

DRAFT
MOJAVE SOLAR PROJECT
BURROWING OWL
MONITORING AND MITIGATION PLAN

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I. INTRODUCTION

Mojave Solar, LLC (hereafter referred to as the Applicant or MSLLC) proposes to develop the Mojave Solar Project (MSP or Project), a solar electric-generating facility, in unincorporated San Bernardino County, California, approximately 9 miles northwest of Hinkley, California (Figure 1). The site is largely fallow agricultural land specifically sited and configured to minimize environmental impacts. This land was originally proposed in the 1990s as Solar Energy Generating Systems (SEGS) XI and XII, and is located next to the existing SEGS VIII and IX facilities.

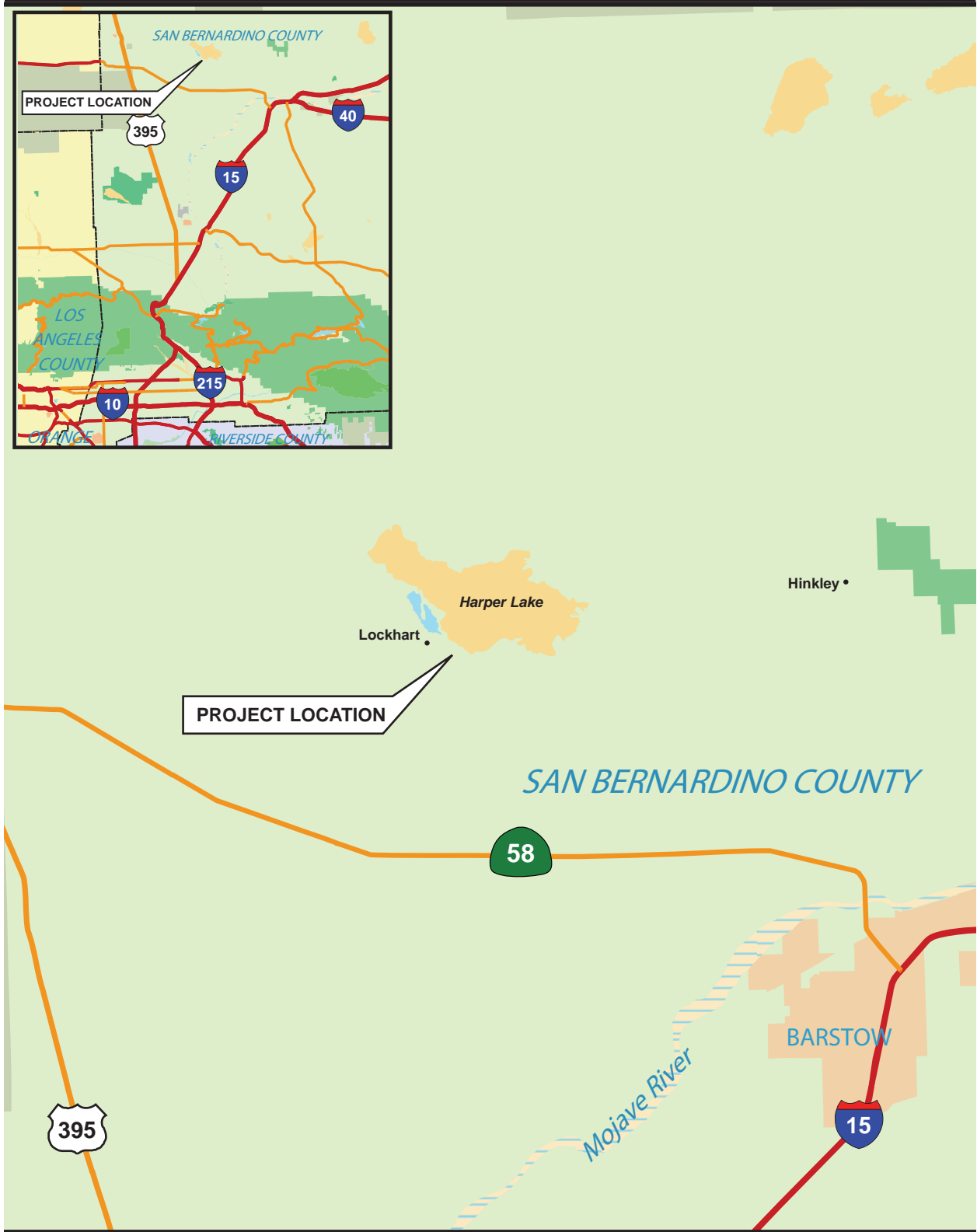
AECOM was contracted by the Applicant to perform environmental services to support the review process being undertaken by the California Energy Commission (CEC). The western burrowing owl (*Athene cunicularia*) (WBO) is protected under the federal Migratory Bird Treaty Act (MBTA) and is designated as a Species of Special Concern by the California Department of Fish and Game (CDFG). A reconnaissance-level survey was conducted in 2006 and protocol surveys were conducted in spring 2007 and 2008 to determine WBO presence/absence, distribution, abundance, and breeding status of the species within a broad expanse of land under the control of the Applicant, within which the ultimate proposed Project was sited, in order to avoid and minimize Project effects to biological resources. During WBO surveys in 2008, a single WBO was observed within the Project Area (Figure 2). A pair of WBO that had been observed in the Project Area during 2007 surveys was not observed in the 2008 surveys. A domestic dog was observed within this area, so the loss of the pair may have been due to dog predation, or the owls may have simply moved. During 2006 reconnaissance surveys, four WBO individuals were detected in the eastern section of the Project Area.

This Burrowing Owl Monitoring and Mitigation Plan (Plan) was prepared on behalf of the Applicant and outlines the methods that would be used to protect WBO within the Project Area and to relocate WBO to suitable conservation areas away from the Project. This Plan also identifies measures that would be implemented for the maintenance, monitoring, reporting, and management of the WBO on the relocation property.

II. BACKGROUND

A. Project Description

The MSP is a solar electric-generating facility proposed on approximately 1,765 acres in unincorporated San Bernardino County, California, approximately 9 miles northwest of Hinkley, California (Figure 1). The site is largely fallow agricultural land specifically sited and configured to minimize environmental impacts. This land was originally proposed in the 1990s as SEGS XI and XII, and is located next to the existing SEGS VIII and IX facilities.



Source: Thomas Guide, 2007

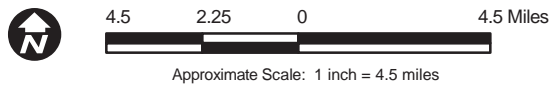
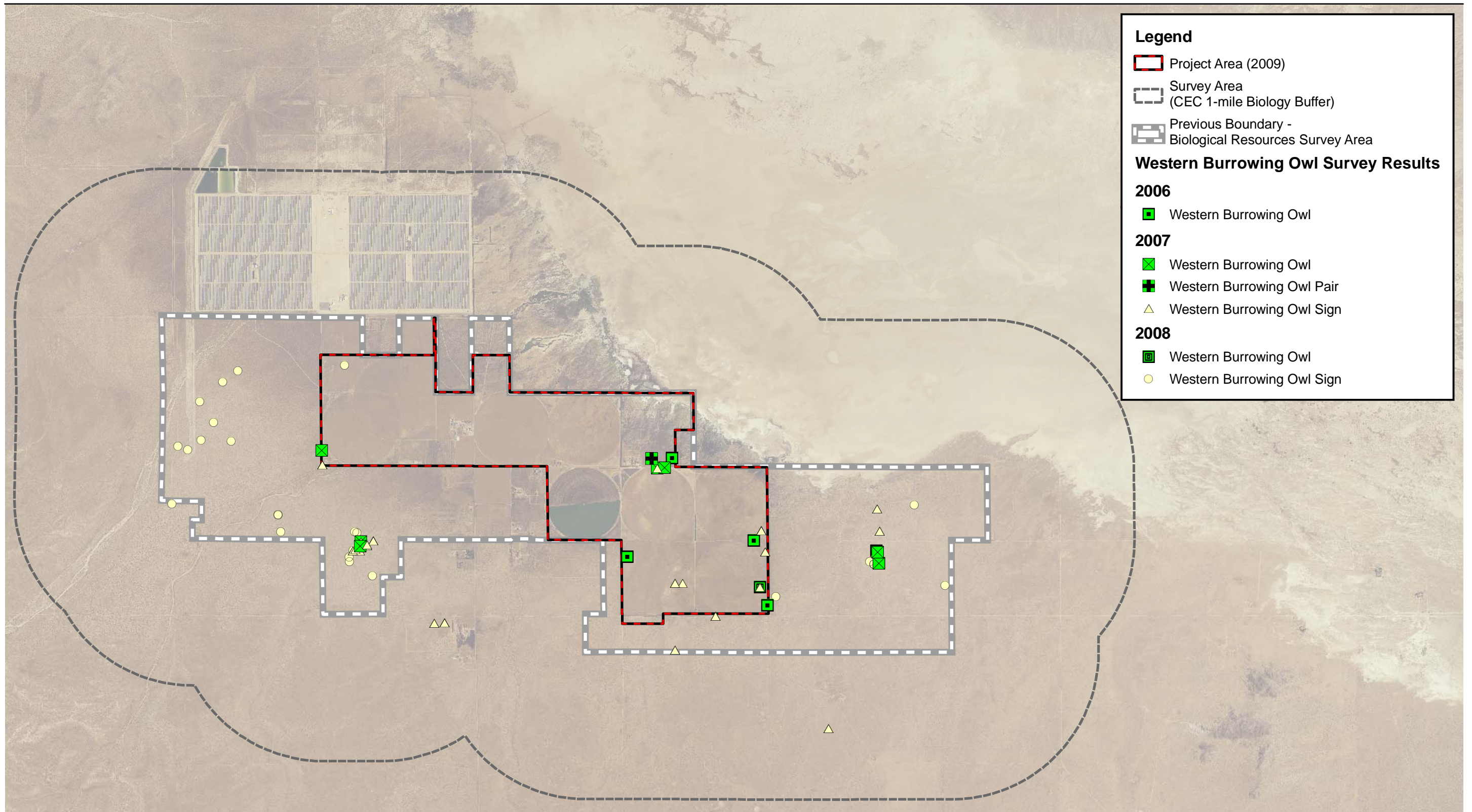


Figure 1
Project Vicinity Map



Legend

- Project Area (2009)
- Survey Area (CEC 1-mile Biology Buffer)
- Previous Boundary - Biological Resources Survey Area

Western Burrowing Owl Survey Results

2006

- Western Burrowing Owl

2007

- Western Burrowing Owl
- Western Burrowing Owl Pair
- △ Western Burrowing Owl Sign

2008

- Western Burrowing Owl
- Western Burrowing Owl Sign

Source: NAIP 2005; Mojave Solar, LLC 2009

2,000 1,000 0 2,000 Feet

Scale: 1 = 42,000; 1 inch = 3,500 feet

Figure 2
Burrowing Owl Survey Data

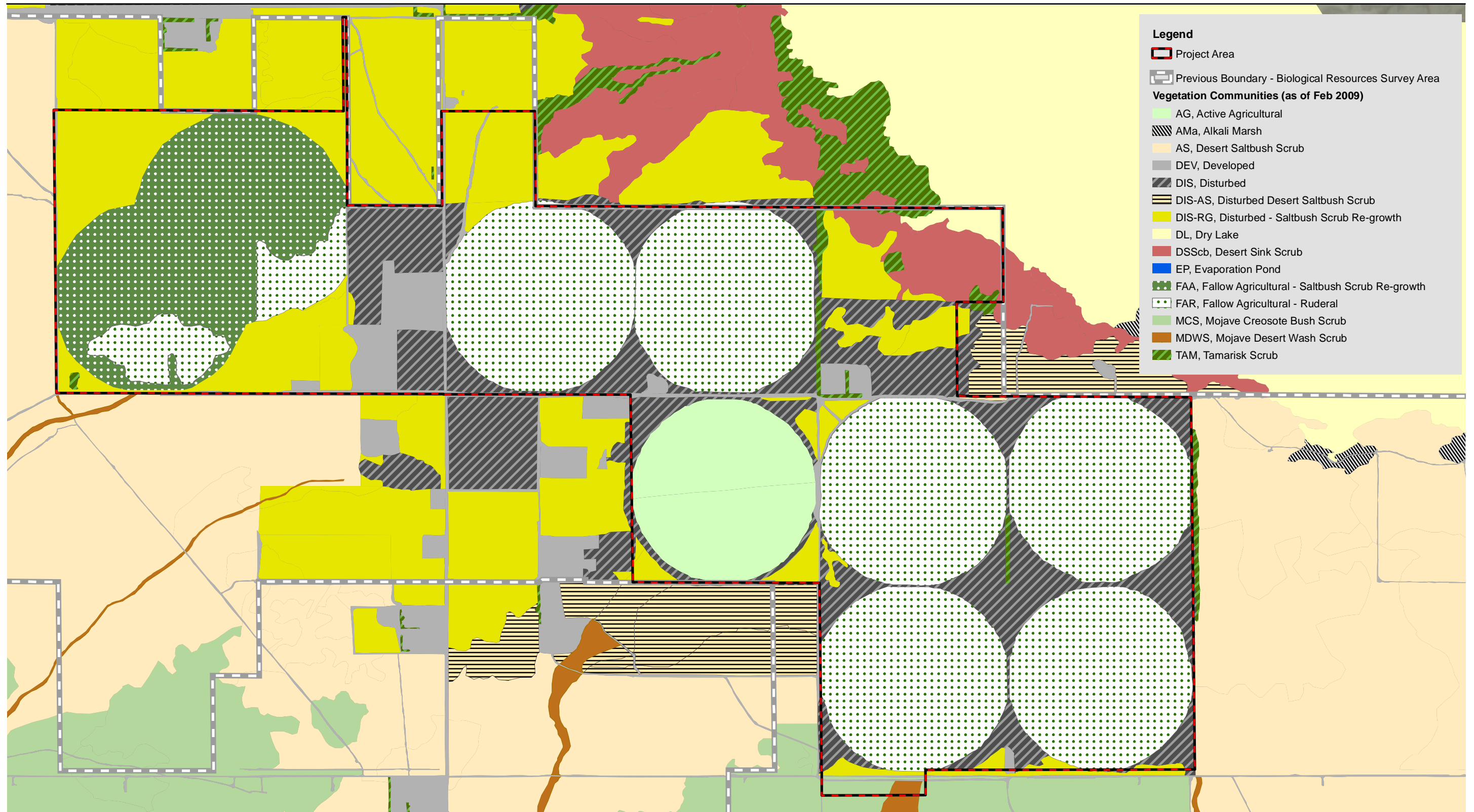
The Project will implement well-established parabolic trough technology to solar heat a heat transfer fluid (HTF). This hot HTF will generate steam in solar steam generators (SSGs), which will expand through a steam turbine generator (STG) to produce electrical power. The Project will have a combined nominal electrical output of 250 megawatts (MW) from twin, independently operable solar fields, each feeding a 125-MW power island. The Plant Site will include two power islands, identified as Alpha (the northwest portion of the Project Area) and Beta (the southeast portion of the Project Area), which will occupy 884 acres and 800 acres, respectively, and will be joined at the transmission line interconnection substation to form one full-output transmission interconnection (Figure 2). An additional 81 acres shared between the two power islands will be used for receiving and discharging offsite drainage improvements. Start of commercial operation is planned for winter 2012, subject to timing of regulatory approvals and Applicant achievement of Project equipment procurement and construction milestones.

Once the Project is completed and the site is developed, the site would be devoid of vegetation and likely would no longer provide suitable habitat for WBO.

B. Burrowing Owl Survey Results

Surveys for WBO were conducted by AECOM biologists in the spring of 2007 and 2008, per California Burrowing Owl Consortium (CBOC) protocol (CBOC 1993), and were focused to determine the presence or absence, distribution, abundance, and breeding status of the species. Surveys were conducted within the lands under control of the Applicant, plus a 500-foot buffer per the CBOC protocol, with an addition of a 1-mile buffer as directed by CEC where two CEC-recommended transects within a 1-mile buffer were also conducted. Transects located at ¾-mile and 1-mile intervals from and parallel to the disturbance boundary were surveyed. The limits of the survey extend to this 1-mile CEC buffer. Information collected on WBO was included in the biological resources analysis in the Project Application for Certification (AFC), which quantifies potential impacts on WBO and identifies appropriate avoidance, minimization, and mitigation measures. A biological reconnaissance survey of the property was conducted in 2006. During the reconnaissance survey, incidental observations of WBO were documented. A detailed description of the survey methodology and results can be found in the Project AFC, Volume 3 (MSLLC 2009).

Most of the lands under control of the Applicant, as well as the adjacent buffer, are considered suitable WBO habitat. The survey area consists of primarily previously disturbed vegetation. Within the proposed Project site, the dominant vegetation community is fallow agricultural fields, with lesser patches of disturbed areas, active agriculture, saltbush scrub regrowth, and minor pockets of vegetation associated with the Harper Dry Lake margin (Figure 3).



Source: EDAW 2008; NAIP 2005; Mojave Solar, LLC 2009

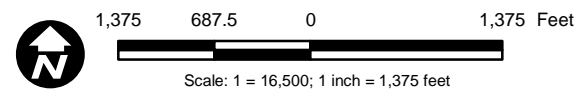


Figure 3
Vegetation Communities

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Within the proposed Project boundary, seven locations of WBO burrows/sign were documented and mapped. An additional 37 locations of WBO burrows/sign were documented outside of the proposed Project boundary, within the lands under the control of the Applicant, and within the 1-mile buffer. Burrows where WBOs were either observed or where their sign was documented were all located in flat, sparsely vegetated areas. The low density of WBO in the Project site is consistent with the documented low general numbers of the species in the surrounding region.

Figure 2 displays the locations of WBOs observed and burrows where sign was observed during the 2006 reconnaissance survey and the 2007 and 2008 protocol surveys. During WBO surveys in 2008, a single WBO was observed within the Project Area. A pair of WBO that had been observed in the Project Area during 2007 surveys was not observed in the 2008 surveys. A domestic dog was observed within this area, so the loss of the pair may have been due to dog predation, or the owls may have simply moved. During 2006 reconnaissance surveys, four WBO individuals were detected in the eastern section of the Project Area.

Four additional WBO in close proximity to burrows with sign were recorded during the 2007 survey within the lands under control of the Applicant, but outside of the Project Area. No WBO were observed or detected within the buffer area during the 2007 and 2008 surveys.

III. PLAN PURPOSE AND GOALS

The primary purpose of this Plan is to provide an effective but feasible strategy that would avoid, minimize, and mitigate potential Project impacts to WBO. This Plan also describes the methodology for passive relocation of WBO from the Project Area.

This Plan discusses management strategies for the avoidance and passive relocation of WBO for the MSP. A multi-tiered approach is proposed to prevent or reduce impacts during construction and operation of the Project. While avoidance measures often focus on protecting animals *in situ* by making adjustments to construction activities near occupied burrows, moving individuals out of harm's way to offsite locations is sometimes the best alternative. Because WBO are resident within the Project Area, it may be necessary to move individuals out of harm's way when they are within the Project Area scheduled for construction. Compensation is also proposed to mitigate for WBO impacts that cannot be avoided or minimized.

The goals of this Plan are as follows:

- Provide avoidance measures to protect WBOs during Project implementation.

-
- Describe the strategy and methodology for passive relocation of all WBOs within the Project Area to a nearby area that provides suitable nesting and foraging habitat.
 - Minimize impacts to WBOs within the passive relocation site.
 - Assess the success of the WBO passive relocation effort through monitoring.
 - Implement mitigation/compensation measures for WBO.

The multi-tiered approach requires pre-activity surveys to assess the resident population of WBO, relocating WBO prior to construction activities to an approved area, monitoring during construction activities for returning birds, and monitoring the relocation site to determine the fate of relocated birds. The schedule for relocating individual birds would be outside the known nesting season and in advance of the anticipated construction start date to determine if relocated individuals return to the site. The following sections describe the recommended relocation methods and incorporate measures to address the likelihood of this species to move back to the site.

If active WBO burrows are documented outside of the Project development footprint but within the CBOC buffer area, avoidance measures as outlined by CBOC would be implemented. This would include the installation of exclusion fencing to ensure that no disturbance occurs within 160 feet during the non-breeding season and 250 feet during the breeding season to avoid impacts to WBO. In addition, offsite habitat is proposed once the site is developed because there would be no suitable habitat within the Project Area at that point, and onsite conditions would likely not support WBO.

This management strategy describes the following:

1. Pre-activity Surveys
2. Artificial Burrow Construction on Compensation Lands
3. Passive Relocation
4. Preservation and Management of Compensatory Habitat
5. Monitoring and Maintenance
6. Reporting

IV. WESTERN BURROWING OWL AVOIDANCE MEASURES

A pre-construction survey of the Project Area and 150-meter buffer surrounding the Project Area would be conducted by qualified biologists under the direct supervision of a Designated Biologist (DB) no more than 30 days prior to the anticipated initiation of site mobilization in fall/winter 2010 to locate and identify active WBO burrows, estimate the current number of WBO individuals or pairs onsite, and attempt to determine if they are breeding pairs or migrating transient birds within the Project Area. Per the CBOC mitigation guidelines adopted by CDFG, compensation and the number of artificial burrows required for impacts to WBO is based on the number of pairs disturbed, as determined by the pre-construction surveys. The Project will adhere to the CBOB guidelines. The survey would consist of walking parallel transects to allow for 100 percent coverage of the area, noting any fresh WBO sign or presence of WBOs. The results of the pre-construction survey, and recommended avoidance measures based on the location of any identified birds, would be provided to CDFG.

Pre-activity surveys would be conducted no more than 30 days prior to construction, and ground-disturbing actions would be carried out within the period from September 1 to January 31, which is prior to the burrowing owl nesting season and also potentially within the desert tortoise active season, depending on ground and climate conditions. The WBO DB and the desert tortoise (DT) Authorized Biologist (AB) would coordinate with the Compliance Project Manager (CPM) to avoid and minimize impacts to WBO and DT.

At all times, surveyors shall maintain a minimum distance of approximately 10 feet from known occupied burrows or observed WBOs to minimize disturbance to WBOs. If WBOs are present within 500 feet of the Project Area or linear facilities during the pre-construction surveys, CDFG WBO mitigation guidelines shall be implemented.

If, during pre-construction surveys, WBO activity is detected at a burrow, every attempt shall be made to avoid disturbance to the burrow by modifying either the placement or the timing of work activity. If active nesting is documented during the breeding season (February 1 through August 31), a 250-foot buffer shall be flagged surrounding the occupied burrow per CBOC guidelines and all work activity shall remain outside of the flagged area until a DB determines the burrow is no longer occupied (e.g., juveniles are foraging independently and are capable of independent survival).

All unoccupied, but potentially suitable, WBO burrows located on site during the initial surveys and still present during the 30-day pre-activity survey shall be carefully excavated and filled in

under the supervision of a qualified biologist prior to site grading to ensure that WBO are not occupying onsite burrows within the disturbance footprint at the time of construction.

V. WESTERN BURROWING OWL PASSIVE RELOCATION FROM THE PROJECT AREA

A. Artificial Burrow Installation in Relocation Area

Prior to any ground-disturbing activities, the Project owner will install five artificial burrows within the proposed relocation area for each identified WBO burrow in the Project Area that would be destroyed by Project construction or impacted by Project operations. The Applicant identified approximately 233 acres of habitat located within a 647-acre parcel west of the Project Area to compensate for impacts to sensitive resources, including WBO. Of the approximately 233 acres of land owned by the Project owner (and not encumbered by the adjacent flood control easement), 118.2 acres will be used to compensate for Project impacts to DT, Mohave ground squirrel (*Spermophilus mohavensis*) (MGS), and WBO and provide the locations for artificial burrows (Relocation Area).

The DB shall survey the site selected for artificial burrow construction to verify that such construction will not affect DT or MGS or existing burrowing owl colonies in the Relocation Area. Installation of the artificial burrows shall occur after baseline surveys of the Relocation Area and prior to ground disturbance or heavy equipment staging. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG. A general design schematic for an artificial burrow is provided as Attachment A.

B. Passive Relocation Methodology

Passive relocation is considered the preferred option to trapping (CBOC 1993). During the non-breeding season, owls shall be given a minimum of 3 weeks to become familiar with the new artificial burrows, after which eviction of owls within the Project Area shall begin.

One-way doors as described by Trulio (1995) and Clark and Plumpton (2005) shall be used to facilitate passive relocation of owls. If relocation occurs near the breeding season, focused monitoring of the WBOs shall be conducted to ensure nesting is not underway and to determine if nesting has been concluded prior to relocation efforts. Burrows shall be excavated after determined vacant by use of a down-hole camera, monitoring, and the use of one-way doors.

Excluded burrows shall be monitored daily for 1 week to confirm no additional WBO use them before excavating burrows. After burrows are confirmed to no longer be in use, the burrow shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bag shall be inserted into the tunnels during excavation to maintain an escape route for any WBOs inside the burrow.

C. Relocation Area Monitoring and Maintenance

Post-relocation monitoring shall include a spring and a winter census of the relocation site to determine if burrowing owls are using natural or artificial burrows within the mitigation area. Maintenance of artificial burrows shall occur three to four times during the year immediately following relocation, as necessary, to ensure boxes are usable for the breeding and non-breeding seasons.

D. Reporting

An annual report will be submitted to CEC, CDFG, and the U.S. Fish and Wildlife Service (USFWS) following each breeding season for 2 years post-relocation. and the annual reports would include the date when passive relocation efforts begin, the date of burrow excavations, findings, and initiation of construction activities. Additionally, any injuries, mortality, or other unforeseen circumstances would be reported to all resource agencies within 24 hours.

Reports would include the following data:

- Project name, locations, and all pertinent information pertaining to the origin site.
- Known predators or humans visiting or disturbing the site.
- Dates of removal of one-way trap doors and the collapse of unoccupied burrows.
- Monitoring results.
- Any other pertinent data gathered through the exclusion, passive relocation efforts, and post-relocation monitoring.

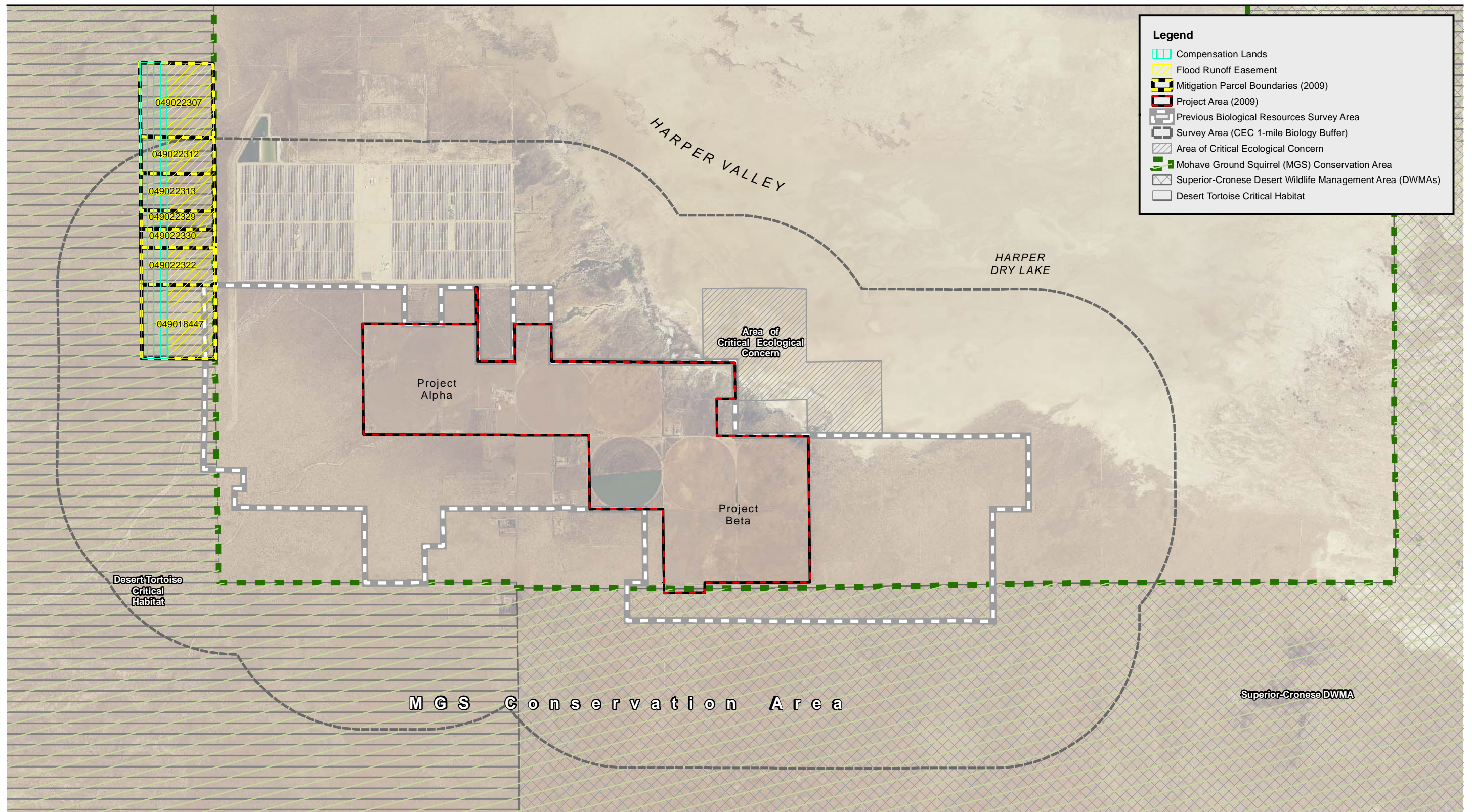
VI. WESTERN BURROWING OWL COMPENSATION LANDS

As discussed above, the Applicant owns approximately 233 acres of habitat, unencumbered by the flood control easement to the east, located within a 647-acre parcel west of the Project Area. Of the identified 233 acres, the Applicant proposes to compensate for impacts to sensitive resources, including WBO within an approximately 118.2 acre compensation site (Figure 4). Of the approximately 233 acres owned by the Applicant, and are unencumbered by the flood control easement, 118.2 acres is available to offset impacts to DT, MGS, and WBO and provide the location for artificial burrows. The Applicant has assessed the proposed mitigation site as supporting biological resources that include components of suitable western burrowing owl habitat (AECOM 2010). It is anticipated that this 118.2 acres would fully mitigate potential Project impacts to WBO.

CBOC guidelines recommend that 6.5 acres of compensation land be preserved and managed in perpetuity for each individual WBO or WBO pair identified as potentially impacted in the Project Area and the 150-meter pre-construction survey buffer. Based on the results of previous WBO surveys of the Project Area and surrounding buffers, it is anticipated that the 118.2 acres will be sufficient to provide compensation for the pairs (or individuals assumed to be pairs) of WBO that have been or may be identified within the Project Area or buffers. Per the CBOC and CDFG mitigation guidelines, a pre-construction survey will be conducted to determine the number of WBO pairs and the amount of compensation land that shall be required to be protected.

The compensatory habitat shall be managed for the benefit of WBOs with the following specific goals:

- a. Maintaining the functionality of artificial and natural burrows; and
- b. Minimizing the occurrence of weeds (species considered “moderate” or “high” threat to California wildlands as defined by California Invasive Plant Council [CAL-IPC 2006] and noxious weeds rated “A” or “B” by the California Department of Food and Agriculture and any federal-rated pest plants [CDFG 2010]) at less than 10 percent cover of the shrub and herb layers.



Source: NAIP 2005; USFWS 2006; BLM 2009; Mojave Solar, LLC 2009; San Bernardino County 2009

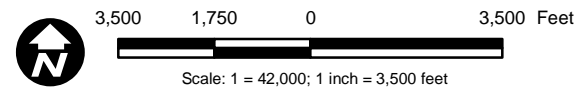


Figure 4
Compensation Lands and Project Vicinity

MSP Burrowing Owl Monitoring and Mitigation

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VII. CONTINGENCY PLANNING AND PROGRAM CONTACTS

To cope with unforeseen circumstances, the Applicant is committed to implementing an adaptive management program that functions within the constraints of the Project permits and approvals. Adaptive management decisions will be made with the input from pertinent regulatory agency staff in a timely manner so that mid-course corrections can be made to ensure the protection of resident and Project-related WBO.

In the event that unforeseen circumstances arise relative to this Monitoring and Mitigation Program, or any CEC Condition of Certification, the CEC's CPM for this Project, the CEC's Project Manager, or the CEC Siting Office Manager shall be notified by the Monitoring and Mitigation Program's DB to resolve the issue or determine a subsequent course of action.

Where these circumstances may involve specific reporting details, clarifications, or questions related to complying with Biological Opinion Terms and Conditions, the Environmental Protection Agency's San Francisco Office and the applicable USFWS staff, either in the Carlsbad office, Ventura field office, or Portland office, shall be contacted by either the CPM or the Monitoring and Mitigation Program's DB.

Similarly, where California Endangered Species Act (CESA) Section 2081 incidental take permit condition issues are involved, clarifications or reporting may be involved, and CDFG Inland Desert Region 6 representatives and/or staff in the CDFG's Regional Office located in Ontario shall be contacted by either the CPM or the DB.

Burrowing owl experts, such as Peter Bloom or David Bittner, Ph.D., shall be consulted on an ongoing basis on the technical aspects and review of relocation data monitoring and reporting.

The following is a list of agency staff members who shall be contacted, as applicable, on various aspects of relocation site selection and long-term management of the relocation site:

Mr. Rick York
California Energy Commission
1516 Ninth Street, MS-40
Sacramento, CA 95814-5512
(916) 654-3945
ryork@energy.state.ca.us

Ms. Ashleigh Blackford
USFWS, Ventura Office
6010 Hidden Valley Road, Suite 101
Carlsbad, CA 92011
(805) 644-1766
(805) 644-3958 fax
ashleigh_blackford@fws.gov

Mr. Eric Weiss
California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Blvd, Suite C-220
Ontario, CA 91764
(909) 484-0167
(909) 481-2945 fax
eweiss@dfg.ca.gov

VIII. REFERENCES

AECOM

- 2010 Abengoa Mojave Solar Project Compensatory Mitigation Site Details Letter Report. April.

California Burrowing Owl Consortium (CBOC)

- 1993 Burrowing Owl Survey Protocols and Mitigation Guidelines. Sacramento, California.

California Department of Fish and Game (CDFG)

- 1995 Staff report on burrowing owl mitigation. Unpublished report.

California Department of Food and Agriculture (CDFA)

- 2010 Pest Ratings of Noxious Weed Species and Noxious Weed Seed. State of California Department of Food and Agriculture, Division of Plant Health & Pest Prevention Services. January.

California Invasive Plant Council (Cal-IPC)

- 2006 California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Available: www.cal-ipc.org.

Clark, H.O., Jr., and D.L. Plumpton

- 2005 A simple one-way door design for passive relocation of western burrowing owls. California Fish and Game 91:286-289. Available at <http://www.docstoc.com/docs/1660512/Clark-HO-Jr-and-DL-Plumpton-2005-A-simple-one-way-door-design-for-passive-relocation-of-western-burrowing-owls--California-Fish-and-Game-91286-289>.

Mojave Solar, LLC (MSLLC)

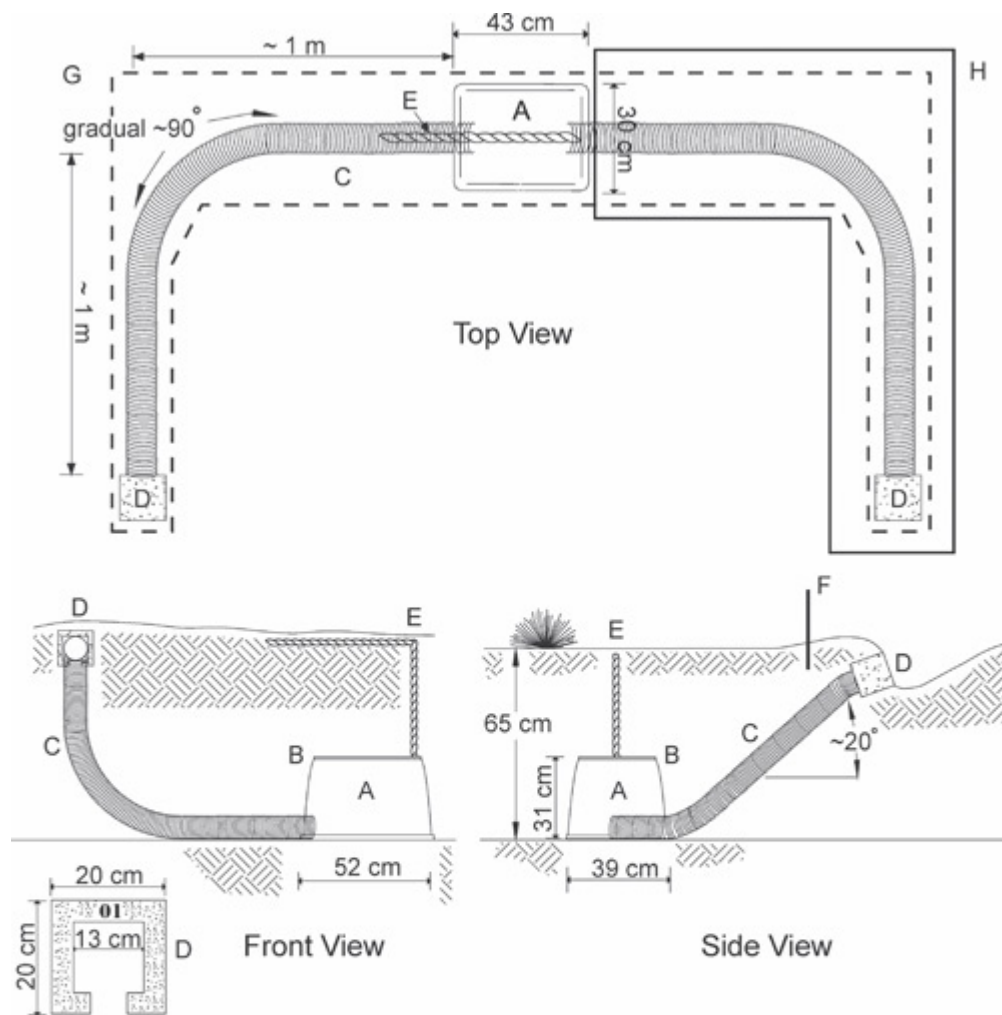
- 2009 Mojave Solar Project Application for Certification. Volumes 1 through 3. July.

Trulio, Lynne A.

- 1995 Passive Relocation: A Method to Preserve Burrowing Owls on Disturbed Sites. *Journal of Field Ornithology* 66(11): 99–106.

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ATTACHMENT A
TYPICAL ARTIFICIAL BURROW DESIGN



- A - Plastic irrigation valve box, 48 cm long x 35 cm wide x 27 cm high (inside dimensions)
- B - Removable lid
- C - Ca. 2 m of 10-cm diameter perforated flexible plastic pipe
- D - 20 x 20 x 15 cm hollow concrete block
- E - Plastic rope or chain marking location of nest chamber on ground surface
- F - 0.5 m perch post (optional)
- G - Excavation footprint for installation - - -
- H - Optional second entrance