RE KERN COUNTY DESERT SOLAR BIOLOGICAL RESOURCES ASSESSMENT

January 2011

Biological Resources Assessment

RE Kern County Desert Solar

RE Rosamond One and Two
RE Rio Grande
RE Columbia, Columbia Two, and Columbia 3
RE Great Lakes
RE Barren Ridge 1
RE Tehachapi Solar
RE Tehachapi 2

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SECTION 1 - INTRODUCTION

Rincon Consultants, Inc. (Rincon) has prepared a Biological Resources Assessment for the Recurrent Energy (RE) Kern County Desert Solar projects. The projects are distributed at seven locations within a geographic region from the western Mojave to the Tehachapi Range, in eastern Kern County. The sites are collectively referred to as the Kern County Desert Solar project sites. Formal names for each of the individual project sites are listed below followed by the designation given for the purpose of this report in parentheses. Please note that several project sites adjoin one another (e.g. Rosamond One and Rosamond Two).

- RE Rosamond One and RE Rosamond Two (Rosamond)
- RE Rio Grande (Rio Grande)
- RE Columbia, Columbia Two, and Columbia 3 (Columbia)
- RE Great Lakes (Great Lakes)
- RE Barren Ridge 1 (Barren Ridge)
- RE Tehachapi Solar (Tehachapi)
- RE Tehachapi 2 (Tehachapi 2)

Because the proposed projects encompass seven locations within a broad biogeographic region, relevant biological information is presented in both a regional and site-specific analysis. Therefore, this report is organized as follows: *Section 1 – Introduction* provides location information, project description, and significance criteria for evaluation of biological effects, *Section 2 – Methodology* details the study methods employed, *Section 3 – Regional Biological Resources* describes the biological resources and environmental conditions within the general project area, *Section 4 – Site-Specific Biological Resources and Effects Analysis* presents the biological survey results and evaluates potential environmental effects at each site, *Section 5 – Mitigation Measures* lists proposed mitigation measures for the projects, and *Section 6 – Summary and Conclusions* provides a summary of potential effects and recommended mitigations measures for each site. References are included in Section 7, a List of Preparers is in Section 8, and botanical compendia, site photographs, and sub-consultant technical reports are included in Appendices A-C.

This report has been prepared for RE Rosamond One, RE Rosamond Two, RE Rio Grande, RE Columbia, RE Columbia Two, RE Columbia 3, RE Great Lakes, RE Barren Ridge 1, RE Tehachapi Solar, and RE Tehachapi 2 ("Clients"). This report may be used and relied upon by Clients, any entity that has an ownership interest in any of these Clients, any of Clients' subsidiaries and/or affiliates, and any successor in interest to Clients' interest in the project.

1.1 PROJECT LOCATIONS

The Kern County Desert Solar project sites are generally located in eastern Kern County, California. They are geographically distributed within a project region that includes the Mojave Desert in the east to the Tehachapi Range in the west. The Mojave Desert sites are located in the Antelope Valley along State Route (SR) 14, north of the City of Lancaster and west of Edwards Air Force Base. The Tehachapi and Tehachapi 2 sites occur in the Tehachapi Valley along SR-202, west of the City of Tehachapi. The sites

range in size from approximately 40 to 594 acres. Site locations are listed in Table 1 and shown on Figure 1.

Table 1. Location Information for the Kern County Desert Solar Sites

Project Name	Community	Location	APN	Elevation	Size
RE Rosamond One and RE Rosamond Two	Rosamond	6500-7514 Favorito Avenue	252-031-01	2560-2632 ft	320 acres
RE Rio Grande	Mojave	State Route 14, 0.75 mile north of Silver Queen Road	427-400-05	2655-2683 ft	46 acres
RE Columbia RE Columbia Two RE Columbia 3	Mojave	2998 Purdy Avenue	427-030-03	2683-2760 ft	400 acres
RE Great Lakes	Rosamond	10th Street W and Patterson Road	473-023-10	2304-2307 ft	40 acres
RE Barren Ridge 1	Mojave	State Route 14 at Phillips Road	461-15-10	2390-2675 ft	594 acres
RE Tehachapi	Tehachapi (Unincorporated)	Dale Road, between Pellisier Road and Bailey Road	448-052-10 448-052-11	3828-3865 ft	156 acres
RE Tehachapi 2	Tehachapi (Unincorporated)	Baumbach Avenue, between Pellisier Road and Bailey Road	448-051-30 - 31; -69-74	3820-3848 ft	160 acres

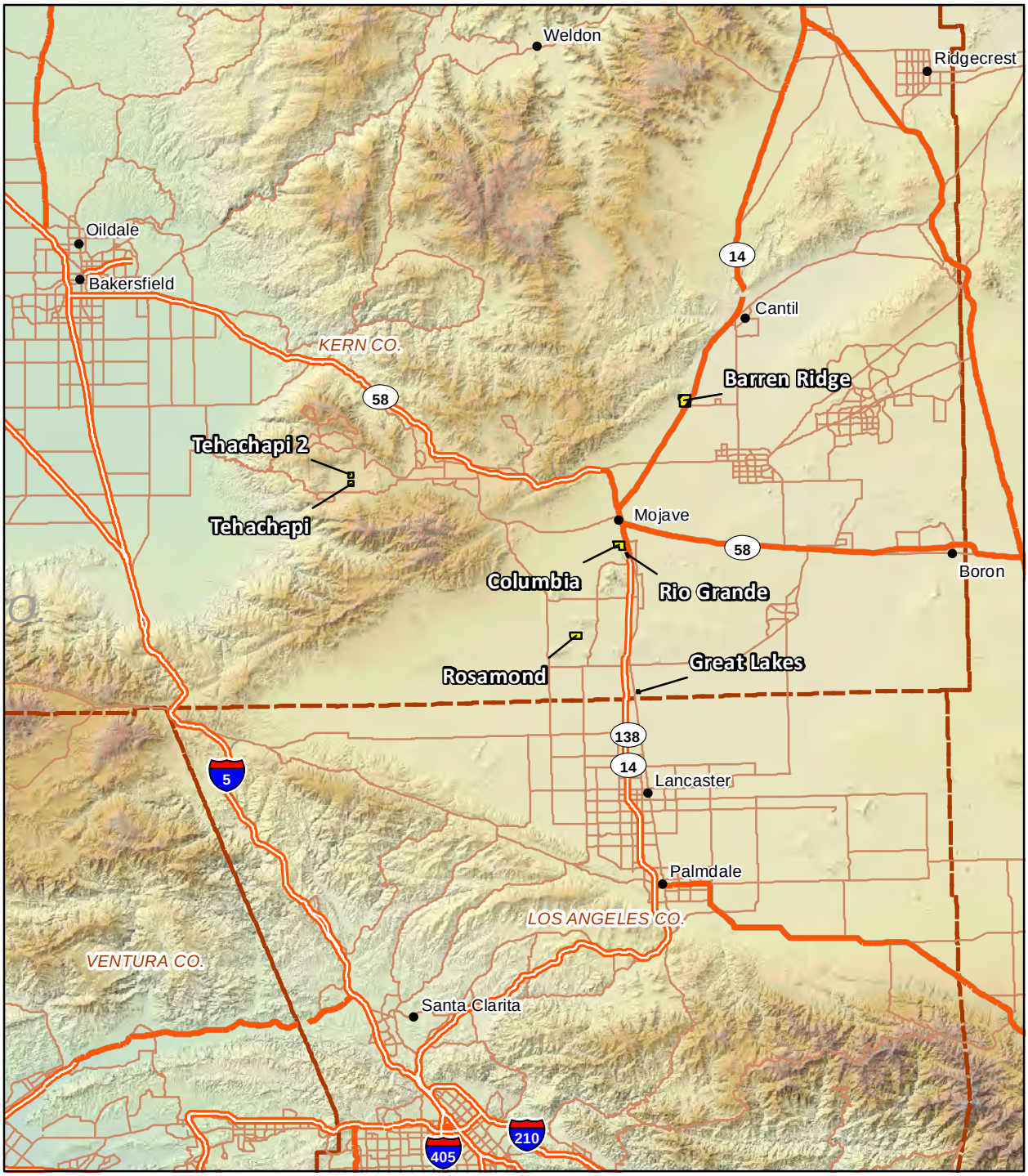
1.2 PROJECT DESCRIPTION

The proposed projects consist of the development of a photovoltaic (PV) solar electrical generation facilities. The facilities would include PV panels mounted on steel and aluminum structures, solar substations, equipment pads, and associated infrastructure such as access roads, fencing, and tie-ins to adjacent power lines.

1.3 REGULATORY OVERVIEW

For the purpose of this report, potential impacts to biological resources were analyzed based on the following statutes:

- California Environmental Quality Act (CEQA)
- Federal Endangered Species Act (ESA)
- California Endangered Species Act (CESA)
- Federal Clean Water Act (CWA)
- California Fish and Game Code (CFGC)
- Migratory Bird Treaty Act (MBTA)
- The Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- Kern County General Plan



Basemap Source: ESRI Data, 2004, and USGS/CDFG, 2002. Additional map data from Kern County Assessor's Office, Assessment Standards Division, Mapping Section, 2010.

Project Sites

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Miles

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Regional Location

Figure 1

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The sites in the vicinity of SR-14 within the Antelope Valley (Rosamond, Rio Grande, Columbia, Great Lakes) and Fremont Valley (Barren Ridge) are within the Western Mojave Recovery Unit of the West Mojave Plan Habitat Conservation Plan (HCP) and the Desert Renewable Energy Conservation Plan (DRECP), neither of which have been formally adopted. None of the sites occur within a Desert Tortoise Critical Habitat area or a Desert Wildlife Management Area (DWMA).

1.3.1 SIGNIFICANCE CRITERIA

The following threshold criteria from the Kern County CEQA Environmental Checklist Form were used to evaluate potential environmental effects. Based on these criteria, the proposed project would have a significant effect on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interrup-tion, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

SECTION 2 – METHODOLOGY

The biological resources at the project sites were analyzed through a review of relevant literature, field reconnaissance survey, focused biological surveys, and jurisdictional delineations/evaluations. The methods used are described below, and survey dates for each site are listed in Table 2. For the purpose of this report, sensitive biological resources include special-status plant and wildlife species, sensitive plant communities, jurisdictional drainages and wetlands, wildlife movement corridors, locally protected resources such as Joshua trees, and other regulated resources or areas, such as those subject to adopted Habitat Conservation Plans (HCPs).

2.1 LITERATURE REVIEW

Rincon reviewed literature for baseline information on biological resources potentially occurring at the project sites and in the surrounding areas. The literature review included information available in peer-reviewed journals, standard reference materials (e.g. e.g. Bowers, Bowers, & Kaufman 2004, Burt and Grossenheider 1980, Holland 1986, Hickman 1993, Sawyer, Keeler-Wolf, and Evens 2009, Stebbins 2003, American Ornithologists Union 2010, USACE 2008), and relevant databases on sensitive resource occurrences from the California Department of Fish and Game (CDFG) California Natural Diversity Data Base (CNDDB), Biogeographic Information and Observation System (BIOS – www.bios.dfg.ca.gov), and U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal (http://criticalhabitat.fws.gov). Other sources of information about the sites included aerial photographs, topographic maps, soil survey maps, geologic maps, climatic data, previous biological studies, and project plans.

2.2 FIELD RECONNAISSANCE SURVEY

Rincon biologists John Dreher and Duane Vander Pluym conducted field reconnaissance surveys of the project sites, with the exception of Tehachapi and Tehachapi 2, on March 19, 2010. The surveys were conducted after a review of aerial photographs and other resources, then driving and walking the project areas to document existing biological conditions (e.g. vegetative communities, potential presence of sensitive species and/or habitats, and presence of jurisdictional wetlands and waters of the U.S.). The purpose of the surveys was to identify potential sensitive biological resources and constraints, and determine which focused surveys would be required at each site.

2.3 FOCUSED SURVEYS

The literature review and field reconnaissance identified five sensitive biological resources that would require focused surveys: special-status plant species, desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*) and other special status raptors, and Mohave ground squirrel (*Xerospermophilus mohavensis*). Observations of other sensitive species potentially occurring on-site were made concurrent with the focused surveys. The methods employed in each of the focused surveys are described below, and specific survey dates for each site are included in Table 2.

Note that focused surveys for special status plants, desert tortoise, and Mohave ground squirrel were not conducted at the Tehachapi and Tehachapi 2 sites. Both sites are in agricultural production with no potential to harbor special-status plants. The Tehachapi Valley lies outside the range of desert tortoise and Mohave ground squirrel and no suitable habitat is present at either site. Focused surveys for

Table 2. 2010 Field Survey Dates for the Kern County Desert Solar Sites

Project Site	Field Recon	Special Status Plants	Desert Tortoise	Burrowing Owl	Swainson's Hawk / Raptors	Mojave Ground Squirrel	Jurisdictional Evaluation
Rosamond	3/18 - 3/19	4/7 - 4/8 5/12 - 5/13	4/27 - 4/30 5/8	4/27- 4/30 5/8	6/24 - 6/25	1st Term: (4/5 - 4/14)(4/20 - 4/24) 2nd Term: (5/16 - 5/25) 3rd Term: (6/24 - 6/28) (6/29 - 7/3)	7/7 7/26
Rio Grande	3/18 - 3/19	4/15 5/5	5/6 - 5/7	5/6 - 5/7	6/24	1st Term: (4/25 - 4/29) 2nd Term: (5/27 - 5/21) 3rd Term: (6/15 - 6/19)	7/16
Columbia	3/18 - 3/19	4/14 - 4/15 5/4 - 5/5	5/1 - 5/7	5/1 - 5/7	6/22 6/24	1st Term: (4/11 - 4/15) (4/20 - 4/29) 2nd Term: (5/9 - 5/13) (5/22 - 5/31) 3rd Term: (6/15 - 6/29)	7/16
Great Lakes	3/18 - 3/19	4/12 5/12	5/9	5/9	7/12	1st Term: (4/25 - 4/29) 2nd Term: (5/11 - 5/15) 3rd Term: (7/5 - 7/9)	7/16 7/22
Barren Ridge	3/18 - 3/19 10/19	N/A	9/29 - 10/3	9/29 - 10/3	N/A	N/A	10/19
Tehachapi	7/7	N/A	N/A	5/22	7/11	N/A	7/26
Tehachapi 2	9/30	N/A	N/A	9/30	N/A	N/A	N/A

burrowing owl at Barren Ridge and Tehachapi 2 were conducted outside the protocol survey window (February 1 - August 31) and thus consisted of a survey for potentially suitable burrows. Special status plant surveys were not conducted at Barren Ridge.

2.3.1 SPECIAL STATUS PLANT SPECIES

Prior to conducting field surveys, a search and review of the CNDDB was conducted for recorded occurrences of special status plant taxa (species, varieties, and subspecies) within a five-mile radius of the study area. A search range of this extent was used to encompass a sufficient distance to accommodate for regional habitat diversity and to overcome the limitations of the CNDDB. The CNDDB is based on recorded occurrences of special-status plant taxa and does not constitute an exhaustive inventory of botanical resources for any given area. A search was also conducted using the California Native Plant Society (CNPS) online *Inventory of Rare and Endangered Plants of California* (California Native Plant Society 2010) for the *Soledad Mountain* and *Willow Springs* USGS 7.5-minute quadrangles and the ten surrounding quadrangles at the Rosamond project site, and for the *Mohave* USGS 7.5-minute quadrangle and the eight surrounding quadrangles at the Rio Grande and Columbia sites. Additionally, the U.S. Fish and Wildlife Service (USFWS) website was queried for federally listed plants occurring in Kern County.

For the purpose of this report, special status plant taxa consist of plants: 1) listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the federal Endangered Species Act; 2) listed or proposed for listing as rare, threatened, or endangered by the CDFG under the California Endangered Species Act; and 3) recognized on lists 1, 2, 3 and 4 of the CNPS *Inventory of Rare and Endangered Plants of California* per the following CNPS code definitions:

- **List 1A:** Plants presumed extinct in California;
- **List 1B.1:** Rare or endangered in California and elsewhere; seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat);
- **List 1B.2:** Rare or endangered in California and elsewhere; fairly endangered in California (20-80% occurrences threatened);
- **List 1B.3:** Rare or endangered in California and elsewhere, not very endangered in California (<20% of occurrences threatened or no current threats known);
- **List 2:** Rare, threatened or endangered in California, but more common elsewhere;
- **List 3:** Plants needing more information (most are species that are taxonomically unresolved; some species on this list meet the definitions of rarity under CNPS and CESA);
- **List 4.2:** Plants of limited distribution (watch list), fairly endangered in California (20-80% occurrences threatened); and
- **List 4.3:** Plants of limited distribution (watch list), not very endangered in California.

A list of special-status plant taxa that could potentially occur on-site was developed from the CNDDB, CNPS, and USFWS search results (see Table 4). Listing status was cross-referenced with the CDFG *Special Vascular Plants, Bryophytes, and Lichens List* (April 2010) to verify rarity status for each special-status plant with potential to occur on-site. Habitat requirements and flowering periods for special-status plant

taxa were obtained from the California Native Plant Society (2010), The Jepson Desert Manual (Baldwin et al. 2002), and The Jepson Manual (Hickman 1993). Using this information, Rincon conducted an evaluation of the likelihood of occurrence on the site based upon species' local distribution and habitat requirements (e.g., vegetation community type, soil type, elevation above sea level). Special status plants with habitat requirements similar to the habitat types expected to occur on-site were included on a target list to be used during botanical surveys performed on the site. Furthermore, a field guide was prepared to assist in the identification of special-status plant taxa with potential to occur on-site. The field guide included photographs and/or illustrations of habitat, plant and/or diagnostic features, as well as descriptions of morphological and ecological attributes, as excerpted from The Jepson Manual (Hickman 1993) and CNPS online *Inventory of Rare and Endangered Plants of California* (California Native Plant Society 2010), for each plant taxon.

Focused surveys for the special-status plants indentified as having potential to occur on-site were conducted, which consisted of two seasonally timed botanical surveys to capture the flowering periods of potentially occurring species. The botanical surveys were conducted in general accordance with the guidelines set forth by the CDFG (2009) and CNPS (2001). To achieve sufficient visual coverage of the site, systematic surveys were employed through the incorporation of survey transects with 30 meters between each surveyor. Transects were generally walked in a north-south direction to avoid sun glare in the morning and late afternoon, and to ensure that good visibility and high detectability was achieved during the survey. In addition to focused surveys, a floristic inventory was conducted at each site, with all plant species observed identified to a sufficient level to determine rarity (e.g. genus, species, subspecies, or variety). Plant taxa were identified in the field through examination of morphological characteristics and referencing regional plant field guides and dichotomous keys. Unknown plant taxa were identified off-site using regional plant field guides, dichotomous keys and a dissecting microscope, with taxonomic nomenclature based on Baldwin et al. (2002), Hickman (1993) and updates from the Jepson Online Interchange (UCB, 2010). As specified in *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), a CNDDB Field Survey Form was completed for each special-status plant occurrence detected on-site. Vegetation communities were classified in accordance with the classification system presented in Sawyer et al. (2009) and cross-referenced to Holland (1986). Modifications to the vegetation community classifications were made by Rincon as appropriate based on the floristic composition and plant taxa distribution and abundance observed on-site.

2.3.2 DESERT TORTOISE

The survey for desert tortoise was conducted in accordance with the *Pre-project Survey Protocol for Potential Desert Tortoise Habitats, 2010* (USFWS, 2010). The survey was managed by Stephen Boland and Mercy Vaughn of Sundance Biology, Inc., with field work by Leslie Backus and Juan Miranda. The extent of potential desert tortoise habitat was determined for all sites during a field reconnaissance in April 2010. Subsequent survey dates are shown in Table 2. The survey was conducted by walking a set of transects spaced ~10 meters (30 feet) between transect centerlines (the standard width for desert tortoise presence/absence surveys) that covered the entirety of the survey area. Lowrance iFinder handheld global positioning system (GPS) units were used for transect navigation. Transects were established by calculating UTM coordinates for virtual north-south transects, as follows:

- Rosamond: 81 transects, each 1 mile in length
- Rio Grande: 35 transects, from 500 - 1,300 feet in length
- Columbia: 122 transects, from 0.5 - 1 mile in length

- Great Lakes: 41 transects, each 0.25 mile in length
- Barren Ridge: 191 transects, each 1.2 miles in length

In accordance with the desert tortoise pre-survey protocol (USFWS, 2010), Zone-of-Interest (ZOI) transects at three 200-meter (~650-foot) intervals from the project boundary were conducted in adjacent habitat at sites where the action area was less than 81 hectares (200 acres) (Rio Grande and Great Lakes). Weather conditions were generally calm and clear at the time of survey, with the only exception being winds 15-20 mph out of the southwest at the time of the Great Lakes project site survey. Daily high temperatures were generally less than 70ºF on all survey days, with the exception of Barren Ridge, in which temperatures ranged from 63 ºF to 95 ºF.

2.3.3 BURROWING OWL

Burrowing owl surveys were conducted in accordance with the *Staff Report on Burrowing Owl Mitigation* (CDFG, 1995). The survey was managed by Stephen Boland and Mercy Vaughn of Sundance Biology, Inc. The extent of potential burrowing owl habitat was determined for all sites during a field reconnaissance in April 2010. Subsequent field surveys were conducted in late April to early May, 2010 by Leslie Backus and Juan Miranda for the Rosamond, Rio Grande, Columbia and Great Lakes sites, and on May 22, 2010 by Ashley Spenceley for the Tehachapi site. Focused surveys for burrowing owl at Barren Ridge and Tehachapi 2 were conducted outside the protocol survey window (February 1 - August 31) and thus consisted of a survey for potentially suitable burrows. Exact survey dates are shown in Table 2.

The *Staff Report on Burrowing Owl Mitigation* (CDFG 1995) recommends transects be surveyed at ~30-meter (100-foot) intervals throughout a given site, with five transects spaced at ~30 meter (100-foot) intervals surveyed in adjacent areas. However, at the western Mojave sites transects were established at ~10-meter (30 foot) intervals to provide greater visual coverage. Burrowing owl surveys were conducted simultaneous with the desert tortoise surveys. In addition, fifteen transects spaced ~10 meters (30 feet) apart were established in the 150 meter (500-foot) buffer zone around the project site. Lowrance iFinder handheld global positioning system (GPS) units were used for transect navigation. Any burrows that could potentially be used by burrowing owls (e.g. coyote and kit fox burrows), if observed, were monitored for one hour before sunset until shortly after sunset on four consecutive days. In addition, any burrowing owl sign was recorded, which includes burrows with and without whitewash (i.e. droppings), feathers, and/or diagnostic pellets. No winter surveys were performed.

Field surveys at the Tehachapi site were adjusted based on existing conditions. As the site was under agricultural production (sod farming), the survey attention was focused on potential burrowing owl habitat that included a small strip of unplowed land in the NW corner of the property, and a 20 meter area of untilled earth and a pile of 5-inch diameter pipes in the NE corner of the property. No winter surveys were performed.

2.3.4 SWAINSON'S HAWK/RAPTORS

Swainson's hawk surveys were conducted using *Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (California Energy Commission and CDFG, 2010) as the guide. The survey was managed by Stephen Boland and Mercy Vaughn of Sundance Biology, Inc. Potential habitat for the

Swainson's hawk was evaluated during a field reconnaissance conducted in June 2010. Field surveys were conducted by field biologists Rachel Woodard (Rosamond, Rio Grande, and Columbia sites) and Ashley Spencely (Great Lakes and Tehachapi sites) in late June – early July, 2010 (Survey Period IV). Exact survey dates for each site are shown in Table 2. All potential nest trees on-site and within a 1-mile radius were surveyed for the presence of nests. A windshield survey was conducted along all roadways on site and within a 1-mile radius, with periodic stops and walks using binoculars and a spotting scope to survey the habitat.

In addition to the Swainson's hawk, a number of year-round resident raptor species are found in the project region, such as the golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), prairie falcon (*Falco mexicanus*), great-horned owl (*Bubo virginianus*). Surveys for these raptor species were conducted concurrent with the Swainson's hawk protocol surveys.

2.3.5 MOHAVE GROUND SQUIRREL

Presence/absence surveys for the Mohave ground squirrel were performed in compliance with CESA and CEQA, as the project area is within habitats currently or historically occupied by this species. If field surveys indicate that there is a likelihood of "take" of these species, consultation with the CDFG under Fish and Game Code Section 2050 and 2091 would be required.

Surveys were conducted by certified wildlife biologists William J. Vanherweg, with field work by Mike McGovern, Greg Wivert and Paul Vanherweg, from April – June 2010 (exact survey dates shown in Table 2). The surveys were conducted using methods recommended by CDFG (2003). This included a visual survey of all potential habitat at each project site to determine Mohave ground squirrel activity and habitat quality, conducted during daylight hours by a biologist who can readily identify both the Mohave ground squirrel and the white-tailed antelope squirrel (*Ammospermophilus leucurus*). Following the visual survey, a live-trap sampling grid was established. One sampling grid consisting of 100 Sherman live-traps was established for each 80 acres (or fraction thereof) of potential Mohave ground squirrel habitat at each site, as follows:

- Rosamond: 320 acres of habitat, 4 grids
- Rio Grande: 40 acres of habitat, 1 grid
- Columbia: 400 acres of habitat, 5 grids
- Great Lakes: 40 acres of habitat, 1 grid

The traps were arranged in a 10 x 10 grid, with 35-meter (~115-foot) spacing between traps. Each sampling grid was trapped for up to three terms consisting of five consecutive days each, or until a Mohave ground squirrel was captured on any sampling grid at the project site. All trapping was conducted during appropriate weather conditions, avoiding periods of high wind, precipitation, and low temperatures (<50°F or 10°C), within the following time periods: the *first term* from March 15 to April 30, 2010, the *second term* from May 1 to May 31, 2010, and the *third term*, if required, from June 15 to July 15, 2010. All trapping was conducted by qualified biologists to minimize heat stress. No surveys were conducted at the Barren Ridge, Tehachapi, or Tehachapi 2 sites.

2.3.6 OTHER SENSITIVE SPECIES

Observations on other sensitive species with the potential to occur on-site were conducted concurrent with the focused surveys. All sensitive species observed were recorded, location information was recorded with a GPS where possible, and the results are presented in the site-specific biological resources section.

2.4 JURISDICTIONAL WATERS EVALUATION/DELINEATION

Each project site was evaluated for the presence of potentially jurisdictional waters and delineations were conducted at sites where such features were determined present (note that the regulatory agencies make the final jurisdictional determination). Any observed drainage features, riparian habitat, wetland features, and wetland sample points were mapped on recent aerial photography. Width measurements for USACE and Regional Water Quality Control Board (RWQCB) jurisdiction were determined based on the lateral extent of the Ordinary High Water Mark (OHWM). CDFG jurisdictional limits were measured laterally from bank to bank at the top of the channel. Width measurements were taken at approximately 100-foot intervals or based on changes in drainage width, using a 100-foot tape. When appropriate, wetland sample points were taken at representative locations to determine the presence/absence of wetland indicators, such as hydrophytic vegetation, hydric soils, and wetland hydrology. Soil pits were dug at the sample points, and data collected with a Munsell® color chart, tactile evaluation of soil texture, and other visual observations of soil characteristics. When necessary, the soil was probed in the surrounding areas to ensure the test pit is representative of site conditions. Data from the sample points was entered on standardized Wetland Determination Data Forms. Waters and wetlands potentially subject to agency jurisdiction were evaluated in accordance with:

- USACE *Wetlands Delineation Manual* (1987)
- USACE *Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest* (2001)
- USACE *Jurisdictional Determination Form Instructional Guidebook* (2007)
- USACE *Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region* (2008)
- USACE *A Field Guide to the Identification of the Ordinary High Water mark (OHWM) in the Arid West Region of the Western United States* (2008)
- Section 1602(a) of the California Fish and Game Code
- Porter-Cologne Water Quality Control Act

SECTION 3 – REGIONAL BIOLOGICAL RESOURCES

This section describes the environmental setting, flora and fauna, sensitive biological resources, and wetland/riparian resources within the project region. Section 4 describes existing conditions, biological resources, potential jurisdictional areas, and environmental effects specific to each of the seven project sites.

3.1 ENVIRONMENTAL SETTING

Elevation within the project area ranges from 2304 – 3865 feet above mean sea level (msl), with environmental conditions varying along a gradient from the Mojave Desert in the eastern part of the project region, to the Tehachapi Mountains in the western part. The sites in the vicinity of SR-14 (Rosamond, Rio Grande, Columbia, Great Lakes and Barren Ridge) are located in the Antelope Valley, a broad gently sloping to undulating high basin with scattered remnants of low granitic uplands (e.g. the Rosamond Hills). This portion of the project area lies within the Mojave Desert biogeographic region. The Tehachapi Valley sites (Tehachapi and Tehachapi 2) are located in a montane valley within the Tehachapi Range, part of the geologically complex Transverse Ranges.

3.1.1 CLIMATE

Data from NOAA Western Regional Climate Centers' Mojave, Lancaster and Tehachapi stations (NOAA 2010, Table 3) indicates that climate varies within the projects region along an elevation gradient from the Tehachapi Valley in the west to the Antelope Valley in the east, and along a latitudinal gradient from south to north.

The Antelope Valley is broadly classified as a continental desert regime formed in the rain shadow of the Coast and Transverse Ranges, commonly known as 'high desert' due to the combination of an arid climate regime and a relatively high elevation (~2500 feet). Desert climates are characterized by an arid environment (low humidity/rainfall), strong fluctuations in daily temperatures, hot summers and cold winters, and generally clear skies. Wind is also a strong feature of this climatic regime, with dry winds in excess of 25 mph in the late winter and early spring. Regionally, average temperature ranges from 46.9 to 75.8 degrees Fahrenheit, with an average annual rainfall of 6.2 inches. Rainfall in the Mojave is characterized by a high degree of spatio-temporal variability, with isolated precipitation events, high inter-annual variability and decadal oscillations in rainfall rates, and rainfall gradients from south to north and west to east (e.g. decreased rainfall from Lancaster to Mojave, Table 3). Prolonged droughts are common, and exert a strong influence on vegetation (Twisselman 1995). The extreme heat and aridity of the Mojave exerts a strong influence on soils, vegetation types, and predominant land uses.

The climate of the Tehachapi Valley and surrounding slopes, in contrast, is strongly influenced by the montane environment of the Tehachapi Range, with warm dry summers and cold wet winters. Average temperatures range from 41.1 to 67.6 degrees Fahrenheit, with an average annual rainfall of 11.1 inches (with an additional annual snowfall rate of 23.3 inches).

Table 3. Comparison of Climate Data for the Antelope and Tehachapi Valleys, Kern County.

Station	Elevation	Average Maximum Temperature	Average Minimum Temperature	Average Annual Precipitation
Antelope Valley Mojave, CA – Coop ID 045756	2801 ft	75.8ºF	49.4ºF	5.9 in/yr
Antelope Valley Lancaster, CA – Coop ID 044749	2351 ft	75.5ºF	46.9ºF	7.8 in/yr
Tehachapi Valley Tehachapi, CA – Coop ID 048826	4220 ft	67.6ºF	41.1ºF	11.1 in/yr

Sources: NOAA Western Regional Climate Center historical climate information, http://www.wrcc.dri.edu/CLIMATEDATA.html
NRCS Web soil survey, http://websoilsurvey.nrcs.usda.gov/app/

3.1.2 WATERSHEDS

The Antelope Valley is an isolated basin that comprises approximately 1,580 square miles of alluvial valley in the western Mojave Desert, bounded by the Tehachapi Mountains to the northwest and the San Gabriel Mountains to the southwest. As evapotranspiration greatly exceeds precipitation in the Mojave, salt sinks and alkali playas are common in low-lying areas. In the lowest part of the basin are Rosamond Lake and Rodgers Lake, dry lake beds that receive intermittent water from terminal ephemeral drainages.

Four of the five Mojave sites are part of the Antelope Hydrologic Unit (CalWater Version 2.2, http://www.ca.nrcs.usda.gov/features/calwater/); the Rosamond and Great Lakes sites are part of Lancaster Hydrologic Area that drains to Armagosa Creek, and the Columbia and Rio Grande sites are part of the Chafee Hydrologic Area that drains to Cache Creek. Barren Ridge is within the Fremont Hydrologic Unit in the Koehn Hydrologic Area, and drains to Koehn Dry Lake. The Tehachapi Valley sites are part of the Grapevine Hydrologic Unit, and the Tejon Creek Hydrologic Area. The Tehachapi sites drain to Chanac Creek, which is a tributary to Tejon Creek.

3.1.3 SOILS

Topography within the Antelope Valley ranges from nearly level to gently undulating plains to steeply sloping areas associated with remnants of older landforms that occur as scattered buttes or low granitic uplands (e.g. Rosamond Hills). The soils formed predominantly on alluvial fans and terraces, with parent material derived from granitic rock common to the Rosamond Hills to the north, the Tehachapi Range to the west, and the San Gabriel Mountains to the south (USDA 1970). Dominant soils at the Mojave project sites are from the Hesperia – Rosamond – Cajon association, and the Pond – Tray – Oban association. The Hesperia – Rosamond – Cajon soils are moderately well drained to excessively well drained, deep soils that developed on recent alluvial fans; surface layers are mildly acidic light brownish-gray to pale brown loamy sands or silty clays over mildly alkaline and calcareous soils at depth. The Pond – Tray – Oban soils are nearly level moderately well drained soils in basins; surface soils are moderately saline-alkali yellowish-brown to light brownish gray calcareous fine sand, sandy loams, or

silty clay loams over gravelly coarse sandy loams. Other soils in the project region include soils associated with low granitic uplands which are shallow, moderately alkaline and calcareous, pale-brown to light yellowish-brown sandy loams over granitic bedrock, and Riverwash soils associated with ephemeral drainages and washes.

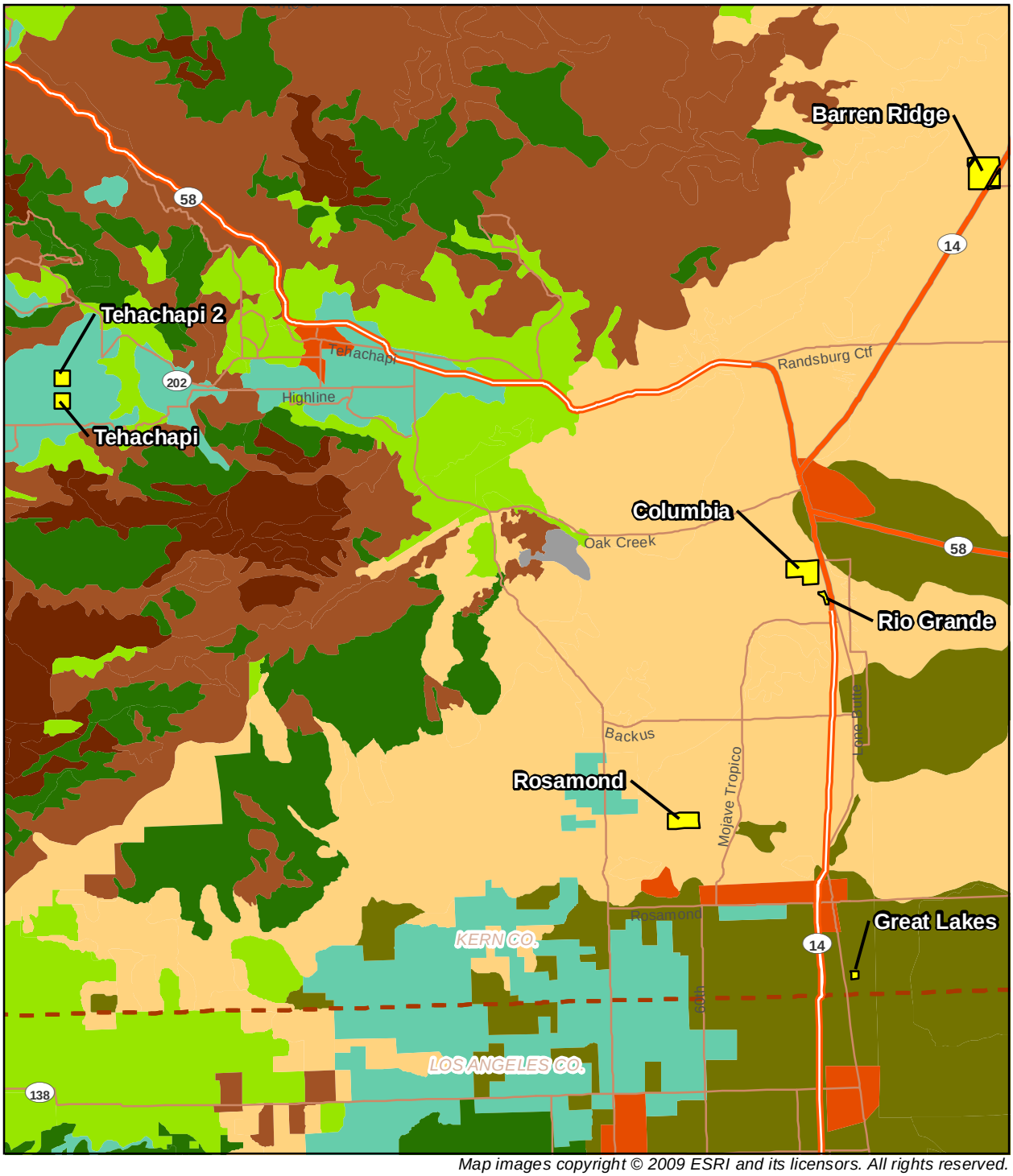
Desert soils have several unique properties that influence vegetative community development and restrict land use options. Under arid climatic conditions where evapotranspiration exceeds precipitation, excess salt accumulation (e.g. Na^-, Cl^-, Ca_2^-, Mg_2^- and HCO_3^-) can cause drastic changes in the physical and chemical properties of soils (Chhabra 2005), including a high *salinity* and *sodicity* (high electrical conductivity/sodium adsorption ratio) and *alkalinity* (high pH). Salt affected soils occupy as much as 7 percent of the world's land surface (Dudal and Purnell 1986), resulting in an environment unsuitable for growth of most crops (Qadir et al. 2000), limiting plant growth to *halophytic* (salt adapted) and *xerophytic* and *phraetophytic* (drought adapted) species, and reducing the organic content of soils. Saline-alkali soils can also lack redoximorphic features and other indicators of hydric soil conditions. Surface soil layers also commonly exhibit specialized properties such as desert pavement or biotic crusts. Biotic crusts are complex surficial biological communities comprised of lichens, bryophytes, cyanobacteria, soil fungi and other microbes that facilitate infiltration, nutrient retention, and seed germination/establishment (Bowker 2007). As a result of these factors, desert soils are often susceptible to disturbance that can disrupt ecosystem processes and reduce the capacity to recover following stress. Land use suitability of desert soils is often restricted to development or open space/wildlands management.

Soils in the Tehachapi area, in contrast, developed on granitic alluvium deposited on the alluvial fans and floodplains of the Tehachapi Valley. Topography is nearly level to gently sloping or undulating. The Stueber sandy loams are well drained coarse sandy loams, light brown to yellowish-brown and are not saline or alkali due to a moderate temperature regime and higher rainfall. Land use in the Tehachapi Valley is dominated by agricultural production and rural residential areas.

Hydric soils potentially present at the Kern Desert project sites (National list of Hydric Soils, Feb. 2010; http://soils.usda.gov/use/hydric/lists/state.html) include Riverwash soils (associated with drainageways), Arizo loamy fine sands, 0 to 2 percent slopes (associated with drainageways), Cajon loamy sand, 0 to 2 percent slope (associated with plays), and the Pond-Oban complex (associated with basin floors).

3.2 VEGETATION

Vegetation types in the Mojave Desert (Figure 2) are strongly influenced by climate and soils, with a predominance of plant morphological adaptations to extreme aridity (e.g. waxy or resinous leaf cuticles, drought deciduous or succulent plants, woolly leaf pubescence, deep tap root systems), saline-alkali soils (e.g. salt excretion, active transport systems), and vegetation structure characterized by short stature and widely spaced shrubs and arborescent shrubs due to competition for soil water resources (Twisselman 1995, Hickman 1993). Desert ecosystem function is also influenced by the integrity of the highly diverse biotic soil crusts that increase infiltration, soil water holding capacity, and nutrient retention, provide temperature regulation, and facilitate seed germination and establishment (Bowker 2007).



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Project Sites
Agriculture
Alkali Desert Scrub
Annual Grassland
Barren
Chaparral / Sage Scrub
Cismontane Woodland
Desert Scrub
Montane Woodland/Forest
Urban

0 2.5 5
Miles

N

Regional Vegetation Communities

Figure 2

Mojave Desert ecosystems have been subjected to a variety of human disturbances, including off-highway vehicle (OHV) use, mineral extraction (e.g. gold, borax), road building, agriculture, historical sheep grazing, and fire. Due to the marginal nature of desert environments, vegetative resources can be poorly resilient, often taking a long time to recover or following successional pathways towards an alternative stable state dominated by invasive species (Beisner et al. 2003, Chartier and Rostagno 2006). Therefore, portions of the Mojave are currently in a degraded state, with cleared lands, non-native species, and/or altered vegetative structure evident. For example, it was observed that a high proportion of associated species in desert saltbush scrub vegetation in the western portion of the Mojave are invasive exotics (Thomas et al. 2004).

Three vegetation types contribute to 75 percent of the land cover in the Mojave Desert region (Davis et al. 1998): Mojave creosote bush scrub (16,398 square miles), Mojave mixed woody scrub (Joshua tree woodland, 3,646 square miles), and desert saltbush scrub (1,510 square miles). Other vegetation types (Holland 1986) occurring or potentially occurring within the project area include desert and valley sink scrub, Mojave desert wash scrub, Mojave mixed steppe. Disturbed or non-native vegetation types within the Mojave include California annual grasslands, agricultural lands, and developed areas.

In contrast, vegetation in the Tehachapi Valley has been altered and degraded by a variety of human land use, road construction, and residential and commercial development. Vegetation types in this portion of the project area are dominated by agricultural lands, California annual grassland, ruderal, and developed areas. The surrounding areas contain a diverse assemblage of coniferous montane forest (e.g. oak woodlands, pinyon juniper woodlands), chaparral (e.g. chamise chaparral), grassland (e.g. California annual grassland, needlegrass grassland), and wetland and riparian vegetation types.

3.3 WILDLIFE

The desert scrub habitats in the project area support a wide variety of reptiles, birds, and mammals. Common reptiles include side-blotched lizard (*Uta stansburiana*), western whiptail (*Aspidoscelis tigris*), rattlesnake (*Crotalus* sp.), and gopher snake (*Pituophis melanoleucus*). Bird species include, but are not limited to red-tailed hawks (*Buteo jamaicensis*), burrowing owl (*Athene cunicularia*), western meadowlark (*Sturnella neglecta*), and loggerhead shrike (*Lanius ludoviciaus*). Mammals occupying desert scrub habitat types are black-tailed hare (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), kangaroo rats (*Dipodomys* spp.), deer mouse (*Peromyscus maniculatus*), desert kit fox (*Vulpes macrotus arsipus*), coyote (*Canis latrans*), and American badger (*Taxidea taxus*).

The Transverse Range is biologically significant due to its function as a linkage and wildlife corridor between the Sierra Nevada and the Coast Ranges, the specific climatic conditions created by its east-west orientation, and the convergence of the distinct biogeographic regions associated with the Mojave Desert, the Great Central Valley, the Sierra Nevada, and the Coast Ranges. The wildlife movement functions that the Transverse Ranges provide is particularly important for ungulates and for predators that require large home ranges (e.g. bobcat, mountain lions, bears).

3.4 SENSITIVE BIOLOGICAL RESOURCES

3.4.1 SPECIAL STATUS SPECIES

Special status plant and wildlife species potentially occurring in the project area (tracked within approximately 5 miles of each site) or known to occur at the project sites are listed in Table 4. The natural history and status on or in the vicinity of the sites for each of these species, based on the focused survey findings, is presented in Table 2 and discussed in the following sections.

Table 4. Special Status Species Potentially Occurring in the Project Region

Scientific Name	Common Name	Status [1] Fed/State/CNPS	Habitat Preference/ Requirements	Status on Project Sites / Factual Basis for Determination
PLANTS				
Androstephium breviflorum	Small-flowered androstephium	CNPS 2.2	Found in mid-elevation open desert scrub. Blooms March-April.	**Absent.** Marginally suitable habitat present at project sites. Species not observed during focused botanical surveys.
Astragalus hornii var. *hornii*	Horn's milk-vetch	CNPS 1B.1	Found in meadows and seeps, playas or lake margins. Prefers alkaline soils. Blooms May-October.	**Absent.** Marginally suitable habitat present at Great Lakes project site. Species not observed during focused botanical surveys.
Erodium macrophylla	Round-leaved filaree	CNPS 1B.1	Found in loamy soils open sites, grassland and scrub habitats below 1,200m. Blooms March-May.	**Absent.** No suitable habitat present at project sites. Species not observed during focused botanical surveys.
Calochortus striatus	Alkali mariposa lily	CNPS 1B.2	Inhabits alkaline meadows and ephemeral washes within chaparral, chenopod scrub, Mojavean desert scrub, and meadows. Blooms April-June.	**Present (Great Lakes).** Suitable habitat present at Great Lakes site. Species observed during focused botanical surveys.
Calystegia peirsonii	Peirson's morning-glory	CNPS 4.2	Found in grassland and open chaparral or scrub vegetation on rocky slopes. Blooms May-June.	**Absent.** No suitable habitat present at project sites. Species not observed during focused botanical surveys.
Canbya candida	White pygmy-poppy	CNPS 1B.2	Found in open sandy soils in the western Mojave and adjacent Sierra Nevada. Blooms April-May.	**Absent.** Suitable habitat present at project sites, and recorded occurrence within 5-mile radius of Columbia and Rio Grande. Species not observed during focused botanical surveys.
Chorizanthe parryi var. *parryi*	Parry's spineflower	CNPS 1B.1	Found in chaparral and coastal scrub in openings with sandy or rocky soil. Blooms April-June.	**Absent.** No suitable habitat present at project sites. Species not observed during focused botanical surveys.
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower	SE / CNPS 1B.1	Found in chaparral and coastal scrub in openings with sandy or rocky soil. Blooms April-June.	**Absent.** No suitable habitat present at project sites. Species not observed during focused botanical surveys.

Table 4. Special Status Species Potentially Occurring in the Project Region

Scientific Name	Common Name	Status [1] Fed/State/CNPS	Habitat Preference/ Requirements	Status on Project Sites / Factual Basis for Determination
Chorizanthe spinosa	Mojave spineflower	CNPS 4.2	Found in desert and creosote bush scrub, Joshua tree woodland in the western Mojave Desert. Blooms April – July.	**Present (Great Lakes).** Suitable habitat present at Great Lakes project site. Species observed during focused botanical surveys.
Eschscholzia minutiflora ssp. *twisselmannii*	Red Rock poppy	CNPS 1B.2	Found in creosote bush scrub in the Mojave Desert, specifically on volcanic tuff soils.	**Absent.** No suitable habitat present at project sites (lack of suitable soils). Recorded occurrence within 5-mile radius of Barren Ridge. Species not observed during focused botanical surveys at other sites.
Goodmania luteola	Golden goodmania	CNPS 4.2	Meadows and playas in creosote bush scrub, valley grassland, alkali sinks, and wetland-riparian areas. Blooms April-August.	**Present (Great Lakes).** Suitable habitat present at Great Lakes site. Species observed during focused botanical surveys.
Layia heterotricha	Pale yellow layia	CNPS 1B.1	Alkaline or clay soils in grasslands, coastal scrub, cismontane woodland, pinyon-juniper woodland. Blooms March-June.	**Absent.** No suitable habitat present at project sites. Species not observed during focused botanical surveys.
Loeflingia squarrosa var. *artemisiarum*	Sagebrush loeflingia	CNPS 2.2	Found in desert dunes, Great Basin scrub and sandy Sonoran desert scrub. Blooms April-May.	**Absent.** Suitable habitat present at project sites. Species not observed during focused botanical surveys.
Mimulus pictus	Calico monkeyflower	CNPS 1B.2	Found in foothill woodlands, often on granitic soils. Blooms March – May.	**Absent.** No suitable habitat present at project sites. Recorded occurrence within 5-mile radius of Tehachapi. Species not observed during focused botanical surveys.
Phacelia nashiana	Charlotte's phacelia	CNPS 1B.2	Found in creosote bush scrub, Joshua tree woodland, pinyon-juniper woodland. Blooms March – June.	**Absent.** Suitable habitat present at project sites. Recorded occurrence within 5-mile radius of Barren Ridge. Species not observed during focused botanical surveys.
Phacelia parishii	Parish's phacelia	CNPS 1B.1	Clay or alkaline soils, dry lake margins in the western Mojave. Blooms April-July.	**Absent.** Suitable habitat present at Great Lakes. Species not observed during focused botanical surveys.
Plagiobothrys parishii	Parish's popcorn-flower	CNPS 1B.1	Wet, alkaline soils around desert springs in the Mojave and eastern Sierra Nevada. Blooms April-June.	**Absent.** Suitable habitat present at Great Lakes. Species not observed during focused botanical surveys.
Puccinellia parishii	Parish's alkali grass	CNPS 1B.1	Inhabits higher elevation mineral springs in the Mojave Desert. Blooms April-May.	**Absent.** No suitable habitats present at project sites. Species not observed during focused botanical surveys.

Table 4. Special Status Species Potentially Occurring in the Project Region

Scientific Name	Common Name	Status [1] Fed/State/CNPS	Habitat Preference/ Requirements	Status on Project Sites / Factual Basis for Determination
Saltugilia latimeri	Latimer's woodland-gilia	CNPS 1B.2	Chaparral, Mojavean desert scrub, pinyon and juniper woodland, rocky or sandy, often granitic, sometimes washes. Blooms March-June.	**Absent.** Suitable habitat present at project sites. Species not observed during focused botanical surveys.
Sidalcea neomexicana	Salt spring checkerbloom	CNPS 1B.2	Inhabits alkaline springs and marshes in the South Coast, San Gabriel Mountains, San Bernardino Mountains, Peninsular Ranges, southwest Mojave Desert. Blooms April-June.	**Absent.** No suitable habitats present at project sites. Species not observed during focused botanical surveys.
Viola aurea	Golden violet	CNPS 2.2	Found in sagebrush scrub and pinyon-juniper woodland, sandy soils. Blooms April-June.	**Absent.** Marginally suitable habitat present at project sites. Recorded occurrence within 5-mile radius of Columbia and Rio Grande. Species not observed during focused botanical surveys.
REPTILES				
Gopherus agassizii	Desert tortoise	FT / ST	Prefers creosote bush habitat with annual wildflower blooms. Inhabits friable soil for burrow and nest construction, occurs in most desert habitats.	**Present (Barren Ridge).** Three individuals observed on Barren Ridge project site during fall focused surveys and field reconnaissance. Species not observed/detected on any of the other project sites. Recorded occurrences 6.5 miles north and 4 miles east of Rosamond, and 4.5 miles east of Rio Grande and Columbia.
BIRDS				
Athene cunicularia	Burrowing owl	SSC	Inhabits open, dry, annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	**Potentially Present (Columbia & Barren Ridge).** Although marginal to suitable habitat is present at the project sites, observations of burrowing owl sign was limited to 6 burrows with burrowing owl sign (pellets, scat, seed pods) at Columbia, an incidental pellet observed in the buffer area of Rio Grande, and potential burrows at Barren Ridge. No burrowing owls were observed at the other sites during focused surveys.
Aquila chrysaetos	Golden eagle	FP	Nests in canyons on cliffs and large trees in open habitats. Forages chiefly for mammalian prey in grasslands and over open areas.	**Present (Tehachapi).** Observed flying over the Tehachapi sites. No nests observed and no suitable nesting habitat present on any of the sites, but species may occasionally use the sites for foraging.

Table 4. Special Status Species Potentially Occurring in the Project Region

Scientific Name	Common Name	Status [1] Fed/State/CNPS	Habitat Preference/ Requirements	Status on Project Sites / Factual Basis for Determination
Buteo swainsoni	Swainson's hawk	ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural areas or ranches; requires adjacent suitable foraging areas such as grasslands, alfalfa or grain fields supporting rodent populations.	**Absent.** Marginally suitable foraging habitat occurs at the project sites, and potential nesting habitat occurs at or adjacent to the sites. No Swainson's hawks were observed at the project sites during the focused surveys.
Lanius ludovicianus	Loggerhead shrike	SSC	Occurs in open habitats utilizing shrubs, trees, posts, fences, and low utility lines for perches. Specifically prefers open foothill and valley woodlands with some canopy cover and adequate roosting and foraging perches. Forages in edge habitats, and in particular prefers shrubs adjacent to grasslands.	**Present (Rio Grande).** Suitable foraging and nesting habitat exists at the project sites. Three adult individuals observed at Rio Grande.
Toxostoma lecontei	Le Conte's thrasher	SSC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	**Present (Columbia).** Suitable foraging and nesting habitat exists at the project sites. Two adults (calling pair) observed at Columbia.
MAMMALS				
Xerospermophilus mohavensis	Mohave ground squirrel	ST	Inhabits open desert scrub, alkali scrub, and Joshua tree woodland; feeds in annual grasslands; restricted to Mojave desert. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover. Nests are in burrows.	**Absent.** No Mohave ground squirrels trapped at any of the project sites. No sign (scat) seen near burrows or within any of the sites. Potentially suitable habitat observed at all Mojave Desert sites. Note: focused surveys not conducted at Barren Ridge.
Taxidea taxus	American badger	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Needs sufficient food and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**Present (Rosamond, Columbia, & Barren Ridge)**. Suitable burrows and scrapes found on Rosamond, Columbia, and Barren Ridge. No badgers or sign observed at any of the other sites.

[1] FT = Federally threatened; FE = Federally endangered; • SE = State endangered; ST = State threatened; SR = State rare; FP = CA Fully Protected; SSC = CA Species of Special Concern; SA = CDFG Special Animal; • California Native Plant Society (CNPS): 1B = Rare or endangered in California and elsewhere; 2 = Rare or endangered in California, more common elsewhere; 3 = Plants for which more information is needed (Review list); 4 = Plants with limited distribution (Watch list); .1 = Seriously endangered in California; .2 = Fairly endangered in California; .3 = Not very endangered in California

Special Status Plant Species

Following a literature review (described in Section 2.1), the list of special status plant species occurring in the western Mojave and the Tehachapi Valley was evaluated for potential to occur at the project sites. Species known to occur within the project region but limited to specific biotypes or soil types not present at the project site (e.g. dunes, mineral springs), and species common to ubiquitous habitats of the Tehachapi Range that are not present at the Tehachapi sites due to agricultural land use were excluded from the list, unless an occurrence record was found within a 5-mile radius. The final list of special-status plants potentially occurring at the project sites included a total of 21 species. All the plant species listed in Table 4 are from CNPS List 1B, List 2 or List 4; only one species (San Fernando Valley spineflower, *Chorizanthe parryi* var. *fernandina*) is also listed as endangered by CDFG and as a candidate for listing by USFWS.

Desert Tortoise

The desert tortoise is a long-lived species found on flats, alluvial fans, bajadas and rocky terrain. This species has characteristics that enable it to survive in arid environments, including elephantine limbs with well-developed claws that allow them to create burrows over 3 meters long. Individuals emerge to forage in the morning or late afternoon from March – October, and hibernate from November to March. Human impacts and habitat loss have contributed to the decline of historical populations throughout much of its range. The desert tortoise is federally and state-listed as threatened, and potential impacts to the species requires incidental take permits from both the USFWS and CDFG. The Mojave population of the desert tortoise was listed by the USFWS as threatened on April 2, 1990. Consequently, proposed actions within the range of the desert tortoise fall under purview of the federal Endangered Species Act (ESA), 16 U.S.C. § 1531, et seq. ESA § 7, in addition to State (CESA) regulations.

Burrowing Owl

The burrowing owl is a small long-legged owl found in dry, open areas with low vegetation in North and South America. Habitats include grasslands, rangelands or agricultural areas. Burrowing owls rely on existing burrows of other animals, such as coyotes or kit foxes, which they modify for their own use. The burrowing owl is a California Species of Special Concern (SSC) and is protected by CFGC Section 3503 et. seq. and the federal MBTA. Mitigation measures for potential project impacts to the species typically follow the guidelines developed by the California Burrowing Owl Consortium (1993) and CDFG (1995). Mitigation requirements under CEQA are established at the discretion of the lead agency and not CDFG or the consortium. Mitigation is typically comprised of at least 2 steps: 1) construction buffers for active burrows during the breeding season, and 2) passive relocation of owls during the non-breeding season. Compensatory mitigation for occupied habitat is typically recommended by CDFG, but the amount has varied. When compensatory mitigation lands are required for other species (e.g., Mohave ground squirrel, desert tortoise), no additional land is typically required for burrowing owl. No mitigation is required for unoccupied or unsuitable habitat.

Swainson's Hawk/Golden Eagle/Raptors

In addition to the burrowing owl, the Mojave Desert region provides habitat for a number of year-round resident raptor species, such as the golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), prairie falcon (*Falco mexicanus*), great-horned owl (*Bubo virginianus*), rare breeding populations for Swainson's hawk (*Buteo swainsonii*), and wintering species such as the ferruginous hawk (*Buteo regalis*). Raptors are generally protected by CFGC Section 3503 et. seq. and the federal MBTA. Specific legal protections are afforded to the golden eagle pursuant to The Bald and Golden Eagle Protection Act and

CFGC 3511, to Swainson's hawk pursuant to CESA, and to the white-tailed kite under CFGC 3511. Mitigation measures for potential project impacts typically include nesting surveys and avoidance of active nests and surrounding buffers. Compensatory mitigation is usually not required for permanent impacts to raptor foraging habitat in general, but may be required for the permanent loss of a breeding territory for species such as the golden eagle and Swainson's hawk.

Mohave Ground Squirrel

Mohave ground squirrels (*Xerospermophilus mohavensis*) are approximately 8.5 - 9 inches in length and can be found in desert scrub habitats. Activity periods for this species vary and little is known about their reproduction (Ingles 1979). Their diet consists of seeds, vegetative parts of desert plants including fruits of the Joshua tree. Due to the aridity and high temperatures of its environment they are a diurnal species spending up to seven months underground. The Mohave ground squirrel is state-listed as threatened and potential impacts to the species, including activities that jeopardize the continued existence of Mohave ground squirrel and activities that impact occupied habitat for Mohave ground squirrel, would require an Incidental Take Permit (ITP) under Section 2081(b) of Fish and Game Code would be required for compliance with CESA.

Other Sensitive Species

Other sensitive avian and mammal species present or potentially occurring at the project sites include the loggerhead shrike (*Lanius ludovicianus*) listed as an SSC by CDFG and a bird of conservation concern by the USFWS, Le Conte's thrasher (*Toxostoma lecontei*) listed as an SSC by CDFG and a bird species of conservation concern by the USFWS, and the American badger (*Taxidea taxus*) listed as an SSC by CDFG. The avian SSCs are specifically considered sensitive when nesting. The project sites also contain suitable nesting habitat for a variety of native avian species common to the desert, including black-throated sparrow, horned lark (*Eremophila alpestris*), northern mockingbird (*Mimus polyglottos*), and cactus wren (*Campylorhynchus brunneicapillus*). Native bird nests are protected by CFGC 3503 and the MBTA.

3.4.2 SENSITIVE PLANT COMMUNITIES

Of the plant communities occurring within Kern County (excluding the San Joaquin Valley) and potentially occurring within the project region, eight are designated as sensitive by CDFG. These include alkali seep, stabilized interior dunes, valley needlegrass grassland, valley sacaton grassland, valley saltbush scrub, valley sink scrub, valley oak woodland, and wildflower fields. The Kern County Desert project sites are not within a Desert Tortoise Critical Habitat area or a Desert Wildlife Management Area (DWMA), carbonate endemic plants critical habitat, California towhee critical habitat, or California condor critical habitat.

A habitat of local concern is Joshua tree woodland, which CDFG considers globally 'uncommon, but not rare' and a 'high priority for inventory' (CDFG 2003); this habitat is also specifically designated in many local plans, ordinances, and policies as a biological resource of concern. Mitigation is typically comprised of either: 1) avoidance, 2) moving (transplanting) Joshua trees, and/ or 3) revegetation using nursery-grown stock. Joshua trees (*Yucca brevifolia*) are irregularly branched to 30' tall, from the Agave family (Agavaceae). Joshua trees grow on dry stony mesas, flats and slopes from 2,000 – 6,000 feet in the Mojave Desert, in association with desert scrub vegetation. While a formal Joshua tree inventory was not conducted for this analysis, per CDFGs *California Wildlife Habitat Relationships System* classification rules, a plant community with greater than 10% aerial vegetation coverage by Joshua trees would be considered a Joshua tree woodland.

3.4.3 JURISDICTIONAL WATERS

Within the arid and semi-arid western United States limited precipitation restricts wetland and riparian resources to 1-5% of the land surface, a relatively low proportion compared to other systems globally; the proportion of wetland resources is even lower (<1%) in extremely arid areas such as the Mojave Desert and the Great Basin (USACE 2008). The Regional Supplement to the Corps *Wetland Delineation Manual: Arid West Region* (USACE 2008) describes considerations and methodologies for delineating wetlands in arid regions in general, and for 'problem' hydric soils in particular. Challenges to delineating wetlands in arid regions include 1) the fact that many hydrophytic species are halophytes or phraetophytes that can also survive in saline-alkali soils or in areas where groundwater resources are present but below typical wetland delineation depths, 2) the prevalent use of surface soil cracks, salt crusts and ponding-remnant biotic crusts as indicators of wetland hydrology, and 3) the fact that many arid soils do not exhibit clear indicators of redoximorphic conditions and organic accumulation resulting from repeated saturation and/or inundation ('problem' soils). Examples of 'problem soils' include moderately to very strongly alkaline soils that do not readily develop iron or manganese reduction indicators, areas of active deposition (young soils) such as vegetated sandbars within floodplains, and seasonally ponded soils with a limited saturation depth above a restrictive soil layer.

Portions of the project area within the Antelope Valley are located in isolated basins associated with the dry lakebeds of Rosamond Lake and Rogers Lake that receive intermittent water from terminal ephemeral drainages. Therefore, many wetland and riparian resources may not be considered USACE Jurisdictional Wetlands or Waters of the U.S. as they are hydrologically isolated from Traditional Navigable Waters, but may be subject to RWQCB and CDFG jurisdiction. Wetland and riparian resources potentially considered jurisdictional within the project area include ephemeral drainages and washes, desert playas, alkali sinks and vernal depressions, springs and seeps that support small marshes, oasis, or other wetland types, and emergent marshes associated with remnants of large lakes.

3.4.4 WILDLIFE MOVEMENT

The project region contains large expanses of open habitat. The western Mojave sites are surrounded by open space areas where local wildlife movement likely occurs within the sites. However, given the extent of open space in the surrounding area, the sites do not appear to concentrate wildlife movement through a narrow corridor that links large areas of undeveloped open space on a local or regional basis. The Mojave Desert sites do not lie within a wildlife connectivity area as indentified by the *California Essential Habitat Connectivity Project* (Spencer et al., 2010).

The Tehachapi project sites, in contrast, are under active management and situated within converted agricultural lands of relatively low function as habitat or wildlife movement areas; significant wildlife movement does not likely occur at these sites. The *California Essential Habitat Connectivity Project* identifies connectivity areas in the vicinity of these sites; however, these areas correspond with natural, relatively undeveloped habitat to the east and west of the sites. Therefore, the Tehachapi projects are not likely to adversely affect wildlife movement. No further site-specific evaluation of the effect of the proposed projects on wildlife movement is included within this analysis.

3.4.5 LOCALLY PROTECTED RESOURCES

Biological resources, such as Joshua trees, are often afforded protection by local ordinances, such as development codes or general plans. The Kern County General Plan does not have specific Joshua tree

protections. However, Joshua trees are sensitive resources as designated by the County's Willow Springs and Mojave Specific Plans that contain the Rosamond and Columbia project sites, respectively.

In addition to CDFG classification of valley oak woodlands as a sensitive habitat, the Kern County General Plan (Code 1.10.10) protects oak woodlands as well as large oaks. A development parcel with greater than 10% aerial vegetation coverage by oak trees would be considered a woodland. Potential environmental effects associated with oak woodlands or individual oak trees is limited to the Tehachapi Valley; however, no large oaks were observed at the Tehachapi sites during the reconnaissance surveys. Therefore, no further site specific evaluations of the effects of the proposed projects on large oaks are necessary or included within this analysis.

3.4.6 HABITAT CONSERVATION PLANS

The Antelope Valley project sites are located within the boundaries of the draft West Mohave Plan portion of the Western Mojave Recovery Unit (WMRU). However, the HCP for this portion of the CDCA has not been adopted. The Desert Renewable Energy Conservation Plan (DRECP), a joint collaboration between the California Energy Commission, the Bureau of Land Management, the USFWS, and the CDFG, is currently being developed but it is still approximately 2 to 3 years from formal adoption. The sites are not located within any other local, regional, or state conservation planning areas; therefore, no additional, site-specific discussion of HCPs is included within this analysis.

4.5 BARREN RIDGE

Issues of Concern:

- The site is potential habitat for the desert tortoise, burrowing owl, and Mojave ground squirrel. Desert tortoises were observed on-site. Burrowing owl sign was observed on-site.
- One other special status species, American badger, was observed on-site.
- Three drainages potentially subject to CDFG and RWQCB jurisdiction exist on-site.

4.5.1 PROJECT LOCATION

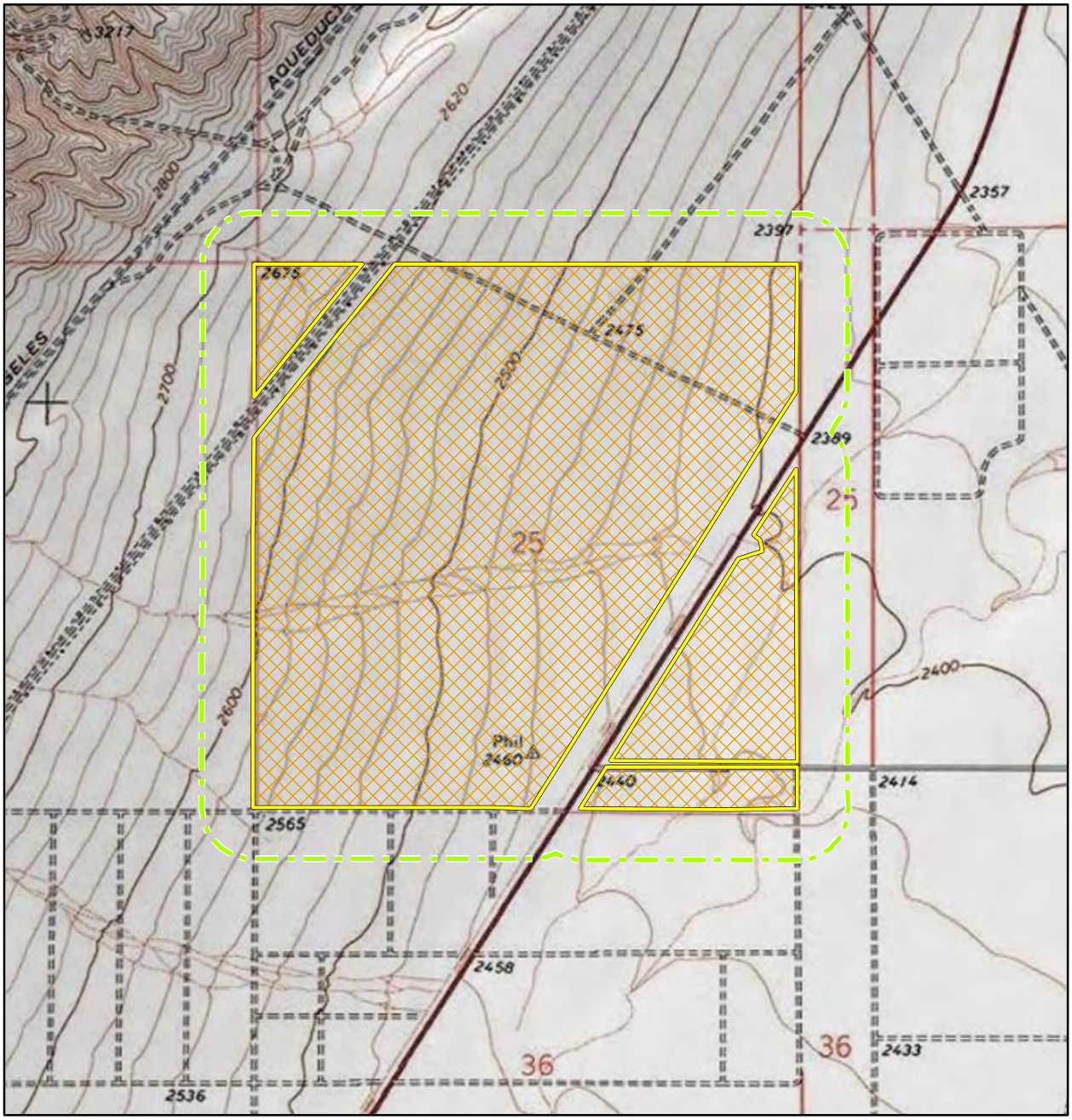
The Barren Ridge project site consists of an approximate 594-acre rectangular shaped property located in an unincorporated area of Kern County. The site occurs approximately 6.5 miles northwest of the community of California City, approximately 12 miles northeast of the community of Mojave, and approximately 0.8 mile south of the Los Angeles Aqueduct. It is bisected by SR-14, a transmission corridor easement extends through the northwest corner of the site, and Phillips Road extends through the southeast portion of the site. The site is bounded on all sides by undeveloped natural habitat. The Barren Ridge project site is located in the Mojave NE USGS 7.5-minute quadrangle (Figure 7a).

4.5.2 PHYSICAL SETTING

The Barren Ridge project site is located in the Fremont Valley portion of the western Mojave Desert, characterized by low precipitation and atmospheric humidity, high summer temperatures, and relatively cool winter temperatures. Elevation at the project site ranges from 2420 – 2670 feet. Topography is generally moderately sloping (2 - 15% slopes) and undulating, with water flowing generally northwest to southeast across the site.

Vegetation in the project area is dominated by creosote bush – white burr sage scrub, with disturbed and ruderal areas as associated vegetation types along the highway, transmission corridor and dirt roads. Though human use of the site is evident throughout, the project site has been comparatively minimally disturbed by human activity. A few rural access roads exist on-site, a flood control channel has been constructed along the west side of SR-14 to capture storm-water flows, and scattered trash dump sites are present in relatively close proximity to SR-14. Evidence of grazing and recreational shooting (skeets and shotgun shells) are also present.

Land uses in the regional vicinity of the Barren Ridge site include rural residential areas, recreational OHV areas, ecological reserves, grazing, and commercial and industrial areas.



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Project Site

Desert Tortoise, Burrowing Owl, (100% Visual Coverage)

Burrowing Owl Survey Buffer Zone (500 Feet)

N

0 700 1,400
Feet

Barren Ridge Survey Area

Figure 7a

4.5.3 BARREN RIDGE VEGETATION

In accordance with the vegetation classification system presented in Sawyer et al. (2009), one vegetation community is present at the proposed project site: creosote bush-white burr sage scrub (Figure 7b).

Creosote Bush-White Burr Sage Scrub

This floristic association corresponds to Mojave creosote bush scrub (Holland 1986). Creosote bush-white burr sage occurs throughout the site, and is dominated by creosote bush and white burr sage. Associated shrubs and subshrubs include allscale saltbush, Nevada ephedra, scalebroom (*Lepidospartum squamatum*), Cooper's goldenbush, rubber rabbitbrush, California buckwheat, cheesebush, winterfat, and Anderson's desert thorn. Cacti present include Wiggins' cholla (*Cylindropuntia echinocarpa*). Common herbaceous plants include fiddleneck (*Amsinckia* sp.), filaree (*Erodium* sp.), chia (*Saliva columbariae*), and angled stem buckwheat. Grass species present in this community consist of red brome, cheat grass, ripgut (*B. diandrus*), and rattail fescue.

4.5.4 BARREN RIDGE SPECIAL STATUS SPECIES

This section presents the results of the 2010 focused biological surveys at the Barren Ridge project site. Survey areas are shown in Figure 7a. Survey results are summarized in Table 10, and locations of all sensitive species are shown in Figure 7b.

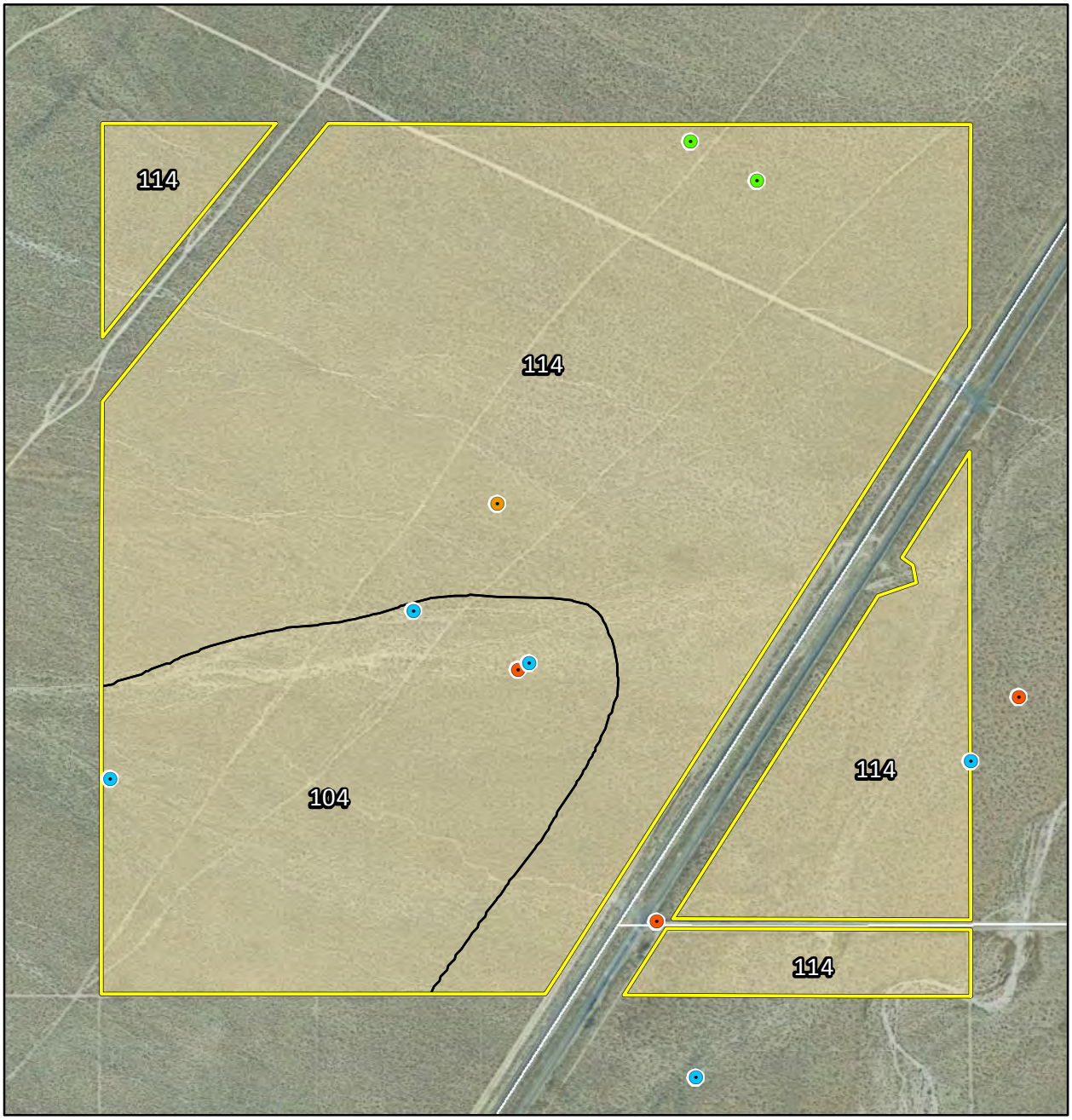
Special Status Plant Species

The project site provides suitable habitat for a number of special status plant species. No special status plants were observed on the project site during the field reconnaissance surveys; however, the site visits were conducted during a time of year when many species are unrecognizable. As discussed in Section 5, spring botanical surveys are recommended to definitively determine the presence/absence of special status species on-site.

Desert Tortoise

The project site provides suitable habitat for the desert tortoise. Three desert tortoise observations were made on-site. One adult female and one juvenile were observed during protocol surveys conducted by Sundance Biology, Inc. between September 29 and October 3, 2010. The juvenile detection occurred west of SR-14 and the adult female detection was east of SR-14, within the ZOI off-site. The second sighting was of an 8 - 10 year old male at the intersection of SR-14 and Phillips Road on October 14, 2010 by Rincon biologists. In addition to these sightings, suitable burrows (some with scat or tracks) were detected on-site and at off-site buffers surveyed for burrowing owls. Tortoise-shell skeletal remains were also observed off-site.

Because some desert tortoises may be missed during focused surveys, the desert tortoise survey protocol (USFWS 2010) provides an equation to estimate the number of tortoises within the project's action area based on several factors. Three desert tortoises were observed during the focused surveys; however, only 2 of the tortoises had a midline carapace length (MCL) greater than 160 mm, the minimum length necessary to be included in the estimation. Calculating the equation based on the observation of these 2 tortoises provides an estimated number of approximately 4 tortoises within the action area (based on rainfall greater than 1.5 inches and assuming the action area is roughly the same



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Project Site

Creosote Bush-White Burr Sage Scrub

104 Arizo gravelly loamy sand, 2 to 9 percent slopes

114 Cajon loamy sand, 0 to 5 percent slopes

Active American Badger Burrow

Inactive Burrowing Owl Burrow

Desert Tortoise

Desert Tortoise Burrow

N

0 500 1,000
Feet

Barren Ridge Biological Resources **Figure 7b**

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size as the project site). The site is approximately 2.41 square kilometers, thus the density of desert tortoises onsite is less than 2 tortoises per square kilometer. Population monitoring within desert tortoise critical habitat indicates that tortoise densities range from a low of 1.2 tortoises to a high of 8.2 tortoises per square kilometer (USFWS 2009). Therefore, the density of desert tortoises on the Barren Ridge project site is relatively low in contrast to range-wide densities.

Burrowing Owl

The project site provides suitable habitat for the burrowing owl. The site is adjacent to natural areas that provide foraging habitat, and burrows suitable for occupation by burrowing owls were observed on-site. Three burrows observed on-site had burrowing owl sign (white wash and pellets). However, no burrowing owls were detected at the project site or the buffer zone during focused surveys.

Golden Eagle/Raptors

The Barren Ridge site provides potential foraging habitat for raptors, and common raptors, such as the red-tailed hawk, could nest in the transmission towers adjacent to the site. No special status raptors, such as the golden eagle, were observed on the project site or within survey buffers during the field surveys. Furthermore, no golden eagle nests are tracked in the vicinity of the project site (within 5 miles, CNDDB 2010).

Mohave Ground Squirrel

The project site provides suitable habitat for the Mohave ground squirrel. The site is not located near known core areas (Leitner 2009) and suitable burrows were not commonly encountered during the field surveys. However, based on the presence of suitable habitat and project location within the known range of Mohave ground squirrel, there is potential for this species to occur.

Other Sensitive Species

The project site provides suitable habitat for American badger, and one badger was observed in a burrow west of SR-14. The site also contains suitable nesting habitat for native birds protected by the MBTA and CFG Code 3503.

Table 10. Summary of Barren Ridge Focused Survey Results

Observation	Date	Location (NAD 83, Zone 11)		Comments
1. Desert Tortoise	9/29/2010 -10/3/2010	E 402704	N 3896055	Juvenile (inside burrow)
2. Desert Tortoise	9/29/2010 -10/3/2010	E 403636	N 3895996	Adult female; detected in ZOI off-site
3. Desert Tortoise burrow	9/29/2010 -10/3/2010	E 403545	N 3895876	Observed within project site
4. Desert Tortoise burrow	9/29/2010 -10/3/2010	E 402508	N 3896168	Tracks also present
5. Desert Tortoise burrow	9/29/2010 -10/3/2010	E 403026	N 3895291	Detected in ZOI off-site
6. Desert Tortoise shell-skeletal remains	9/29/2010 -10/3/2010	E 403597	N 3896220	Detected in ZOI off-site

Table 10. Summary of Barren Ridge Focused Survey Results

Observation	Date	Location (NAD 83, Zone 11)		Comments
7. Desert Tortoise shell-skeletal remains	9/29/2010 -10/3/2010	E 403048	N 3895293	Detected in ZOI off-site
8. Desert Tortoise burrow	10/14/2010	E 401941	N 3895861	At base of creosote bush in a drainage
9. Juvenile Desert Tortoise	10/14/2010	E 402956	N 3895583	Intersection of SR-14 and Phillips Rd.
10. Burrowing Owl sign	9/29/2010 -10/3/2010	E 402668	N 3896365	Pellets and white wash at burrow
11. Burrowing Owl sign	9/29/2010 -10/3/2010	E 403035	N 3897036	Pellets and white wash at burrow
12. Burrowing Owl sign	9/29/2010 -10/3/2010	E 403158	N 3896962	Pellets and white wash at burrow
13. American Badger	9/29/2010 -10/3/2010	E 402668	N 3896365	Individual in burrow

4.5.5 BARREN RIDGE JURISDICTIONAL DELINEATION

The soils at the Barren Ridge site include Cajon loamy sand, 0 to 5 percent slopes, and Arizo gravelly loamy sand, 2 to 9 percent slopes. Cajon soils, which dominate the site, are somewhat excessively drained, moderately sloping loamy sands formed on alluvial fans and floodplains. Arizo soils are excessively drained soils on alluvial fans and floodplains. None of the soils at the Barren Ridge site are listed as hydric by NRCS (National list of Hydric Soils, Feb. 2010; http://soils.usda.gov/use/hydric/lists/state.html).

The Barren Ridge site is located on a broad alluvial fan that receives water flows from the mountains northwest of the project site. High energy water flows from the steeply sloping mountain range flow onto the alluvial fan via well-defined channels approximately 0.5 mile northwest of the site. This portion of the alluvial fan at the base of the mountains is inactive, characterized by relatively high topographic relief due to historic sediment deposition, and the formation of well-defined, stable and continuous channels. The Barren Ridge project site is in the active portion of the alluvial fan east and southeast of the mountain range. In this portion of the alluvial fan, slope decreases and channelized flows give way to radiating flow patterns, sheet flows, and active sediment deposition. Primary measurable alluvial fan characteristics (Table 2, USACE 2008b) evident on the project site include overall deposition patterns, debris flows, radiating channel patterns changing to sheet flow areas, and discontinuous and/or abandoned channels due to active processes of stream capture and avulsion.

The dynamic nature of the alluvial fan system limits the delineation of jurisdictional waters to a current "snapshot" in time. Both the spatial location of channels and whether or not water is present within a particular channel is likely to vary substantially over time. Although water flows were delineated through field observation and analysis of aerial photographs of the site, the jurisdictional limit is expected to change over time as deposition/flow patterns and channel locations change from year to

year. In addition, hydrologic flows on-site have been altered by road construction and flood control measures.

Water drains east and southeast across the project site in sheet flows, generally collecting in discontinuous channels for short to moderate reaches before radiating out in sheet flows again. For the portion of the site west of SR-14, water flows eventually collect in a flood control channel that parallels SR-14, before discharging through a culvert under SR-14 near the eastern property boundary. Observations indicate that most defined channels in the current year (Figure 7c) occur within areas of prominent historic braided drainage patterns. As the discontinuous drainages are located in historic drainage areas and the previous rainfall year is representative of the long-term mean, it is assumed that the current extent is both a good indicator of the amount of jurisdictional waters at the site, as well as a good indicator of general flow patterns on-site from an ecological perspective.

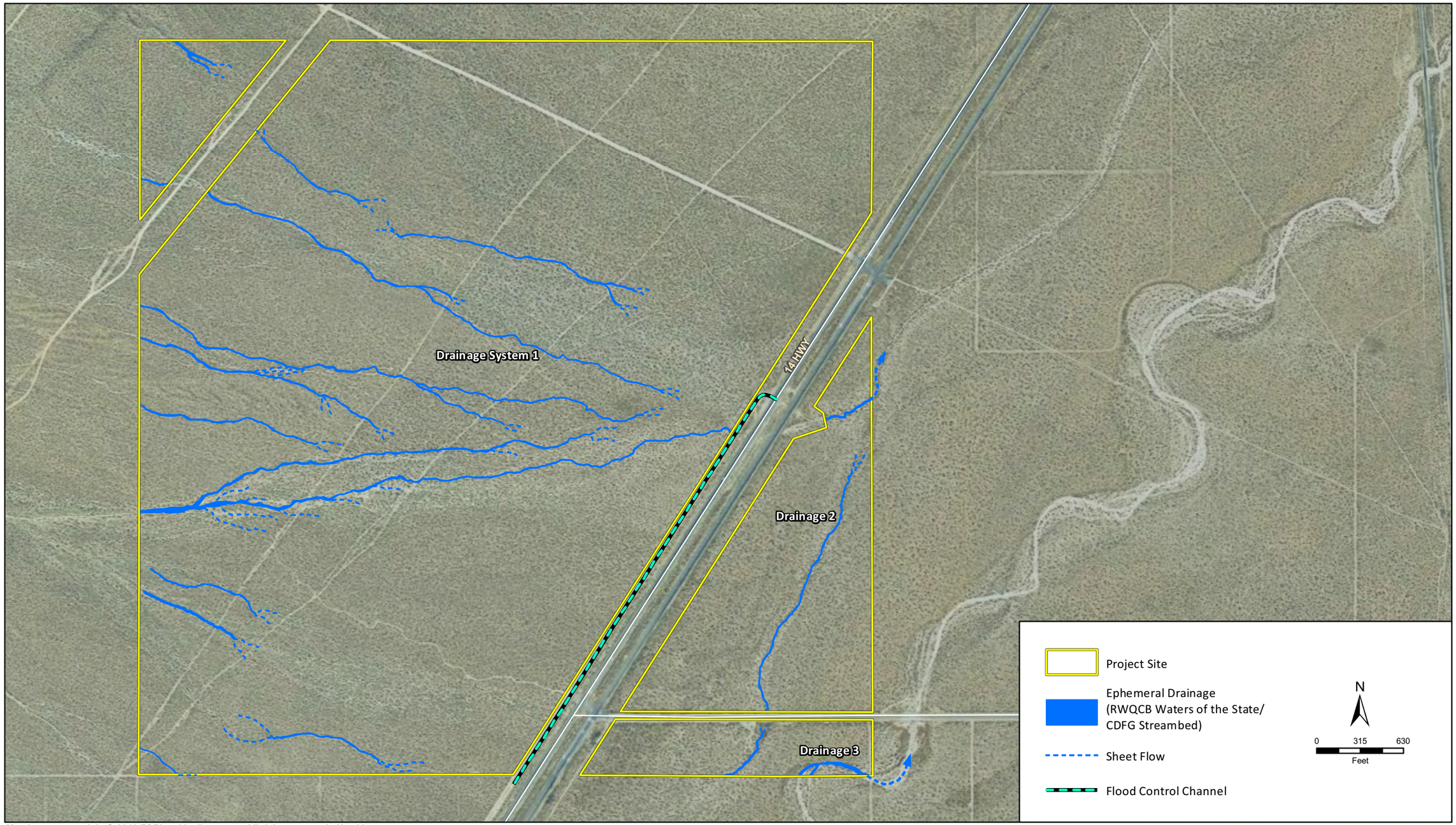
The alluvial fan system west of SR-14 is classified and mapped on Figure 7c as Drainage System 1. Two additional drainages, Drainage 2 and Drainage 3 occur east of SR-14. These drainages are more well-defined desert washes. Drainage System 1 and Drainage 2 converge immediately east of the project site, and then connect with Drainage 3 approximately 1.5 miles northeast of the site. Water flow from the drainages is conveyed northeast and appears to empty into isolated Koehn Dry Lake approximately 11.5 miles northeast of the site.

A summary of jurisdictional resources at the Barren Ridge project site is shown in Table 11. The drainages within the site are not expected to be subject to USACE jurisdiction because the western Mojave region is isolated from Traditional Navigable Waters. As discussed in Section 2.4, RWQCB jurisdiction is typically delineated based on the lateral extent of the OHWM, whereas CDFG jurisdiction is determined based on the bank to bank width. Due to significant overlap between OHWM indicators and channel embankments throughout alluvial fan and desert wash drainages, as well as the discontinuous nature of discernible drainage indicators in many locations, jurisdiction was delineated at the same extent for both agencies.

Drainage System 1

Drainage System 1 comprises the alluvial fan system within the project site west of SR-14, and contains approximately 4.32 acres (26,655 linear feet) subject to RWQCB and CDFG jurisdiction within the project site. As described above, water flow generally originates in well-defined channels at the base of the mountains northwest of the project site and then radiates into discontinuous channels and sheet flow across the site. It accumulates within the flood control channel adjacent to SR-14, which traverses under the freeway and connects with Drainage 2 east of the site.

The largest defined feature enters the eastern boundary of the project site through a well-defined channel, approximately 30 feet wide, and gradually fans out into discontinuous channels and sheet flow through the central portion of the site. Water within this feature is generally conveyed through two intermittently defined channels that become smaller and less discernible through the central portion of the site as water is lost to sheet flow in adjacent areas. The southern channel is barely evident as an approximate 1-foot-wide erosional feature at the connection with the flood control channel adjacent to SR-14. Discontinuous channels in the southwestern portion of the site appear to be associated with water flow that is conveyed southeast across the alluvial fan during larger storm events. These channels transport water for short distances before fanning out into sheet flow.



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Barren Ridge Jurisdictional Drainages

Figure 7c

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Several discontinuous channels are also present in the northern portion of the project site. The widths of these channels generally range from 2 to 6 feet and are evident for varying lengths before transitioning to sheet flow. None of the features appeared to have direct channel connectivity to the SR-14 flood control channel.

Drainage 2

Drainage 2 is a small, ephemeral feature that comprises approximately 0.36 acre (2,471 linear feet) subject to RWQCB and CDFG jurisdiction within the project site. This drainage enters the southeastern portion of the project site and flows northeast across the site. Most of the drainage has a well-defined channel ranging in width from 2 to 4 feet. However, water flow in the upstream (southern) portion of the drainage has been altered by the construction of Phillips Road and appears to accumulate within a depression south of the road. As such, water likely only flows across the road and connects downstream during larger storm events. In addition, Phillips Road discharges runoff into the feature as it continues north.

Water flow within Drainage 2 traverses northeast and then transitions to sheet flow near the eastern site boundary. Flows then re-converge and connect with Drainage System 1 approximately 650 feet to the northeast, immediately east of the site boundary.

Drainage 3

Drainage 3 is a large, braided wash that contains approximately 0.24 acre (687 linear feet) of RWQCB and CDFG jurisdiction within the project site. This drainage enters the extreme southeastern portion of the project site, traverses north for a short distance, and then rapidly bends to the east and exits at the southeastern corner of the site. The feature has a well-defined channel approximately 30 feet wide that contains sandy/cobbly soils and is mostly devoid of vegetation. The drainage braids into two channels near the southern site boundary that converge within the site. After exiting the site, water flow is conveyed northeast for 2 miles and then converges with flows from Drainage System 1 and Drainage 2.

Table 11. Summary of Barren Ridge RWQCB and CDFG Jurisdiction

Jurisdictional Feature	Acreage	Linear Feet
Drainage System 1	4.32	26,655
Drainage 2	0.36	2,471
Drainage 3	0.24	687
TOTAL	4.92	29,813

4.5.6 BARREN RIDGE POTENTIAL ENVIRONMENTAL EFFECTS

Implementation of the proposed project at the Barren Ridge site has the potential to affect special-status species and jurisdictional waters. Recommended mitigation measures to avoid and/or minimize potential project effects to these sensitive resources are detailed below. The project is not expected to substantially interfere with wildlife movement in the project vicinity or region, or conflict with the

provisions of an adopted HCP. Therefore, potential effects to these sensitive resource types are considered less than significant.

BIO I: POTENTIAL EFFECTS TO SPECIAL-STATUS SPECIES

The project site contains suitable habitat for several special status plant species that occur in desert scrub communities. No special status plants were observed on the Barren Ridge project site during the field reconnaissance survey. However, the timing of the survey was such that many plant species were desiccated or in a state of dormancy and, thus, unidentifiable to a sufficient level to determine rarity. Therefore, the proposed project may potentially affect special status plant species, and spring botanical surveys are recommended to definitively determine the presence/absence of special status species on-site (see Section 5).

The Barren Ridge site provides suitable habitat for desert tortoises, and desert tortoises were observed onsite. Additionally, burrows suitable for use by desert tortoises were observed on and offsite and other sign (e.g., tracks, skeletal remains) were also observed. Completion of the proposed project may result in direct impacts to desert tortoise individuals during construction and would result in loss of suitable habitat.

The Barren Ridge site provides suitable habitat for burrowing owl. A total of three burrows with evidence of recent occupation (whitewash and pellets) were detected during the 2010 focused surveys; however, no burrowing owls were observed. The proposed project could potentially result in adverse impacts to this species if these burrows become re-occupied prior to project construction.

No trapping efforts have been conducted for Mohave ground squirrels onsite. Based on the presence of suitable habitat, the project location within the historic range of the species and recorded occurrences in the project region, the proposed project has the potential to result in adverse effects if Mohave ground squirrels were to occur on the site prior to construction. The project would also result in loss of suitable habitat for the species.

The Barren Ridge site provides potential foraging habitat for raptors, and common raptors, such as the red-tailed hawk, could nest in the transmission towers adjacent to the site. No special status raptors, such as the golden eagle, were observed on the project site or within survey buffers during the field surveys. Furthermore, no golden eagle nests are tracked in the vicinity of the project site (within 5 miles, CNDDB 2010). Therefore, the project is not expected to directly affect or result in incidental take of special status raptors. The site contains suitable nesting habitat for a variety of native avian species common to the desert and protected by CFGC §3503 and the MBTA. The proposed project could result in direct impacts to protected nesting birds if implemented during the nesting season.

One additional mammal species of special concern, the American badger, was observed on site, and dens suitable for this species were also observed. The proposed project has the potential to directly impact this species during construction of the project.

BIO II: POTENTIAL EFFECTS TO SENSITIVE PLANT COMMUNITIES/LOCALLY PROTECTED RESOURCES

No sensitive plant communities tracked by the CNDDB or locally protected resources occur on or adjacent to the Barren Ridge project site. Therefore, implementation of the proposed project is not expected to affect any sensitive plant communities or locally protected resources.

BIO III: POTENTIAL EFFECTS TO JURISDICTIONAL WATERS

Three unnamed ephemeral drainage features, Drainage System 1, and Drainages 2 and 3, occur on the Barren Ridge project site. These features comprise CDFG jurisdictional streambed and RWQCB waters of the state. Alteration of drainages within the site would likely constitute an impact to jurisdictional waters and require the acquisition of appropriate permits prior to altering these features. Implementation of the proposed project has the potential to affect up to 4.92 acres (29,813 linear feet) of RWQCB and CDFG jurisdiction. These drainages are not considered subject to USACE jurisdiction as the western Mojave is isolated from traditional navigable waters; however, this requires USACE verification.

SECTION 5 – RECOMMENDED MITIGATION MEASURES

The following measures are recommended to ensure adverse effects to sensitive biological resources are avoided and/or minimized. With implementation of these measures, potential effects to sensitive biological resources are anticipated to be less than significant.

MM BIO I-A: MITIGATION MEASURES FOR SPECIAL STATUS PLANT SPECIES

The following measures apply to special-status plant species encountered at the Great Lakes project site, and are intended to reduce the impacts to regional conservation objectives for alkali mariposa lily (potential impacts to Mojave spineflower and golden goodmania are not considered significant). The following measures are recommended:

1. To the extent feasible, the project should be designed to avoid impacts to special status plant species. Establishing a buffer on either side of the central drainage at the Great Lakes site would not only minimize impacts to jurisdictional waters and maintain water flows through the site, but would preserve several rare plant locations. These include some of the main sub-populations of alkali mariposa lily, as well as two of the golden goodmania sub-populations, and the highest Mojave spineflower densities within 120 feet of the central drainage. If mitigation is implemented on-site, a Habitat Management Plan should be developed to ensure adequate management and conservation of botanical resources on-site over the long term.
2. If on-site avoidance/minimization is not feasible, a Mitigation and Monitoring Plan should be prepared that details impacts to alkali mariposa lily, identifies a suitable offsite property (preferably with a historical alkali mariposa lily population), and proposes a plan for habitat restoration, enhancement, and potential transplanting of special status plant species present at the Great Lakes at a minimum 1:1 ratio. A 1:1 ratio is considered sufficient because alkali mariposa is not federally or state listed as threatened or endangered and is relatively common in the project area. If feasible, offsite mitigation should be incorporated into the Mitigation and Monitoring Plan for impacts to jurisdictional resources as described in MM BIO III.

The following measures are recommended for the Barren Ridge project site:

1. Conduct preconstruction botanical surveys for special status plant species during the appropriate blooming period, in accordance with the guidelines established by CDFG (2009). If no special status plant species are observed during the focused surveys, no further actions are recommended.
2. If special status plant species (i.e., endangered, threatened, or CNPS List 1B species) are observed within the site, the proposed project should be designed to reduce impacts to these species through the establishment of preservation areas and buffers, to the extent feasible. If mitigation is implemented on-site, a Habitat Management Plan should be developed to ensure adequate management and conservation of botanical resources on-site over the long term.
3. If on-site avoidance/minimization is not feasible, a Mitigation and Monitoring Plan should be prepared that details impacts to special status plant species, identifies a suitable offsite property, and proposes a plan for habitat restoration, enhancement, and/or potential transplanting of special status plant species at a minimum 1:1 ratio.

4. If impacts to federally or state-listed threatened and/or endangered plant species cannot be avoided, consultation with the wildlife agencies should be initiated to obtain any necessary incidental take permit authorizations.

MM BIO I-B: GENERAL MITIGATION MEASURES FOR SPECIAL STATUS WILDLIFE SPECIES

The following recommended measures are based on standard mitigation policies and guidelines currently practiced and are intended to reduce the potential for direct take of special status wildlife species, specifically the desert tortoise, Mohave ground squirrel, and American badger. No desert tortoises or Mohave ground squirrels were observed during the focused surveys on the Rosamond, Rio Grande, Columbia, and Great Lakes sites. However, these sites contain suitable habitat for the species and adverse effects could occur if individuals were to occupy the sites prior during construction, although the potential for effects is low. The measures discussed below are recommended to ensure that adverse effects to these species are avoided and/or minimized on the Rosamond, Rio Grande, Columbia, and Great Lakes sites. Specific measures for desert tortoise and Mohave ground squirrel at the Barren Ridge site are outlined in the sections that follow.

1. Qualified biologists should conduct preconstruction clearance surveys for desert tortoises, Mohave ground squirrels, and American badgers within 48 hours of the start of any ground disturbing construction activity and during all grading/ground disturbing activities. All burrows that could provide shelter for any of these species should be hand excavated during the first clearance survey. A biologist should remain on-call throughout construction in the event a tortoise or badger wanders onto the site.
2. If a permanent tortoise proof exclusion fence is practicable, a fence should be installed around all construction areas prior to the initiation of earth disturbing activities, in coordination with a qualified biologist. The fence should be constructed of ½-inch mesh hardware cloth and extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches would be folded outward against the ground and fastened to the ground so as to prevent desert tortoise entry. The fence should be supported sufficiently to maintain its integrity, be checked at least monthly during construction and operations, and maintained when necessary by site operator to ensure its integrity. Provisions should be made for closing off the fence at the point of vehicle entry. Raven perching deterrents should be installed as part of the fence construction.
3. After fence installation, the qualified biologist should conduct a clearance survey for special status wildlife species within the construction site.
4. A raven management plan should be developed for the projects. This plan should include language stipulating that all trash that could attract predators of the desert tortoise, such as common ravens, be removed from work sites or completely secured at the end of each work day.
5. All construction and operations personnel should undergo environmental awareness training, with specific discussion of desert tortoise, Mohave ground squirrel, and American badger natural history and protective measures.
6. If any American badger burrows are determined to be active, an on-site passive relocation program should be implemented. This program should consist of excluding badgers from occupied burrows by installation of one-way doors at burrow entrances, monitoring of the

burrow for one week to confirm badger usage has been discontinued, and hand excavation and collapse of the burrow to prevent reoccupation.

7. If a desert tortoise or Mohave ground squirrel is found onsite during subsequent surveys or biological monitoring activities, construction activities should cease to avoid the potential for take. Consultation with CDFG and the USFWS should be initiated to obtain the necessary incidental take permit authorizations pursuant to the federal ESA and CESA.

MM BIO I-C: MITIGATION MEASURES FOR DESERT TORTOISE

The following measures specific to desert tortoise are recommended for the Barren Ridge project site:

1. Consult with the USFWS and CDFG to obtain incidental take permit authorizations for desert tortoise. If the project has a federal nexus (e.g. requires federal approval or is subject to federal funding), incidental take authorization would be obtained by the federal agency through the ESA Section 7 consultation process. If no federal nexus exists, take authorization would be obtained by the project proponent through direct consultation with the USFWS through the ESA Section 10 Habitat Conservation Plan (HCP) process. Incidental take authorization from CDFG can be obtained through acquisition of a CESA Section 2081b permit or Consistency Determination.
2. Develop a desert tortoise translocation and monitoring plan in coordination with the USFWS and CDFG. It is anticipated that development of this plan will be required for acquisition of the incidental take permits. The plan should provide the framework for implementing the following measures:
    a. All land surveying personnel prior to construction should be accompanied by an authorized desert tortoise biologist. An authorized desert tortoise biologist has the appropriate education and experience to accomplish biological monitoring and mitigation tasks and is approved by the resource agencies.
    b. Authorized biologists should conduct preconstruction clearance surveys for desert tortoise prior to the start of any ground disturbing construction activity.
    c. If a permanent tortoise proof exclusion fence is practicable, the fence should be installed around all construction areas prior to the initiation of earth disturbing activities, in coordination with a qualified biologist. The fence should be constructed of ½-inch mesh hardware cloth and extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches would be folded outward against the ground and fastened to the ground so as to prevent desert tortoise entry. The fence should be supported sufficiently to maintain its integrity, be checked at least monthly during construction and operations, and maintained when necessary by site operator to ensure its integrity. Provisions should be made for closing off the fence at the point of vehicle entry. Raven perching deterrents should be installed as part of the fence construction.
    d. After fence installation, authorized biologists should conduct clearance surveys for desert tortoises within the fenced project site. Two surveys without finding any tortoises or new tortoise sign should occur prior to declaring the site clear of tortoises. All burrows that could provide shelter for a desert tortoise should be excavated during the first clearance survey. An authorized biologist should remain onsite until all vegetation is cleared and, at a minimum, conduct site and fence inspections on a regular

basis throughout construction in order to ensure project compliance with mitigation measures.

e. Authorized biologists should be onsite to survey for tortoises immediately in front of vegetation clearance activities in the event a tortoise was inadvertently missed during clearance surveys. A biologist should remain on-call throughout construction in the event a tortoise wanders onto the site.

f. A raven management plan should be developed for the project.

g. Post-construction reporting should be provided to all agencies within 90 days of completion of construction.

3. Develop a mitigation plan in coordination with the USFWS and CDFG to provide adequate compensatory mitigation for the loss of desert tortoise habitat. Providing compensatory mitigation to offset species/habitat impacts can be accomplished through purchase of credit from an existing mitigation bank, such as the Desert Tortoise Natural Area (DTNA), or private purchase of mitigation lands. Compensatory mitigation should be provided at a minimum 1:1 ratio to reduce potential effects to less than significant under CEQA. This ratio is considered adequate based on the relatively low density of desert tortoises on-site in contrast to range-wide densities (see discussion in Section 4.5.4). It is noted that the final mitigation ratio required by the wildlife agencies for incidental take authorization may differ.

MM BIO I-D: MITIGATION MEASURES FOR BURROWING OWL

Mitigation measures for potential project impacts to burrowing owls typically follow the guidelines developed by the California Burrowing Owl Consortium (1993) and CDFG (1995). However, mitigation requirements under CEQA are established at the discretion of the lead agency. No burrowing owls were observed on any of the sites during the focused surveys. However, each of the sites contain suitable habitat for the species and burrowing owl sign was observed on the Columbia and Barren Ridge sites. Therefore, adverse effects to burrowing owls could occur if individuals were to occupy the sites in the future and the following measures are recommended for all project sites (note that additional measures are recommended for Barren Ridge at the end of this discussion).

1. Conduct preconstruction clearance surveys of the sites and within 250 feet of the sites to confirm burrowing owls remain absent. Clearance surveys are typically conducted 30 days prior to construction activities. If no burrowing owls are observed, no further actions are recommended.

2. If burrowing owls are found during the clearance surveys, develop a burrowing owl Mitigation and Monitoring Plan. The plan should provide the framework for implementing the following tasks:

   a. Unless otherwise authorized by CDFG, avoid disturbance within 50 meters of occupied burrows during the non-breeding season (September 1 through January 31) or within 75 meters during the breeding season (February 1 through August 31).

   b. Passively relocate burrowing owls to a suitable offsite location. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 meters from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls can only occur during the non-breeding season.

c. At minimum one, and potentially two, alternate natural or artificial burrows should be provided/identified for each active burrow that will be excavated in the project impact zone.

d. The project area should be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone.

e. Burrows should be excavated using hand tools and refilled to prevent reoccupation.

f. If the project will reduce the amount of suitable foraging habitat contiguous to occupied burrows on or adjacent to the site below the 6.5-acre threshold (per pair or individual owl), provide compensatory mitigation for direct impacts to occupied burrowing owl habitat based on the ratios outlined by the Burrowing Owl Consortium (1993).

The following measures are specifically recommended for the Barren Ridge project site:

1. Conduct focused protocol surveys for burrowing owl during the breeding season (February 1 - August 31) to definitively determine if burrowing owls are present on the project site and the number present. The focused surveys should be conducted in accordance with the California Burrowing Owl Consortium (1993) and CDFG (1995) guidelines.
2. If no burrowing owls are found during the protocol surveys, conduct preconstruction clearance surveys of the site and within 250 feet of the site 30 days prior to construction to confirm burrowing owls remain absent. If no burrowing owls are observed during the clearance surveys, no further actions are necessary.
3. If burrowing owls are found during the protocol or clearance surveys, develop a burrowing owl mitigation and monitoring plan, as described above.

MM BIO I-E: MITIGATION MEASURES FOR SPECIAL STATUS RAPTORS AND NESTING BIRDS

The following measures are recommended for all projects to ensure that potential direct or indirect effects to nesting raptors and other avian species are avoided and/or minimized:

1. Project construction should avoid the general avian nesting season (February – August), if feasible.
2. If breeding season avoidance is not feasible, a qualified biologist should conduct a preconstruction nesting bird survey to determine the presence/absence, location, and status of any active nests on or adjacent to the project site. The extent of the survey buffer area surrounding the site should be established by the qualified biologist to ensure that indirect effects to nesting birds are avoided. Nesting bird surveys are typically conducted 3-30 days prior to construction activities (last survey conducted within 3 days of the start of construction). A suitable buffer (e.g. 0.25 mile for Swainson's hawk, 200-300 feet for common raptors; 30-50 feet for passerines) should be established around active nests and no construction within the buffer allowed until a qualified biologist has determined that the nest is no longer active (e.g. the nestlings have fledged and are no longer reliant on the nest). Encroachment into the buffer should occur at the discretion of a qualified biologist.

MM BIO I-F: MITIGATION MEASURES FOR MOHAVE GROUND SQUIRREL

The following measures specific to Mohave ground squirrel are recommended for the Barren Ridge project site:

1. Conduct protocol trapping surveys for Mohave ground squirrel to determine the presence/absence of this species on the project site in accordance with the CDFG *Mohave Ground Squirrel Survey Guidelines* (2003). If no Mohave ground squirrels are trapped on the site during protocol surveys, implement MM BIO I-B.
2. As an alternative to conducting protocol trapping surveys, the project proponent can assume that Mohave ground squirrel is present on the project site and obtain an incidental take permit from CDFG pursuant to CESA Section 2081b.
3. If Mohave ground squirrels are determined present during the focused trapping surveys, or Mohave ground squirrels are assumed present, develop a Mohave ground squirrel translocation and monitoring plan in coordination with the USFWS and CDFG. It is anticipated that development of this plan will be required for acquisition of the incidental take permit. The plan should provide the framework for implementing the following measures:
    a. Authorized biologists should conduct preconstruction clearance surveys for Mohave ground squirrel prior to the start of any ground disturbing construction activity. An authorized Mohave ground squirrel biologist has the appropriate education and experience to accomplish biological monitoring and mitigation tasks and is approved by the resource agencies.
    b. After installation of a tortoise exclusion fence, if implemented, authorized biologists should conduct clearance surveys for Mohave ground squirrels within the fenced project site. All burrows that could provide shelter for a Mohave ground squirrel should be excavated during the clearance survey.
    c. Authorized biologists should be onsite to survey for Mohave ground squirrels immediately in front of vegetation clearance activities in the event a squirrel was inadvertently missed during clearance surveys. A biologist should remain on-call throughout construction in the event a squirrel wanders onto the site.
    d. Post-construction reporting should be provided to all agencies within 90 days of completion of construction.
4. Develop a mitigation plan in coordination with the CDFG to provide adequate compensatory mitigation for the loss of Mohave ground squirrel habitat. Providing compensatory mitigation to offset species/habitat impacts can be accomplished through purchase of credit from an existing mitigation bank, such as the DTNA, or private purchase of mitigation lands. Compensatory mitigation should be provided at a minimum 1:1 ratio to reduce potential effects to less than significant under CEQA. This ratio is considered adequate based on the fact that the site is not located within any Mohave ground squirrel core areas or known population areas (Leitner 2008). It is noted that the final mitigation ratio required by CDFG for acquisition of a 2081 incidental take permit may differ. Given that Mohave ground squirrel and desert tortoise occupy the same habitat types, compensatory mitigation for both species can be combined into one mitigation program.

MM BIO II: MITIGATION MEASURES FOR JOSHUA TREES/WOODLANDS

The following measures are recommended for the Rosamond, Rio Grande, and Columbia projects to ensure that potential direct effects to Joshua trees/woodlands (sensitive plant communities/locally protected resources) are minimized:

1. Conduct a Joshua tree survey to inventory Joshua trees within the project sites. The survey should include an assessment of the height, diameter at breast height (dbh), and health status of all trees. Joshua tree woodlands should be mapped based on groupings of trees with greater than 10% areal coverage in accordance with the *California Wildlife Habitat Relationships System Classification Rules*. Such mapping shall be conducted based on aerial photography and other remote sensing techniques, and shall be determined based on a census count and a spatial analysis technique such as "nearest neighbor" and associated statistical analysis.
2. Prepare a Joshua Tree Impact and Mitigation Plan that details the acreage of Joshua trees/woodlands to be removed and mitigation measures to compensate for impacts. The plan should outline a compensatory mitigation approach consisting either of relocation of trees to an approved preserve, or the purchase of preserved mitigation lands at a minimum 1:1 ratio of impacted specimen trees or Joshua tree woodlands. A 1:1 ratio is considered sufficient to reduce potential effects to less than significant because Joshua trees/woodlands are relatively abundant in the vicinity of the project sites and comprise one of the more common communities in the region (Davis et al. 1998).

MM BIO III: MITIGATION MEASURES FOR JURISDICTIONAL WATERS

The following measures are recommended for the Rosamond, Great Lakes, and Barren Ridge projects to ensure that direct or indirect effects to jurisdictional waters are minimized:

1. To the extent practicable, the project should be designed to avoid impacts to the jurisdictional waters within the Rosamond, Great Lakes, and Barren Ridge project sites, and the following avoidance/minimization measures are recommended:
    a. Any material/spoils from project activities should be located away from jurisdictional areas or sensitive habitat and protected from stormwater run-off using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
    b. Only the minimal amount of material needed for the project should be stored. Materials should be stored on impervious surfaces or plastic ground covers to prevent any spills or leakage from contaminating the ground and generally at least 50 feet from the top of bank.
    c. Any spillage of material will be stopped if it can be done safely. The contaminated area will be cleaned and any contaminated materials properly disposed of. For all spills the project foreman or designated environmental representative will be notified.
2. If jurisdictional waters cannot be avoided, minimization measures should be applied and all necessary resource agency permits should be obtained. This includes Waste Discharge Requirements (WDRs) from the RWQCB and a Streambed Alteration Agreement from CDFG. It is also recommended that verification from the USACE be obtained to confirm the drainages do not constitute waters of U.S.

3. Minimization measures for impacts to jurisdictional waters should include routing on-site drainage and placing the water discharge point at the location of existing or historic ephemeral drainages. Small retention basins should be placed at the discharge points, sized in such a manner that temporary water ponding and subsequent soil saturation foster the growth of seasonal wetland habitat.
4. Prepare a Habitat Mitigation and Monitoring Plan that outlines a compensatory mitigation approach for the projects in coordination with the RWQCB and CDFG. Impacts to jurisdictional waters should be mitigated at a minimum 1:1 ratio. This ratio is considered sufficient to reduce effects to less than significant under CEQA because the type of affected jurisdictional features (i.e. non-riparian desert wash/scrub and non-wetland seasonal ponds) are relatively common in the context of desert region drainage features. Furthermore, most effects would likely be temporary because jurisdictional features are anticipated to be relocated on-site to maintain hydrology in the project area for flood control purposes. It is noted that the final mitigation ratio required by the RWQCB and CDFG for acquisition of regulatory permits may differ.

   The Habitat Mitigation and Monitoring Plan should identify portions of the site, such as relocated drainage routes, that contain suitable characteristics (e.g., hydrology) for restoration of alluvial desert scrub habitat and provide adequate acreage to compensate for the anticipated project impacts. If mitigation must be implemented offsite, suitable mitigation lands should be identified and purchased in the local vicinity of the site or watershed. The Plan should discuss preservation of the site through a conservation easement and identify an approach for funding assurance for the long-term management of the conserved land.

6.4 GREAT LAKES

The Great Lakes project site does not contain any locally protected trees, provide an important wildlife movement corridor or occur within an adopted HCP. Therefore, potential adverse effects to these sensitive biological resources are not expected and no further actions are recommended.

Three special status plant species, alkali mariposa lily, golden goodmania, and Mojave spineflower, occur on the Great Lakes site. Mojave spineflower and golden goodmania are CNPS List 4.2 (watchlist) species with abundant local distribution. The Mojave spineflower in particular was observed growing in high densities on adjacent properties. Although the proposed project will result in direct effects to the Mojave spineflower and golden goodmania, these effects are not considered significant. The proposed project has the potential to result in adverse direct effects to alkali mariposa lily if unmitigated. Therefore, mitigation measure MM BIO I-A is recommended to ensure potential effects to alkali mariposa lily are avoided and/or minimized.

No desert tortoises, burrowing owls, or Mohave ground squirrels were observed during the focused surveys. Therefore, the proposed project is not expected to result in direct adverse effects to these special status wildlife species. Nonetheless, the site contains suitable habitat for these species. Adverse effects could occur if individuals were to wander on to the site during construction, although the potential for effects is relatively low. Mitigation measures BIO MM I-B and I-D are recommended to ensure that adverse effects to special status wildlife species are avoided and/or minimized.

No Swainson's hawks, golden eagles, or other special status raptors were observed on the Great Lakes site or within 1 mile of the site during the focused surveys. Therefore, the project is not expected to result in direct effects to or incidental take of these species. However, the project site contains suitable foraging habitat for raptor species and nesting habitat for a variety of native avian species common to the desert and protected by CFGC 3503 and the MBTA. Mitigation measure BIO MM I-E is recommended to ensure that adverse effects to nesting birds/raptors are avoided and/or minimized.

The project site contains jurisdictional waters. Therefore, mitigation measure BIO III is recommended to ensure impacts to this sensitive resource are avoided and/or minimized.

With implementation of the mitigation measures described above, potential effects to sensitive biological resources associated with the proposed project at the Great Lakes site would be less than significant.

6.5 BARREN RIDGE

The Barren Ridge project site does not contain any sensitive plant communities or locally protected resources, such as Joshua trees. The site does not provide an important wildlife movement corridor or occur within an adopted HCP. Therefore, potential adverse effects to these sensitive biological resources are not expected and no further actions are recommended.

No special status plant species were observed on the project site during the field reconnaissance surveys; however, the site visits were conducted during a time of year when many species are unrecognizable. Therefore, MM BIO I-A is recommended to ensure potential effects to special status plants are avoided or minimized.

Three desert tortoises were observed on the Barren Ridge project site during the focused surveys. Project implementation would likely result in direct adverse effects to this species. Therefore MM BIO I-C is recommended to ensure potential effects to desert tortoise are avoided or minimized.

No burrowing owl individuals were observed on the project site during focused surveys; however, potential burrows and owl sign were detected. Therefore, MM BIO I-D is recommended to ensure potential adverse effects to burrowing owl are avoided or minimized.

No golden eagles or other special status raptors were observed on the Barren Ridge site or in the survey buffer or adjacent areas during focused surveys. Therefore, the project is not expected to result in direct effects to or incidental take of these species. However, the project site contains suitable foraging habitat for raptor species and nesting habitat for a variety of native avian species common to the desert and protected by CFGC 3503 and the MBTA. Mitigation measure BIO MM I-E is recommended to ensure that adverse effects to nesting birds/raptors are avoided or minimized.

Mohave ground squirrel surveys were not conducted on the Barren Ridge project site. The site is not located within any core areas or known population areas (Leitner 2009). Nonetheless, the site contains suitable habitat for Mohave ground squirrel and project implementation could result in adverse effects. Therefore, MM BIO I-F is recommended to ensure potential effects to Mohave ground squirrel are avoided or minimized.

An active American badger burrow was observed on the project site. Project implementation could result in direct adverse effects to this species, including mortality or injury. Therefore, MM BIO I-B is recommended to ensure potential effects are avoided or minimized.

The Barren Ride project site contains potential jurisdictional waters. Therefore, mitigation measure BIO MM III is recommended to ensure impacts to this sensitive resource are avoided or minimized.

With implementation of the mitigation measures described above, potential effects to sensitive biological resources associated with the proposed project at the Barren Ridge project site would be less than significant.

6.6 TEHACHAPI

No special status plants or jurisdictional waters occur on the Tehachapi project site. The site does not contain sensitive plant communities or locally protected trees, provide an important wildlife movement corridor, or occur within an adopted HCP. Therefore, potential adverse effects to these sensitive biological resources are not expected and no further actions are recommended.

No burrowing owls were observed during the field surveys at the Tehachapi site. Therefore, the proposed project is not expected to result in direct adverse effects to this or any other special status wildlife species. Nonetheless, the site contains suitable habitat for the species. Adverse effects could occur if a burrowing owl were to occupy the site in the future prior to construction, although the potential for effects is relatively low. Mitigation measure BIO MM I-D is recommended to ensure that adverse effects to burrowing owl are avoided and/or minimized.

No Swainson's hawks were observed on the Tehachapi site or within 1 mile of the site during the focused surveys. One golden eagle was observed flying over the site, but no golden eagle nests were

Photo 1 - View of Creosote Bush - White Burr Sage Scrub characteristic of the entire site.

Photo 2 - View of man-made ditch along the western side of SR-14, looking south.

Photo 3 - View of alluvial fan (Drainage 1) facing west. Drainage system is made up of numerous discontinuous channels and areas of sheet flow.

Photo 4 - Desert tortoise observed at the intersection of SR-14 and Phillips Road.

Barren Ridge Site Photographs