

**APPENDIX E-3**  
**DESERT TORTOISE PRE-PROJECT SURVEY REPORT**

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# Administrative Draft 2018 Desert Tortoise Pre-project Survey Report

Daggett Solar Power Facility

*San Bernardino County, California*

June 4, 2018





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## Acronyms and Abbreviations

amsl	above mean sea level
Applicant	Daggett Solar Power 1 LLC
CDFW	California Department of Fish and Wildlife
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
cm	centimeters
project	Daggett Solar Power Facility
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

# Introduction and Project Description

Daggett Solar Power 1, LLC, a subsidiary of NRG Renew LLC (Applicant), is proposing to develop the Daggett Solar Power Facility in San Bernardino County, east of Daggett (Figure 1). The proposed project consists of constructing and operating a utility-scale, solar photovoltaic, electricity generation and energy storage facility that would produce up to 650 megawatts of power and include up to 450 megawatts of battery storage capacity on approximately 3,500 acres of land (Figure 2 and Figure 3). The project would utilize existing electrical transmission infrastructure adjacent to the existing Coolwater Generating Station, a recently retired natural gas-fired power plant, to deliver renewable energy to the electric grid.

This *Desert Tortoise Pre-project Survey Report* is intended to communicate the Applicant's results for focused surveys for desert tortoise. The surveys were conducted in support of the Applicant's compliance with the California Environmental Quality Act and other state and federal regulations.

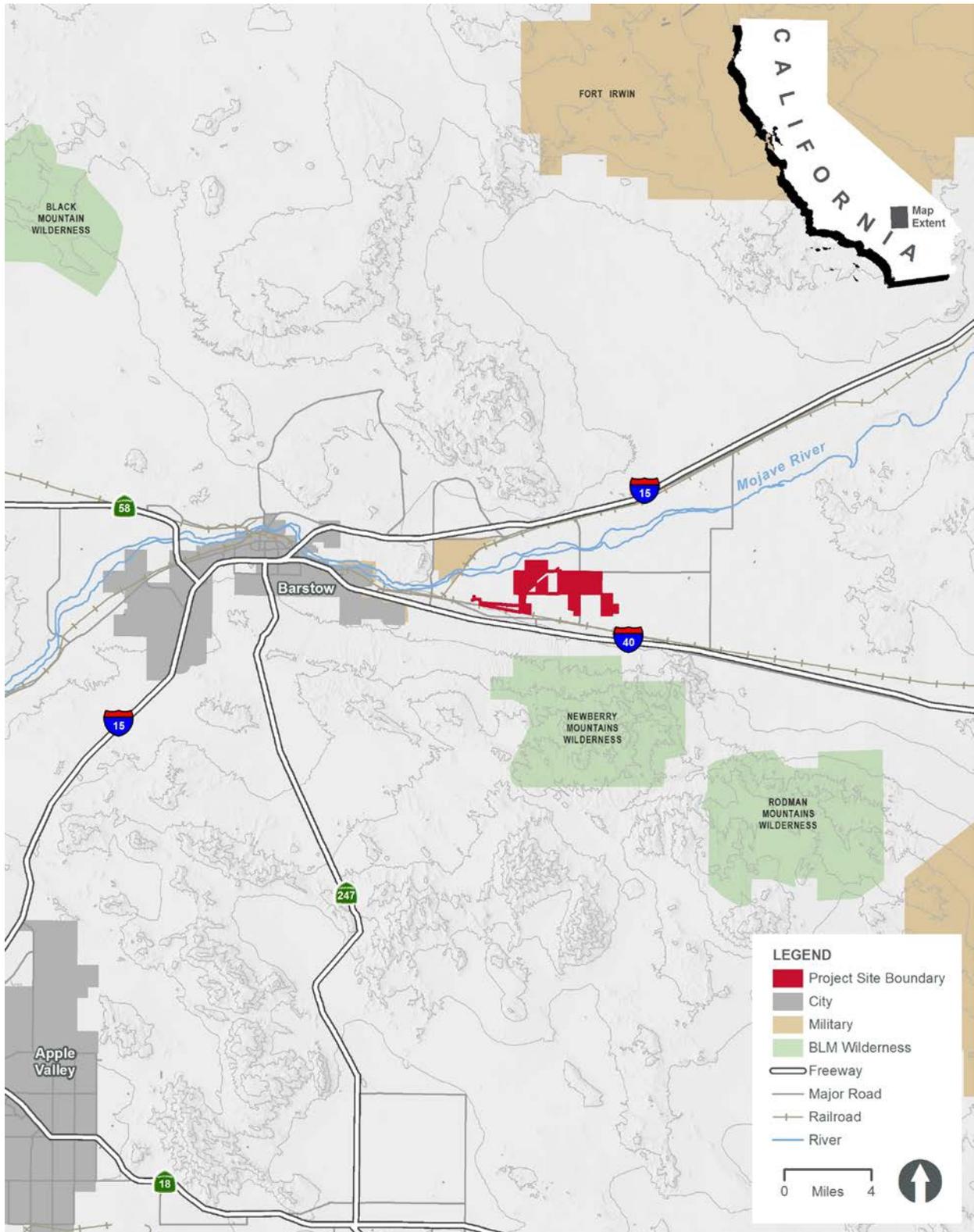
## 1 Project Site Description

The project is to be located east of Barstow and Daggett, south of Interstate 15 and the Mojave River, north of Interstate 40, and adjacent to Barstow-Daggett Airport (Figure 1). The project area is situated within Township 9 North and within Ranges 1 East and 2 East. The sections are Sections 13, 23, and 24 in Range 1 East; Sections 7, 8, 15-19, 21, and 23 in Range 2 East.

The project site is flat and is generally bounded by the town of Daggett approximately 0.5 mile to the west; the Mojave River, Yermo, and Interstate 15 to the north; Barstow-Daggett Airport, Route 66, and Interstate 40 to the south; and Newberry Springs and Mojave Valley to the east.

The project site is shown on four U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles in California: Yermo, Minneola, Harvard Hill, and Newberry Springs. The site is approximately within the latitudes of 34.83° and 34.90° and within the longitudes of –116.70° and –116.88° (34° 52' 0" N/116° 48' 0" W). Figure 1 shows the project location.

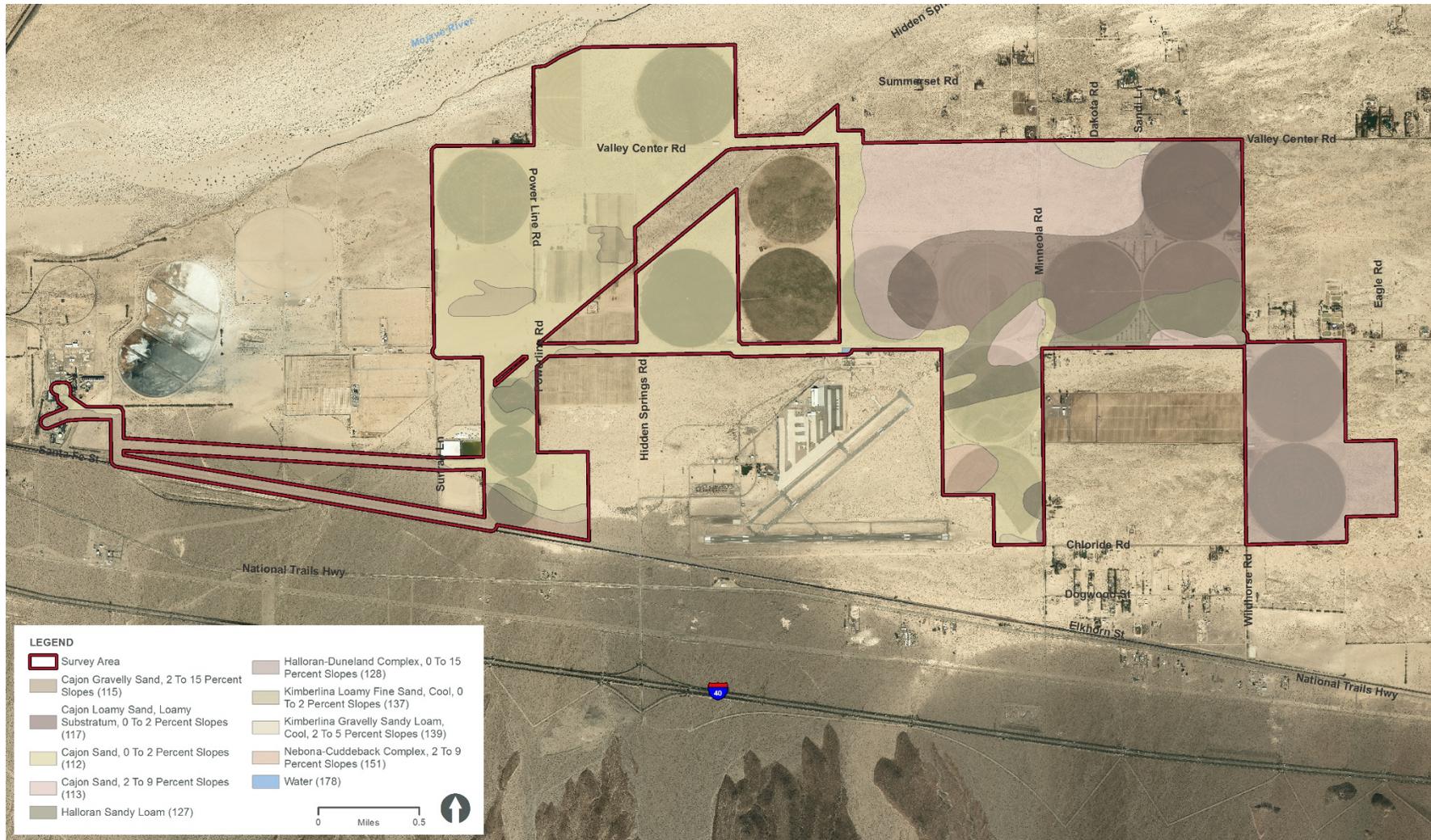
Figure 1. Project Location



**Figure 2. Project Site on USGS Quadrangles**

### Figure 3. Project Site Aerial Imagery

Figure 4. Soils





**Figure 5. Vegetation Communities within the Project Area**

## 1.1 Topography and Rainfall

The project area exists at elevations between approximately 1,870 feet above mean sea level (amsl) on the southeastern boundary of the project area to 1,970 feet amsl on the western boundary (Figure 2 and Figure 3). The project area has a gentle slope from south to north, toward the Mojave River, which is immediately north of the project area.

The Daggett Airport (Barstow Daggett AP, California 042257) receives an average of 4.1 inches of precipitation per year, of which the majority (3.97 inches) occurs between July and April. During the 2017-2018 rainfall year thus far to date (07/01/2017 through 5/17/2018), Daggett received 1.53 inch of rain (39 percent of the average rainfall for the site) (U.S. Climate Data 2018).

## 1.2 Soils

Soils within much of the project area have been disturbed as a result of agricultural, residential, and industrial uses. Soils in the project area were mapped using the Natural Resources Conservation Service Web Soil Survey (USDA 2017, Figure 4). The proposed project encompasses water and the following five different soil series:

**Cajon Series** - This series consists of very deep, somewhat excessively drained soils that are formed in sandy alluvium from dominantly granitic rocks. These soils range from strongly alkaline to strongly saline-alkali. Runoff is negligible to low with rapid permeability. Cajon soils are formed on recent fans, fan skirts and aprons, and river terraces from 200 to 4,300 feet amsl on 0- to 15-percent slopes.

**Halloran Series** - This series consists of deep, moderately well-drained soils that formed in mixed alluvium. These soils range from mildly to moderately alkaline. Runoff is slow with moderately slow permeability. Halloran soils are formed on old alluvial terraces and depressional areas that have been overblown with irregularly-spaced hummocks and small dunes, which occupy 15 to 35 percent of the area and are mapped in some areas as a complex with dune land. This complex occurs from 1,800 to 1,850 feet amsl on 0- to 2-percent slopes.

**Kimberlina Series** - This series consists of very deep, well-drained soils formed in mixed alluvium from dominantly igneous and/or sedimentary rocks. These soils are moderately alkaline. Runoff is medium with moderately rapid and moderate permeability. Kimberlina soils are formed from recent alluvial fans and flood plains from 1,800 to 4,100 feet amsl in the Mojave Desert on 0- to 9-percent slopes.

**Nebona-Cuddeback Series** - The Nebona series consists of shallow, well-drained soils formed in mixed alluvium. These soils are mildly to moderately alkaline. Runoff is medium to rapid with moderately rapid permeability. Nebona soils are formed from old gravelly desert pavement-covered terraces derived from nonmarine mixed alluvium from 2,200 to 3,000 feet amsl on 2- to 9-percent slopes.

The Cuddeback series consists of well-drained soils formed in alluvium from mixed sources. These soils are mildly to moderately alkaline. Runoff is medium to rapid with moderately slow permeability. Cuddeback soils are formed from old terraces and alluvial fans from 2,200 to 3,000 feet amsl on 2- to 9-percent slopes.

**Riverwash Series** - This series consists of generally rapid runoff that typically consists of sandy or gravelly cobble and boulder deposits. Soils of this series occurring on alluvial fans are considered hydric.

## 1.3 Vegetation Communities

The project area supports six vegetation communities or other land cover types including Creosote Bush Scrub, Desert Saltbush Scrub, Disturbed Saltbush Scrub, agriculture, Tamarisk Windrows, and disturbed/developed/ruderal, which are described in detail in the *Daggett Solar Biological Resources Technical Report* (HDR 2017) and depicted in Figure 5. As further described in Section 2.1, only the two communities described below have characteristics of potential desert tortoise habitat. Representative photographs of these vegetation communities are provided in Appendix A. Lists of plants and animals observed during this survey will be presented in a separate report prepared by HDR in 2018.

### 1.3.1 Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance)

Within the Creosote Bush Scrub community (*Larrea tridentata* Shrubland Alliance), creosote bush is dominant or codominant in the shrub canopy, with several subdominant desert shrub species such as white bursage (*Ambrosia dumosa*), common burrobrush (*Ambrosia salsola*), various saltbush (*Atriplex*) species, and California jointfir (*Ephedra californica*).

In the project area, the Creosote Bush Scrub community is found primarily on undeveloped lands in the western and northern portions of the project area (Figure 5), and creosote bush is largely dominant. Some small areas of this community consist of an equal mix of creosote bush and allscale saltbush (*Atriplex polycarpa*). Other plants observed in this community include silver cholla (*Cylindropuntia echinoocarpa*), diamond cholla (*Cylindropuntia ramosissima*), common Mediterranean grass (*Schismus barbatus*), bristly fiddleneck (*Amsinckia tessellata*), white bursage, burrobrush, and California jointfir. Representative photographs of Creosote Bush Scrub within the project area are included in Appendix A, Photographs 1 and 2.

### 1.3.2 Desert Saltbush Scrub (*Atriplex polycarpa* Alliance)

Allscale is dominant in the shrub canopy within the Desert Saltbush Scrub community (*Atriplex polycarpa* Shrubland Alliance), with subdominant species such as creosote bush, burrobrush, slenderleaf saltbush (*Atriplex canescens* var. *linearis*), and common Mediterranean grass.

In the project area, this community occurs primarily on sandy soils in the eastern portion of the project area (Figure 4 and Figure 5), and the dominant shrub is allscale, with creosote bush and white bursage as subdominants. Other plants observed in this community include common Mediterranean grass, slenderleaf saltbush, silver cholla, and bristly fiddleneck. Annuals were, for the most part, not identifiable due to the lack of sufficient rainfall. Representative photographs of Desert Saltbush Scrub within the project area are included in Appendix A, Photographs 3 and 4.

## 2 2018 Desert Tortoise Pre-Project Survey Methods

### 2.1 Survey Area

Per recommendations made by U.S. Fish and Wildlife Service (USFWS) staff (R. Bransfield, personal communication, January 10, 2018), the survey protocol below is based upon USFWS' *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2010). Although a more current (2017) survey protocol is available, it is still under revision and the primary changes in thresholds for sampling are not relevant to this project because surveys were conducted on 100% of the project site.

The protocol guidance indicates that pre-project desert tortoise surveys should be conducted in areas with the following characteristics:

- Creosote bush scrub, Joshua tree woodland, Mojave allscale saltbush scrub, blackbrush and/or juniper woodland communities

- Average annual precipitation from 5 to 20 cm (2 to 8 inches)

- Desert flats, valleys, washes, bajadas, alluvial fans, rolling hills, and/or low mountains

- Elevations of ~100 to 1525 miles (~300 to 5000 feet)

- Friable soils for digging burrows and/or caliche caves

Habitat supporting these characteristics occurs within the Creosote Bush Scrub and Desert Saltbush Scrub. Table 1 summarizes the area that was surveyed within those two communities.

During initial site visits for this desert tortoise pre-project survey, HDR biologists determined that a third vegetation community, disturbed Saltbush Scrub, is not potential habitat for desert tortoises because soils there are compacted and not suitable for digging burrows. This community occurs at the edges of agricultural areas and adjacent to desert saltbush scrub, where there is evidence of prior cultivation, grading, or other intense impacts that resulted in the loss of most native vegetation. As a result, these areas have compacted soil and have been recolonized with a mix of native and non-native shrub species, most commonly dominated by allscale and Russian thistle. Along with allscale and Russian thistle, Sahara mustard (*Brassica tournefortii*) and London rocket (*Sisymbrium irio*) are also common. The other three vegetation communities within the project area (Agriculture, Tamarisk Windrows and Disturbed/Developed/Ruderal) are developed or otherwise disturbed and do not have characteristics of desert tortoise habitat (HDR 2017).

**Table 1. Vegetation Communities in the Desert Tortoise Survey Area (acres)**

Plant Community	Solar Field	Gen-tie
Creosote Bush Scrub ( <i>Larrea tridentata</i> Shrubland Alliance)	798.5	127.6
Desert Saltbush Scrub ( <i>Atriplex polycarpa</i> Shrubland Alliance)	137.6	17.2
<b>Total</b>	<b>936.1</b>	<b>144.8</b>

The project area has about 1,080 acres of potential desert tortoise habitat (Table 1). All of that land has been subjected to some level of disturbance, such as off-road vehicle use and sheep grazing. As a result, those areas support only a sparse herbaceous/shrub cover dominated by non-native species such as common Mediterranean grass, *Erodium* sp. and bristly fiddleneck. Potential desert tortoise habitat within the project area is fragmented by agriculture, residences, transmission lines, and other development. In addition, the entire project area is isolated from larger tracts of occupied desert tortoise habitat to the north by I-15, Yermo Road, and a railroad line, and to the south by I-40, US Route 66, and a railroad line.

## 2.2 Literature and Record Search

Prior to conducting desert tortoise surveys, HDR examined the following to identify potential habitat, and designated critical habitat for this species within or near the project area.

California Natural Diversity Database (CNDDDB) RareFind [CDFW 2017; dated August 1, 2017] search of nine USGS quadrangles surrounding and including the site (*Minneola, Nebo, Yermo, Harvard Hill, Newberry Springs, Camp Rock Mine, Ord Mountain, West Ord Mountain, and Daggett*)

USFWS online Information for Planning and Conservation tool (USFWS 2011)

USFWS online Critical Habitat Mapper; HDR acquired information on the habitat requirements of special-status plants from California Native Plant Society (CNPS 2017) and Calflora (Calflora 2017)

As depicted in Figure 7 of the 2017 *Daggett Solar Biological Resources Technical Report* (HDR 2017), the nearest CNDDDB record for desert tortoise is 0.8 miles to the south of the Santa Fe Road Gen-Tie Option and south of Interstate 40 (HDR 2017). There is no designated critical habitat for the desert tortoise within the project area (USFWS 1994). The Superior-Cronese Critical Habitat Unit (USFWS 1994, 2011) is about 1.5 mile to the north of the project area, and the Ord-Rodman Critical Habitat Unit (USFWS 1994, 2011) (Figure 6) is about 0.8 mile to the south of the area. Both of these habitat units are separated from the project area by major transportation corridors (I-15 and I-40, respectively).

## 2.3 Focused Surveys

A presence/absence survey for desert tortoise was conducted in potential desert tortoise habitat within the project area in accordance with guidelines in USFWS' *Preparing for Any*

*Action That May Occur Within the Range of the Mojave Desert Tortoise (Gopherus agassizii) (USFWS 2010).*

Complete (100%) coverage of all potential desert tortoise habitat within the project area was surveyed by walking 10-meter-wide (30-foot) belt transects. Transects were surveyed for presence of tortoises and sign, including shell, bones, scutes, limbs, scat, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, mineral licks, etc.

Surveys were conducted during the tortoise’s most active periods [April through May] when air temperatures were under 40 C (104 F). Perimeter belt transects were not surveyed for the linear portions of the project associated with the gen-tie lines because areas adjacent to the gen-tie lines, such as the BNSF railroad, are private property for which biologists did not have right of entry. Survey dates, surveyors, and weather conditions are provided in Table 2. Incidental wildlife and plant observations are compiled and included in the Daggett Solar Project Biological Resources 2018 Spring Survey Report (HDR 2018).

**Table 2. 2018 Desert Tortoise Pre-project Survey Dates, Surveyors, and Weather Conditions**

Date	Start/Stop Time	Surveyors*	Weather Conditions
4/2/18	12:45 – 16:30	AL, AN, RS, MS, TG	Start: 89°F, 4 mph wind, clear skies End: 84°F, 12 mph wind, clear skies
4/3/18	09:10 – 16:45	AL, AN, RS, MS, TG, SB	Start: 67.6°F, 4.7 mph wind End: 82°F, 6 mph wind
4/4/18	09:10 – 15:35	AL, AN, RS, SB, MS, TG	Start: 66°F, 10 mph wind, overcast End: 88°F, 12 mph wind, clear
4/17/18	08:45 – 16:30	AL, AN, RS, MS, TG, SB	Start: 58°F, 3.3 mph wind, clear End: 66°F, 3 mph wind, clear
4/18/18	09:00 – 16:00	AL, AN, RS, SB, MS, TG	Start: 61°F, 1.6 mph wind, clear End: 78°F, 1 mph wind, clear
4/19/18		AL, AN, RS, MS, TG	Start: 48°F, >30 mph wind No surveys conducted
5/1/18	09:00 – 15:15	AL, AN, RS, MS, SB, TG	Start: 66°F, 15 mph wind, partly cloudy End: 73°F, 18 mph wind, cloudy/storming
5/2/18	08:30 – 16:00	AL, AN, RS, MS, TG	Start: 58°F, 7mph wind, cloudy/light rain End: 79°F, 2.4 mph wind, partly cloudy

\*Surveyors: AL: Adam Lockyer; AN: Aaron Newton; RS: Ronell Santos; MS: McKenna Smith; TG: Tracy Goyak; SB: Sarah Barrera

### 3 2018 Desert Tortoise Pre-project Survey Results

No live tortoises or definitive sign of desert tortoises (e.g., carcass; scat; Class 1, 2, or 3 burrows) were observed during focused surveys conducted in April and May 2018.

Two burrows that could have been created or otherwise used by desert tortoises were found. One was within the southern-most gen-tie option near the Coolwater Power Plant, the other was in the southeastern corner of the project area (Figure 6). Per USFWS



protocol survey guidelines, a mirror was used to direct sunlight into the burrow openings to search for desert tortoises and tortoise sign; no sign was found within or near either burrow. Table 3 provides details of these burrows.

Both burrows had the characteristic half-moon shape of desert tortoise burrows (i.e., flat floor and rounded roof), however, there was no other indication that they were excavated or used by desert tortoises, and it is equally likely that they were created by other wildlife species and exhibit their shape due to erosion. The burrow near the Coolwater Power Plant is located on the side of a wash in relatively hard-packed dirt and rock. The burrow in the southeastern portion of the project area is located in sandy soil and is likely a partially collapsed mammal burrow. Neither burrow showed sign of recent use by mammals or other animals. Based on characteristics of these burrows, surveyors designated both as Class 4 (Good Condition, possibly tortoise).

**Table 3. 2018 Desert Tortoise Pre-project Survey Results**

Date	Sign Type	Class <sup>1</sup>	Number	Location <sup>2</sup>	Comments
5/1/18	Burrow	4	1	513952 E 3857347 N	Burrow continues straight back and deeper than visible. No indication of current use. No other sign in area.
5/1/18	Burrow	4	1	3856865 E 523945 N	No indication of current use. No other sign in area.

<sup>1</sup> Class 1. Currently active, with desert tortoise or recent desert tortoise sign

Class 2. Good condition, definitely desert tortoise; no evidence of recent use

Class 3. Deteriorated condition; this includes collapsed burrows; definitely desert tortoise

Class 4. Good condition; possibly desert tortoise

Class 5. Deteriorated condition; this includes collapsed burrows; possibly desert tortoise (USFWS 2009)

<sup>2</sup> Universal Transverse Mercator Zone 11

## 4 Conclusions and Discussion

No live desert tortoises or definitive sign of tortoises were found during pre-project surveys of about 1,080 acres of potential habitat in the spring of 2018. Two Class 4 burrows that had no indication of use by tortoises (other than typical shape) were observed.

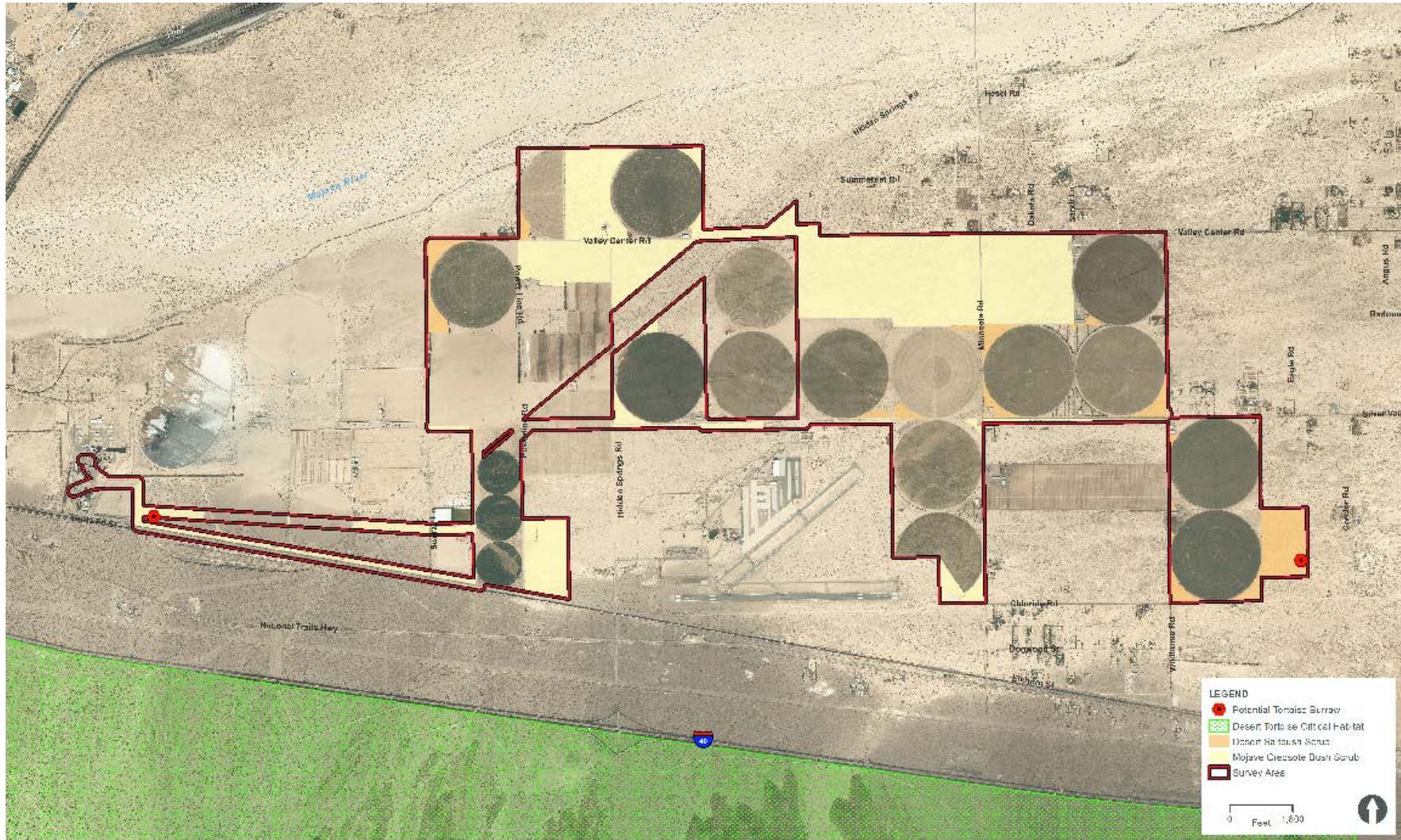
Similarly, no desert tortoises or tortoise sign were found during numerous other surveys of the project area conducted by HDR biologists during spring 2018. During surveys conducted to date for rare plants, burrowing owls (*Athene cunicularia*), Mojave fringe-toed lizards (*Uma scoparia*), raptors, and regulated streambeds, no tortoise or tortoise sign were observed. HDR biologists spent more than 102 person days within the project area conducting those other surveys, and all potential habitat for desert tortoises was surveyed at least three additional times. The biologists conducting those surveys are familiar with desert tortoise biology and identification of sign.

Most of the project area consists of disturbed agricultural fields and other developed sites. Potential desert tortoise habitat there is of low quality because it is fragmented and because past and ongoing disturbances have resulted in sparse herbaceous and shrub cover. In addition, the project location and surrounding area are isolated from occupied habitat to the north and south (including critical habitat units) by interstate highways, other



roads, and railroad tracks. Although the project area is in the vicinity of higher quality habitat, the lack of connectivity could explain the absence of evidence of current or recent historical use by desert tortoises within the project area.

Figure 6. 2018 Desert Tortoise Pre-project Survey Results



## 5 References

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## Appendix A. Site Photographs



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**Photograph 1.** Creosote Bush Scrub in the eastern portion of the project area. View looking north.



**Photograph 2.** Creosote Bush Scrub in the eastern portion of the project area. View looking south.



**Photograph 3.** Desert Saltbush Scrub in eastern portion of project area. View looking north.



**Photograph 4.** Desert Saltbush Scrub in central portion of project area. View looking south.



**Photograph 5.** Disturbed Saltbush Scrub community adjacent to Agriculture near central, northern portion of site. View looking west.



**Photograph 6.** Class 4 Burrow observed along southern gen-tie alignment, near Coolwater Power Plant



**Photograph 7.** Class 4 Burrow observed in southeast portion of project area.