



# Biological Survey Report for the Rancho Viejo Solar Project in Santa Fe County, New Mexico

JULY 2024

PREPARED FOR  
**Rancho Viejo Solar, LLC**

PREPARED BY  
**SWCA Environmental Consultants**

**BIOLOGICAL SURVEY REPORT  
FOR THE RANCHO VIEJO SOLAR PROJECT  
IN SANTA FE COUNTY, NEW MEXICO**

Prepared for

**Rancho Viejo Solar, LLC**  
282 Century Place, Suite 2000  
Louisville, Colorado 80027

Prepared by

**SWCA Environmental Consultants**  
5647 Jefferson Street NE  
Albuquerque, New Mexico 87109  
[www.swca.com](http://www.swca.com)

July 2024

## CONTENTS

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>2</b>	<b>Methodology.....</b>	<b>1</b>
2.1	Survey Methods.....	1
2.2	Species Covered in the Evaluation of Potential Impacts .....	2
<b>3</b>	<b>Results.....</b>	<b>2</b>
3.1	General Characteristics.....	2
3.2	Soils .....	2
3.3	Vegetation.....	3
3.4	Noxious Weeds.....	4
3.5	Wildlife.....	4
3.5.1	Migratory Bird Treaty Act.....	5
3.5.2	Bald and Golden Eagle Protection Act .....	6
3.6	Special-status Species.....	6
3.6.1	Monarch Butterfly.....	10
3.6.2	Burrowing Owl .....	11
3.6.3	Gunnison’s Prairie Dog .....	11
<b>4</b>	<b>Impact Analysis and Conclusions .....</b>	<b>11</b>
4.1	Vegetation and Noxious Weeds.....	12
4.2	General Wildlife .....	12
4.3	Migratory Bird Treaty Act.....	13
4.4	Bald and Golden Eagle Protection Act.....	13
4.5	Special-status Species.....	14
<b>5</b>	<b>Recommended Actions.....</b>	<b>14</b>
<b>6</b>	<b>Literature Cited.....</b>	<b>15</b>

## Appendices

- Appendix A Project Maps
- Appendix B Project Photographs

## Tables

Table 1.	Soils in the Analysis Area.....	2
Table 2.	Plant Species Observed during Biological Survey .....	3
Table 3.	Wildlife Detected During Biological Survey.....	4
Table 4.	Special-status Species Listed for Santa Fe County, New Mexico .....	6

## **List of Acronyms and Abbreviations**

°F	degrees Fahrenheit
amsl	above mean sea level
BISON-M	Biota Information System of New Mexico
Commission	New Mexico Public Regulation Commission
EMNRD	New Mexico Energy, Minerals and Natural Resources Department
ESA	Endangered Species Act
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
M	meter
MW	megawatt
NMDGF	New Mexico Department of Game and Fish
NMSA	New Mexico Statutes Annotated
NRCS	Natural Resources Conservation Service
project	Rancho Viejo Solar Project
Rancho Viejo	Rancho Viejo Solar, LLC
SFPSWCD	Santa Fe – Pojoaque Soil and Water Conservation District
SWCA	SWCA Environmental Consultants
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

# 1 INTRODUCTION

Rancho Viejo Solar, LLC (Rancho Viejo), proposes to construct the Rancho Viejo Solar Project (project) in Santa Fe County, New Mexico. The project consists of an up to 96-megawatt (MW), alternating current utility-scale solar energy system, an up to 48-MW (4-megawatt-hour storage energy capacity) battery energy storage system (BESS), a 2.3-mile generation-tie line, and ancillary facilities. Project components include solar panels mounted on trackers arranged in multiple arrays, transformers, direct current to alternating current inverters, a collection system that connects the arrays to a BESS, a substation, an operations and maintenance building, and a switchyard. The solar facility would be located on approximately 680 acres of private land in Santa Fe County, New Mexico, approximately 4.2 miles east of La Cienega (project area) (Figures A-1 and A-2 in Appendix A). SWCA Environmental Consultants (SWCA) completed a biological survey and prepared this associated report to support the permitting and completion of the project. Rancho Viejo would clear and grade the entire project area, except for any sensitive areas that must be avoided.

Because the solar facility's capacity would be less than 300 MW, this project is not subject to location approval from the New Mexico Public Regulation Commission (Commission). Location approval is required when a transmission line has a capacity of 230 or more kilovolts and is associated with a power plant that requires the Commission's location approval for new generation of 300 or more MW (62-9-3. B New Mexico Statutes Annotated [NMSA] 1978). In addition, the right-of-way width for the generation tie line, once fully designed, would not exceed the 100-foot-wide threshold for transmission line oversight by the Commission.

The biological surveys completed for this report cover the 1,143-acre analysis area, which encompasses the proposed project components and the survey buffer (Figure A-3). This report details the evaluation of the potential impacts of the project on federally threatened or endangered species listed under the Endangered Species Act of 1973 (ESA), as amended (16 United States Code 531–1541 et seq.), state threatened or endangered species listed under the New Mexico Wildlife Conservation Act (17-2-41 NMSA 1978), and the state's endangered plant species regulations (75-6-1 NMSA 1978). This report also provides a description of general site characteristics, soils, vegetation, and wildlife within the analysis area.

## 2 METHODOLOGY

### 2.1 Survey Methods

SWCA biologists Kimberly Goering, William Youmans, and Joseph Acord conducted a biological survey of the analysis area on April 4-11, 2022, and an additional survey occurred on October 2, 2023, to conduct a biological survey where the access road route was revised. Prior to the biological survey, SWCA reviewed baseline data for the analysis area, including U.S. Geological Survey topographic maps; Natural Resources Conservation Service (NRCS) soil maps (NRCS 2023a); New Mexico Crucial Habitat Assessment Tool data (New Mexico Crucial Habitat Data Set 2013); U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system data (USFWS 2023a); the USFWS Critical Habitat Portal (USFWS 2023b); the New Mexico Department of Game and Fish (NMDGF) Biota Information System of New Mexico (BISON-M) data (BISON-M 2023); the New Mexico Rare Plants website (New Mexico Rare Plant Technical Council 1999); and the New Mexico Energy, Minerals and Natural Resources Department (EMNRD) state endangered plant species list (EMNRD 2023). During the biological survey, SWCA used maps and shapefiles provided by Rancho Viejo to locate the project area's boundaries and analysis area to create maps (see Appendix A).

## 2.2 Species Covered in the Evaluation of Potential Impacts

The special-status species evaluated in this report consist of 1) federally protected (endangered and threatened) species (USFWS 2023a); 2) additional species listed by the USFWS as candidate and proposed species (USFWS 2023a); and 3) state-listed endangered and threatened species (EMNRD 2023; BISON-M 2023). The potential for local species occurrence was based on 1) existing information on distribution and 2) qualitative comparisons of the habitat requirements of each species with vegetation communities, landscape features, and/or water quality conditions in the analysis area. SWCA identified the potential occurrence of a given species using the following categories:

- *Known to occur*: The species was documented in the analysis area either during or prior to the biological survey by a reliable observer.
- *May occur*: The analysis area is within the species' currently known range, and vegetation communities, soils, and water quality conditions, among other factors, resemble those of habitats known to be used by the species.
- *Unlikely to occur*: The analysis area is within the species' currently known range, but vegetation communities, soils, and water quality conditions, among other factors, do not resemble those known to be used by the species, or the analysis area is clearly outside the species' currently known range.

SWCA used the USFWS IPaC database and the USFWS Critical Habitat Portal (USFWS 2023a, 2023b) to examine distribution of critical habitat.

## 3 RESULTS

### 3.1 General Characteristics

The proposed project area is approximately 3 miles south of Santa Fe city limits and approximately 4.2 miles east of La Cienega. The elevation range in the analysis area is approximately 6,292 feet to 6,681 feet above mean sea level (amsl). The climate of the area, according to the climatic records for Santa Fe 2, New Mexico (COOP Station 298085), has an average annual maximum temperature of 64.9 degrees Fahrenheit (°F) and an average annual minimum temperature of 36.0°F. The average annual precipitation is 13.7 inches, with the majority of it occurring between May and October, while the average annual total snowfall is 21.0 inches, which largely occurs between November and March (Western Regional Climate Center 2023). During the biological survey, temperatures ranged between 41°F and 71°F and the weather was sunny to cloudy with winds of 0 to 35 miles per hour.

### 3.2 Soils

According to the NRCS (2023a), 12 soil map units are mapped within the 1,143-acre analysis area (Table 1). These soils are considered well drained to excessively drained and non-hydric. None of the soils are considered prime farmland of statewide importance (NRCS 2023a).

**Table 1. Soils in the Analysis Area**

Soil Type Name	Soil Map Unit Symbol	Acres in Analysis Area	Percent of Analysis Area
Panky loam, 1 to 4 percent slopes	100	742.9	65.0

Soil Type Name	Soil Map Unit Symbol	Acres in Analysis Area	Percent of Analysis Area
Zozobra-Jaconita complex, 5 to 25 percent slopes	101	47.8	4.2
Khapo sandy loam, 3 to 8 percent slopes	102	266.9	23.4
Zepol silt loam, 0 to 2 percent slopes, flooded	103	40.0	3.5
Arents-Urban land-Orthents complex, 1 to 60 percent slopes	116	0.5	<0.1
Predawn loam, 1 to 4 percent slopes	200	2.1	0.2
Tanoan-Encantado complex, 5 to 25 percent slopes	201	14.2	1.2
Alire loam, 2 to 6 percent slopes	202	7.5	0.7
Buckhorse-Altazano complex, 2 to 8 percent slopes, flooded	203	11.4	1.0
Levante-Riverwash complex, 1 to 3 percent slopes, flooded	213	0.9	0.1
Dondiego loam, 1 to 3 percent slopes	216	5.8	0.5
Ohke sandy loam, 1 to 3 percent slopes	217	2.9	0.3
<b>Total</b>		<b>1,142.9</b>	<b>100.0</b>

Source: NRCS (2023a).

### 3.3 Vegetation

The analysis area is located within the Arizona/New Mexico Plateau: North-Central New Mexico Valleys and Mesas U.S. Environmental Protection Agency Level IV ecoregion (Griffith et al. 2006). During the biological survey, the biologists identified two distinct habitat types within the analysis area. Habitat 1 is grasslands dominated by blue grama (*Bouteloua gracilis*), prickly Russian thistle (*Salsola tragus*), and rubber rabbitbrush (*Ericameria nauseosa*) (see Figures B-1 through B-4 in Appendix B) and features approximately 61% vegetative cover. Habitat 2 is pinyon-juniper savanna dominated by blue grama, twoneedle piñon (*Pinus edulis*), oneseed juniper (*Juniperus monosperma*), and rubber rabbitbrush and features approximately 21% vegetative cover. The analysis area and surrounding landscape have been previously disturbed by two-track roads, cattle grazing, State Route 14, and transmission lines. Plant species recorded during the biological survey are listed in Table 2. Photographs of the vegetative communities are provided in Appendix B.

**Table 2. Plant Species Observed during Biological Survey**

Common Name	Scientific Name	Habitat 1 (Grasslands)	Habitat 2 (Pinyon-juniper savanna)
Arizona threeawn	<i>Aristida arizonica</i>	x	–
Bigelow sage	<i>Artemisia bigelovii</i>	x	x
Blue grama	<i>Bouteloua gracilis</i>	x*	x*
Broom snakeweed	<i>Gutierrezia sarothrae</i>	x	x
Club cholla	<i>Grusonia clavata</i>	x	–
Curly dock	<i>Rumex crispus</i>	x	–
Hairy crinklemat	<i>Tiquilia hispidissima</i>	x	–
Hairy grama	<i>Bouteloua hirsuta</i>	–	x
Indian ricegrass	<i>Achnatherum hymenoides</i>	X	–
Jimsonweed	<i>Datura</i> sp.	x	–
Kingcup cactus	<i>Echinocereus triglochidiatus</i>	x	–
Littleleaf sumac	<i>Rhus microphyllia</i>	X	–
Mock vervain	<i>Glandularia</i> sp.	x	–

Common Name	Scientific Name	Habitat 1 (Grasslands)	Habitat 2 (Pinyon-juniper savanna)
Narrowleaf yucca	<i>Yucca angustissima</i>	x	x
Oneseed juniper	<i>Juniperus monosperma</i>	x	x*
Pinkflower hedgehog cactus	<i>Echinocereus fendleri</i>	X	–
Plains pricklypear	<i>Opuntia polyacantha</i>	x	–
Prickly Russian thistle	<i>Salsola tragus</i>	x*	–
Pricklypear	<i>Opuntia</i> sp.	–	x
Rubber rabbitbrush	<i>Ericameria nauseosa</i>	x*	x*
Sand sagebrush	<i>Artemisia filifolia</i>	X	–
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	X	–
Soapweed yucca	<i>Yucca glauca</i>	x	–
Spiny star	<i>Escobaria vivipara</i>	x	–
Springparsley	<i>Cymopterus</i> sp.	x	–
Tree cholla	<i>Cylindropuntia imbricata</i>	x	x
Twoneedle piñon	<i>Pinus edulis</i>	x	x*
Winterfat	<i>Krascheninnikovia lanata</i>	x	–

Note: Nomenclature follows the PLANTS Database (NRCS 2023b).

\* Dominant species

### 3.4 Noxious Weeds

During the biological survey, no U.S. Department of Agriculture (USDA)–listed noxious weed species or New Mexico Department of Agriculture–listed invasive or non-native plant species were observed within or around the analysis area (New Mexico Department of Agriculture 2020; USDA 2010). However, the biologists observed prickly Russian thistle (*Salsola tragus*). Prickly Russian thistle is not a designated noxious weed but is an introduced species to the analysis area and throughout New Mexico (NRCS 2023c). The plant is considered a species that may cause economic or environmental harm or harm to human health or safety. Mitigation measures, such as noxious weed washing stations, can be used to reduce the introduction of noxious, invasive, and non-native plants. Rancho Viejo developed and will implement a vegetation and noxious weed management plan for the control of noxious weeds and invasive species that could occur as a result of new surface disturbance activities at the site.

### 3.5 Wildlife

The Arizona/New Mexico Plateau: North-Central New Mexico Valleys and Mesas Ecoregion provides habitat for a variety of wildlife species. The SWCA biologists detected 15 bird species, one reptile species, and six mammal species during the biological survey of the analysis area (Table 3). One of the mammal species detected is domestic. In addition, a Gunnison’s prairie dog (*Cynomys gunnisoni*) colony was detected during the April 2022 biological survey and was still present during the October 2023 biological survey. Inactive Prairie dog colonies can provide habitat for burrowing owls (*Athene cunicularia*).

**Table 3. Wildlife Detected During Biological Survey**

Common Name	Scientific Name
<b>Birds</b>	
American Kestrel	<i>Falco sparverius</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Burrowing owl	<i>Athene cunicularia</i>



Common Name	Scientific Name
Bushtit	<i>Psaltriparus minimus</i>
Common raven	<i>Corvus corax</i>
Curve-bill thrasher	<i>Toxostoma curvirostra</i>
Eastern meadowlark	<i>Sturnella magna</i>
Horned Lark	<i>Eremophila alpestris</i>
House finch	<i>Haemorhous mexicanus</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Say's phoebe	<i>Sayornis saya</i>
Scaled quail	<i>Callipepla squamata</i>
Turkey vulture	<i>Cathartes aura</i>
Western meadowlark	<i>Sturnella neglecta</i>
<b>Reptiles</b>	
Short-horned lizard	<i>Phrynosoma hernandesi</i>
<b>Mammals</b>	
Black-tailed jackrabbit	<i>Lepus californicus</i>
Coyote (scat)	<i>Canis latrans</i>
Domestic cattle (scat)	<i>Bos taurus</i>
Gunnison's prairie dog (colony, scat)	<i>Cynomys gunnisoni</i>
Northern grasshopper mouse (dead)	<i>Onychomys leucogaster</i>
Pronghorn	<i>Antilocapra americana</i>

Note: Individuals of each species were observed unless otherwise noted.

### 3.5.1 Migratory Bird Treaty Act

Most bird species are protected by the Migratory Bird Treaty Act (MBTA). The MBTA implements various treaties and conventions between the United States and other countries for the protection of migratory birds. Under the MBTA, unless permitted by regulations, it is unlawful to 1) pursue, hunt, take, capture, or kill; 2) attempt to take, capture, or kill; and 3) possess, offer to sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. USFWS regulations broadly define “take” under the MBTA to mean “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” Under the MBTA, take does not include habitat loss or alteration.

Suitable nesting habitat for migratory birds, such as oneseed juniper and twoneedle piñon, was present throughout the analysis area during the survey. In addition, the biologist also observed one active curve-billed thrasher (*Toxostoma curvirostra*) nest, 15 inactive passerine nests in fair to poor condition, and two undetectable activity passerine nests during the biological surveys (see Figure A-3 and Figures B-5 and B-6).

SWCA observed several burrows throughout the analysis area that could be utilized by burrowing owls (Photograph B-7). In addition, the biologists observed two burrowing owls during the April 2022 biological survey. To prevent impacts to migratory bird species, any vegetation removal during the breeding season (March–August) could be preceded by a pre-construction nesting survey up to 2 weeks prior to vegetation removal to establish the occupancy status of any potentially suitable nesting burrows detected within the analysis area.

### 3.5.2 Bald and Golden Eagle Protection Act

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the MBTA and the Bald and Golden Eagle Protection Act. Bald eagles are found typically in association with water and nest and breed from October to July throughout the state of New Mexico. Golden eagles nest primarily on rock ledges or cliffs and occasionally in large trees at elevations ranging from 4,000 to 10,000 feet amsl. Golden eagles are typically found in mountainous regions of open country, prairies, arctic and alpine tundra, open wooded areas, and barren areas. Both bald and golden eagles are carnivores. Bald eagles prey on fish but also on mammals, especially prairie dogs (*Cynomys* sp.). Golden eagles feed mainly on small mammals, invertebrates, other wildlife, and carrion (BISON-M 2023; Stahlecker and Walker 2010).

No bald or golden eagle individuals were observed during the biological survey. The habitat in and surrounding the analysis area is not ideal foraging habitat for golden eagles because of the lack of available perching locations and lack of nearby mountains and is not ideal foraging habitat for bald eagles because of the lack of riparian habitat. It is unlikely that bald or golden eagles inhabit the analysis area.

### 3.6 Special-status Species

SWCA reviewed the federally listed and state-listed species with the potential to occur in Santa Fe County, New Mexico (EMNRD 2021; BISON-M 2023; USFWS 2023a). One federally listed candidate species, the monarch butterfly (*Danaus plexippus plexippus*), may occur in the analysis area during migration; however, neither this species nor larval host plants were observed during the biological survey. This species is further discussed in Section 3.6.1. Two additional species are known to occur in the analysis area: burrowing owls (see Section 3.6.2) and Gunnison’s prairie dogs (see Section 3.6.3). Neither of these species are listed in Santa Fe County. Prairie dog colonies provide habitat for burrowing owls, which are MBTA-protected. The remaining species are not likely to occur in the analysis area because of lack of suitable habitat and because the analysis area is outside the known range of some of the species. The special-status species with the potential to occur in Santa Fe County, New Mexico, their habitat, and their likelihood to occur in the analysis area are described in Table 4.

**Table 4. Special-status Species Listed for Santa Fe County, New Mexico**

Common Name (scientific name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Analysis Area
<b>Plants</b>			
Great Plains Lady's tresses ( <i>Spiranthes magnicamporum</i> )	NM E	This species is widely distributed in the Great Plains and Great Lakes regions north to Ontario, Canada and is rare in New Mexico. The plant occurs in wetlands, ciénegas, and stream sides in New Mexico from 4,560 to 6,500 feet amsl. Flowers from mid-July to August.	Unlikely to occur within the analysis area because of the lack of wetlands, ciénegas, and streams there.
Holy Ghost ipomopsis ( <i>Ipomopsis sancti-spiritus</i> )	USFWS E NM E	This species grows on relatively dry, steep west to southwest-facing slopes in open ponderosa pine or mixed conifer forest at 2,400 to 2,500 meters (m) (7,730-8,220 feet) amsl in San Miguel County and is found only in one canyon in the upper Pecos River drainage of the southern Sangre de Cristo Mountains. The geologic substrate is partly weathered Tererro limestone. This plant appears to grow best in bare mineral soils and is highest in density on disturbed sites such as road cuts. Flowers from July to September.	Unlikely to occur within the analysis area, as the only known population is restricted to one canyon in the Sangre de Cristo Mountains.

Common Name (scientific name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Analysis Area
Large yellow lady's slipper ( <i>Cypripedium parviflorum</i> var. <i>pubescens</i> )	NM E	Typically found growing in mesic deciduous and coniferous forests, openings, prairies, meadows, and fens. Grows at elevations between 5,750 – 11,000 feet asml. Can be found in Catron, Colfax, Grant, Los Alamos, Mora, San Juan, San Miguel, And Santa Fe Counties, New Mexico.	Unlikely to occur due to the lack of mesic deciduous and coniferous forests.
Santa Fe cholla ( <i>Cylindropuntia viridiflora</i> )	NM E	The Santa Fe cholla is known from only three areas between Santa Fe and Chimayo and occurs in gravelly rolling hills in pinion-juniper woodland at 1,770 to 2,200 m (5,800-7,200 feet) asml. Flowers in July.	Unlikely to occur within the analysis area, as the closest known population is approximately 6 miles north of the analysis area (NHNM 2023).
Wood lily ( <i>Lilium philadelphicum</i> var. <i>andinum</i> )	NM E	This species occurs in moist woodlands and meadows in mixed conifer forests and canyon bottoms between 7,550 and 10,000 feet in Sandoval, Otero, Santa Fe, San Miguel, Los Alamos, and Colfax Counties. The plant is widespread in Canada and the United States. Flowers late spring- through summer (late May through August).	Unlikely to occur within the analysis area because of the lack of mixed conifer forests and canyon bottoms there. The analysis area is also below the elevation range of the species.
<b>Arthropods</b>			
Monarch butterfly ( <i>Danaus plexippus plexippus</i> )	USFWS C	In New Mexico, this species' migration peaks in April and subsides by mid-May. Breeding occurs within the state, and a new generation matures in New Mexico by each July. In-state population numbers peak in August and September. The southward migration back to Mexico begins in late August and September. During the breeding season in New Mexico, young monarch butterfly caterpillars require milkweed species ( <i>Asclepias</i> sp.) as a food source (Cary and DeLay 2016). Overall, monarch butterflies seem to be most abundant in southeast New Mexico. There is currently no evidence that monarchs overwinter in New Mexico.	May occur within the analysis area for foraging if the area contains herbaceous flowering plants, including milkweed species, during breeding periods. Neither this species nor milkweed vegetation was observed during the biological surveys.
<b>Mollusks</b>			
Lilljeborg peaclam ( <i>Pisidium lilljeborgi</i> )	NM T	In New Mexico, this species occurs in cold, alpine Nambe Lake, which is surrounded by rocky talus, stands of Engelmann spruce ( <i>Picea engelmannii</i> ) and subalpine fir ( <i>Abies lasiocarpa</i> ), and grass-sedge-forb communities at approximately 11,350 m asml.	Unlikely to occur in the analysis area because of the lack of wetlands and the species restriction to Nambe Lake, which is approximately 17 miles northeast of the analysis area.
Great Basin silverspot butterfly ( <i>Speyeria nokomis Nokomis</i> )	USFWS PT	Associated with pinyon-juniper, fir, spruce, tamarack, pine species, burch, alder, maple, and aspen trees, a variety of shrubs. Found in habitats that have permanent spring-fed meadows, seeps, marshes and boggy streamside meadows with flowing water in arid country. (Selby 2007).	Unlikely to occur due to the lack of permanent spring-fed meadows, seeps, marshes and boggy streamside meadows with flowing water in arid country.
<b>Fish</b>			
Rio Grande cutthroat trout ( <i>Oncorhynchus clarkia virginalis</i> )	USFWS C	This subspecies of cutthroat trout is endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins in New Mexico and Colorado. The species' historical range included Colorado, New Mexico, Texas.	Unlikely to occur in the analysis area because of the lack of major rivers.

Common Name (scientific name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Analysis Area
Rio Grande silvery minnow ( <i>Hybognathus amarus</i> )	USFWS E NM E	Historically, the Rio Grande silvery minnow was one of the most abundant and widespread fishes in the Rio Grande basin (from Espanola, New Mexico, to the Gulf of Mexico) (Bestgen and Platania 1991). It was also found in the Pecos River, a major tributary of the Rio Grande, from Santa Rosa, New Mexico, downstream to its confluence with the Rio Grande (Pflieger 1980). The last known collections of this species from the Pecos River took place in 1968 near Roswell, New Mexico (53 Fed. Reg. 11821-11828). The Rio Grande silvery minnow occupies a variety of habitats in low-gradient, large streams with shifting sand or silty bottoms (Propst and Hatch 1985). Designated critical habitat exists in Sandoval County, New Mexico.	Unlikely to occur because the analysis area is not near the Rio Grande, Pecos River, low-gradient streams or large streams with shifting sand or silty bottoms.
<b>Amphibians</b>			
Jemez Mountains salamander ( <i>Plethodon neomexicanus</i> )	USFWS E NM E	Predominantly occurs in mixed-conifer forests, consisting mostly of Douglas fir ( <i>Pseudotsuga menziesii</i> ), blue spruce ( <i>Pseudotsuga menziesii</i> ), Engelman spruce ( <i>Picea engelmannii</i> ), white fir ( <i>Abies concolor</i> ), limber pine ( <i>Pinus flexilis</i> ), ponderosa pine ( <i>Pinus ponderosa</i> ), Rocky Mountain maple ( <i>Acer glabrum</i> ), and aspen ( <i>Populus</i> spp.). The designated critical habitat for the species is in Los Alamos, Rio Arriba, and Sandoval Counties	Unlikely to occur in the analysis area due to the lack of Douglas fir, blue and Engelman spruce, white fir, limber and Ponderosa pine, Rocky Mountain maple and aspen.
<b>Birds</b>			
Baird's sparrow ( <i>Ammodramus bairdii</i> )	NM T	A winter resident in New Mexico, this species has been found on Otero Mesa and in the Animas Valley and may occur in other areas of suitable winter habitat, particularly in the southern portion of state. Generally, this species prefers dense, extensive grasslands with few shrubs and avoids heavily grazed areas.	Not known to occur in this area, although marginally suitable grassland habitat is present. The species is known to occur only in the southern portion of the state.
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	NM T	This species occurs in New Mexico year-round. Bald eagle breeding is restricted to a few areas mainly in the northern part of the state or near lakes. During migration and winter months, the species is found chiefly along or near rivers and streams and in grasslands associated with large prairie dog ( <i>Cynomys</i> sp.) colonies. Bald eagles typically perch in trees.	Although prairie dog colonies were present, this species is unlikely to occur in the analysis area because of lack suitable habitat, water features. In addition, no suitable perching trees were observed during the biological surveys.
Boreal owl ( <i>Aegolius funereus</i> )	NM T	This species is found predominantly in spruce-fir forests. Populations are thought to be unviable in New Mexico because the state lacks adequate spruce-fir habitat in isolated mountain ranges, but small populations have been found in in spruce fir and similar habitats in the San Juan, Sangre de Cristo, and Jemez Mountains (Stahlecker and Duncan 1996).	Unlikely to occur within the analysis area because of the lack of spruce-fir forests. The analysis area is approximately 9 miles southwest of the closest known population.
Broad-billed hummingbird ( <i>Cyananthus latirostris</i> )	State T	Occurs in riparian habitat or dense mesquite in canyons in southwestern New Mexico. Found in Guadalupe Canyon in Hidalgo County and rarely found in the Peloncillo Mountains.	Unlikely to occur within the Analysis Area due to the lack of riparian habitat and dense mesquite is unlikely to occur. The Analysis Area is also outside of the species' known habitat range.
Gray vireo ( <i>Vireo vicinior</i> )	NM T	This species is strongly associated with piñon-juniper ( <i>Pinus</i> and <i>Juniperus</i> spp.) and scrub oak ( <i>Quercus</i> spp.) habitats and is distributed mainly across the western two-thirds of the state. The gray vireo [refers gently sloped canyons, rock outcrops, ridgetops, and moderate scrub cover.	Unlikely to occur within the analysis area because of lack of canyon habitat and exposed rock outcropping.

Common Name (scientific name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Analysis Area
Least tern ( <i>Sterna antillarum</i> )	NM E	This migratory species occurring in North America during the breeding season and is associated with water (e.g., lakes, reservoirs, and rivers). In New Mexico, the species' breeding is restricted to the Pecos River Basin, primarily at Bitter Lake National Wildlife Refuge in Chaves County. The least tern may occur in the Bureau of Land Management Farmington Field Office planning area during migration but has not been recorded there. Suitable least tern habitat along rivers consists of bare sandy shorelines and salt flats.	Unlikely to occur in the analysis area because of the lack of perennial river bodies. The analysis area is also more than 150 miles north of the species' known breeding range within the state.
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	USFWS T	This species occupies mountainous areas and deep canyons incised within flat plateaus. The owl's habitat consists typically of mixed-conifer, ponderosa pine, and ponderosa pine–Gambel oak forest. The species prefers shaded mesic environments such as canyon bottoms and mountainous riparian areas.	Unlikely to occur within the analysis area because of the lack of mountainous habitat, old-growth mixed conifer forest, and deep canyons preferred by the species.
Peregrine falcon ( <i>Falco peregrinus</i> )	NM T	This species occurs in New Mexico year-round. All peregrine falcon nests in New Mexico are found on cliffs. During migration and winter, New Mexico's peregrine falcons are typically associated with water and large wetlands.	Unlikely to occur in the analysis area because of the lack of water, dense riparian habitat, large wetlands, and cliff roosting habitat.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	USFWS E NM E	This species breeds and migrates through relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes and reservoirs. The southwestern willow flycatcher historically nested in native vegetation such as willow ( <i>Salix</i> spp.), seepwillow, boxelder ( <i>Acer negundo</i> ), buttonbush ( <i>Cephalanthus</i> spp.), and cottonwood. This subspecies nests in native vegetation but also uses thickets dominated by non-native tamarisk ( <i>Tamarix</i> spp.) and Russian olive ( <i>Elaeagnus angustifolia</i> ) and mixed native and non-native stands of vegetation. In New Mexico the southwestern willow flycatcher is known to breed along the Gila River and the Rio Grande.	Unlikely to occur in the analysis area due to the lack of dense riparian habitat.
Violet-crowned hummingbird ( <i>Leucolia violiceps</i> )	NM T	In New Mexico, this species is found primarily in riparian woodlands at low to moderate elevations (Baltosser et al. 1985) and seeks only well-developed riparian areas of Guadalupe Canyon in the summer (NMDGF 1994).	Unlikely to occur in the analysis area due to a lack of riparian woodlands. In addition, the proposed analysis area is not near the Guadalupe Canyon.
White-tailed ptarmigan ( <i>Lagopus leucura</i> )	NM E	This species inhabits alpine tundra and timberline habitat in New Mexico above about 10,500 feet (Hubbard and Eley 1985). Associated with sedges ( <i>Carex</i> ) and grasslike plants ( <i>Heleocharis</i> , <i>Scirpus</i> ) above the treeline.	Unlikely to occur in the analysis area due to a lack of suitable tundra habitat and elevation.
Yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	USFWS T	Only the western population of this species beyond the Pecos River drainage has been listed as threatened under the ESA. The yellow-billed cuckoo breeds and migrates through riparian habitat and associated drainages; springs, developed wells, and earthen ponds supporting mesic vegetation; and deciduous woodlands with cottonwoods and willows. Dense understory foliage is important for nest site selection. The species nests in willow, mesquite, cottonwood, and hackberry; forages in similar riparian woodlands; and requires patches of at least 25 acres for breeding and nesting.	Unlikely to occur. The analysis area lacks riparian and deciduous woodland habitat.
<b>Mammals</b>			
Meadow jumping mouse ( <i>Zapus luteus luteus</i> )	USFWS E NM E	In New Mexico primarily associated with riparian habitats with short vegetation, high herbaceous vegetation cover, and species including common three-square, coyote willow, dogbane, foxtail barley, and Japanese brome.	Unlikely to occur in the analysis area due to lack of associated species and lack of riparian habitat.

Common Name (scientific name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Analysis Area
Mexican gray wolf ( <i>Canis lupus baileyi</i> )	USFWS EXPN	Wolves in the Southwest generally have been associated with montane forests and woodlands. West of the New Mexico plains, they are most prevalent in high mountain country capped with conifer forest. The historic distribution of the gray wolf included much of North America extending from northern tundra regions southward through New Mexico to Durango, Mexico.	Unlikely to occur. The analysis area does not contain suitable mountainous or wooded habitat.
Pacific marten ( <i>Martes caurina</i> )	NM T	This species has been observed in the San Juan and Sangre de Cristo Mountains. The Pacific marten prefers late successional stands of conifer-dominated mesic forest of spruce ( <i>Picea</i> sp.), fir ( <i>Abies</i> spp.), Douglas fir ( <i>Pseudotsuga menziesii</i> ), and associated trees. Optimal habitat likely consists of mature old-growth spruce-fir communities with more than 30% canopy cover, a well-established understory of fallen logs and stumps, and lush shrub and forb vegetation. The species avoids large openings.	Unlikely to occur in the analysis area due to the lack of mature conifer habitat of spruce, fir, or Douglas fir.
Spotted bat ( <i>Euderma maculatum</i> )	NM T	This species is found in open habitats, ponderosa pine forests, and marshlands. Distribution is limited to areas within flying distance of cliffs and stony outcrops, which provide suitable roosting sites. Spotted bats have been documented at numerous localities throughout the western two-thirds of New Mexico, and in 2014 through 2016, the species was detected by its distinct audible calls at multiple sites along the Gila River in Grant County.	Unlikely to occur because the analysis area lacks suitable roosting habitat, such as cliffs and limestone outcroppings, dense forests, and marshes.

Sources: Except where otherwise noted, range or habitat information for wildlife species comes from the BISON-M (2023) website, IPaC (USFWS 2023a), EMNRD (2023), and NatureServe (2023)

\* Federal (USFWS) status: E = Endangered, T = Threatened, PT = Proposed Threatened, C = Candidate  
 State of New Mexico status: NM E = Endangered, NM T = Threatened.

### 3.6.1 Monarch Butterfly

The monarch butterfly is designated as a federally listed candidate species. This species was listed due to the decline in populations across North America because of habitat reduction and fragmentation. This species is important ecologically for plant population stability, as the species is an opportunistic pollinator. This species is known to occur throughout New Mexico during seasonal migration and breeding season and the warmer months of April to October but is not known to overwinter within the state (Cary and Delay 2016). Monarch butterflies use milkweed (*Asclepias* sp.) habitat for breeding and milkweed is the sole source of food for this species during the caterpillar phase of life.

The species was not observed during the biological surveys of the analysis area. With the annual migratory path of the species, adult monarch butterflies may occur within the analysis area, and with the presence of flowering plants, the analysis area provides suitable foraging habitat for the species. During the surveys, SWCA did not observe any milkweed vegetation suitable for monarch butterfly breeding within the analysis area; however, revisiting the analysis area during this species' flowering period (June–August) would involve determining whether the analysis area provides milkweed habitat suitable for breeding.

A lack of milkweed vegetation within the analysis area would confirm that the proposed project footprint does not contain the plants required for monarch butterfly egg laying; in that case, the breeding efforts of the species likely would not be impacted by the proposed project. Also, because of their ability to move out of areas of human activity, adult butterflies are not likely to be directly harmed by the proposed project. Removal of vegetation in the analysis area would reduce the availability of flowering plants and

thus possibly impact the species' food sources. The proposed project could impact individuals but would not likely contribute to a trend toward federal listing or cause a loss of population or species viability.

### **3.6.2 Burrowing Owl**

The burrowing owl is protected under the MBTA and State of New Mexico Statute 17-2-14. Populations of burrowing owls are declining across much of North America, particularly in the northern portion of the continent, chiefly because of prairie grassland habitat loss and fragmentation, human-caused mortality on wintering grounds and during migration, and the loss of colonial sciurids such as prairie dogs (Desmond 2010). During the April 2022 biological survey, SWCA observed one active burrowing owl burrow with two adults in addition to a prairie dog colony (Figure A-3 and Photograph B-8). No burrowing owls were observed during the October 2023 biological survey.

Potential impacts to burrowing owls could range from temporary habitat disturbance to loss of foraging habitat. Due to the permanent disturbance associated with the proposed project, foraging habitat would be impacted. However, the habitat within the analysis area is not unique to its surroundings; therefore, adult burrowing owls could relocate. The proposed project may impact individuals or localized foraging habitat but would not likely contribute to a trend toward federal listing or cause a loss of population or species viability.

### **3.6.3 Gunnison's Prairie Dog**

Gunnison's prairie dog is native only to North America, inhabiting montane shrublands and high mountain valleys and plateaus in the southern Rocky Mountains at 6,000 to 12,000 feet amsl east of the continental divide. As a fossorial mammal, this species inhabits burrow complexes within sagebrush shrubland and pinyon-juniper habitats (BISON-M 2023). This species lives in colonies that can contain thousands of individuals within a complex (Miller and Cully 2001). These colonies provide an important food source for many predators within grassland habitats, and their burrows provide suitable burrows for burrowing owls.

SWCA observed an extensive prairie dog colony during the 2022 and 2023 biological surveys within the analysis area (Figure A-3 and Photograph B-7). Although Gunnison's prairie dog is not listed in Santa Fe County, burrows can be a concern in regard to construction safety, and their destruction can affect burrowing owl habitat. If construction begins during the burrowing owl nesting season (March 1–October 31), SWCA could conduct occupied nesting burrow surveys, including verifying the presence/absence of prairie dogs, before then. Rancho Viejo has excluded the prairie dog colony area from development to avoid impacts. The proposed project may impact potential habitat for this species but, with the implementation of mitigation measures to protect the species from entrapment and presence/absence surveys before construction, is not likely to contribute toward a federal listing or loss of viability.

## **4 IMPACT ANALYSIS AND CONCLUSIONS**

Impacts to wildlife and vegetation would result from actions that alter wildlife habitats, including changes to vegetation and disturbance. Altering wildlife habitat in ways that would be considered adverse may occur directly (through habitat loss from surface disturbance) or indirectly (through the reduction in habitat quality caused by increased noise levels, increased human activity, and the presence of fugitive dust).

The loss of wildlife habitat from project construction would not cause undue degradation to general wildlife or vegetation because habitat characteristic of the analysis area is common across the regional

landscape and is readily available on lands adjacent to the analysis area. The project is not expected to unduly impair important environmental values relating to biological resources.

## 4.1 Vegetation and Noxious Weeds

At this time, it is assumed that Rancho Viejo would clear and grade the entire project area, except for any sensitive areas that must be avoided. Vegetation in vicinity of the project area would be affected by the deposition of fugitive dust generated by clearing and grading activities, the use of access roads, and wind erosion of exposed soils. This could reduce photosynthesis and productivity, increase water loss (Eveling and Bataille 1984), and result in injury to leaves in plants near the project area. Areas of soil exposed by blading associated with construction could also be a source of localized fugitive dust. Vegetative community composition could subsequently be altered, resulting in habitat degradation. Localized impacts to plant populations and communities could occur if seed production in plant species is reduced. Construction traffic and equipment brought to the site also represent a pathway for the introduction and spread of noxious weeds and invasive species. One invasive species, prickly Russian thistle was observed in the analysis area during the biological survey. Rancho Viejo could coordinate with the Santa Fe – Pojoaque Soil and Water Conservation District (SFPSWCD) to ensure that the best management practices for meeting invasive and noxious plant management objectives within the district are implemented for the project (SFPSWCD 2023). These best management practices may include implementation of control methods for the listed invasive and noxious plant species outlined in New Mexico State’s booklet *Troublesome Weeds of New Mexico* (Ashigh et al. 2010).

Postconstruction and interim reclamation could occur in areas not needed for long-term operations and maintenance. Reclamation could include establishment of native vegetation. Rancho Viejo could also consult with the SFPSWCD on developing a reclamation plan. Impacts to vegetation from decommissioning activities would be similar to impacts from construction. Once decommissioning is complete, final reclamation of the project area would reestablish vegetation.

## 4.2 General Wildlife

Direct impacts to wildlife from construction would include the removal of approximately 724 acres of existing vegetation, risk of direct mortality of species during construction, loss or degradation of native habitat, and displacement of wildlife species from their habitat. Additional potential indirect impacts could include disruption or displacement of species from nesting/birthing and foraging areas, changes in activity patterns resulting from construction, increased human activity, and noise disturbance. Noise disturbance could impact wildlife by interfering with animals’ abilities to detect important sounds or by posing an artificial threat to animals (Clinton and Barber 2013). Construction equipment associated with the project would contribute the highest noise levels.

Gunnison’s prairie dogs are known to occur in the analysis area as an extensive colony was observed during the biological surveys. However, development in this area will be avoided. Wherever possible, occupied prairie dog colonies should be left undisturbed, and all project activities should be directed off the colonies. Any burrows that are located on the project site should be surveyed during the period of 1 March-1 September to determine whether burrows are active or inactive, and whether burrowing owls may be utilizing the site. If ground-disturbing activities cannot be relocated off the prairie dog colony, or if project activities involve control of prairie dogs, NMDGF recommends live-trapping and relocation of prairie dogs. The NMDGF can provide recommendations regarding suitability of potential translocation areas and procedures.



During operation and maintenance, personnel could fence the solar facility perimeter, limiting the types of wildlife that may use the analysis area, such as reptiles, birds, and small mammals. Operations activities would occasionally include noise disturbances that would temporarily displace wildlife in the analysis area and vicinity. These impacts may be short-term and could occur approximately twice per year under routine operations. Affected individuals would be able to shift use to adjacent land. Long-term impacts to wildlife species would be negligible and unlikely to result in population-level effects.

### **4.3 Migratory Bird Treaty Act**

During the biological survey of the analysis area, SWCA detected 15 bird species (see Table 3). One active curve-billed thrasher nest, 15 inactive passerine nests in fair to poor condition, and two undetectable activity passerine nests were observed. In addition, several prairie dog colonies, which could be utilized by burrowing owls, were observed.

No major or long-term effects on migratory birds from the proposed project are anticipated. Incidental mortality or displacement of migratory bird species is possible on a local scale as a result of construction disturbance. However, many birds occurring locally would likely move into adjacent habitat in response to disturbance. Adult migratory birds likely would not be directly harmed by the proposed project because of their mobility and ability to avoid areas of human activity. Because of the abundance of similar habitat in the surrounding area, the impacts on bird populations that use this habitat type within the analysis area would be low.

All migratory birds are protected against direct take under the Migratory Bird Treaty Act. In addition, hawks, falcons, vultures, songbirds, and other insect-eating birds are protected under New Mexico State Statutes (17-2-13 and 17-2-14 NMSA), unless permitted by the applicable regulatory agency. To minimize potential impacts to migratory birds, SWCA recommends that construction take place outside the bird breeding season (March 1–August 31). However, if construction and vegetation removal take place during the migratory bird breeding season, a preconstruction nesting survey up to 2 weeks before vegetation removal is recommended to prevent impacts to migratory bird species. The preconstruction nesting survey would establish the occupancy status of any potentially suitable nests and burrows detected within the analysis area. SWCA can provide a scope of work and cost proposal for preconstruction nesting survey.

If active nests or burrows are detected, nest disturbance should be avoided until the young have fledged. For active nests, adequate buffer zones should be established to minimize disturbance to nesting birds. Buffer distances should be greater than 100 feet from songbird and raven nests, and 0.25 mile from raptor nests. Buffer zones of up to 0.5 mile may be established for golden eagles, ferruginous hawk, prairie falcon and peregrine falcon active nests. Active nest sites in trees or shrubs that must be removed should be mitigated by qualified biologists or wildlife rehabilitators. NMDGF biologists are available for consultation regarding nest site mitigation and can facilitate contact with qualified personnel.

Operations activities, such as occasional noise disturbances, would temporarily displace migratory birds in the analysis area and vicinity. These impacts would be short term, occurring approximately twice per year under routine operations. Affected individuals would be able to shift use to adjacent land. Long-term impacts to migratory bird species would be minimal and unlikely to result in population-level effects.

### **4.4 Bald and Golden Eagle Protection Act**

No bald or golden eagles were observed during the biological survey. Activities in the analysis area are not expected to impact bald or golden eagles. Because the analysis area and surrounding area lack suitable

nesting and foraging habitat for these two species, the project is not anticipated to cause take of individual bald or golden eagles, their nests, or their eggs. Because of their mobility and ability to avoid areas of human activity, adult eagles likely would not be directly harmed by the proposed project.

## **4.5 Special-status Species**

One federally listed candidate species, the monarch butterfly, has the potential to occur in the analysis area. Because of the timing of biological survey early in the season, the presence of milkweed species in the analysis area cannot be confirmed. A follow-up survey to confirm the presence of milkweed vegetation would determine whether suitable breeding habitat is present. If milkweed vegetation is present, SWCA recommends that the revegetation seed mix includes pollinator species such as milkweed and impacts to this vegetation is minimized to the greatest extent possible.

In addition, SWCA observed burrowing owls, which are protected by the MBTA, and Gunnison's prairie dog colonies, which could provide habitat for this species, within the analysis area. If construction begins during the burrowing owl nesting season (March 1–October 31), SWCA could conduct occupied nesting burrow surveys, including verifying the presence/absence of prairie dogs.

Currently, the project does not have a state or federal nexus, so no regulatory agency requires additional biological surveys. If any of these species or any other listed species are found in the project area (either during a species-specific survey or during construction and operation), any harm to those species would violate 75-6-1 NMSA and the New Mexico Wildlife Conservation Act (17-2-37 through 17-2-46 NMSA 1978) (NMDGF 2020). For endangered animal species, SWCA recommends that Rancho Viejo coordinate with the NMDGF if any individuals are detected. Avoidance or minimization is recommended to avoid impacts to these species.

## **5 RECOMMENDED ACTIONS**

SWCA recommends the following actions for the project:

- Avoidance or minimization of impacts to burrowing owls and prairie dogs are recommended. If burrowing owls or prairie dogs are identified in the project area during construction, Rancho Viejo should immediately contact a biologist to confirm the identification of this species and coordinate with the NMDGF.
- If milkweed vegetation is present, the revegetation seed mix would include pollinator species such as milkweed. Milkweed vegetation removal will be minimized to the greatest extent possible.
- Conduct preconstruction nest surveys to avoid potential impacts to MBTA protected species. If active nests are observed, recommended buffers should be applied until the young have fledged.
- Enroll the construction crew in a worker environmental awareness program.
- Any new powerlines, generation interconnection lines, inverters, substations, or upgrades to existing transmission line infrastructure necessary for the proposed project should be in conformance with the Avian Power Line Interaction Committee's suggestions (APLIC 2006; 2012).

## 6 LITERATURE CITED

- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Available at: [https://www.aplic.org/uploads/files/2613/SuggestedPractices2006\(LR-2watermark\).pdf](https://www.aplic.org/uploads/files/2613/SuggestedPractices2006(LR-2watermark).pdf). Accessed October 2023.
- . 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Available at: [https://www.aplic.org/uploads/files/15518/Reducing\\_Avian\\_Collisions\\_2012watermarkLR.pdf](https://www.aplic.org/uploads/files/15518/Reducing_Avian_Collisions_2012watermarkLR.pdf). Accessed October 2023.
- Ashigh, J., J. Wanstall, and F. Sholedice. 2010. *Troublesome Weeds of New Mexico*. Las Cruces: New Mexico State University College of Agricultural, Consumer and Environmental Sciences. Cooperative Extension Services. Available at: <http://mckinleyswcd.com/troublesome-weeds-report>. Accessed October 2023.
- Biota Information System of New Mexico (BISON-M). 2023. Biota Information System of New Mexico (BISON-M). Available at: <http://www.bison-m.org/>. Accessed October 2023.
- Cary, S.J., and L.S. DeLay. 2016. *Monarch Butterfly (Danaus plexippus) in New Mexico and a Proposed Framework for Its Conservation*. Santa Fe, New Mexico: Natural Resources Institute.
- Cartron, J-L.E. (ed.). 2010. *Raptors of New Mexico*. Albuquerque: University of New Mexico Press.
- Clinton, D.F., and J.R. Barber. 2013. A framework for understanding noise impacts on wildlife: an urgent conservation priority. *Frontiers in Ecology and the Environment* 11:305–313.
- Desmond, M.J. 2010. The Burrowing Owl (*Athene cunicularia*). In *Raptors of New Mexico*, J-L.E. Cartron (ed.). Albuquerque: University of New Mexico Press.
- Eveling, D.W., and D.W. Bataille. 1984. The effect of deposits of small particles on the resistance of leaves and petals to water loss. *Environmental Pollution* 36:229–238.
- Griffith, G.E., J.M. Omernik, M.M. McGraw, G.Z. Jacobi, C.M. Canavan, T.S. Schrader, D. Mercer, R. Hill, and B.C. Moran. 2006. Ecoregions of New Mexico (two-sided color poster with map, descriptive text, summary tables, and photographs). Scale 1:1,400,000. Reston, Virginia: U.S. Geological Survey.
- Miller, S.D., and J.F. Cully, Jr. 2001. Conservation of Black-Tailed Prairie Dogs (*Cynomys ludovicianus*). *Journal of Mammalogy* 82(4):889–893. Available at: <https://academic.oup.com/jmammal/article/82/4/889/2372868>. Accessed October 2023.
- Natural Heritage New Mexico (NHNM). 2023. Species Information. NMBiotics Database. Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico. Available at: <https://nhnm.unm.edu>. Accessed October 2023.
- Natural Resources Conservation Service (NRCS). 2023a. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov/app/>. Accessed October 2023.
- . 2023b. The PLANTS Database. Available at: <http://plants.usda.gov>. Accessed October 2023.

- . 2023c. *Salsola tragus* L. Prickly Russian thistle. Available at: <https://plants.usda.gov/home/plantProfile?symbol=SATR12>. Accessed October 2023.
- NatureServe. 2023. NatureServe Explorer. Available at: <http://explorer.natureserve.org/>. Accessed October 2023.
- New Mexico Department of Agriculture. 2020. New Mexico noxious weed list update. New Mexico State University. Available at: [noxious-weed-memo-and-list-june-2020.pdf \(nmsu.edu\)](#). Accessed October 2023.
- New Mexico Department of Game and Fish (NMDGF). 1994. *Endangered Species of New Mexico – 1994 Biennial Review and Recommendations*. Authority: New Mexico Wildlife Conservation Act (17-2-37 NMSA 1978).
- . 2020. *Threatened and Endangered Species of New Mexico. 2020 Biennial Review*. Santa Fe, New Mexico: New Mexico Department of Game and Fish Wildlife Management and Fisheries Management Divisions. Available at: <https://www.wildlife.state.nm.us/conservation/wildlife-species-information/threatened-and-endangered-species/>. Accessed October 2023.
- New Mexico Department of Game and Fish (NMDGF) and Natural Heritage New Mexico (NHNM). 2013. New Mexico Crucial Habitat Assessment Tool. Available at: <http://nmchat.org/>. Accessed October 2023.
- New Mexico Energy, Minerals and Natural Resources Department (EMNRD). 2021. New Mexico state endangered plant species (19.21.2.8 NMAC). Available at: [http://www.emnrd.state.nm.us/SFD/ForestMgt/documents/NMENDANGEREDPLANTList\\_000.pdf](http://www.emnrd.state.nm.us/SFD/ForestMgt/documents/NMENDANGEREDPLANTList_000.pdf). Accessed October 2023.
- New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants website (Version 26, August 2020). Available at: <http://nmrareplants.unm.edu>. Accessed October 2023.
- Santa Fe-Pojoaque Soil and Water Conservation District (SFPWCD). 2023. Santa Fe-Pojoaque County Soil and Water Conservation District. Available at: <https://www.landcan.org/local-resources/Santa-FePojoaque-Soil-and-Water-Conservation-District/5130/>. Accessed October 2023.
- Selby, G. 2007. Great Basin Silverspot Butterfly (*Speyeria nokomis nokomis* [W.H. Edwards]): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/greatbasinsilverspotbutterfly.pdf>. Accessed October 2023.
- Stahlecker, D.W., and R.B. Duncan. 1996. The Boreal Owl at the Southern Terminus of the Rocky Mountains: Undocumented Longtime Resident or Recent Arrival? *The Condor* 98:153–161.
- Stahlecker, D.W., and H.A. Walker. 2010. Bald eagle. In *Raptors of New Mexico*, edited by J.-L. E. Cartron, pp. 131–149. Albuquerque, New Mexico: University of New Mexico Press.
- U.S. Department of Agriculture (USDA). 2010. Federal Noxious Weed List. Updated March 21, 2017. Available at: [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/weeds/downloads/weedlist.pdf](http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf). Accessed October 2023.

U.S. Fish and Wildlife Service (USFWS). 2023a. Information for Planning and Consultation (IPaC). Available at: <http://ecos.fws.gov/ipac/>. Accessed October 2023.

———. 2023b. U.S. Fish and Wildlife Service Critical Habitat Portal. Available at: <http://criticalhabitat.fws.gov/>. Accessed October 2023.

Western Regional Climate Center. 2023. New Mexico Climate Summaries: Santa Fe 2, New Mexico (COOP Station 298085). Available at: <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm8085>. Accessed October 2023.

## **APPENDIX A**

### **Project Maps**

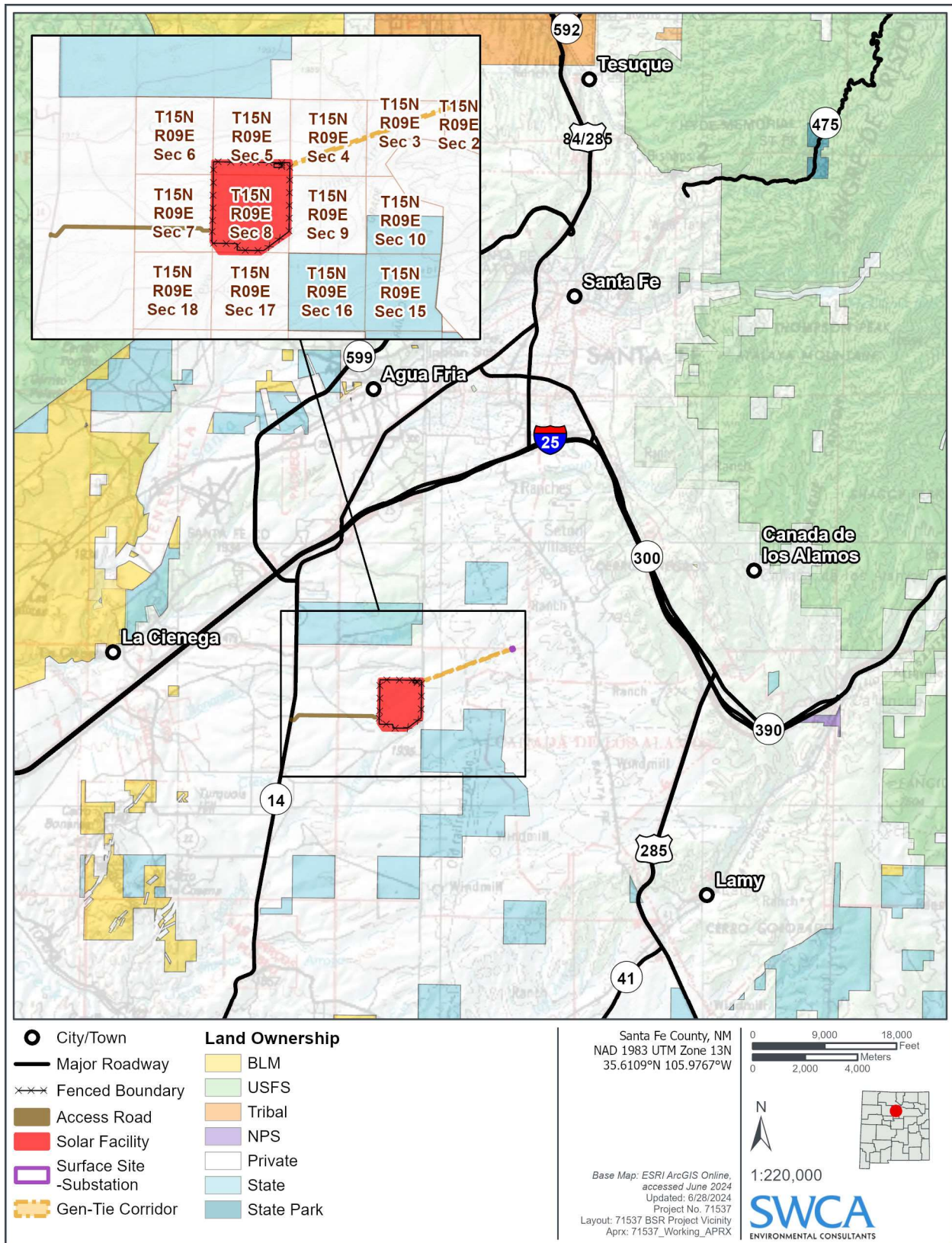


Figure A-1. Project location map.

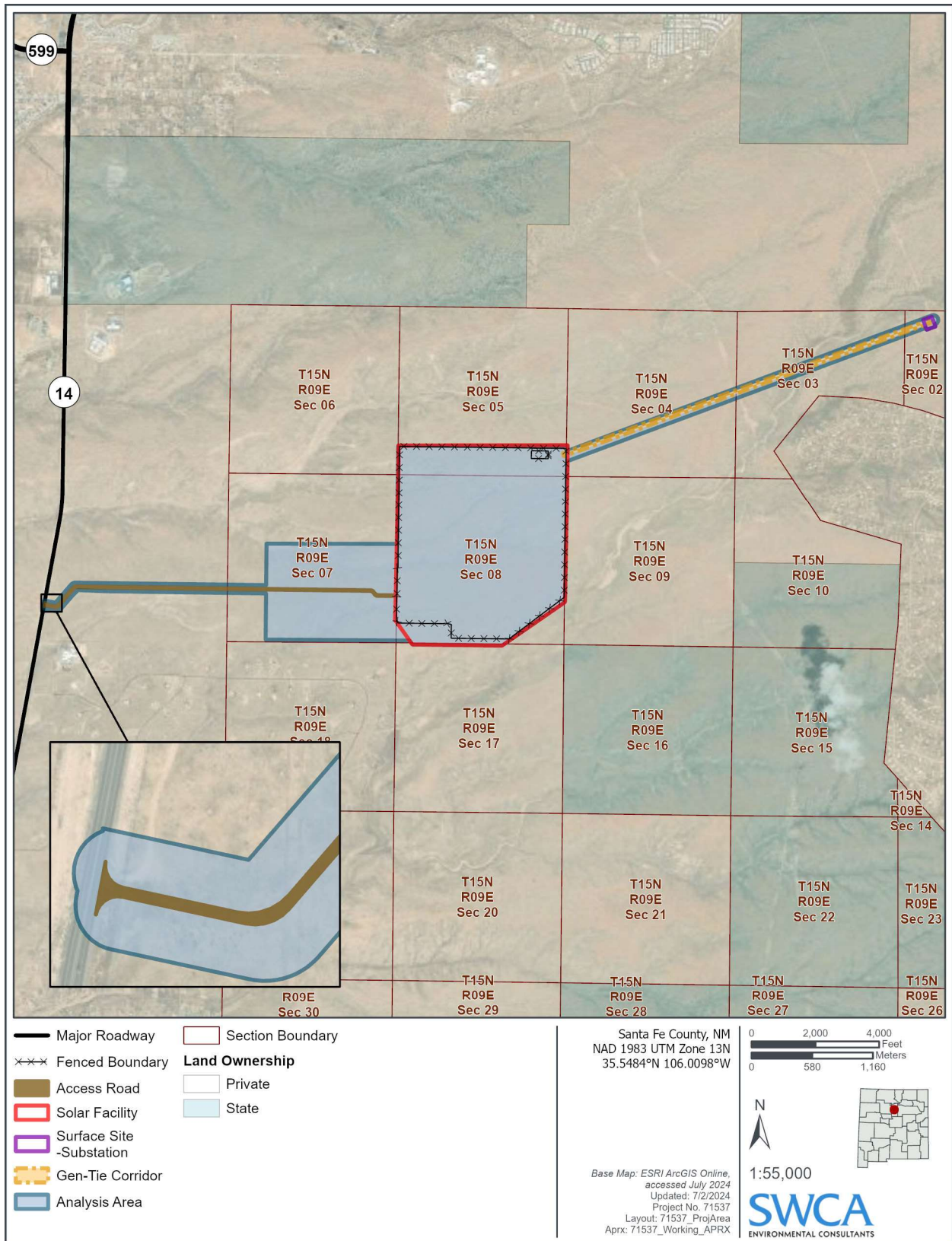


Figure A-2. Analysis area map.



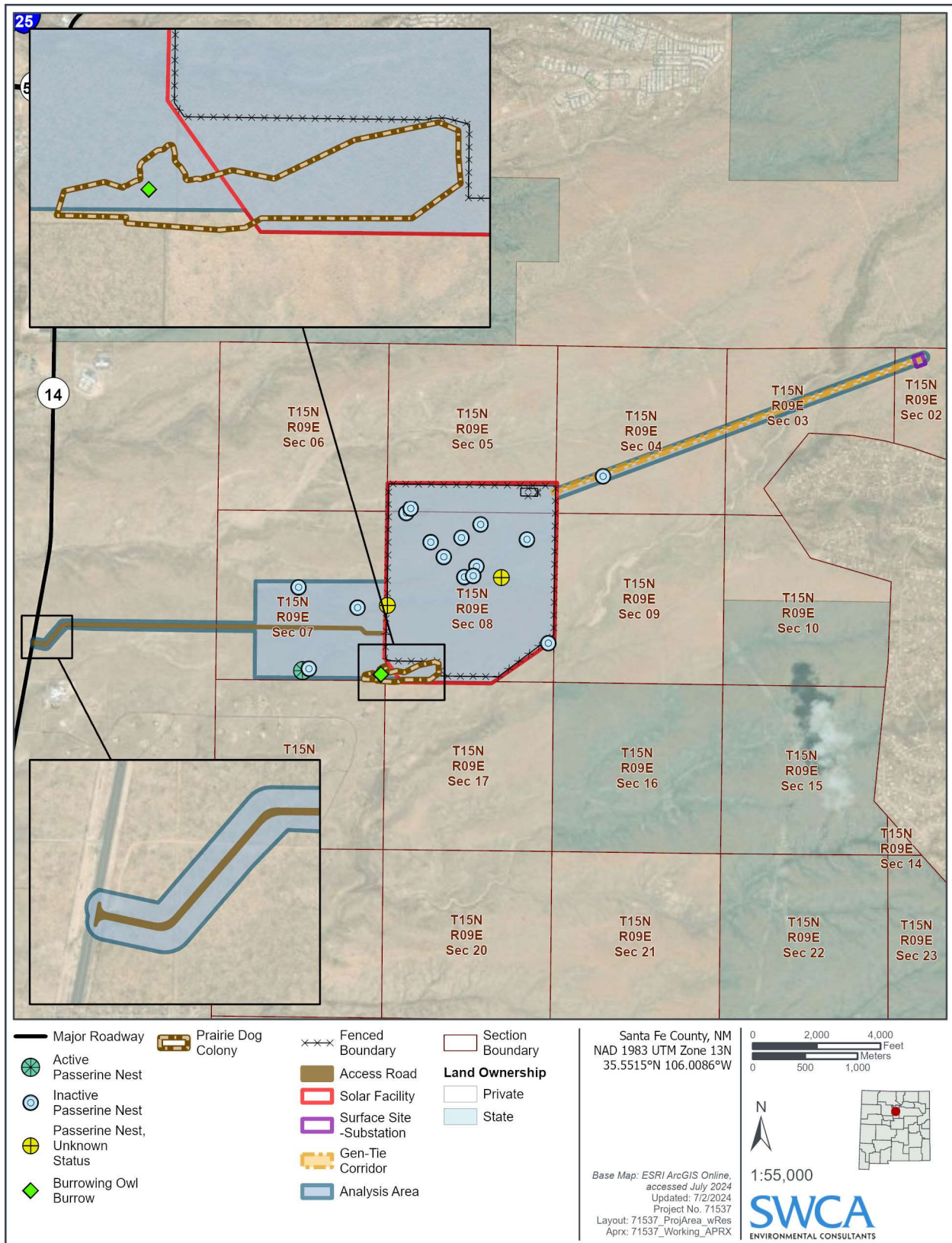


Figure A-3. Analysis area map with natural resources.

## **APPENDIX B**

### **Project Photographs**



**Figure B-1. View of Habitat 1 (grasslands) within the analysis area, facing north.**



**Figure B-2. View of Habitat 1 (grasslands) within the analysis area, facing east.**



**Figure B-3. View of Habitat 2 (pinyon-juniper savanna) within the analysis area, facing north.**



**Figure B-4. View of Habitat 2 (pinyon-juniper savanna) within the analysis area, facing west.**



**Figure B-5. View of an inactive passerine nest in fair condition in tree cholla (*Cylindropuntia imbricata*), facing northeast.**



**Figure B-6. View of an active curve-billed thrasher nest under construction and in good condition in tree cholla, facing northeast.**



**Figure B-7. Gunnison's prairie dog colony in the analysis area, facing north.**



**Figure B-8. Burrow complex suitable for burrowing owls in the analysis area, facing north.**