

Biological Resources Assessment

Atolia Mining Project, Atolia, California

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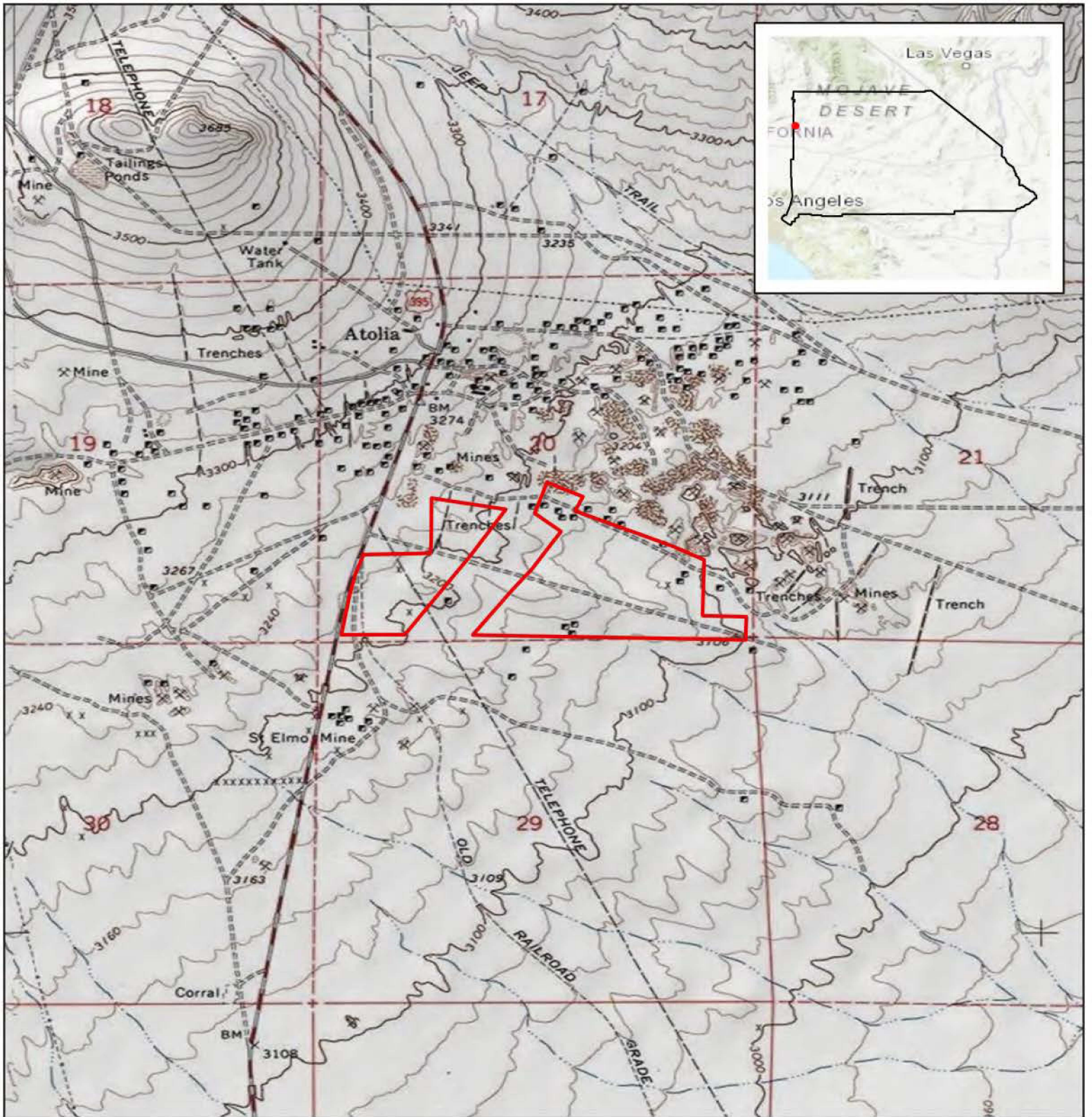
1. Introduction

This report includes the findings of a Biological Resources Assessment (BRA) conducted by South Environmental for a proposed mining operation by Gold Discovery Group LLC on Bureau of Land Management (BLM) owned land outside the abandoned mining town of Atolia in San Bernardino County, California. The purpose of this report is to identify and characterize biological resources that occur on the project site and surrounding 300-foot (study area), quantify and assess potential impacts to protected biological resources, and propose regulatory compliance measures, recommended mitigation, and avoidance measures to reduce impacts to a less than significant level. The scope of this report includes a description of the proposed development, methods used to assess the biological resources, the environmental setting including technical characterizations and of vegetation communities and potential jurisdictional features, an assessment of the occurrence and potential for federally- and state-protected plants and animals to occur on the study area, a description of the regulatory setting, and an analysis of the project based on relevant regulations including the National Environmental Protection Act (NEPA) and the U.S. and California Endangered Species Act (ESA). Representative photographs of the study area are in Appendix A.

1.1 Project Description

Location and Setting

The study area includes the entire 129-acres project site consisting of an eastern study area and a western study area that are separated by 600-feet and located immediately east of US Highway 395 and south of the abandoned mining town of Atolia in an unincorporated area of San Bernardino County. The study area is federal land administered by the BLM. The study area is less than a mile east of the border with Kern County within the United States Geological Service (USGS) Red Mountain 7.5 minute quad and within Section 20 of Township 30 South and Range 41 East at a center coordinate (decimal degrees) of 35.304600 North, -117.605804 West. The study area is set within an undeveloped area immediately south of an existing mining operation that has entirely developed the areas to the north. Abandoned mineshafts, old mining pits, and tailings mounds occur frequently on the study area but it is relatively undisturbed. Photographs of the study area are in the attached Photograph Exhibit.



Source: ESRI USA Topo Maps and World Topo Map 2022

Gold Discover Group - Atolia Mining Project

Figure 1. Project Location

Project Site

0 1,000 2,000 Feet

Scale: 1:24,000



The Survey Area is in an unincorporated area of San Bernardino County, California on the USGS Red Mountain quadrangle map in Section 20 of Township 30 South (T30S) North and Range 41 East (R41E)

Center Coordinate (Decimal Degrees):
 Latitude: 35.3063454N Longitude: -117.6013587W



Proposed Development

The Gold Discovery Group LLC proposes a gold mining operation that will extend across the entire project site. Gold Discovery Group LLC is planning to extract desert placer style gold from unconsolidated to semi consolidated sands and silts (sediments) from placer mining claims on the project site. These sediments have been tested and show economic gold grades for surface mining extraction down to a depth of 24'. The operation is planned to support up to a 75,000 Cu Yd/Month processing operation. Mining will be by surface pit extraction with a single excavator and wheel loader. Excavation passes will be in 12' increments with a total of two passes to extract to 24' depth.

1.2 Methodology

This biological resource assessment is based on information compiled through a literature review involving an assessment of appropriate reference materials and literature regarding the biological resources of the region, and several focused survey conducted during 2021 and 2022.

Literature Review

The assessment of the project began with a review of literature relating to the natural resources — flora, fauna, and water resources — that were targeted for study to ensure compliance with relevant environmental legislation including the National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) or the United States and California. State and federal online resources and in house South Environmental resources were used to identify resources including Bureau of Land Management (BLM) sensitive species and federally threatened and endangered species as listed under the U.S. Endangered Species Act. To better understand these natural resources including the occurrence of the aforementioned plants and animals, the following were consulted:

Flora and Fauna

- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB) was reviewed to identify Bureau of Land Management (BLM) sensitive plants and animals that have previously recorded in the United States Geological Survey (USGS) Red Mountain 7.5"quad in which the project site is located, and the eight surrounding USGS 7.5"quads: Klinker Mountain, West of Black Hills, Cuddeback Lake, Fremont Peak, Boron Northeast, Boron Northwest, Johannesburg, and El Paso Peaks (CDFW 2022a).
- California Wildlife Habitat Relationships life history accounts and range maps (CDFW 2022b)

- California Natural Community List (CDFW 2022c)
- USFWS Designated and Proposed Critical Habitat GIS data (USFWS 2022a)
- California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2022).
- Rare, Threatened, and Endangered (“Special-Status”) Plant Survey on 129-Acres Proposed Mining Project South of Red Mountain in San Bernardino County, California (South Environmental 2022c)
- Desert Tortoise Survey of 58-Acre Proposed Mining Project South of Red Mountain in San Bernardino County, California (South Environmental 2022a)
- Desert Tortoise on 80-Acre Proposed Mining Project South of Red Mountain in San Bernardino County, California (South Environmental 2022b)
- Mohave Ground Squirrel Protocol Surveys for the Southwest Proposed Mine Project, in unincorporated San Bernardino County, California (Dipodomys, 2022)
- Focused Mohave Ground Squirrel Survey, Atolia Placer Mining Claims. (Phoenix Biological Consulting 2021).

Water and Soil Resources

- National Hydrography Dataset (USGS 2022a)
- National Wetlands Inventory (USFWS 2022b)
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soils Database (USDA 2022)

Field Reconnaissance

South Environmental biologists Matthew South, Scott Altmann, and Laura Muhlhauser conducted a general field reconnaissance of the project site on April 29, 2022, to assess and map plant communities, plant and wildlife species, and potential jurisdictional resources. In addition to the field reconnaissance, several focused surveys were conducted that are listed above in the Literature Review.

2. Environmental Setting

The project site is along Route 395 to the immediate south of the abandoned Atolia mining town. The area is generally flat with desert scrub vegetation and sandy soils. There are rugged, rocky mountains vegetated with scrub to the northeast and northwest that reach up to 5,000-ft. There are ephemeral, channeled streams throughout the area. Several areas have remnants of past mining including mine shafts, roads, and large mounds in a line or single presumably for tailings and other waste. The closest development is the town of Red Mountain located along Route 395 approximately 3-miles to the north. There are several dirt roads that traverse the project site and area and Route 395 is the closest highway whereas Route 14 is the next closest highway located 20-miles to the west.

2.1 Topography and Climate

The study area has undulating hills with a gentle slope toward the east and an elevation of 3,225 feet on the western edge of the western area and 3,090 feet on the eastern edge of the eastern area. The average annual rainfall in Atolia, California is 5.67-inches per year with the wettest months in January through May. This area of California has had below average rainfall in 2021 and in 2022 according to the National Centers for Environmental Information (NOAA 2022).

2.2 Soils

No soils information from the Natural Resources Conservation Service is available for this location of San Bernardino County. However, the soils observed during the survey were sandy, friable, and suitable for burrowing species.

2.3 Plants

A total of 40 vascular plant species most of which are species native to California were identified on the study area. Most of the species are annual herbs and shrubs with only a few perennial herbs and no trees or vines identified. No special-status plants were identified through the literature search and listed in Attachment B were recorded and identified either in the field or laboratory. Important genera for which more than one species were observed were *Ambrosia*, *Chorizanthe*, *Ericameria*, *Eriogonum*, *Lycium*, *Malacothrix*, *Mentzelia*, and *Tetradymia*. A list of the species observed on the site is presented below in Table 1.

Table 1. List of plant species at Proposed Mining Site in Atolia, California.

Common name	Scientific name	Habit	Native/Non-Native
rayless goldenhead	<i>Acamptopappus sphaerocephalus</i>	Shrub	Native

white bursage	<i>Ambrosia dumosa</i>	Shrub	Native
cheesebush	<i>Ambrosia salsola</i>	Shrub	Native
bristly fiddleneck	<i>Amsinckia tessellata</i>	Annual herb	Native
Layne milkvetch	<i>Astragalus layneae</i>	Perennial herb	Native
brome	<i>Bromus sp.</i>	Annual grass	Non-native
Kern suncup	<i>Camissonia kernensis</i>	Annual herb	Native
Fremont's pincushion	<i>Chaenactis fremontii</i>	Annual herb	Native
brittle spine flower	<i>Chorizanthe brevicornu</i>	Annual herb	Native
Mojave spineflower	<i>Chorizanthe spinosa</i>	Annual herb	Native
silver cholla	<i>Cylindropuntia echinocarpa</i>	Shrub	Native
desert suncup	<i>Eremothera boothii</i> ssp. <i>desertorum</i>	Annual herb	Native
desert woollystar	<i>Eriastrum eremicum</i>	Annual herb	Native
Cooper's goldenbush	<i>Ericameria cooperii</i>	Shrub	Native
rubber rabbitbrush	<i>Ericameria nauseosa</i>	Shrub	Native
skeleton weed	<i>Eriogonum deflexum</i>	Annual herb	Native
spotted wild buckwheat	<i>Eriogonum maculatum</i>	Annual herb	Native
Thomas's wild buckwheat	<i>Eriogonum thomasii</i>	Annual herb	Native
Pringle's woolly sunflower	<i>Eriophyllum pringlei</i>	Annual herb	Native
redstem stork's-bill	<i>Erodium cicutarium</i>	Annual herb	Non-native
little gold poppy	<i>Eschscholzia minutiflora</i>	Annual herb	Native
whitemargin sandmat	<i>Euphorbia albomarginata</i>	Perennial herb	Native
creosote bush	<i>Larrea tridentata</i>	Shrub	Native
small-ray goldfields	<i>Lasthenia microglossa</i>	Annual herb	Native
Anderson thornbush	<i>Lycium andersonii</i>	Shrub	Native
peach-thorn	<i>Lycium cooperi</i>	Shrub	Native
snake's head	<i>Malacothrix coulteri</i>	Annual herb	Native
desert dandelion	<i>Malacothrix glabrata</i>	Annual herb	Native
whitestem blazingstar	<i>Mentzelia albicaulis</i>	Annual herb	Native
Veatch's blazingstar	<i>Mentzelia veatchiana</i>	Annual herb	Native
wishbone bush	<i>Mirabilis laevis</i>	Perennial herb	Native
desert needlegrass	<i>Pappostipa speciosa</i>	Perennial grass	Native
lacy phacelia	<i>Phacelia tanacetifolia</i>	Annual herb	Native
Mojave indigo bush	<i>Psoralethamnus arborescens</i>	Shrub	Native
Arabian grass	<i>Schismus arabicus</i>	Annual herb	Non-native
catclaw acacia	<i>Senegalia greggii</i>	Shrub	Native
littleleaf horsebrush	<i>Tetradymia glabrata</i>	Shrub	Native
Mojave cottonthorn	<i>Tetradymia stenolepis</i>	Shrub	Native
Mojave aster	<i>Xylorhiza tortifolia</i>	Perennial herb	Native

2.4 Plant Communities

The entire study area was characterized by **Creosote Bush Scrub** (*Larrea tridentata* Shrubland Alliance) that was dominated by mature (3-5 feet tall) creosote bush (*Larrea tridentata*) that are typically sparse with considerable area between the shrubs. Another prominent shrub species was **white bursage** (*Ambrosia dumosa*) and other shrubs observed were cheesebush (*Ambrosia salsola*), Anderson's thornbush (*Lycium andersonii*), Mojave indigo bush (*Psoralethamnus arborescens*), and silver cholla (*Cylindropuntia echinocarpa*). Important annuals observed were red brome (*Bromus rubens*), red-stemmed filaree (*Erodium cicutarium*), bristly fiddleneck (*Amsinckia tessellata*), small ray goldfields (*Lasthenia microglossa*), lacy phacelia (*Phacelia tanacetifolia*),

Arabian grass (*Schismus arabicus*), and desert woollystar (*Eriastrum eremicum*). The red brome, Arabian grass, and red-stemmed filaree were important non-native forbs at the ground level.

2.5 Wildlife

The wildlife observed on the study area or observed during focused surveys on the site are listed below in Table 3. Numerous other animals are expected to occur at the site but were not observed during the reconnaissance.

Table 3. Summary of Wildlife Observed on the Study Area

<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>
Birds		
<i>Cathartes aura</i>	turkey vulture	None
<i>Buteo jamaicensis</i>	red-tailed hawk	None
<i>Corvus corax</i>	common raven	None
<i>Amphispiza bilineata</i>	Black-throated sparrow	None
<i>Zenaida macroura</i>	Mourning dove	None
<i>Eremophila alpestris</i>	Horned lark	None
<i>Zonotrichia leucophrys</i>	White-crowned sparrow	None
Reptiles		
<i>Dipsosaurus dorsalis dorsalis</i>	desert iguana	None
<i>Callisaurus draconoides rhodostictus</i>	zebra-tailed lizard	None
<i>Uta stansburiana elegans</i>	Western side-blotched lizard	None
<i>Aspidoscelis tigris</i>	Great Basin whiptail	None
Mammals		
<i>Ammospermophilus leucurus</i>	White-tailed antelope ground squirrel	None
<i>Lepus californicus</i>	Black-tailed jackrabbit	None
<i>Vulpes macrotis</i>	Desert kit fox	None
<i>Perognathus longimembris</i>	Little pocket mouse	None
<i>Chaetodipus formosus</i>	Long-tailed pocket mouse	None
<i>Dipodomys panamintinus</i>	Panamint kangaroo rat	None

2.6 Special-Status Species

A literature analysis of species listed under the Endangered Species Act (ESA) or listed as “sensitive” by the U.S. Bureau of Land Management (BLM) was conducted. All endangered and threatened species at a federal level would be considered sensitive species under the BLM. There are 11 special-status species that have a potential to occur at the site including 5 plant species and 6 wildlife species (CDFW 2022a; CDFW 2022b; CNPS 2022). The study area is not within any designated or proposed USFWS Critical Habitat units) for any plant or animal species, however,

critical habitat for the desert tortoise is adjacent to the site to the east, south, and west (USFWS 2022b).

Special-Status Plants

A botanical field survey was conducted over three days in late-April and early-May of 2022 (South Environmental 2022c) and resulted in the identification of 40 plant taxon made up primarily of shrubs and annual herbs. Of the 40 plants identified, none of them were assessed as special-status (listed or BLM-sensitive) plants and therefore are not protected as threatened or endangered under the U.S. or California ESA. In sum, over the course of a three-day botanical survey, South Environmental did not detect any BLM-sensitive or state or federal threatened or endangered plant species (South Environmental 2022b).

Special-Status Wildlife

There are six special-status wildlife species known to occur in the region of the project site and assessment of potential to occur on the study area are presented in Appendix B. Based on focused survey conducted on the project site and immediate areas, federally threatened desert tortoise (*Gopherus agassizii*) has one active burrow just outside the project site and is expected to occur on the project site. In addition, protocol surveys for BLM sensitive Mojave ground squirrel (*Xerospermophilus mohavensis*) is known to occur on the southwestern portion of the project site but was not observed in the northern portions of the project site. The BLM sensitive prairie falcon (*Falco mexicanus*) has been observed within one-mile of the site and could potentially forage in the area. Since it requires cliffs for breeding and there are no cliffs on the site, it is highly unlikely the species would nest there (CDFW 2022a).

Desert Tortoise

The desert tortoise is listed as a threatened species at a federal and state level. According to the CNDDDB, the species is "most common in desert scrub, desert wash, and Joshua tree habitats; occurs in almost every desert habitat. Requires friable soil for burrow and nest construction. Creosote bush habitat with large annual wildflower blooms preferred" (CDFW 2022a, CDFW 2022b).

The northern portions of the project site was surveyed for desert tortoise in October of 2021 and the southern portions in late-April and early-May of 2022. As shown in Figure 4, a Class 1 active desert tortoise burrow was observed in an area just outside the project site to the northeast in October 2021, and a Class 2 inactive desert tortoise burrowing was observed on the project site in May 2022. A Class 1 burrow is characterized as "currently active, with desert tortoise or recent desert tortoise sign." There was also desert tortoise signs in the form of recent scat observed near

the Class 1 burrow. The second survey conducted in early Spring of 2022 resulted in the observance of one potential desert tortoise burrow. The data from the two surveys which included the presence of active or recently used burrows indicates that desert tortoise occurs on the site at least for foraging and dispersal, but no active burrows are on the project site (South Environmental 2022a; South Environmental 2022b).

Mojave Ground Squirrel

The Mojave ground squirrel is a BLM-sensitive species that is listed as threatened at the state but not the federal level. According to the CNDDb, the species inhabits "open desert scrub, alkali scrub and Joshua tree woodland. Also 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" (CDFW 2022a; CDFW 2022b)

A protocol-level survey was conducted for the Mojave ground squirrel on the northern portion of the site in 2021 (Phoenix Biological Consulting 2021) and in the southern portion of the site in April 2022 (Dipodomys 2022). Both surveys included live-trapping and wildlife camera trapping. No Mojave ground squirrels were trapped during the protocol survey conducted in 2021 and Mojave ground squirrel is considered absent from the northern half of the project site.

One Mojave ground squirrel was live-trapped on April 15, 2022 off the project site between the east and west sections, confirming presence of the species on the southwestern portions of the project site as they use a large area for foraging. A habitat assessment showed that the site has numerous food plants and substrates suitable for MGS. The two main food plants normally associated with Mojave ground squirrel presence are winterfat and spiny hopsage and both were observed on the site. Other plants also known to provide forage for MGS were also observed including creosote bush, Anderson's boxthorn, Cooper's boxthorn, fiddleneck, Parry's buckwheat, and red-stemmed filaree (Dipodomys Ecological Consulting 2022).

2.7 Hydrology and Jurisdictional Features

The project site is within the Coyote-Cuddeback Lakes Hydrologic Unit and the Town of Atolia sub-watershed. Based on the literature search and reconnaissance there are water resources on the project site classified as a "Riverine, intermittent, streambed, intermittently flooded (R4SBJ)". The resource is characterized as channelized streambeds that are flooded from time to time (i.e., ephemeral) (USFWS 2022b). During the field visits by South Environmental several areas with shallow, dry, ephemeral stream channels were observed. These water resources originate on the site and end at Cuddeback Lake, a dry lake 6-miles east of the project site. Cuddeback Lake is not waters of the US because it is an isolated basin with no connection to the Mojave or Colorado

Rivers. Therefore, the dry, ephemeral washes on the project site lack downstream connection to a federal water of the US. No federally protected jurisdictional features occur on the project site.

2.8 Habitat Linkages and Wildlife Migration Corridors

The project site does not form part of a federal or state designated wildlife movement corridor or habitat linkage. Furthermore, it is not located within a habitat "Landscape Block" or "Linkage Design" as established by the SC Wildlands (SC Wildlands 2008). However, the tract of land does form part of a large contiguous area of undeveloped native desert habitats that provide wildlife movement opportunities and habitat linkages for a variety of wildlife. And there is designated desert tortoise "Critical Habitat" pursuant to the U.S. and California ESA adjacent to the site and surrounding the site. Also adjacent to the site is a BLM-designated desert tortoise "Area of Environmental Critical Concern" (ACEC). While the CNDDDB does not have any specific records for desert tortoise on the study area, the Fremont-Stoddard area encompasses the study area, and this area has one of the largest historical populations of desert tortoise in the state. Because of the observed desert tortoise signs on the site and the history of its presence in the area, it is certain that desert tortoise use the site as a movement corridor or habitat linkage within and adjacent to critical habitat. Other animals, including the Mojave ground squirrel, would also use the site to move within the large contiguous tract of undeveloped land. Based on the project site's position surrounded by protected, undeveloped areas of pristine desert scrub, the project site is part of a habitat linkage and migration corridor for the wildlife in the region.

3. Impacts Analysis

For the purposes of this report, impacts to protected biological resources are analyzed within the context of the regulatory setting. Below is an overview of the federal and state regulations pertaining to protected biological resources on the study area, and an analysis of impacts to those resources that may occur as a result of the proposed development follows.

3.1 Regulatory Setting

Federal Regulations

National Environmental Policy Act

The National Environmental Policy Act or NEPA was promulgated in 1969 and serves as the overarching legislation governing environmental protection in the U.S. It was formulated to “foster the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” NEPA sets up a system environmental review of federal projects using an “environmental assessment” and/or “environmental impact statement” as the central mechanism to aid decision-makers at a federal, state, and local level to make determinations about a federal development project and its potential harm to the environment. Project assessment considers the applicability of other federal, state, and local legislation with the goal being a complete, multi-faceted approach that involves all relevant stakeholders in the process of development and environmental protection. In considering the effects of a project on the environment, NEPA considers both beneficial and adverse, and long-term effects on the environment. The analysis of a project includes selection of a federal lead agency to direct the process and make important decisions regarding environmental impact. With an environmental assessment, the analysis may result in a declaration of “no significant impact” whereby there is no further assessment of potentially detrimental impacts to the environment from the project. If an impact is likely, the NEPA assessment will trigger a next level analysis being an environmental impact statement.

Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as “any species which is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range.” Under provisions of Section 9(a)(1)(B) of the FESA, unless properly permitted, it is unlawful to “take” any listed

species. "Take" is defined in Section 3(18) of FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the USFWS, through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action which could affect a federally listed plant or animal species, the property owner and agency are required to consult with USFWS pursuant to Section 7 of the FESA if there is a federal nexus, or pursuant to Section 10 of the FESA. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects individuals as well as any part, nest, or eggs of any bird listed as migratory. In practice, federal permits issued for activities that potentially impact migratory birds typically have conditions that require pre-disturbance surveys for nesting birds. In the event nesting is observed, a buffer area with a specified radius must be established, within which no disturbance or intrusion is allowed until the young have fledged and left the nest, or it has been determined that the nest has failed. If not otherwise specified in the permit, the size of the buffer area varies with species and local circumstances (e.g., presence of busy roads, intervening topography, etc.), and is based on the professional judgment of a monitoring biologist. A list of migratory bird species protected under the MBTA is published by USFWS.

State Regulations

California Endangered Species Act

The California ESA mirrors the main tenets of the U.S. ESA with a few exceptions and is legislated through the Fish and Game Code, chapter 1.5, sections 2050-2115.5. One major difference is that under the California ESA, a species can be a "candidate" species for listing, a category that does not exist under the U.S. ESA. Similar to the U.S. ESA, Section 2080 of the Code prohibits the "import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species." The idea of "take" in terms of listed species is defined in Section 2086 of Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." In contrast to the U.S. ESA, the Code does not include the idea of "harass" or "harm" in the definition of take. The U.S. ESA uses Habitat Conservation Plans (HCPs) whereas the California ESA uses "Natural Community Conservation Planning (NCCP). Central tents of an NCCPS are to "promote coordination, effectively address cumulative impact concerns, and promote conservation of un-fragmented habitat areas, promote multispecies and multi-habitat management". Importantly, if a species is listed both under the U.S. ESA and the California ESA, a

“consistency determination” can be requested to the California Department of Fish and Wildlife requesting that the federal “take” complies with the California “take” regulations which would effectively avoid further deliberations for the take under the California ESA.

3.2 Project Impacts

Impacts to Plant Communities and Habitats

The entire project site consists of Creosote Bush Scrub. This is an upland desert scrub community where shrubs and annual herbs dominate with no trees and a lesser presence of perennial herbs. The plant community supports the desert tortoise and Mojave desert squirrel which are BLM sensitive species, and the desert tortoise is listed as threatened under the U.S. and California Endangered Species Act (ESA) and the Mojave ground squirrel is listed as threatened under the California ESA (CDFW 2022a).

The project will result in the destruction or alteration of habitat for both of the desert tortoise and Mojave ground squirrel. The development of mining infrastructure will impact the entire project site (129-acres) in one form or another through the development of roads, utilities infrastructure (electricity and water), mine shafts, mining infrastructure, and tailings areas. Other impacts could be the increased presence of vehicles and equipment. The loss of the habitat for these species would have an undeniable impact on them in both the short and longer term. The habitat here is fairly high-quality with relatively little development, human presence, or invasive plants or animals. It is also adjacent to desert tortoise “critical habitat” as established under the U.S. ESA (USFWS 2022a) and therefore provides habitat linkages to an area that has a considerable abundance of desert tortoise habitat and is highly important for the future survival of the species. And it is adjacent to an Area of Critical Environmental Concern for the desert tortoise. There is no data on the past presence of the Mojave ground squirrel in relation to the project site, but the capture of one individual is a clear indication of its presence. In addition, the habitat on the site was characterized as high value for Mohave ground squirrel.

Recommendations BIO-1 and BIO-2 below includes permitting under the U.S. and/or California ESA for incidental take of the desert tortoise and Mojave ground squirrel in terms of construction impacts, loss of habitat and/or burrows, and measures to mitigate for the incidental take (see below).

Impacts to Desert Tortoise

Over the course of two surveys on the project site there were several signs of desert tortoise including an active burrow just outside the project site, which confirms its presence and use on the project site. The desert tortoise is a BLM-sensitive species and is listed as threatened under the

U.S. and California Endangered Species Act. It is possible that the species when traversing above ground would be directly killed or injured by construction activity and desert tortoise are known to take refuge under vehicles and can be crushed if not detected and removed from the vehicle area and roadway. Compaction or trampling of the soil around or directly over the desert tortoise burrow could result in death or injury to the animal.

There are also indirect ways in which the species could be injured or impacted. If the species was forced to abandon its burrow because of noise and vibration from construction, it could become stressed making it more vulnerable to predation or disease. The desert tortoise might seek a new burrow during which it could be attacked by a predator like a kit fox or it could use a relatively large amount of energy and water while looking for a burrow which could weaken it leading to disease or predation.

Injury or death of the desert tortoise by any manner as a result of construction activity on the site would be considered a "take" under the U.S. and California ESA. Under the U.S. ESA, the term "take" in terms of a threatened or endangered species means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Direct or indirect harm as discussed above (e.g., trampling, or stress-related) to the species would be considered a "take" under the California and U.S. ESA. Furthermore, the destruction of habitat, even if it can't be directly linked to killing or harming the desert tortoise, is also often considered to be a form of "take" by the state. Application for an "incidental take" permit issued by the USFWS and the CDFW in this case would be necessary to mitigate for direct or indirect damage to the desert tortoise from the project. The application for the permit should include mitigation measures including fencing and monitoring measures during construction and operation of the mine. **Recommendation BIO-1** in Section 4 recommends a permitting per the U.S. and California ESA for incidental take of the desert tortoise and additional mitigation measures to avoid take during the construction and operation phases.

Impacts to Mojave Ground Squirrel

The Mojave Ground Squirrel was trapped off-site in the area between the east and west project sites. Therefore, the species is considered present throughout the southern areas of the project site. There exists the potential that the species is killed or injured above ground or it's burrows damaged or destroyed from any number of construction activities including vegetation removal or drilling, vehicle or equipment movement, and drilling. The species would also be open to injury or death if forced to abandon its burrow because of noise or vibration from construction, in which case it could become stressed and more vulnerable to predation or disease.

Injury or death of the Mojave ground squirrel or destruction of occupied burrows by any manner as a result of construction activity on the site would be considered a "take" under the California

ESA. Furthermore, the destruction of habitat is also often considered to be a form of “take”. Application for an “incidental take” permit issued by the CDFW in this case would be necessary to mitigate for direct or indirect damage to the Mohave ground squirrel from the project. The application for the permit should include mitigation measures including fencing and monitoring measures. **Recommendation BIO-2** in Section 4 recommends an incidental take permit be obtained from CDFW for take of the Mojave ground squirrel.

Impacts to Nesting Birds and Raptors

The proposed development would require potential removal of shrubs and herbaceous plants that could provide potential nesting habitat for birds including migratory species and raptors protected by the U.S. Migratory Bird Treaty Act (MBTA). If present at the time of vegetation removal, active nests, eggs, or young could be destroyed or otherwise disturbed to a point at which the young do not survive, which would be a violation of the MBTA. In addition, indirect impacts from noise or vibration has the potential to disturb an active bird nest that may occur on site or on adjacent landscaping to the point of failure, and this would also be a violation of the MBTA. To avoid impacts to active bird nests, eggs, or young, mitigation measures are recommended including delaying vegetation removal until after the nesting season and preconstruction nest surveys. **Recommendation BIO-3** in Section 4 indicates measures to avoid impacts to active bird nests, eggs, or young, including preconstruction nesting bird surveys and monitoring as required by the MBTA.

Impacts to Jurisdictional Resources

The dry, ephemeral washes on the project site are not waters of the US and therefore, no waters of the US would be impacted by the project.

Impacts to Wildlife Movement Corridors and Habitat Linkages

As discussed, the tract of land does form part of a large contiguous area of undeveloped native habitats that provide wildlife movement opportunities and habitat linkages for a variety of wildlife. And adjacent to the site is designated desert tortoise “Critical Habitat” pursuant to the U.S. and California ESA (USFWS 2022a) and a BLM-designated desert tortoise ACEC. Because of the observed desert tortoise signs on the site and the history of its presence in the area, it is certain that desert tortoise use the site as a movement corridor or habitat linkage. Other animals, including the Mojave ground squirrel, would also use the site to move within the large contiguous tract of undeveloped land.

The potential impacts to wildlife movement corridors and habitat linkages includes negative impacts to wildlife movement from vibration, noise, lighting, and fencing or equipment used

during construction and operation of the mine. In general, these factors could deter wildlife from using an area they are habituated to using which could stress them. **Recommendation BIO-4** in Section 4 includes mitigation for these potential impacts such as limiting work to daylight hours, avoiding using lights at night, and placing fencing (such as desert tortoise fencing) so it won't hurt wildlife or obstruct wildlife movement on the project site.

4. Recommendations

Recommendation BIO-1 : Desert Tortoise Take Permit and Mitigation Measures

- To comply with the ESA and the CESA, the applicant shall prepare and submit an Incidental Take Permit application to the CDFW for take of desert tortoise, and shall prepare a Biological Assessment and complete a Section 7 Consultation with the USFWS and BLM and receive a Biological Opinion for take of desert tortoise. The Authorized Biologist shall be onsite during desert tortoise exclusion fencing installation. The Biologist shall administer the Worker Environmental Awareness Program (WEAP) to construction personnel and report project mitigation activities to USFWS, BLM, and CDFW. The Authorized Biologist shall have the authority to stop work if work activities threaten sensitive biological resources.

Construction Phase General Biological Conditions of Approval

- An Authorized Desert Tortoise Biologist shall be retained to assist with construction and operation of the project. The Authorized Biologist shall be approved by the USFWS and shall be experienced and knowledgeable with monitoring projects with desert tortoise and Mohave ground squirrel.
- The perimeter of the project site shall be fenced with permanent desert tortoise exclusion fencing built per the guidelines in Chapter 8 of the USFWS Desert Tortoise Manual. The fencing installation shall be done by a contractor with prior experience building desert tortoise exclusion fencing. The installation of the fencing shall be monitored by the Authorized Biologist until completed. There are 2 options for fencing:
 - Permanent perimeter fencing surrounding the entire mining site can be installed below grade. The fencing shall be monitored daily during the first week after installation, and then weekly for the next 2-month period. Long-term monitoring of the fencing during operation of the mine should be done a minimum of once every month and after significant rain events (0.25-inches). If the fencing becomes damaged it should be repaired within 24-hours of the observation.
 - Temporary fencing surrounding a smaller temporary work area can be installed around the immediate work area and equipment staging and can be moved to new location as the mining operation moves to new mining locations. The fencing can be folded as shown in Chapter 8 of the Desert Tortoise Manual and does not need to be installed permanently below the ground. The fencing should be monitored

for breaks every day during mining operations and any breaks or maintenance shall be performed within 24-hours of the damage.

- A protocol level Desert Tortoise Clearance Survey shall be conducted within the fenced areas following the installation of the desert tortoise exclusion fence. The survey shall be conducted according to Chapter 6 of the Desert Tortoise Field Manual. If tortoises are found within the fenced area they should be moved to an area outside of the fencing, either passively by creating an opening in the fencing and letting the tortoise move out of the fenced area, and then closing the fence. Or, the tortoise can be moved by the Authorized Biologist. Note that moving tortoises out of the fenced area is considered "take" and should be covered by an Incidental Take Permit and/or Biological Opinion. If desert tortoise is observed in the fenced area during operation of the mine or there are long-term gaps in the fence, another clearance survey should be conducted throughout the entire fenced project site.
- There should be one gate entrance for the fenced area where vehicles and equipment can enter the fenced area. This can be achieved with either a cattle-grate style opening (for permanent fencing) or a gate constructed by desert tortoise exclusion fencing that is opened and closed each time a vehicle passes through (for temporary fencing).
- Best Management Practices (BMPs) should be employed during construction and operation of the project, including but not limited to a 10 mph speed limit, parking in areas where vegetation would be avoided, checking under trucks and equipment for desert tortoise before moving it, minimizing standing water, removing garbage and having closed-top and raven-proof trash containers.
- Worker Environmental Awareness Program (WEAP) shall be prepared by the applicant, and all construction personnel, mine operators, and contractors shall be required to attend a WEAP training prior to start of construction and operation of the mine. The training shall be approved by the CDFW and USFWS and shall include a review of the sensitive species on the site and their legal status and the measures to be implemented for mitigation and avoidance of impacts. A record of all trained personnel shall be maintained on-site.
- Monitoring reports shall be prepared monthly and annually during fencing and construction phase, and shall be completed quarterly and annually during operation to inform USFWS and CDFW of the monitoring efforts of the fencing and any maintenance performed.
-

Recommendation BIO-2: Mohave Ground Squirrel Take Permit and Mitigation Measures

- The applicant shall prepare and submit an Incidental Take Permit to the CDFW for the impacts to Mohave Ground Squirrel on the southern half of the project site. The application shall include an analysis of whether and to what extent the proposed project could result in the taking of the species, an analysis of whether the issuance of the take permit would jeopardize the continued existence of the species, minimization and mitigation measures, a monitoring plan to monitor compliance with the measures and the effectiveness of the measures, and a description of the funding sources and level of funds available for implementation of the conditions of approval.
- To offset the impacts to approximately 64-acres (the southern half of the project site) of occupied Mohave ground squirrel habitat, Mitigation Credits shall be purchased at a 1:1 ratio. The Credits shall include occupied habitat that is equal to or better than the quality of habitat on the project site. The credits shall be purchased from an approved mitigation bank.

Recommendation BIO-3: Nesting Bird Surveys

- If possible, ground disturbing activities and vegetation removal associated with the fence installation or construction of the mine should be timed to occur between September 1 – January 31, which is outside the bird and raptor nesting season.
- If ground disturbing activities or vegetation removal are scheduled between February 1 – August 31, which is the bird nesting season, a preconstruction survey for nesting birds should be conducted within 72 hours prior to construction activities. The survey should be conducted by a qualified biologist with prior experience conducting nesting bird surveys for construction projects. The study area should include the affected area and suitable habitat within a 500-foot buffer, or a buffer size determined by the qualified biologist based on level of proposed disturbance and access. If no active nests are found, no additional measures are required.
- If active nests are found the biologist will map the location and document the species and nesting stage. A no-work buffer will be established around the active nest as determined by the qualified biologist and based on the species sensitivity to disturbance and the type and duration of the disturbance. No construction activities shall occur within the no-work buffer until the biologist has determined the nest is no longer active.

Recommendation-4: Fencing, Lighting, and Noise

- Night work shall be performed under lights that are pointed directly down at the work area and area shaded on the back side to avoid light pollution in the desert. Night work shall minimize the noise and vibration and should only include small mining operations with a single light source and shaded lights.
- The desert tortoise exclusion fencing shall be built according to the approved guidelines in Chapter 8 of the USFWS Desert Tortoise Manual and shall not restricts movement of other wildlife. No additional fencing or barriers shall be construction for the project.

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Appendix A

Photograph Log



Image 1. View of creosote bush scrub habitat in the western survey area.



Image 2: View of channel in dry wash on western survey area.



Image 3: View of creosote bush scrub habitat in eastern survey area.

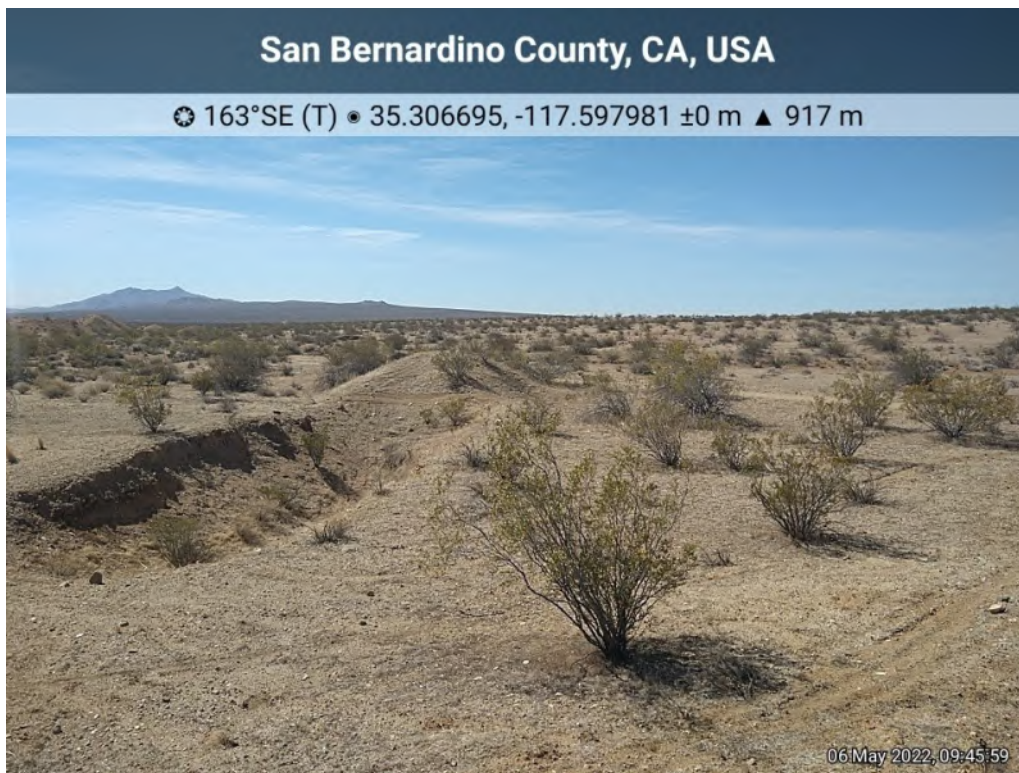


Image 4: View of creosote bush scrub habitat in eastern survey area and an old mining pit in photo.

Appendix B

Special-Status Species Analysis

Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated developments. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as special-status based on adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Special-status species include:

- Plants or wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the federal Endangered Species Act or the California Endangered Species Act;
- Plants or wildlife that meet the definitions of rare or endangered under CEQA Guidelines Section 15380.
- Plants or wildlife covered under an adopted NCCP/HCP;
- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered (List 1A, 1B and 2 plants) in California;
- Plants listed by the CNPS as plants in which there is limited information about distribution (List 3);
- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.);
- Wildlife designated by CDFW as species of special concern;
- Wildlife "fully protected" in California (California Fish and Game Code Sections 3511, 4700, and 5050); and
- Wildlife protected by the Migratory Bird Treaty Act (MTBA).

Federally-Protected Status

All references to Federally-protected species in this BRA include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment the following acronyms are used for Federal status species, as applicable:

FE	Federally-listed as Endangered
FT	Federally-listed as Threatened
FPE	Federally proposed for listing as Endangered
FPT	Federally proposed for listing as Threatened
FPD	Federally proposed for delisting
FC	Federal candidate species (former C1 species)

State-Protected Status

For the purposes of this BRA, the following acronyms are used for State status species, as applicable:

SE	State-listed as Endangered
ST	State-listed as Threatened
SR	State-listed as Rare
SCE	State candidate for listing as Endangered
SCT	State candidate for listing as Threatened
SFP	State Fully Protected
SSC	California Species of Special Concern

California Rare Plant Rank

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of special-status species in California. CNPS has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California (CNPS 2018). The list serves as the candidate list for listing as Threatened and Endangered by CDFW. CNPS has developed six categories of rarity known as the California Rare Plant Rank (CRPR), of which Ranks 1A, 1B, 2A, and 2B are particularly considered sensitive:

Rank 1A	Presumed extinct in California.
Rank 1B	Plants Rare, Threatened, or Endangered in California and elsewhere.
Rank 2A	Presumed extinct in California, but more common elsewhere.
Rank 2B	Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
Rank 3	Plants about which we need more information – a review list.
Rank 4	Plants of limited distribution – a watch list.

The CNPS recently added “threat ranks” which parallel the ranks used by the CNDDDB. These ranks are added as a decimal code after the CNPS List (e.g., Rank 1B.1). The threat codes are as follows:

- .1 Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat);
- .2 Moderately threatened in California (20-80% occurrences threatened);
- .3 Not very threatened in California (<20% of occurrences threatened or no current threats known).

Potential to Occur Assessment

Special-status species that **present** or are **likely** (high or medium potential) to occur within the parcel are based on one or more of the following:

- the direct observation of the species within the parcel during any field surveys;
- a record reported in the CNDDDB; and
- the parcel is within known distribution of a species and contains appropriate habitat.

Special-status species that are **unlikely** (low potential) to occur are based on one of the following:

- the parcel has the general habitat types but lacks necessary habitat elements such as suitable microhabitat or soils; or
- the parcel is outside the known elevation range or distribution of the species, and has otherwise suitable habitats;

Special-status species that have no potential to occur on the parcel are labeled as **none** due to the absence of suitable habitat.

Special-Status Plants

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming period	Low Elevation (ft)	High Elevation (ft)	Habitat	Microhabitat	Potential to Occur
<i>Cryptantha clokeyi</i>	Clokey's cryptantha	1B.2	None	None	Apr	2380	4480	Mojavean desert scrub		Low: The survey site has Mojavean desert scrub; there is only one occurrence of the species according to the CNDDDB in the immediate area.
<i>Cymopterus deserticola</i>	desert cymopterus	1B.2	None	None	Mar-May	2065	4920	Joshua tree "woodland", Mojavean desert scrub	Sandy	Low: The survey site has Mojavean desert scrub and is sandy; there is only one occurrence of the species according to the CNDDDB in the immediate area.
<i>Eriophyllum mohavense</i>	Barstow woolly sunflower	1B.2	None	None	Mar-May	1640	3150	Chenopod scrub, Mojavean desert scrub, Playas		Medium. The survey site has Mojavean desert scrub; according to the CNDDDB the species has occurred in several places in the immediate area.
<i>Erythranthe rhodopetra</i>	Red Rock Canyon monkeyflower	1B.1	None	None	Mar-Apr	2000	3000	Mojavean desert scrub	Sandy, Washes	Low. The survey site has Mojavean desert scrub; however,

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming period	Low Elevation (ft)	High Elevation (ft)	Habitat	Microhabitat	Potential to Occur
										there is only one occurrence of the species according to the CNDDDB in the immediate area.
<i>Eschscholzia minutiflora</i> ssp. <i>twisselmannii</i>	Rock poppy	1B.2	None	None	Mar-May	2230	4035	Mojavean desert scrub		Medium. The survey site has Mojavean desert scrub; according to the CNDDDB the species has occurred in several places in the immediate area.

Special-Status Animals

Scientific Name	Common Name	Taxonomic Group	Federal Listing	State Listing	Other Status	General Habitat	Microhabitat	Potential to Occur on Study area
<i>Antrozous pallidus</i>	pallid bat	Mammals	None	None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low: The site is in a desert; however, it lacks large rocky areas and the species has not been observed in the immediate area.
<i>Aquila chrysaetos</i>	golden eagle	Birds	None	None	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected CDFW_WL-Watch List IUCN_LC-Least Concern	Rolling foothills, mountain areas, sage-juniper flats, and desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	None: The site lacks cliff-walled canyons and large trees that the species requires for nesting.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	Mammals	None	None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	None: There are limited walls and ceilings in the abandoned mine equipment; however, the site is not mesic and the species has not been observed in the immediate area.
<i>Falco mexicanus</i>	prairie falcon	Birds	None	None	CDFW_WL-Watch List IUCN_LC-Least Concern	Inhabits dry, open terrain, either level or hilly.	Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	None: There are no cliffs on the site for breeding/nesting, although there would be cliffs in the mountains nearby. Thus, the species could forage on

Scientific Name	Common Name	Taxonomic Group	Federal Listing	State Listing	Other Status	General Habitat	Microhabitat	Potential to Occur on Study area
								the site. The species has been little observed in the immediate area.
<i>Gopherus agassizii</i>	desert tortoise	Reptiles	Threatened	Threatened	BLM_S-Sensitive IUCN_CR-Critically Endangered	Most common in desert scrub, desert wash, and Joshua tree habitats; occurs in almost every desert habitat.	Require friable soil for burrow and nest construction. Creosote bush habitat with large annual wildflower blooms preferred.	Present on site
<i>Xerospermophilus mohavensis</i>	Mohave ground squirrel	Mammals	None	Threatened	BLM_S-Sensitive IUCN_NT-Near Threatened	Open desert scrub, alkali scrub and Joshua tree woodland. Also 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.	Present on site

Appendix C

Biologist Qualifications

EDUCATION

B.S., Wildlife Ecology, University of Wisconsin-Madison, 2004

CERTIFICATIONS

Certified Wildlife Biologist, The Wildlife Society 2014

ISA Certified Arborist (WE-12564A) 2019

Certified Technical Service Provider (TSP) for Fish and Wildlife Management Plans, USDA NRCS 2017

Authorized Desert Tortoise Biologist – Numerous BOs

Unmanned Aircraft System Pilot Certification, FAA #4177603

TRAINING

Wetland Delineation Training Course – The Wetland Institute (2014)

Southwest Willow Flycatcher Workshop, 2017

USGS Desert Tortoise Health Assessment and Tissue Collection Techniques Training, 2009

Matthew South

PRINCIPAL BIOLOGIST

Matthew South founded South Environmental in 2018. He is a certified wildlife biologist and certified arborist with 17 years of professional experience providing natural resources consulting services for a wide variety of clients that include residential, commercial, government, utility, infrastructure, research, and non-profit projects. For the last 13 years, Mr. South has been an environmental consultant in southern California acting as a Wildlife Biologist and Geographic Information System (GIS) Analyst. In early 2018 he started South Environmental and has since been supporting clients in Los Angeles, San Bernardino, and Riverside Counties.

Mr. South's background in ecology has led to a passion for conservation planning and resources assessments for the purpose of preservation and management. The integration of the latest technologies such as advanced GIS systems, mobile computing, and drone sensing allows him to innovate new data collection, analysis, and collaboration tools for the environmental sciences that produce more accurate data and better-informed resource managers.

EXPERTISE

- **Conservation and Management Planning.** Mr. South's has extensive experience preparing mitigation and monitoring plans, habitat conservation plans, and technical biological resources management plans that are compliant with federal, state, and local regulations. Mr. South is the only active NRCS TSP for Fish and Wildlife Plans Certified in California.
- **Biological Resources Assessment.** Mr. South has completed dozens of biological resources assessments throughout southern California.
- **Rare Plants and Arborist Services.** Mr. South has surveyed and assessed thousands of native and landscaped trees in southern California. He is a certified arborist with 5-years of tree survey experience working closely with some of the most experienced arborists in California. In addition, he has performed hundreds of hours of rare plant surveys and habitat assessments.
- **Wetland & Jurisdictional Delineations.** Mr. South has conducted dozens of jurisdictional and wetland delineations per the guidelines and methods from the US Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and the state Regional Water Quality Control Boards (RWQCB).
- **GIS.** Mr. South is an expert at spatial data collection and analysis using ESRI mobile and desktop software products and Trimble hardware.

SELECT PROJECT EXPERIENCE

Southern California Edison (SCE) As-Needed Natural and Cultural Resources Services (2021-ongoing).

As a subconsultant on this contract for multiple Primes (SWCA, EI, Rincon, Cardno, and ERM), South Environmental has focused its biological resources services on wetland delineations and permitting efforts for SCE throughout all its regions. From single pole delineations in roadside ditches to several hundred poles through miles of wet meadows in the Sierras, the projects vary in size and complexity as well as location. Primarily, delineations have been in the Sierras with the largest and most complex projects in Inyo and Mono Counties and several in Kern and Tulare. A few of the specific projects include

- Pickle Meadow: Aquatic Resources Delineation Report and Permitting for 300-poles located in a wet meadow behind Bridgeport Reservoir.
- Kern River: Wetland Delineation and Permitting for 15 pole replacements in Kernville.
- June Lake to Tom's Place: Wetland Delineation and Permitting for 40 poles spread through Inyo and Mono Counties.
- Cajon Wash: Jurisdictional Delineation and SBKR Assessment and Permitting for 10 pole replacements and realignment for a capital project located in SBKR Critical Habitat.
- Pipes Wash: Delineation and Permitting for 25-poles that are within Pipes Wash, a large ephemeral wash in the San Bernardino desert.

Southern California Gas (SCG) As-Needed Natural and Cultural Resources Services (2022-ongoing).

As a subconsultant on this contract Mr. South has overseen the assessment numerous resources from single point locations to many miles of pipelines. More recently he has begun to conduct biological assessment in the coastal zone in Santa Barbara County as well as endangered species Biological Assessments (BAs) in support of Coastal Development Permits for SCG. Wetland delineation and permitting, biological resources assessments, and resources surveys and monitoring are services that Mr. South both provides personally and oversees a team of specialists that support the environmental impacts analysis and permitting for SCG.

California Department of Water Resources (DWR) As-Needed Environmental Compliance Services (2012-2018).

As part of this contract while employed at another firm, Mr. South prepared conservation and biological resources planning documents as well as oversaw the implementation and compliance components of these documents. Most notably, Mr. South was the lead avian biologist for the billion-dollar Perris Dam Remediation Project where he prepared Avian Protection and Avoidance Plan, Feral Hog Management Plan, negotiated environmental mitigation and compensation with both the USFWS and CDFW biologists, conducted protocol surveys for endangered species such as least Bell's vireo, and oversaw the compliance monitoring efforts for the entire 5-years of project construction.

Los Angeles County Flood Control District and Department of Public Works As-Needed Environmental Compliance Services (2014-2018).

As part of this contract while employed at another firm, Mr. South conducted dozens of biological resources assessments, focused surveys for special-status species, and monitored compliance for a wide variety of water infrastructure project. Notably, Mr. South was the lead biologist for the Eaton Dam Maintenance Projects and for a variety of vegetation management programs within sensitive waterways.



EDUCATION

-MSc, Environmental Sciences and Policy, The Johns Hopkins University

-BA, International Studies, University of Colorado, Boulder

SKILLS

- ESRI ArcGIS Desktop
- Trimble GPS
- Plant identification using dichotomous keys and regional literature
- Application of prominent plant data collection techniques
- Collection, analysis, and presentation of field data
- Statistical modeling and descriptive summaries

TRAINING

- Identification of plant communities with taxonomic keys, Malheur National Forest, 2019
- Ecological restoration of riparian ecosystems, Malheur National Forest, 2019
- Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation, Ochoco National Forest, Prineville, OR, 2019
- Identification of common range grasses, Flagstaff, AZ, 2019

Scott Altmann

SENIOR BOTANIST & ECOLOGIST

Scott Altmann is a Senior Botanist and Ecologist with 23 years of professional experience. He has a high degree of expertise in plant identification using dichotomous keys and has extensive experience identifying rare and at-risk plants in remote field locations using regional plant guides. Much of his experience was gained in Chile where he worked as a freelance and contract research botanist, ecologist, and conservation biologist for over 13 years in collaboration with local universities, government agencies, and botanical gardens. More recently, Mr. Altmann has worked as a botanist to promote conservation of rare and at-risk species for the US Forest Service. For the past year he has worked for South Environmental working closely with large clients such as Southern California Edison (SCE) and private developers on Biological Resources Assessments, impacts analysis, and regulatory permitting.

Mr. Altmann is currently a senior biologist and ecologist with South Environmental with responsibilities including assessing project regulatory settings, developing an impacts assessment and mitigation approach for projects, and then prepares resources assessment reports, impacts analysis, mitigation and monitoring plans, and permitting documents for major utility projects and for large and small developers. Assessments performed are for protected trees, special-status plants and animals, sensitive natural communities, wetlands and jurisdictional delineations, and sensitive habitats.

Mr. Altmann is an expert at assessing projects according to local and regional, state, and federal laws, including experience in Los Angeles City and County, Ventura County, Orange County, San Bernardino, Riverside, Mono, Inyo, and Santa Barbara. He is familiar with the California Coastal Act and has a variety of experiences working in the coastal zone and with various Local Coastal Programs (LCPs). His experience assessing the regulatory setting for projects allow him to assess potential impacts within a variety of situations and land use types, and he can better assist clients with resources that span multiple jurisdictions and that have a variety of different biological resources that could be impacted.

Mr. Altmann has several publications in peer-reviewed scientific journals and has edited hundreds of technical documents and journal articles. He is a Journal Referee for several prominent scientific journals including Journal of Ecology, Plant Ecology, Annals of Botany, and New Zealand Journal of Botany.

SELECT PROJECT EXPERIENCE

SCE On-Call Biologist – Throughout California (2021-present). Conducts wetland delineations, rare plant surveys, and prepares reports and permitting documents for SCE deteriorated poles and for larger scale projects as needed. Work has been completed in several counties throughout California including Santa Barbara, Ventura, Los Angeles, Riverside, San Bernardino, Mono, Kern, Tulare, and Inyo.

Biological Resources Assessments for dozens of clients (2021-present). Scott is the lead biologist and main author for dozens of Biological Resources Assessment for projects that follow strict reporting guidelines such as the City of Los Angeles, the Western Riverside County MSHCP, and the City of Malibu Local Coastal Program.

Rice Canyon Access Road Project – East Valley Municipal Water District (2021-present). Scott is the lead biologist on this project overseeing the BRA, rare plant surveys, burrowing owl surveys, and the mitigation parcel assessments.

USFS Biological Science Technician – John Day, OR (2019). Surveyed streams as part of the Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation protocol for evaluation of critical habitat of two federally listed fish species:

- Performed as principal identifier of plants including trees, shrubs, forbs, grasses, sedges, and rushes
- Used taxonomic keys and regional botanical literature to identify plants
- Measured stubble height of graminoid species
- Assessed height, age, and animal browse of overstory woody species
- Assessed streambank stability and alteration (animal use) and stream width and gravel size
- Organized, reviewed, and summarized data at the local scale using the MIM analysis module
- Analyzed statistically and summarized data at the landscape scale for use in an end-of-year agency report
- Organized fieldwork logistics including site visits and equipment preparation

USFS Biological Science Technician – Williams, AZ (2017). Surveyed rare, at-risk, and endemic vascular plant species on lands designated for ecological restoration.

- Hiked 8 to 10 miles a day in diverse environments under variable climatic conditions

- Identified plant species in the field and lab using botanical keys and regional flora literature
- Used topographic maps to locate primitive roads and survey areas
- Used hand-held, electronic devices to traverse survey areas and record plant and habitat data
- Developed digital maps delineating plant populations in ArcGIS
- Ensured proper maintenance of field equipment and transport vehicles
- Presented talks to co-workers and school students on the local flora, ecology, and forest safety
- Redacted extensively a key Arizona rare and endemic vascular plant guidebook for plant nomenclature and morphology

Ecology and Botany Researcher – Rancagua, Chile (2003-2017). Developed or collaborated on ecological and botanical initiatives in central Chile with support from organizations including the Mayor University, University of La Serena, National Forestry Agency (CONF), National Agency for the Environment (CONMAN), Agriculture and Livestock Agency (SAG), Center for Investigation of Patagonian Ecosystems (CIEP), and National Botanical Garden. Major research is listed Publication; additional research projects:

- Ecology of the choroy (*Enicognathus leptorhynchus*) and cachaña parrot (*Enicognathus ferrugineus*)
- Survey of the plant biodiversity including rare and at-risk species and promotion of sustainable development of the Tanume Experimental Forestry Reserve
- Survey of the plant community and assessment of anthropogenic threats of the National Reserve Río Los Cipreses
- Survey of the frequency and abundance of orchid (Orchidaceae) spp. in commercial pine plantations
- Taxonomic work on an orchid (Orchidaceae) of the genus *Chloraea*
- Disseminated information on opportunities to legally develop and protect wilderness areas
- Realized 37 lectures on biodiversity and wilderness protection at primary and secondary schools and community social organizations

USGS Research Assistant, Laurel, MD (2002-2003)

Participated in plant and wildlife habitat research projects including data collection, analysis, and management and report production:

- Effect of deer browsing on the growth of woody species of a forested wetland of Maryland
- Vegetation regeneration as part of an urban wetland restoration project in Washington, D.C.
- Habitat, migration patterns, and diet of two Northern Hemisphere avifauna species: black duck (*Melanitta nigra*) and scoter duck (*Melanitta perspicillata*)
- Effect of extended managed flooding of a North Carolina floodplain on the diversity and abundance of wildlife, vegetation, and macroinvertebrates
- Survey of the wildlife utilization of seasonally-saturated forested wetlands of Maryland
- Effect of different fertilizer types on the growth of seasonal grasses native to Maryland
- Population abundance and habitat of the endangered Delmarva fox squirrel (*Sciurus niger cinereus*) of the Delmarva Peninsula, Maryland

PUBLICATIONS

- Global patterns of herbivory in gap and understory environments, and their implications for woody plant carbon storage. December 2017.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/oik.04686>
- Insect abundance and damage on the deciduous *Nothofagus macrocarpa* increase with altitude at a site in the Mediterranean climate zone of Chile. February 2015.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/aen.12142>
- Crown condition, water availability, insect damage and landscape features: are they important to the Chilean tree *Nothofagus glauca* in the context of climate change? August 2013.
<http://www.publish.csiro.au/bt/bt13015>
- Insect folivore damage in Nothofagus Blume trees of central Chile and its association with bottom-up plant community attributes. 2011.
http://www.scielo.org.ar/scielo.php?script=sci_abstract&pid=S1667-782X2011000200001
- Reconocimiento del efecto de *Cinara cupressi* (Hemiptera: Aphididae) en el estado sanitario de *Austrocedrus chilensis* mediante imágenes multiespectrales. September 2009.
https://scielo.conicyt.cl/scielo.php?pid=S0717-92002009000300005&script=sci_abstract&lng=e

- Use of satellite-derived hyperspectral indices to identify stress symptoms on an *Austrocedrus chilensis* forest invaded by *Cinara cupressi*. January 2009. <https://www.tandfonline.com/doi/abs/10.1080/09670870902725809>
- Clasificación y caracterización de las comunidades de vegetación del Fundo Santa Elena, Comuna de Nancagua, Región de O'Higgins, Chile. Year 9 (2). 2006. <http://www.chlorischilensis.com>