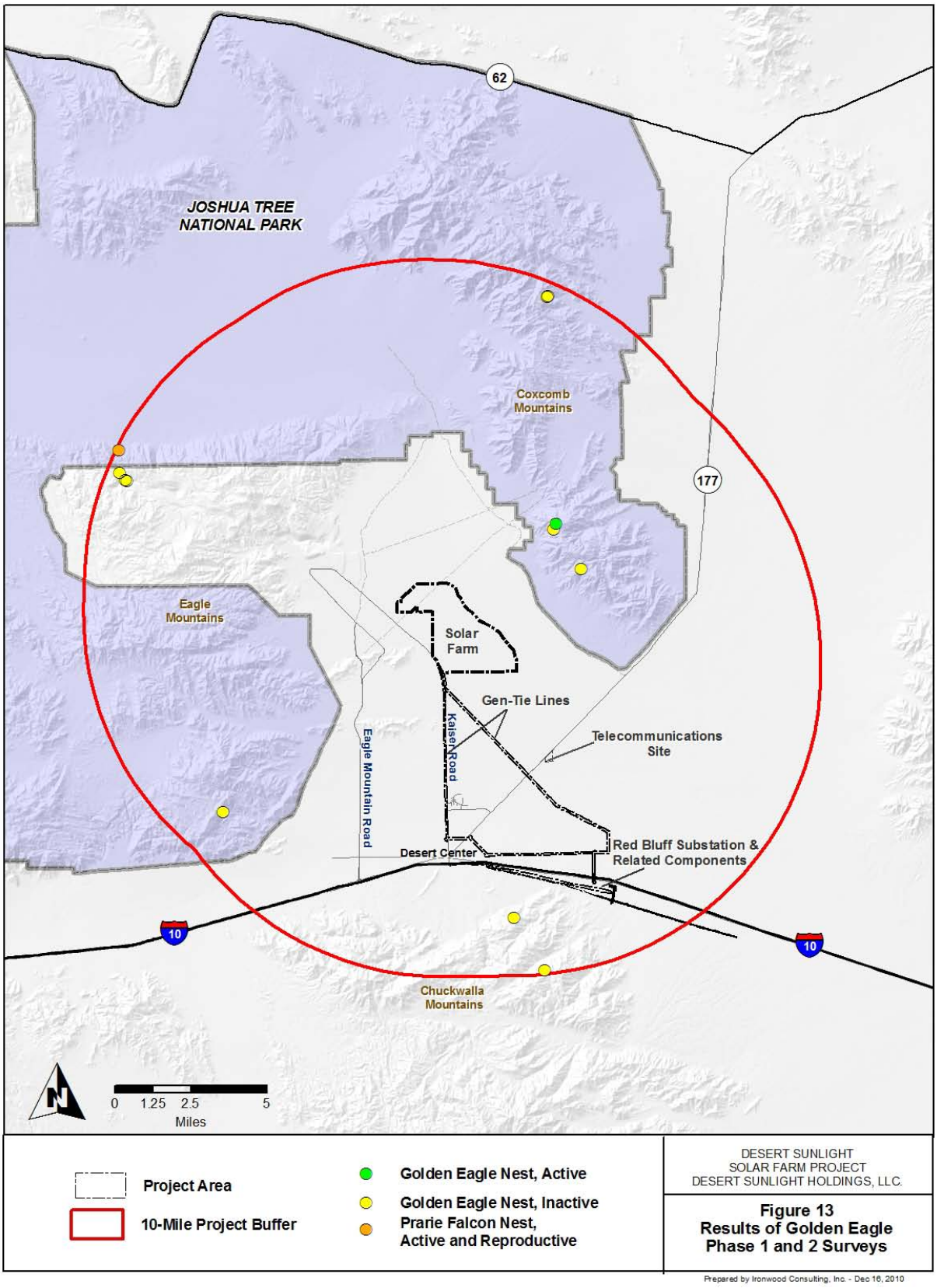
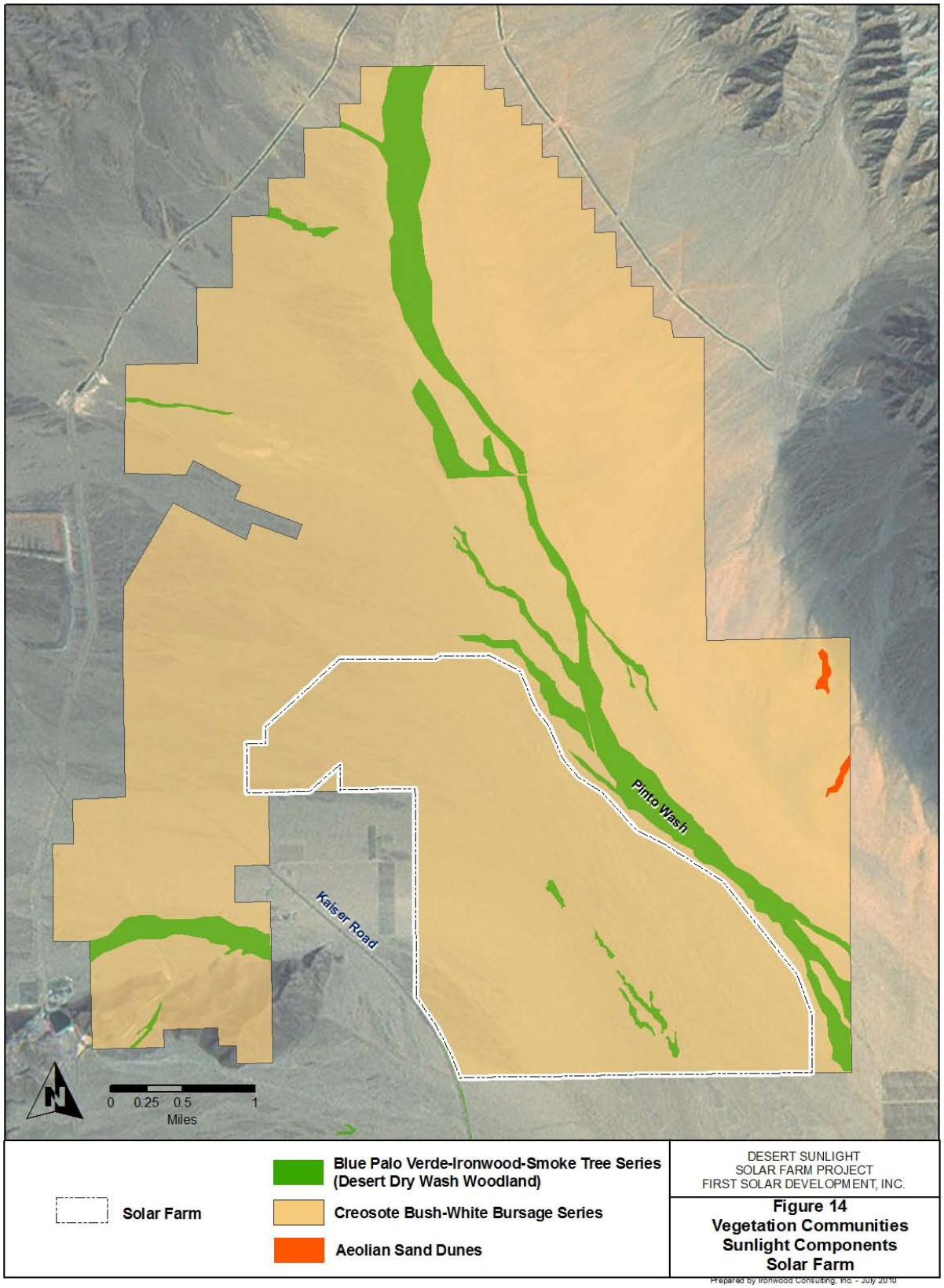
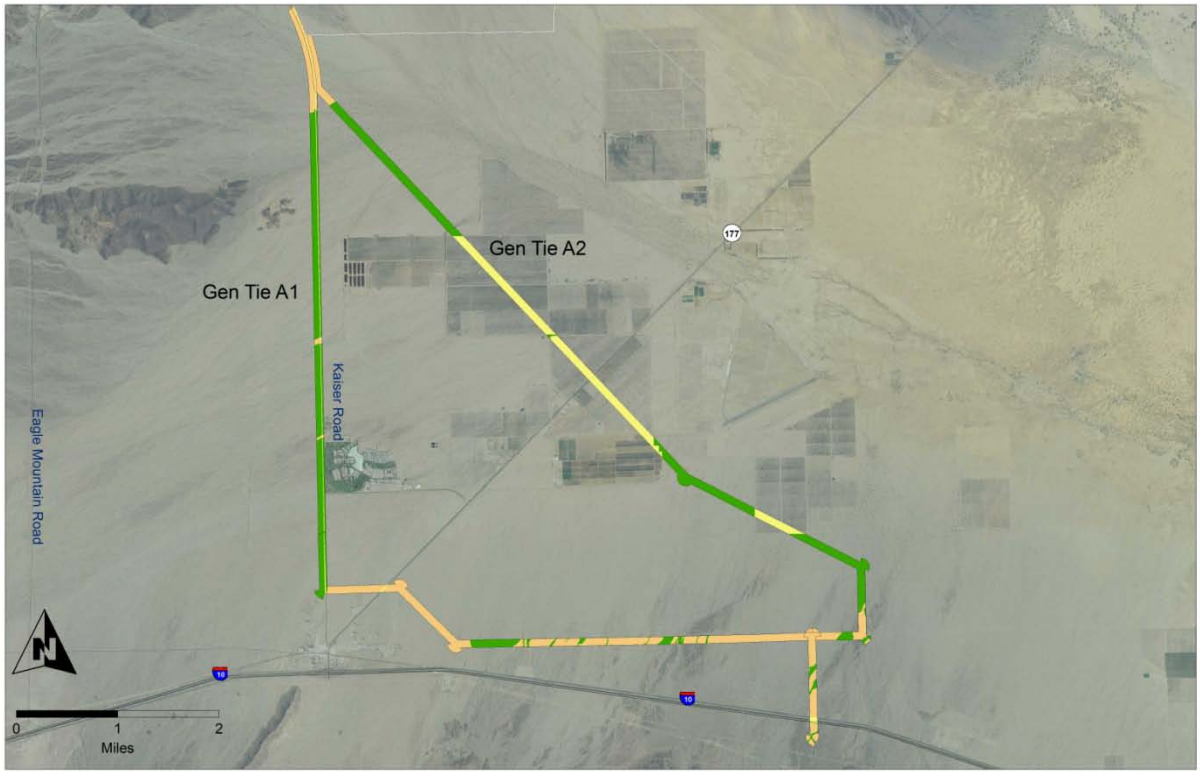


Figure 14 Vegetation Mapping - Solar Farm





Project Alternatives*

* Disturbance areas for linear components are less than area depicted in map.

Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smoke Tree Series)

Sonoran Desert Scrub (Creosote Bush-White Bursage Series)

Developed/Disturbed/Agricultural

DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Figure 15
Vegetation Communities
Sunlight Components
Gen-Tie Line

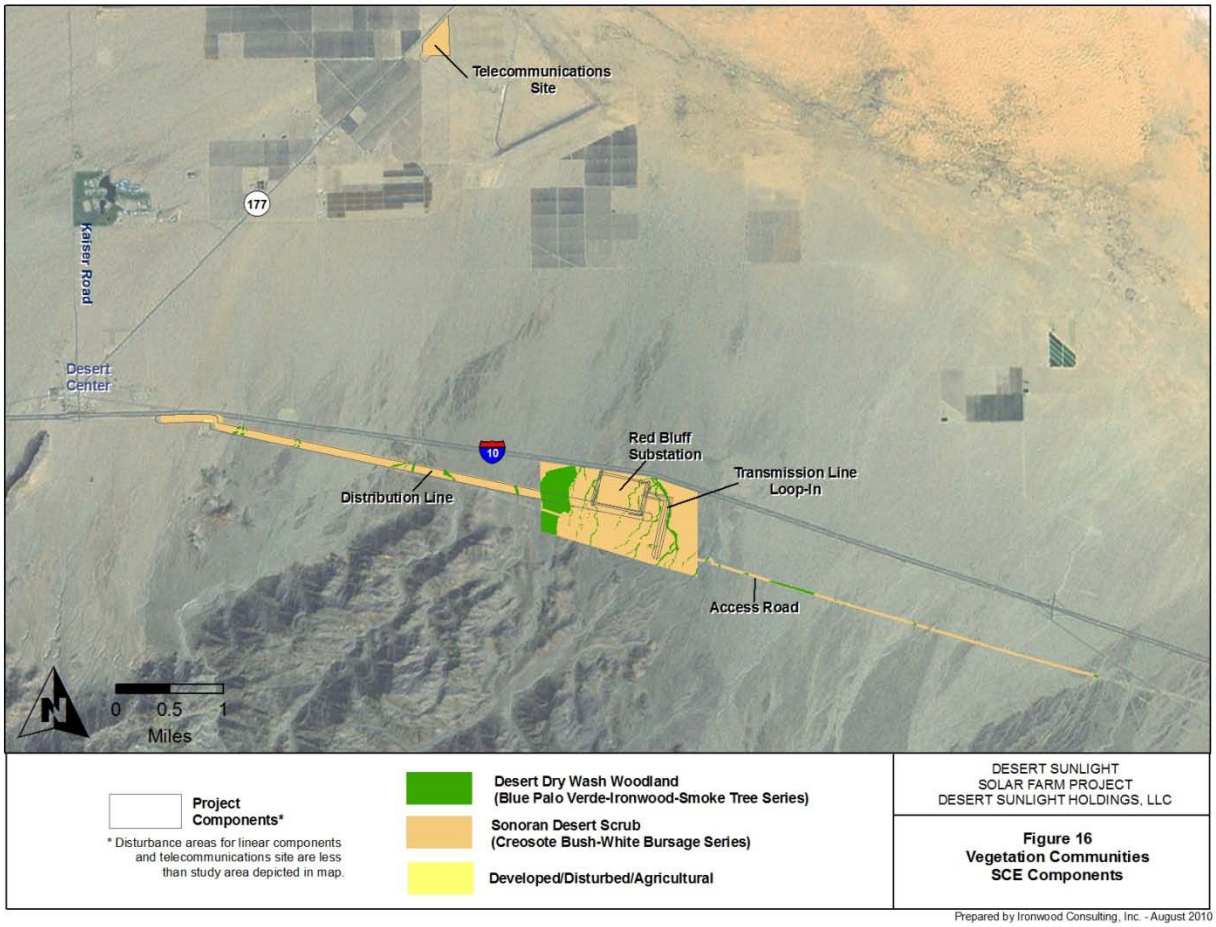
The SCE components consist primarily of creosote bush scrub with active alluvial fans and prominent washes supporting Desert Dry Wash Woodland (Figure 17). Desert dry wash woodland is located within the broad alluvial system in the eastern third of the Red Bluff Substation. Several deeply incised large washes with dry wash woodland occur in the western third of the Red Bluff Substation. Vegetation communities along the access road alternatives and distribution line were relatively disturbed and sparse as a result of historical land disturbance. The presence of existing dirt roads, utility lines, and flood control dykes has had a substantial impact on the vegetation density and diversity. Ironwood trees within this region displayed signs of poor health where surface flow had been diverted as a result of these disturbances.

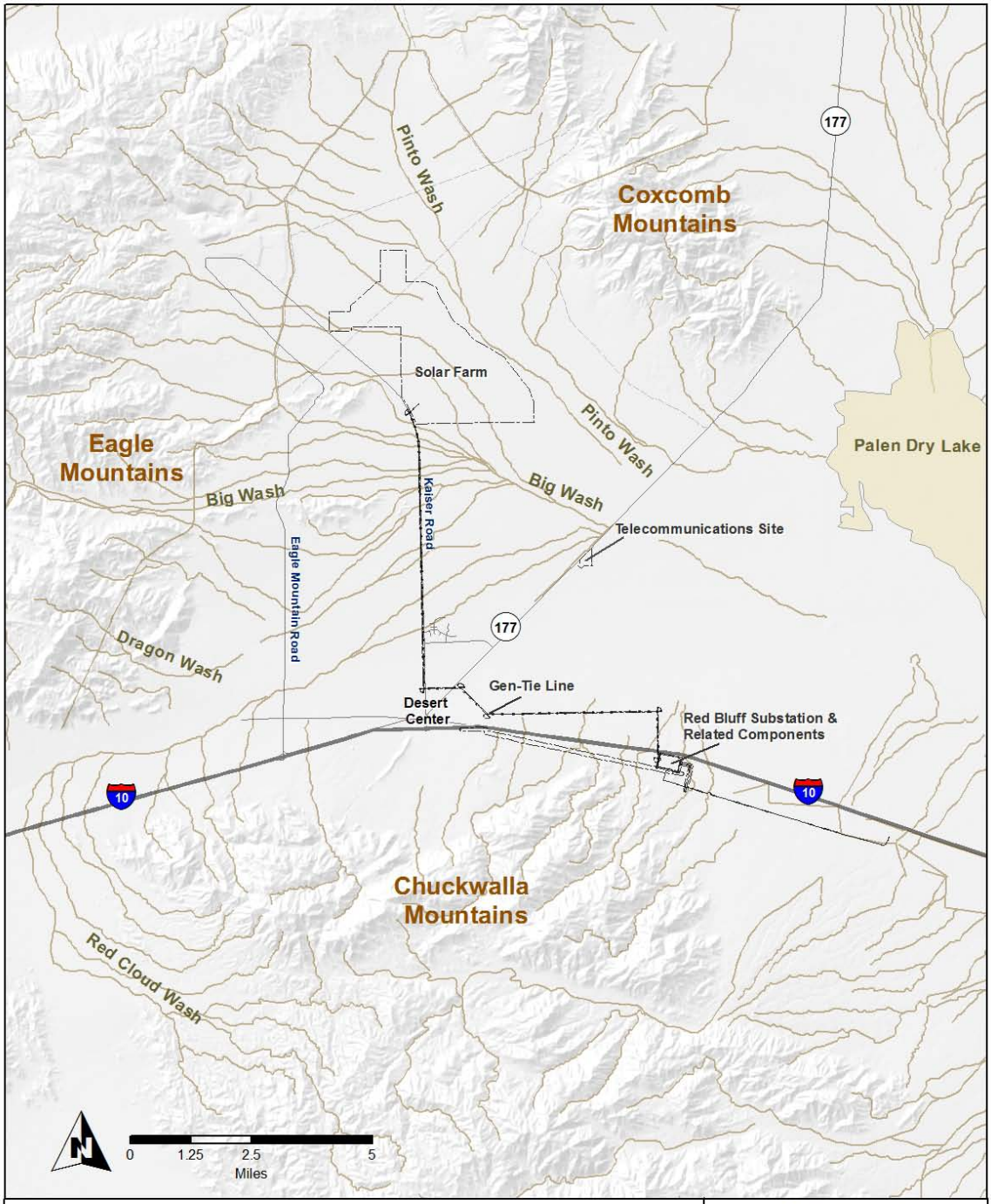
5.2 Soils in the Action Area

Soils in the action area primarily consist of older alluvium with moderate to strong desert pavement, and undifferentiated younger alluvium with interspersed areas of weak desert pavement (Earth Systems Southwest 2010). Older alluvial fan deposits are relatively diverse in soil and vegetation structure. These areas supported elevated uplands with desert pavement (manganese and iron oxidized coatings on cobbles and sand) blanket the top three to six inches of the older alluvial fan material. Drainages that occur within the older alluvial fans are relatively well-defined with well-formed banks up to several feet deep. Active younger sediments are of Holocene age and consist of fine to coarse sand, interbedded with clay, silt and gravel with no evidence of desert pavement. Topography in these areas tends to be uniform, with channel depths generally less than one foot.

5.3 Climate Change and Desert Tortoise

Desert tortoises are believed to undergo environmental sex determination (Spotila and Sandora 1986), which means the incubation temperature of the eggs during the first trimester of development determines the sex of the hatchling (Lovich 2003). Eggs incubated above a pivotal temperature of about 30° C develop into females and those below about 30° C develop into males; although, over long periods of time, the hatchling sex ratios average 1:1 (Lovich 2003). It has been suggested that global climate change has the potential to eliminate the production of male offspring if mean global temperatures increase 4° C, and increases of less than 2° C may dramatically skew sex ratios (Janzen 1994). As "cold-blooded," or ectothermic, animals, the digestion rate, growth, reproduction and activity in desert tortoise are all closely related to temperature; their conservative evolutionary history suggests that they may not be well adapted to rapid environmental changes (Lovich 2003).


Telecommunications Site
177
Kaiser Road
Desert Center
10
Red Bluff Substation
Transmission Line Loop-In
Distribution Line
Access Road
N
0 0.5 1
Miles
Project Components*
* Disturbance areas for linear components and telecommunications site are less than study area depicted in map.
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood-Smoke Tree Series)
Sonoran Desert Scrub (Creosote Bush-White Bursage Series)
Developed/Disturbed/Agricultural
DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC
Figure 16
Vegetation Communities
SCE Components
Prepared by Ironwood Consulting, Inc. - August 2010



DESERT SUNLIGHT
SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

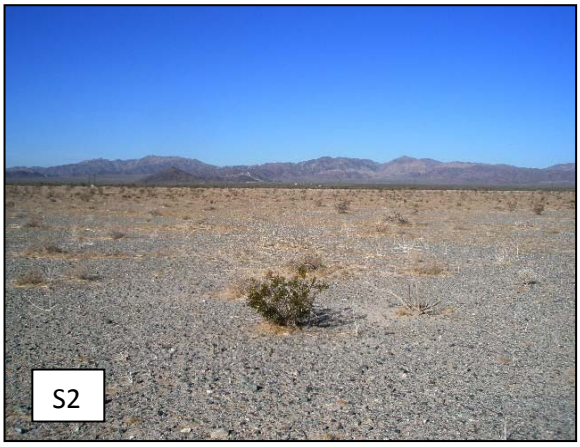
Figure 17
Project Components
Topographical Features

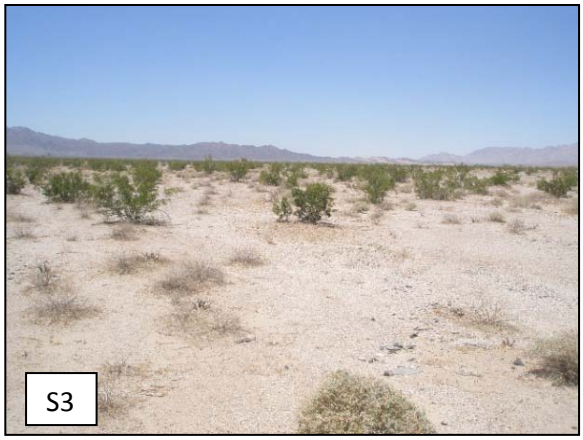
Prepared by Ironwood Consulting, Inc. - July 2010

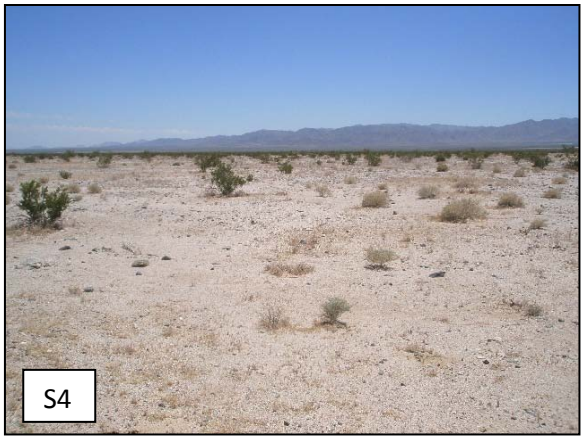
Photos

Photographs N1 and N2 show the northern area of the Solar Farm Site.

Photos S1 through S4 are on the southern and eastern part of the Solar Farm site.







6.0 Effects of the Action on Desert Tortoise

6.1 Direct Effects

Direct effects are those that are caused by the Proposed Action and occur at the same time and place. The direct effects of the Proposed Action are the removal or disturbance of approximately 4,100 acres of desert tortoise habitat with construction of all project components including the Project, Gen-Tie Line A-1, the Red Bluff Substation and related components. Additionally designated critical habitat would be removed or disturbed: approximately 37 acres with the construction of Gen-Tie Line A-1, and approximately 149 acres with construction of the Red Bluff Substation components.

Potential direct effects to the desert tortoise could include:

- Tortoises could be harmed during clearing and grubbing of vegetation, and trenching activities.
- Tortoises could become entrapped within open trenches and pipes.
- Tortoises could be disturbed (e.g., by noise and vibration) or even killed by vehicles or heavy equipment, whether on the Project site or from vehicles straying from existing roads or designated areas into adjacent habitat. The potential for the most severe impacts are along paved roads where vehicle frequency and speed is greatest, though tortoises on dirt roads could also be affected.
- Over time, breaches in the desert tortoise exclusionary fencing could occur, thus allowing tortoises to pass through the barrier and be in affected by Project-related activities.
- Materials and equipment left behind following construction and maintenance activities could entrap or entangle tortoises, attract desert tortoise predators such as common ravens and coyotes, or provide shelter for tortoises and when materials and equipment are removed could result in displacement or injury of the tortoise.
- Tortoises could become crushed or entombed in their burrows during construction.
- Tortoises could be collected or vandalized by Project personnel.
- Tortoises could be injured or killed by visitors' pets.
- Predators of tortoises such as common ravens and coyotes could be attracted to trash located in the Project area.
- Tortoises could take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved.

Activities such as capture, handling, transmittering, disease testing, and translocation could cause mortality, harm or harassment to desert tortoise even when proper methods are being

6.2 Indirect Effects

Indirect effects are those that are caused by, or result from, the Proposed Action, but occur later in time and are reasonably certain to occur. Indirect effects can be both spatial and/or temporal in nature. In contrast to direct effects, indirect effects are more subtle, and may affect populations and habitat quality over an extended period of time, long after construction activities have been completed. Indirect effects are of particular concern for long-lived species such as the desert tortoise because project-related effects may not become evident in individuals or populations until years later.

Potential indirect effects to the desert tortoise could include:

- Tortoises could be harmed by significant loss, modification, or degradation of habitat (50 CFR 17.3).
- An increase of weedy plants, especially non-native grasses, in the action area could lead to increase fire frequency in desert habitat leading to habitat degradation and desert tortoise mortality.
- Raven activity in the action area could increase due to the creation of raven subsidies with human presence thereby leading to increased desert tortoise predation.
- Indirect effects could also occur from increased noise, lighting, and dust in areas outside the direct effects area.

Although implementing the avoidance, minimization and mitigation measures and the project-related Best Management Practices (BMPs) discussed in the body of this BA will reduce the area where these effects could occur and the intensity of these effects; the proposed action would still result in indirect adverse effects to desert tortoise through the potential for harm (50 CFR 17.3).

6.3 Effects to Mojave Desert Tortoise Critical Habitat

Sunlight Components

Direct loss of approximately 37 acres of critical habitat for desert tortoise would occur with the construction of Gen-Tie Line A-1 A-1. This loss of habitat equates to approximately 0.004 percent of the Chuckwalla Critical Habitat Unit (CHU) and approximately 0.0006 percent of the 6.4 million acres of total critical habitat that has been designated for the Mojave population of the desert tortoise that is included in all CHUs. Impacts from construction of Gen-Tie Line A-1 would occur in an area that already experiences considerable edge effects from Interstate 10, utility lines and access roads. This impact is not likely to appreciably diminish the value of the Primary Constituent Elements (PCEs) essential to the species' conservation within the Eastern Colorado Recovery Unit or the Chuckwalla CHU, and is not likely to result in substantial adverse effects throughout the species' range.

Sufficient space to support viable populations within each of the six recovery units, and to provide for movement, dispersal, and gene flow.

Because of the linear nature of the impact and relatively small area of ground disturbance, construction of Gen-Tie Line A-1 and concomitant loss of 37 acres of desert tortoise critical habitat would not likely cause the local population of desert tortoise to become unviable or preclude movement, dispersal or gene flow within the population.

Effects from the addition of tortoises to the CHU in the recipient site would be minimal due to the small number of tortoises (approximately 12, see Section D.1.5) being added to a large area (approximately 4,000 acres), resulting in approximately 1 additional tortoise per a minimum of 250 acres. Thus, whether the potential effects are evaluated for the individual local unit or on a landscape scale, these effects will not likely result in appreciable diminishment of the value of this PCE.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species.
Although soil compaction in the area of the pole sites and new access and spur roads could preclude the germination and growth of forage species in these specific areas, these impact would not likely appreciably reduce the quality and quantity of forage species because the impact is relatively small and forage species would be available in the surrounding undisturbed area.

With the addition of approximately one tortoise per 250 acres in the recipient site, the overall density of tortoises would not be dramatically increased and the amount of available forage would not likely be adversely affected. Thus, the Project would not likely result in appreciable diminishment, on a local or landscape scale, of the value of this PCE.

Suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites.
Although soil compaction in the area of the pole sites and new access and spur roads may render these areas unsuitable for burrowing and nesting, these impacts would not likely appreciably reduce the quality and quantity of suitable substrates for sheltering because the impact is relatively small and suitable soils and sheltering sites would be available in the surrounding undisturbed area

Sufficient vegetation for shelter from temperature extremes and predators.
Vegetation would be removed from each of the pole sites and from the access and spur roads, thereby removing all opportunity for sheltering or escape from predators in these areas. However, the area of impact is relatively small and the surrounding landscape would remain vegetated, which could provide ample opportunity for desert tortoise to escape extreme temperatures and predation in the adjacent undisturbed areas.

These elements of the Chuckwalla CHU would not be significantly adversely affected by the Sunlight components of the Proposed Action due to the extremely small area affected and its location on the edge of the CHU. The portion of the Sunlight components of the Proposed Action along the edge of the CHU is the linear Gen-Tie Line and is not likely to cause effects outside of the small corridor of direct and indirect effects described above. Within the area of direct effects of Gen-Tie Line A-1, vegetation would likely be removed due to construction of new spur roads used to access Gen-Tie Line A-1, and the footprint of the poles themselves which remove vegetation. In the indirect effects area, some vegetation would likely be crushed by vehicle traffic.

With the addition of approximately one tortoise per 250 acres in the recipient site, the overall density of tortoises would not be dramatically increased and amount of available vegetation for shelter would not be adversely affected. Accordingly, the Project will not result in appreciable diminishment, on a local or landscape scale, of the value of this PCE.

Habitat protected from disturbance and human-caused mortality.
Construction of the Project's Gen-Tie Line would completely remove 37 acres of critical habitat and create a new access road and spur roads to each pole. The increase in vehicle traffic for construction and maintenance activities has the potential to kill desert tortoises. Additionally, the new roadway may be an attractive nuisance inviting unauthorized off-road vehicle use. However, this impact would occur in an area that has existing edge effects created by Interstate 10, and other utility lines. Because the impact

would occur in an already disturbed area of the CHU, the loss of this habitat would not likely appreciably reduce the integrity of the Chuckwalla CHU.

The Sunlight components of the Proposed Action and addition of animals to the recipient site would not adversely affect the current level of protection within the CHU. Thus, the Project will not result in appreciable diminishment, on a local or landscape scale, of the value of this PCE.

SCE Components

Direct loss of approximately 149 acres of critical habitat for desert tortoise would occur with the construction of the SCE components of the Project (Table 2). The SCE telecommunications site does not occur in critical habitat.

This loss of critical habitat equates to approximately 0.02 percent of the Chuckwalla CHU and approximately 0.002 percent of the 6.4 million acres of total critical habitat that has been designated for the Mojave population of the desert tortoise that is included in all CHUs. Impacts from construction of the SCE would occur in an area that already experiences considerable edge effects, especially from Interstate 10. Because of the relatively small impact to the CHU in an area with existing edge effects this impact would not likely appreciably diminish the value of the PCEs essential to the species' conservation in Eastern Colorado Recovery Unit or the Chuckwalla CHU, as discussed below for each of these five elements. Overall, these impacts would not likely result in significant adverse effects to the species throughout its range.

Sufficient space to support viable populations within each of the six recovery units, and to provide for movement, dispersal, and gene flow.

Because the loss of 149 acres of critical habitat equates to a relatively small percentage of the Chuckwalla CHU and all CHUs, and the project components are sited in an already disturbed and designated utility corridor, the impact would not likely cause the local population of desert tortoise to become unviable or preclude movement, dispersal or gene flow within the population. Additionally, the lack of desert tortoise observations in the vicinity of the SCE action area suggests that impacts to the CHU in this area would be minimal.

Although no tortoises or active sign were observed in the SCE proposed action area, up to one tortoise could be relocated to the recipient site, which surrounds the Red Bluff Substation. The addition of one animal is not expected to increase the density of tortoises in the immediate area (where no additional animals or sign have been observed) or the area available to support these animals.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species.

Removal of 149 acres of vegetation would preclude this area of supporting forage species and eliminate proper soil conditions for germination and growth of forage species. However, this loss of habitat would not likely appreciably reduce the quality and quantity of forage species within the CHU because the impact would occur at the edge of the CHU in a previously disturbed area and within a designated utility corridor.

The addition of one tortoise to the recipient site is not expected to increase the overall density of tortoise or considerably reduce the amount of available forage in the area.

Suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites.

Clearing and grubbing of 149 acres and soil compaction with site preparation for the SCE components would result in a soil surface that is not suitable for desert tortoise burrowing and nesting in the impact area. However, this impact would occur near the edge of the CHU in a designated utility corridor with existing disturbances. The loss of this habitat would not likely appreciably reduce the integrity of the Chuckwalla CHU because suitable burrowing, nesting, and overwintering substrates would remain intact in the undisturbed surrounding area within the CHU.

The addition of 1 animal to the recipient site within the CHU would have little to no effect on the suitable substrates for burrowing.

Sufficient vegetation for shelter from temperature extremes and predators.
Removal of 149 acres of vegetation for the SCE components would potentially remove all opportunities for desert tortoise shelter and/or escape in those areas. However, fencing of the substation site would prevent desert tortoise from becoming stranded in a large area devoid of vegetation. Although the drainage sites (up to 20 acres) and linear aspects of the Proposed Action would remain unfenced, they present less of an exposure risk to the desert tortoise because they would be surrounded by intact vegetation in the undisturbed portion of the CHU.

The addition of one tortoise to the recipient site is not expected to increase the overall density of tortoise or reduce the amount of vegetation available for shelter and/or escape from predators.

Habitat protected from disturbance and human-caused mortality.
The SCE components of the Proposed Action are sited in and adjacent to an existing utility corridor. The area currently experiences a considerable amount of disturbance and human presence with operation and maintenance of the existing facilities and structures in the area. An increase in vehicle traffic is expected with construction of the SCE components but would not add a substantial number of vehicles or trips during the operations and maintenance phase of the Proposed Action.

The addition of one tortoise in the recipient site would have no effect on the protection of habitat in the recipient site.

<u>Potential Indirect Effects to Mojave Desert Tortoise Critical Habitat</u>

Sunlight Components
During construction, a small portion of the Chuckwalla CHU would be indirectly affected by the Sunlight components of the Proposed Action through temporary effects of driving over habitat; adverse edge effects resulting from construction and operational noise and fugitive dust; the potential for increases of non-native invasive plant species in the area; and the potential for increases in disease in desert tortoise due to stress (Berry 1989).

It is not likely that the indirect effects of the Sunlight components of the Proposed Project will appreciably diminish the value of the constituent elements essential to the conservation of the desert tortoise within the Chuckwalla CHU. The Project would remove 37 acres of designated critical habitat within the Chuckwalla CHU. As discussed under direct effects above this equates to approximately 0.004

percent of the CHU and represents approximately 0.0006 percent of the entire 6.4 million acres of total critical habitat designated for the Mojave population of desert tortoise.

SCE Components

The indirect effects to the Chuckwalla CHU for the SCE components of the Proposed Project are similar to the Sunlight components; however, because the impact is larger, there may be potential indirect effects to occur over a larger area. The indirect effects of the SCE components of the Proposed Action would not likely appreciably diminish the value of the primary constituent elements of critical habitat within the Chuckwalla CHU.

7.0 Cumulative Effects

Cumulative effects are defined as those future state, tribal, local, and private activities that are reasonably certain to occur within the action area of the federal action subject to consultation.

There are approximately 11 reasonably foreseeable projects that are being considered for permitting by the CEC and/or BLM within the Chuckwalla Valley in Eastern Riverside County. However, these projects are located on BLM-managed land and would be considered federal actions that would undergo separate consultation pursuant to Section 7 of the ESA. As such, they are not considered in this document.

8.0 Conclusions

The BLM concludes that the Desert Sunlight Solar Project including all Project and Red Bluff Substation components may affect, and is likely to adversely affect, the Mojave population of the desert tortoise and its designated critical habitat.

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10.0 List of Preparers

Bureau of Land Management (BLM)
Dr. Larry LaPre, District Wildlife Biologist
Kim Marsden, Natural Resources Specialist
California Desert District
22835 Calle San Juan de los Lagos
Moreno Valley, CA 92553
Phone: (951) 697-5200

Mark Massar, Wildlife Biologist
Palm Springs-South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262
Phone: (760) 833-7100

Desert Sunlight Holdings LLC
Amanda Beck, Scott Dawson
Wayne Hoffman Monica Lamb, Kim Oster
1111 Broadway, 4th Floor
Oakland, CA 94607
Phone: (530) 625-7400

Farella Braun + Martel LLP
Paul P. "Skip" Spaulding, III , David Lazerwitz
235 Montgomery St.
San Francisco, CA 94104
Phone: (415) 954-4400

Fontana Energy Associates
Perry H. Fontana, QEP
24 Arbuelo Way
Los Altos, California 94022
650-796-4979

Ironwood Consulting
Chris Blandford, Kathy Simon
20 Nevada St., Suite 300
Redlands, CA 92373
Phone: (909) 798-0330

AECOM
Raymond Romero, Justin Westrum
2737 Campus Drive
Irvine, CA 92612
Phone: (949) 660-8044