BIOLOGICAL ASSESSMENT
FOR THE PERU HILL MILL INDUSTRIAL PARK, LUNA COUNTY, NEW MEXICO

Biological Assessment for the Peru Hill Mill Industrial Park, Luna County, New Mexico

Prepared for
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1.0 Introduction

The City of Deming proposes to develop the Peru Hill Mill Industrial Park, which is located approximately 3.5 miles northwest of Deming in Luna County, southwestern New Mexico (Figure 1-1). The City of Deming intends to apply for a United States (U.S.) Economic Development Administration (EDA) grant to finance construction of the proposed project. This report presents the findings of a biological resource review and field survey conducted by TRC Environmental Corporation, Inc. (TRC) on behalf of the City of Deming to support its intended application to the EDA.

1.1 Project Area

The project area is located within the City of Deming Industrial Park owned by the City of Deming. The project area is accessible by major transportation routes, including railroads and U.S. Interstate 10 (I-10). The City of Deming Industrial Park is part of the Peru Hill Mill Property, a participant in the U.S. Environmental Protection Agency's Brownfields Program. The Peru Hill Mill Property previously was used as a zinc ore-processing mill. The Luna Energy Facility is located east of the project area, north of Arrowhead Drive, and consists of a 570-megawatt natural gas power plant. An existing 16-foot high-pressure gas line travels parallel to the transmission line within the project area and feeds the Luna Energy Facility.

The corresponding U.S. Geological Survey (USGS) 7.5 minute quadrangle map for the project area is West Deming, New Mexico (1964). The project area is an approximately 1,072-acre parcel located along the right-of-way of Arrowhead Road, between Sections 16 and 21 of Township 23 South, Range 9 West and in Township 23 South, Range 9 West, Sections 17-20 (Figure 1.1). The project area is bounded to the north and west by section fence lines that separate the property from New Mexico State Trust Land. The southern boundary is defined by the Mimbres River near the southwestern corner, an overhead electric transmission line, and a natural gas pipeline. The project extends east along the right-of-way along Arrowhead Road to where Arrowhead road intersects Highway 180.

Existing facilities in the project area include a water pumping facility owned by the City of Deming and cooling towers associated with the Luna Energy Facility. A corrugated metal barn constructed when the property was used for zinc processing currently is used as a heavy equipment shed. Other abandoned buildings from the zinc processing operation include a concrete shed adjacent to the heavy equipment shed, and a water storage tank adjacent to the water pump facility. Two tailings piles centrally located in the project area are excluded from the project study area. A groundwater well located adjacent to Peru Mill Road is located in the central portion of the project area, and remnants of an old trailer are located in the central eastern part of the project area. Photographs of the project area and existing facilities are provided in Appendix A: Project Area Photographs.

1.2 Methods

TRC conducted a search of publicly available literature sources to describe the environmental setting and potential biological resources of the project area. A pedestrian survey of the project area was conducted by Stephanie Owens, TRC Biologist, on May 18, 2010, and Carley Sweet, TRC Biologist, on August 17, 2010, to document and describe the vegetation, surface water features, wildlife, and other biological and environmental features present. Areas 50 feet north and south of Arrowhead Drive also were surveyed (Figure 1-1). Focused surveys for target species (i.e. threatened, endangered and sensitive species) were not conducted. Temperatures during the survey ranged from 63 to 93°F with winds at speeds of 5 to 15 miles per hour (mph).

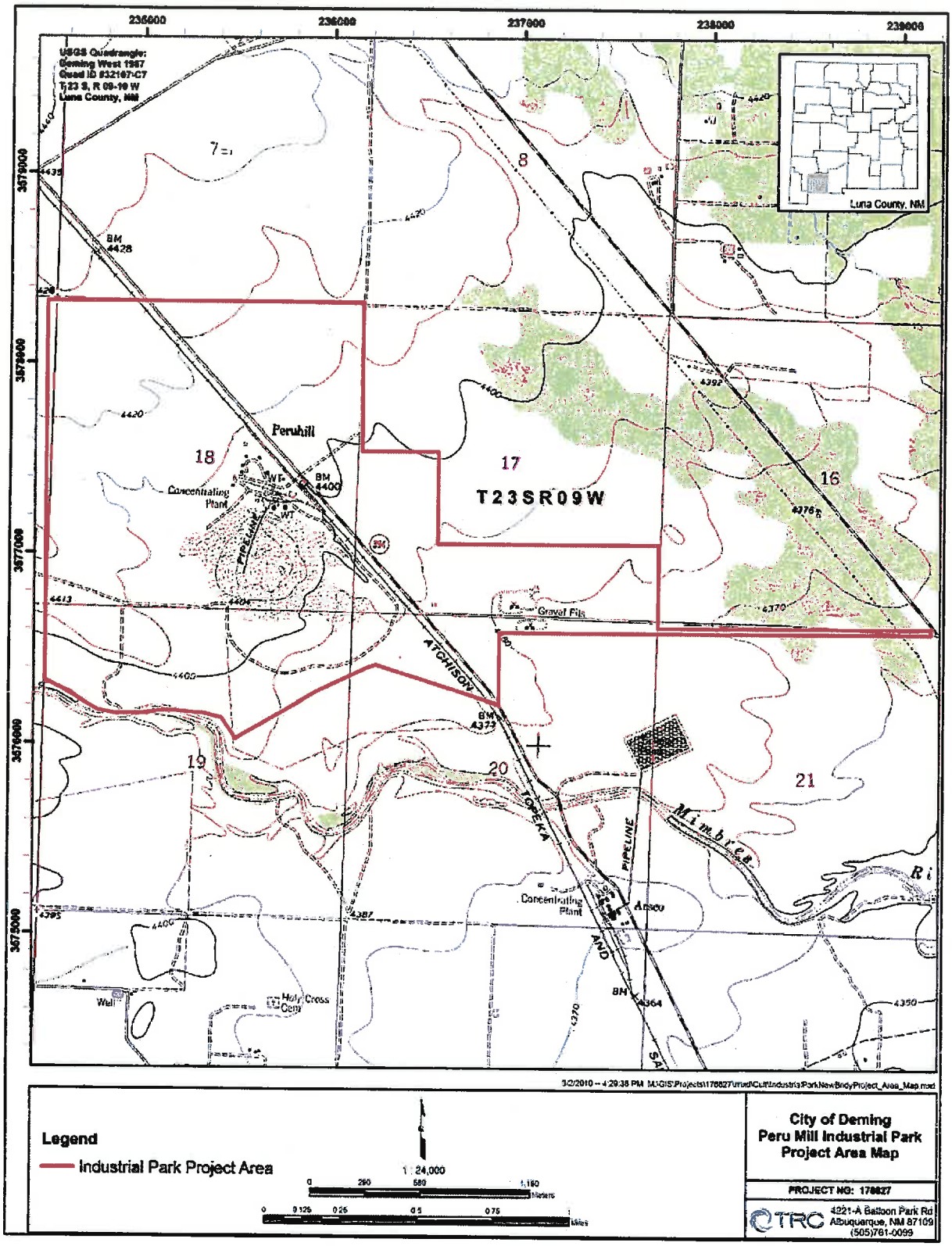

Figure 1.1 Project location map

2.0 Environmental Setting

2.1 Physiography and Climate

The project area is located within the Mexican Highland region of the Basin and Range physiographic province (USGS 2003), characterized by alluvial fans and internally drained basins generally below 4,500 feet that were formed from the sedimentation of collapsed tectonic faults during the Tertiary period (NRCS 2010a, Griffith and Omernik 2009). Elevation in the project area ranges from approximately 4,380 feet along the southern boundary to approximately 4,420 feet to the north. The climate is characterized by short winters and long, hot summers, with average annual temperatures around 65°F (Bailey 1980). Daytime temperatures in the summer often exceed 100°F, while the average temperature in January, the coldest month, is in the mid-50s. Diurnal temperature fluctuations range from 25° to 35°F (WRCC 2002).

Average annual precipitation in the project area ranges from 8 to 11 inches (NRCS 2010b), with most precipitation falling during a period of local intense rain storms beginning around July and continuing through October (Bailey 1980). Convective storms are generated from strong surface heating and orographic lifting of moist air from the Gulf of Mexico circulating from the southeast. Sixty to 80 percent of annual precipitation falls from May to October, the six warmest months of the year (WRCC 2002). Wind speeds are typically moderate; however sustained strong winds exceeding 30 mph accompanying spring storm fronts present the risk of blowing dust and soil erosion of unprotected fields (WRCC 2002).

2.2 Soils

Soils in the project area are generally deep, non-saline, well-drained sandy soils with a low water table (more than 80 inches deep). Soils in the northern, central and east ends of the project area and surrounding the main tailings pile to the southeast are from the Berino and Mohave series, which are deep, well drained sandy soils of valley floors and fan piedmonts from alluvium derived from igneous (Berino series) and sedimentary (Mohave series) parent material. Texture ranges from loamy sand and sandy loam in the top 5 to 8 inches, to sandy clay loams and clay loams for deeper soil layers. The available water capacity, defined as the capacity of soil to hold water available for use by most plants and expressed as inches of water per inch of soil, is rated moderate to high ranging from an average of 7.1 to 11.3 inches (NRCS 2010b).

Most of the western and central portions of the project area are characterized by Mohave sandy clay loam, 0 to 3 percent slopes. This soil type of alluvial fans and hillslopes is a deep, well-drained loam with high available water capacity (12.0 inches). Texture ranges from sandy clay loam in the top 8 inches to clay loam (NRCS 2010b).

The southern boundary of the project area to the west along the Mimbres River has soils from the Arizo and Vinton series, which are deep, well drained to excessively well drained loamy sand to extremely gravelly sand with a rare (Vinton) to occasional (Arizo) frequency of flooding. These alluvial soils have a very low-to-low available water capacity (2.2–4.3 inches) (NRCS 2010b). Other soils along the southern project boundary are from the Bluepoint-Onite association. These soils are deep, well drained to somewhat excessively drained soils ranging in texture from loamy sand to gravelly loamy sand, with low available water capacity (4.2 to 5.7 inches). The Bluepoint-Onite associate is alluvium derived from calcareous sandstone parent material, typically found on alluvial fans and stream terraces of valley floor remnants (Bluepoint series) and fan piedmonts of valley sides (Onite series) (NRCS 2010b).

Areas north and south of Arrowhead Drive are derived of the Dona Ana sandy loam, Dona Ana-Pintura complex (eroded), Mohave sandy loam and Mohave-Pintura complex (eroded). The Dona Ana soils are

very deep, well-drained soils that formed in alluvial sediments derived from sedimentary rocks and contain a moderate water capacity of 7.7 to 7.9 inches. Dona Ana soils are on alluvial fans and fan terraces and have slopes of 0 to 9 percent. The Mohave series is described above (NRCS 2010b).

A gravel pit is located in the central eastern portion of the project area.

2.3 Surface Waters

The project area is located within the Mimbres Watershed (EPA 2010), a closed basin drained by the Mimbres River that includes essentially all of Luna County. The Mimbres River is formed by snow-pack and runoff from the southwestern slopes of the Black Range. Only the upper reach of the river is perennial. As it flows southward, the river dissipates on the desert floor north of Deming. The river floods the Deming area approximately once a decade after periods of unusually heavy rainfall in the Cooke's and Black ranges (Wikipedia 2010). Porter Draw, an ephemeral drainage lacking a defined channel, flows from the western boundary of the project area southeast into the Mimbres River. A small ditch in the vicinity of the City of Deming water pumping facility was filled with water at the time of the field survey. In addition, three ponded areas were observed in the project area. Precipitation levels in the project area ranged from 0.03 to 0.25 inches over a period of five days prior to the survey, indicating that the area had received rainfall and therefore explaining why these areas contained water. Spadefoot toad tadpoles were observed swimming in one of the ponds and juvenile toads were observed around the pond, indicating that the wet area had been holding water for at least two days in order for the tadpoles to hatch (Appendix A: Project Area Photographs). None of the ponded areas appeared to contain hydrophitic vegetation to indicate that they were wetlands.

2.4 Vegetation

The project area is located within the Chihuahuan Basins and Playas ecoregion, which is dominated by desert shrubs and grasses adapted to low available moisture, high evapotranspiration rates, and extreme diurnal temperature fluctuations (Griffith and Omernik 2009). The project area is mostly desert grassland dominated by tobosa grass (*Hilaria mutica*), soapweed yucca (*Yucca palmilla*), broom snakeweed (*Gutierrezia sarothrae*) and Mormon tea (*Ephedra trifurca*); other shrubs include honey mesquite (*Prosopis glandulosa*), and creosote bush (*Larrea tridentata*). Many desert wildflowers were in bloom throughout the project area at the time of the survey, including blanketflower (*Gaillardia* sp.), white flower gilia (*Gilia longiflora*), scarlet globemallow (*Sphaeralcea coccinea*), silverleaf nightshade (*Solanum elaeagnifolium*), desert marigold (*Baileya multiradiata*) and hairyseed bahia (*bahia absinthifolia*).

The tobosa grassland contains patches, mainly in the southwestern portion of the project area, in which grass cover decreases and the dominant ground cover is broom snakeweed. Grassland vegetation in the vicinity of the tailings piles and existing facilities in the central-eastern portion of the project area is disturbed. The southeastern portion of the project area is dominated by soapweed yucca, Mormon tea, fourwing saltbush (*Atriplex canescens*), sand sage (*Artemisia filifolia*), and mixed grasses. Riparian vegetation along the Mimbres River along the southern border of the project area to the west consists of open, deciduous woodland dominated by desert willow (*Chilopsis linearis*). The ditch near the City of Deming water pump facility is lined with tamarisk (*Tamarix* sp.) and giant reed (*Arundo* sp.).

The northern portion of the project area was dominated by tobosa grass, silverleaf nightshade, Russian thistle (*Salsola tragus*), soapweed yucca and creosote bush. Dense patches of tobosa grass were found in the central portion of the project area where the soil classification changed from the Berino and Mohave classification to the Bluepoint-Onite association. Grassland vegetation in the eastern portion of the project area appears to be disturbed and is dominated in most areas by broom snakeweed. In some eastern and central portions of the project area, vegetation was found in sparse patches and the sandy soils

were exposed. Dominant vegetation in these areas consisted of broom dalea (*Psorothamnus scoparius*), broom snakeweed, honey mesquite and silverleaf nightshade. Vegetation north and south of Arrowhead Drive consists mainly of broom snakeweed, Russian thistle and mixed grasses.

2.4.1 Noxious weeds

The New Mexico Department of Agriculture coordinates the management of noxious weeds under the New Mexico Noxious Weed Act (76-7D-1 to 76-7D-6 NMSA 1978). Noxious weeds are defined as plant species that are deemed harmful to the economy or the environment, and are listed on the New Mexico Noxious Weed List. Tamarisk (*Tamarix* sp.), also known as saltcedar, is listed a Class C species on the New Mexico Noxious Weed List. Class C species are widespread, established species that are targeted for local management based on the feasibility of control and level of infestation. The distribution of tamarisk in the project area is limited to the artificial ditch near the City of Deming water pumping facility. An unknown type of starthistle (*Centaurea* sp.) was observed on the east side of Peru Mill Road in the central portion of the project area. The plant could not be more specifically identified due to the season and its condition. A further study would determine if the starthistle is one listed on the New Mexico Noxious Weed List. No other species included on the New Mexico Noxious Weed List were detected in the project area.

2.5 Wildlife

The project occurs in the Chihuahuan Desert, a biologically diverse and unique ecosystem that stretches across southeastern Arizona and southern New Mexico to the Edwards Plateau of western Texas, and extends south to central Mexico. Typical mammal species include ungulate grazers such as the pronghorn antelope (*Antilocapra americana*), and mule deer *(Odocoileus hemionus),* other herbivores such as desert cottontail *(Sylvilagus audubonii),* and black-tailed jack rabbit *(Lepus californicus),* and rodents including kangaroo rats (*Dipodomys*), deer mice (*Peromyscus*), woodrats, (*Neotoma floridana),* pocket gophers (*Geomyidae*), and ground squirrels (*Sciuridae*). Predators include coyote (*Canis latrans*), grey desert fox (*Urocyon cinereoargenteus*), swift fox *(Vulpes velox),* bobcat *(Lynx rufus),* and mountain lion *(Puma concolor*), while typical omnivores include raccoon (*Procyon lotor),* badger *(Mustelidae*), skunk (*Mephitis mephitis)*, and javelina (*Tayassuidae).* Common bird species include the greater roadrunner (*Geococcyx californianus),* scaled quail, (*Callipepla squamata*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow (*Amphispiza bilineata*), Scott's oriole *(Icterus parisorum*), and raptors including the great horned owl *(Bubo virginianus)*, burrowing owl *(Athene cunicularia),* and red-tailed hawk *(Buteo jamaicensis).* Chihuahuan Desert herpetofauna are more strongly associated with the region, compared with common mammal and bird species, which generally have more widespread distribution. Lizards species centered in the region include Texas horned lizard (*Phrynosoma cornutum*), Texas banded gecko (*Coleonyx brevis*) and reticulated gecko (*C. reticulatus*), greater earless lizard (*Cophosaurus texanus*), several species of spiny lizards (*Scelpoprus* spp.), and several species of whiptails (*Cnemidophorus* spp.). Representative snakes include the Trans-Pecos ratsnake (*Elaphe subocularis*), Texas blackheaded snake (*Tantilla atriceps*), and whipsnakes (*Masticophis* spp.) (WWF 2001).

Various migratory birds and raptors were observed in the project area during the biological field investigation, including mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), ash-throated flycatcher (*Myiarchus cinerascens),* western kingbird (*Tyrannus verticalis*), Cassin's sparrow (*Aimophila casinii*), western meadowlark (*Sturnella neglecta*), loggerhead shrike (*Lanius ludovicianus*), black-throated sparrow (*Amphispiza bilineata*), cactus wren (*Campylorhynchus brunneicapillus*), hooded oriole (*Icterus cucullatus*), yellow grosbeak (*Pheucticus chrysopeplus*), Chihuahuan raven *(Corvus cryptoleucus),* turkey vulture *(Cathartes aura),* and Swainson's hawk *(Buteo swainsoni*). One nesting mourning dove was flushed from its nest in the central portion of the project area. One egg was observed in the nest. An active great-horned owl (*Bubo virginianus*) nest is located in the southeast corner of the heavy equipment shed; two adult owls were observed with one downy-

feathered young. An abundance of owl pellets and whitewash in the shed indicate that owls have probably occupied the site for several seasons.

Western burrowing owls (*Athene cunicularia hypugaea*) were observed in the western and northern portions of the project area, and in a kangaroo rat mound complex located northeast of Peru Mill Road and south of Arrowhead Drive (Appendix A: Project Area Photographs).

Black-tailed jackrabbits (*Lepus californicus*), Texas horned lizard (*Phrynosoma cornutum*), little striped whiptail (*Cnemidophorus inornatus*), New Mexico whiptail (*Cnemidophorus inornatus*) and juvenile toads of the genus *Spea* also were observed in the project area during the survey. Bat droppings were observed in openings to a small concrete building adjacent to the heavy equipment shed, indicating use of the building by bats for roosting. Observations of cattle droppings provide evidence of cattle grazing in the project area.

3.0 Threatened, Endangered, and Sensitive Species

A list of threatened, endangered, and sensitive species with potential to occur in Luna County is provided as Table 3.1. The list was compiled from information provided by the U.S. Fish and Wildlife Service (USFWS) (USFWS 2010a), the Biota Information System of New Mexico (BISON-M 2010), the New Mexico Rare Plant Technical Council (NMRPTC 1999), and the New Mexico Administrative Code (19.21.2.8 NMAC and 19.33.6.8 NMAC). The list includes: three species of invertebrates; two species of fish; three species of herpetofauna (reptiles and amphibians); 19 species of birds; two species of mammals; and two species of plants. Table 3.1 also summarizes the habitat requirements, range, and population distribution for each species, which were used to determine which wildlife species could potentially occur in the project area. The following subsections describe the species with potential to occur in the project area; species not likely to occur are excluded from further consideration.

3.1 Invertebrates

Three threatened, endangered, and sensitive invertebrate species occur in Luna County (Table 3.1). All three species are excluded from further consideration because they are not likely to occur in the project area due to specific and limited distribution and/or habitat factors such as vegetation, elevation, or soil type that do not match the conditions of the affected environment in the project area.

3.2 Fish

Two species of special status fish are listed in Luna County (Table 3.1): the federally threatened beautiful shiner (*Cyprinella formosa*), now extirpated from New Mexico (BISON-M 2010); and the Rio Grande sucker (*Catostomus plebius*), a USFWS Species of Concern. The Rio Grande sucker normally occupies middle elevation streams (i.e. 6,500 to 8,000 feet) of the Mimbres drainage, but may occur in downstream reaches following flood events. No permanent water sources providing fish habitat are located within the project area, therefore fish will not be affected by the proposed action.

Table 3.1 List of Threatened, Endangered, and Sensitive Species in Luna County, New Mexico

Common Name† (*Scientific Name*)	Status*	Habitat**	Distribution**	Potential to Occur?
INVERTEBRATES				
Cooke's Peak Woodlandsnail *(Ashmunella macromphala)*	SOC, t	Feeds on decaying organic matter under rocks and debris on the very steep northern slope of Cooke's Peak from about 6,900 to 7,000 feet in elevation.	Known only from Cooke's Peak, Luna County, about 15 miles north of the project area.	No – Project area is outside known distribution.
Florida Mountainsnail *(Oreohelix florida)*	SOC	This species was described from recent shells collected near the central peak on the west side of the Florida Mountains.	Endemic to the Florida Mountains of southwestern New Mexico; believed to be extinct.	No – Project area is outside known distribution.
Shortneck Snaggletooth *(Gastrocopta dalliana dalliana)*	SOC	Feeds on algae and detritus in an array of habitats ranging from Sonoran desert shrublands to montane forest. In New Mexico, this species has been taken from a wooded canyon at 5,900 feet in elevation.	Living specimens in New Mexico are known only from Indian Creek Canyon on the northern slope of Animas Peak, Hidalgo County.	No – Project area is outside known distribution.
FISH				
Beautiful Shiner *(Cyprinella formosa)*	T	Mid-water column species living in pools of small to medium streams and along shorelines of larger streams, near beds of aquatic vegetation or other cover.	Extirpated from New Mexico. Formerly occurred in perennial reaches of the Mimbres drainage in northwest Luna County.	No – Extirpated from New Mexico.
Rio Grande Sucker *(Catostomus plebius)*	SOC	Small to large, middle elevation (6,500 to 8,000 feet) streams, feeding on plankton and invertebrates in swiftly flowing riffle areas over rocks and gravel bottoms.	Normally occurs in the Mimbres River in Grant County, but may occur further downstream during and immediately following flood periods.	No – Lack of permanent aquatic habitat.
HERPETOFAUNA				
Chiricahua Leopard Frog *(Rana chiricahuensis)*	T	Variety of permanently moist, heterogeneous aquatic habitats including springs and seeps, ponds, marshes, stock tanks, wells, intermittent rocky creeks, and mainstream river reaches.	Known to occupy dense riparian habitat along the Mimbres River in northwest Luna County.	No – Lack of suitable aquatic habitat; project area is outside known distribution.
Great Plains Narrowmouth Toad *(Gastrophryne olivacea)*	e	Grassland and desert-grassland habitats, including tobosa grasslands and swales. Breeds opportunistically in temporary aquatic habitats such as rain pools and ponds.	Known population exists in extreme south-central Luna County the vicinity of Hermanas.	Yes – Potential suitable habitat in the project area.
Reticulate Gila Monster *(Heloderma suspectum suspectum)*	e	Inhabits lower slopes of mountains and nearby outwash plains, especially in canyons and arroyos with periodic water; also frequents adjacent irrigated farmlands.	In New Mexico, Gila monsters occur regularly in the Gila Valley and from the Arizona border to the eastern slopes of the Peloncillo Mountains in Hidalgo County.	Yes – Potential suitable habitat in the project area.

Common Name† (*Scientific Name*)	Status*	Habitat**	Distribution**	Potential to Occur?
BIRDS				
Brown Pelican *(Pelecanus occidentalis carolinensis)*	e	Usually found in warmer water marine habitats in North America; rarely occurs inland. Reliable New Mexico records are all of solitary birds near large lakes and reservoirs.	Rare vagrants in New Mexico, primarily as immature wanderers in summer and fall. Recorded in 13 New Mexico counties, including Luna County.	Yes – Rare vagrant or migrant.
Neotropic Cormorant *(Phalacrocorax brasilianus)*	t	Larger bodies of open water such as lakes and reservoirs. Requires trees, shrubs, or dead snags near water for nesting in areas free from human disturbance.	In New Mexico, breeds only in the lower Rio Grande Valley near Elephant Butte and Caballo reservoirs. Nonbreeders occur north to Bernalillo, west to the Gila Valley, and east to the Tularosa and lower Pecos valleys.	Yes – Rare vagrant or migrant.
Bald Eagle *(Haliaeetus leucocephalus alascanus)*	t	Associated with open expanses of water (e.g. streams and lakes) in a variety of habitats. Roosts in trees at protected sites, such as groups of trees or canyons.	Statewide migrant and local winter resident in New Mexico. Winter roost and concentration areas include the Gila and lower Rio Grande valleys, and Elephant Butte and Caballo reservoirs. Breeds at only a few sites to the extreme north and west of the state.	Yes – Local winter resident or occasional migrant.
Common Black-Hawk *(Buteogallus anthracinus)*	SOC	Riparian woodlands along permanent lowland streams. Requires mature, well-developed stands (e.g., cottonwood bosques) for breeding.	Uncommon summer resident from March to October in New Mexico. Regularly occurs in the San Francisco, Gila, and Mimbres valleys; occasionally occurs in the middle Rio Grande valley.	Yes – Potential suitable habitat in the project area.
Northern Gray Hawk *(Buteo nitidus maxima)*	SOC	Lowland riparian woodlands.	Rare and local summer migrants in New Mexico. Reported in the Gila and Mimbres valleys. Breeds south of the U.S. border	Yes – Rare summer migrant.
Northern Aplomado Falcon *(Falco femoralis septentrionalis)*	E/NEP, e	Variable open habitats, including savannahs, desert grasslands, typically associated with yucca grasslands and adjacent shrubby habitats at lower elevations.	Largely extirpated in the U.S. historical breeding range along the U.S./Mexico border from southeast Arizona to Texas. Captive-bred birds are being released in south Texas and New Mexico (BISON-M 2010), including the Armendaris Ranch near Engle, New Mexico and White Sands Missile Range (Peregrine Fund 2010).	Yes – Potential suitable habitat in the project area.

Common Name† (*Scientific Name*)	Status*	Habitat**	Distribution**	Potential to Occur?
American Peregrine Falcon *(Falco peregrinus anatum)*	SOC, t	Occurs in a variety of habitats, from upper and lower montane areas to desert scrub and grasslands. Typically nests on ledges or in potholes on cliffs in wooded/forested habitats near large open areas for foraging	Permanent resident species in New Mexico that breeds locally in mountain areas and migrates statewide.	Yes – Uncommon spring and fall migrant.
Arctic Peregrine Falcon *(Falco peregrinus tundrius)*	SOC, t	Breeds in the Arctic tundra, and inhabits coastlines and mountains from Florida to South America in winter.	Very rare migrant throughout New Mexico.	Yes – Rare transient migrant.
Mountain Plover *(Charadrius montanus)*	SOC	Shortgrass prairies and dry playas during the breeding season. Regularly observed on turf farms and occasionally observed in other agricultural fields during late summer and fall migration.	Breeds in the Great Plains, from Montana south to eastern New Mexico; breeds locally in central-western New Mexico and migrates statewide.	Yes – Rare spring migrant.
Common Ground-dove *(Columbina passerina pallescens)*	e	Agricultural and undeveloped areas, including native shrublands and weedy areas, below 5,400 feet.	Local warm-season (April-September) visitor to the southernmost part of the state, including the lowermost Rio Grande and Pecos valleys.	Yes – Rare summer migrant.
Yellow-billed Cuckoo *(Coccyzus americanus)*	C	Lowland deciduous woodlands, willow and alder thickets, second-growth woods, deserted farmlands, and orchards.	Occurs statewide in New Mexico during migration. Reported as summer breeding season residents throughout the Gila National Forest and at the White Sands Missile Range.	Yes - Possible migrant.
Western Burrowing Owl *(Athene cunicularia hypugaea)*	SOC	Grasslands and open shrublands. Nests and roosts in abandoned burrows of fossorial mammals such as prairie dogs, ground squirrels, foxes, badgers, and armadillos.	Rare year-round residents and common breeding residents in southern New Mexico. Permanent resident at the White Sands Missile Range.	Yes – Observed in the project area.
Violet-crowned Hummingbird *(Amazilia violiceps ellioti)*	t	Well-developed riparian woodlands at low to moderate elevations, typically with cottonwood, sycamore, white oak and hackberry.	A Mexican highland species that reaches its northernmost distribution in Guadalupe Canyon in southeast Arizona and southwest New Mexico (Hidalgo County). Single birds have been documented in Anthony and Las Cruces, New Mexico.	No – Lack of suitable habitat in project area.
Lucifer Hummingbird *(Calothorax lucifer)*	t	Slopes and adjacent canyons in arid montane areas with flowering species such as agave and ocotillo.	In New Mexico, occurs in the Peloncillo Mountains and Guadalupe Canyon (Hidalgo County) and the lower Rio Grande Valley.	No – Lack of suitable habitat in project area.

Common Name† (*Scientific Name*)	Status*	Habitat**	Distribution**	Potential to Occur?
Southwestern Willow Flycatcher *(Empidonax traillii extimus)*	E, e	Dense riparian shrublands, including groves of willows, arrowweed, buttonbush, tamarisk, and Russian olive, often with a scattered overstory of cottonwood.	Occurs statewide in New Mexico during spring and fall migration. Breeds in the Chama, Rio Grande, Zuni, San Francisco, Gila, and probably the Hondo basins and in the San Juan and western Sangre de Cristo mountains.	Yes – Spring and fall migrant.
Bell's Vireo *(Vireo bellii)*	SOC, t	Dense shrublands or woodlands along lowland stream courses, with willows, mesquite, and seepwillow.	Local summer resident in New Mexico in the lower Rio Grande, lower Gila, lower San Francisco, and lower Pecos valleys.	Yes – Spring and fall migrant.
Gray Vireo *(Vireo vicinior)*	t	Oak woodlands with a well-developed grass component in southern New Mexico; arid juniper woodlands on foothills and mesas to the north.	Widespread and locally common summer residents in southern New Mexico, northward to the San Juan and upper Rio Grande valleys. Rare and local during migration.	Yes – Spring and fall migrant.
Baird's Sparrow *(Ammodramus bairdii)*	SOC, t	Grassland species ranging from desert grasslands in the south to mountain meadows up to 11,800 feet in the San Juan and Sangre de Cristo mountains. Breeds in shortgrass prairie in the northern Great Plains.	Regular migrants and local winter residents in New Mexico, primarily in the eastern plains and southern lowlands. Rare winter residents around White Sands National Monument.	Yes – Spring and fall migrant.
Varied Bunting *(Passerina versicolor)*	t	In New Mexico, prefers dense stands of mesquite and associated growth in canyon bottoms.	In New Mexico, occurs in Guadalupe Canyon (Hidalgo County) and near Carlsbad Caverns National Park (Eddy County). Vagrants have been observed in Luna, Sierra, and Otero counties.	No – Lack of suitable habitat in project area.
MAMMALS				
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	SOC	Occurs in a variety of xeric to mesic habitats, including desert scrub, sagebrush, chaparral, and deciduous and coniferous forests. Townsend's big-eared bats do not move or forage far from their day roosts (i.e. caves and mine tunnels), and often rest in abandoned buildings during nighttime foraging	Occurs throughout much of western North America, from British Columbia to Mexico, and eastward to Texas, with isolated populations further east. Known to occur in the Gila National Forest and White Sands Missile Range.	Yes – Foraging and nighttime roosting.
Desert Pocket Gopher *(Geomys arenarius)*	SOC	Most common in soft alluvial soils of arroyo bottoms and flood plains. Also occupies irrigation ditches, borrow pits, roadsides, and agricultural lands with sandy or loamy soils.	Occurs in Doña Ana, Otero, Luna, and Socorro counties as isolated populations in sandy or loamy soils of the White Sands area, the lower Rio Grande Valley, and the eastern half of the Deming Plain.	Yes – Potential suitable habitat in the project area.

Common Name† (*Scientific Name*)	Status*	Habitat**	Distribution**	Potential to Occur?
PLANTS				
Desert Night-blooming Cereus (*Cereus greggii* var. *greggii*)	SOC	Mostly in sandy to silty gravelly soils in gently broken to level terrain in desert grassland or Chihuahuan desert scrub. Typically found growing up through and supported by shrubs, especially creosote bush and mesquite (NMRPTC 2010).	In New Mexico, occurs in Doña Ana, Grant, Hidalgo, and Luna counties. A population has been documented about 10 to 15 miles north of the project area (NMRPTC 2010).	Yes – Potential suitable habitat in the project area.
Sand Prickly Pear (*Opuntia arenaria*)	SOC, e	Sandy areas, particularly semi-stabilized sand dunes among open Chihuahuan desert scrub, often with honey mesquite and a sparse cover of grasses; from 3,800 to 4,300 feet in elevation (NMRPTC 2010).	In New Mexico, southern Doña Ana, Luna, and Socorro counties. Documented Luna County populations are located near the U.S./Mexico border about 30 miles south of the project area (NMRPTC 2010).	No – Project area is outside known distribution and above elevation range.

Notes:

†List compiled from BISON-M (2010), NMRPTC (1999), USFWS (2010a), and the New Mexico Administrative Code (19.21.2.8 NMAC and 19.33.6.8 NMAC).

***Status: E=Federal Endangered; E/NEP=Federal Endangered /Nonessential Experimental Population; T=Federal Threatened; C=Federal Candidate; SOC=Federal Species of Concern; e=State Endangered; t=State Threatened**

****Habitat and distribution information compiled from BISON-M (2010) unless otherwise specified.**

3.3 Herpetofauna

Three species of herpetofauna (amphibians and reptiles) are listed in Luna County (Table 3.1). One species of amphibian and one species of reptile potentially could occur in the project area based on suitable habitat and population distribution.

3.3.1 Great Plains Narrowmouth Toad

The Great Plains narrowmouth toad (*Gastrophryne olivacea*) is a state endangered species. This toad spends most of its lifecycle underground, emerging during periods of high humidity or rain with mild temperatures from March to September to breed in temporary aquatic habitats such as rain pools and ponds. The Great Plains narrowmouth toad occupies grasslands, historically dominated by tobosa grass (*Hilaria mutica*). Tobosa grasslands and swales were once widespread in southern Luna County, but due to farming and ranching this vegetation type now occurs in patches, generally along roadsides (BISON-M 2010). Specimens collected from extreme south-central Luna County were all from roadside ditches flooded by agricultural irrigation in heavily grazed desert scrub dominated by mesquite, creosote bush (*Larrea tridentata*), and desert grasses (Degenhardt et al. 1996).

The project area supports tobosa grassland vegetation, which is historic habitat for the Great Plains narrowmouth toad in Luna County. An artificial ditch near the City of Deming water pumping facility and the temporary ponded areas throughout the project area provide potential breeding habitat for emergent toads. It is possible that the Great Plains narrowmouth toad could occur in the project area; however, the nearest population of Great Plains narrowmouth toads occurs in the vicinity of Hermanas, New Mexico, approximately 30 miles south of the project area (BISON-M 2010, Degenhardt et al. 1996). Due to the far proximity of the nearest population, it is unlikely that the Great Plains narrowmouth toad would occur in the project area.

3.3.2 Reticulate Gila Monster

The reticulate Gila monster (*Heloderma suspectum suspectum*) is a state endangered species. The species inhabits desert grasslands and sometimes pine-oak forests on the lower slopes of mountains and nearby outwash plains (BISON-M 2010) from 3,870 to 6,400 feet in elevation (Degenhardt et al. 1996), favoring rocky foothills over open flats (BISON-M 2010). Gila monsters may dig their own burrows, use other animal burrows, or take cover under boulders, rock crevices, and downed vegetation for thermal shelter. Cover often includes boulders, rock crevices, downed vegetation, and litter (BISON-M 2010).

In southwestern New Mexico, Gila monsters regularly occur in the Gila Valley and from the Arizona border east to the eastern slopes of the Peloncillo Mountains. Gila monsters also have been found in irrigated farmlands adjacent to their typical habitats (BISON-M 2010), including agricultural areas near Silver City and Cotton City (Degenhardt et al. 1996), located approximately 40 miles northwest and 65 miles southwest of the project area, respectively. A species distribution map provided in Degenhardt et al. (1996) shows a population of reticulate Gila monsters in central Luna County due north of the project area.

The project area is located in the Deming Plain, a glacial outwash plain, dominated by desert grassland vegetation providing potential suitable habitat for the reticulate Gila monster. Animal burrows, particularly the kangaroo mound complexes located in the project area, provide suitable thermal shelters. Mountain ranges and ridges with associated preferred habitat for the Gila monster (e.g. rocky foothill terrain) in the vicinity of the project area include Black Mountain approximately 4 miles to the northwest, Fluorite Ridge and the Cooke Range approximately 10 miles to the northeast, the Florida Mountains approximately 12 miles to the southeast, and Red Mountain approximately 6.5 miles to the southwest. The reticulate Gila monster potentially could occur in the project area.

3.4 Birds

Nineteen species of birds are listed in Luna County (Table 3.1). Sixteen species, including six species of raptors, potentially could occur in the project area based on the presence of suitable habitat and species population distribution.

3.4.1 Brown Pelican

The brown pelican (*Pelecanus occidentalis carolinensis*) is a state endangered species. Brown pelicans are usually found in warmer water marine habitats in North America. Brown pelicans feed exclusively on fish, which they catch by diving headfirst into the water. A transient visitor to New Mexico, reliable records of brown pelicans in New Mexico include solitary birds near large lakes or along major rivers including the San Juan, Gila, Rio Grande, and Pecos drainages, most often observed as immature wanderers during the summer and fall (BISON-M 2010). The nearest suitable habitat is Caballo Reservoir, located approximately 50 miles northeast of the project area, and brown pelicans potentially could occur flying over the project area.

3.4.2 Neotropic Cormorant

The neotropic cormorant (*Phalacrocorax brasilianus*) is a state threatened species. Neotropic cormorants occur in larger bodies of open water such as lakes and reservoirs. In New Mexico, neotropic cormorants occur from the Gila Valley and Hidalgo County to the west, to the lower Pecos River valley in the east. The only locations in New Mexico where neotropic cormorants are known to breed are Caballo and Elephant Butte reservoirs (BISON-M 2010), located approximately 50 miles and 110 miles northeast of the project area, respectively. Neotropic cormorants potentially could occur flying over the project area.

3.4.3 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus alascanus*) is a state threatened species and is protected by the federal Bald and Golden Eagle Protection Act. Bald eagles migrate throughout New Mexico year-round, and are associated with open expanses of water (e.g. large streams, rivers and lakes) in a variety of habitats. They generally do not breed in New Mexico, with the exception of a few documented nests sites in the extreme northern and western portions of the state. Roosting habitat is generally provided by trees in protected sites, such as groups of trees or canyons. Bald eagles are local winter residents, and important roosting and winter concentration areas are located in the Gila and lower Rio Grande valleys, and at Caballo and Elephant Butte reservoirs (BISON-M 2010), located approximately 50 miles and 70 miles northeast of the project area, respectively. Bald eagles potentially could occur in the project area as local or seasonal migrants throughout the year.

3.4.4 Common Black-Hawk

The common black-hawk (*Buteogallus anthracinus*) is a USFWS Species of Concern. Common-black hawks are an uncommon summer resident (March to October) in New Mexico that occur in the San Francisco, Gila, and Mimbres valleys. Their habitat is riparian woodlands, especially of cottonwood, and they require mature, well-developed stands for breeding (BISON-M). The desert-willow riparian habitat along the Mimbres River along the southern boundary of the project area does not provide suitable breeding habitat for common black-hawks; however, common black-hawks potentially could occur in the project area for foraging or migration.

3.4.5 Northern Gray Hawk

The northern gray hawk (*Buteo nitidus maxima*) is a USFWS Species of Concern. They are rare and local summer migrants to New Mexico lowland riparian woodlands, and have been reported in the Gila and Mimbres valleys (BISON-M 2010). Northern gray hawks potentially could occur in the project area.

3.4.6 Northern Aplomado Falcon

The northern aplomado falcon (*Falco femoralis septentrionalis*) is a federal and state endangered species, formerly extirpated from New Mexico. The historic breeding range in the U.S. was along the U.S./Mexico border from southeastern Arizona to Texas (BISON-M 2010). Captive breeding and reintroduction programs have established breeding populations of aplomado falcons at the Armendaris Ranch near Engle, New Mexico and at the White Sands Missile Range (Peregrine Fund 2010), approximately 75 and 90 miles northeast of the project area, respectively. Aplomado falcons in New Mexico are managed by the USFWS as nonessential experimental population (NEP) under section 10(j) of the Endangered Species Act. The NEP includes all reintroduced falcons and their offspring plus lone dispersers found within the NEP area (71 FR 143, p.42300), which is geographically defined as all of Arizona and New Mexico (71 FR 143, p.42298). The NEP designation grants partial Endangered Species Act protection to the aplomado falcon by prohibiting intentional take and providing short-term protective measures from natural predators and human-related sources of mortality to facilitate successful reintroduction efforts (71 FR 143, p.42303) (FR 2006); unintentional or incidental take as a result of otherwise legal activities is authorized by the NEP designation (USDOD and USFWS 2007).

The northern aplomado falcon is an intermediate sized falcon, larger than a kestrel and smaller than a peregrine, with rufous underparts, a long banded tail, and a distinctive black and white facial pattern that serves as a unique field identifier (USFWS 2010b). Aplomado falcons inhabit various open habitats including desert grassland associations, rangelands, and savannahs, with scattered trees and shrubs such as mesquite and yucca (USFWS 2010b, NatureServe 2009). Essential habitat elements are scattered trees and shrubs, relatively low ground cover, abundant prey, and available suitable nest sites (USFWS 2010b). Aplomado falcons feed primarily on birds including mourning doves, meadowlarks, mockingbirds, and blackbirds. In addition, insects (beetles, cicadas, grasshoppers) are important prey, while other small prey such as lizards, snakes, and small mammals constitute a lesser part of their diet (NatureServe 2009, USFWS 2010b). Aplomado falcons nest from March to June, using the nests of other raptors and corvids such as red-tailed hawk, Swainson's hawk, and Chihuahuan raven (USDOD and USFWS 2007).

Young et al. (2005) developed a habitat suitability model for northern aplomado falcons and classified highly suitable habitat as homogenous grasslands of tobosa (*Hilaria mutica*) or grama grass (*Bouteloua* sp.) with moderate to high percent cover and low woody vegetation density, which resembles the desert grassland vegetation found on much of the project area and on adjacent New Mexico State Trust lands to the north and west. In addition, three of the seven species that comprise 68 percent of the avian diet of Chihuahuan desert aplomado falcons (Montoya et al. 1997 in Young et al. 2005), northern mockingbirds, western kingbirds, and mourning doves, were abundant in the project area during the biological survey. An inactive stick nest was observed in a honey mesquite, and Chihuahuan ravens and a Swainson's hawk were observed in the project area. Aplomado falcons could disperse to the project area from reintroduced populations to the northeast or from natural populations in Chihuahua, Mexico approximately 35 miles to the south. In addition, aplomado falcons are relatively tolerant of human presence and have been found nesting in well-managed grazed lands (USDOD and USFWS 2007). Northern aplomado falcons potentially could occur in the project area for foraging, breeding, and migration.

3.4.7 American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) is a USFWS Species of Concern and a state threatened species. Peregrine falcons are medium-sized raptors that migrate statewide, breeding locally in mountainous areas that provide suitable nest sites, typically cliff ledges in wooded habitats near large open areas for foraging (BISON-M 2010). Peregrine falcons can occur in a variety of habitats, but prefer open habitats for hunting such as grasslands and open water where their prey, mostly other birds such as pigeons, doves, and waterfowl, are vulnerable to attacks from above (BISON-M 2010). No protected

cliffs occur in the project area for nesting, but peregrine falcons potentially could occur in the project area for hunting or migrating.

3.4.8 Arctic Peregrine Falcon

The arctic peregrine falcon (*Falco peregrinus tundrius*) is a USFWS Species of Concern and a state threatened species. This falcon is very similar to the American peregrine falcon except that it is slightly smaller and paler. The Arctic peregrine falcon breeds on the North American tundra, and is a rare migrant to New Mexico (BISON-M 2010). It is possible but unlikely that arctic peregrine falcons could occur in the project area for hunting or migrating.

3.4.9 Mountain Plover

The mountain plover (*Charadrius montanus*), is a USFWS Species of Concern. Mountain plovers breed in shortgrass prairies and playas of the Great Plains, from Montana to eastern New Mexico; they also breed locally in central-western New Mexico. Non-breeding mountain plovers in New Mexico regularly occur on turf farms, and are occasionally observed in other agricultural areas (BISON-M 2010). Mountain plovers potentially could occur in the project area during migration.

3.4.10 Common Ground-dove

The common ground-dove (*Columbina passerina pallescens*) is a state endangered species. The common ground-dove is a small, chunky, gray-brown dove, smaller than a mourning dove, with black tail edges and a scaly appearance to the breast and head (NatureServe 2009). Habitat includes shrubby riparian habitat, desert shrublands dominated by mesquite or prickly pear, and early successional habitats such as abandoned agricultural fields and open areas near rural developed areas (NatureServe 2009). Southern New Mexico is at the northern periphery of the species range, and common ground-doves may now only be a rare summer (April to September) visitor to the lowermost Rio Grande and Pecos River valleys (BISON-M 2010).

A reliable water source is important for the common ground-dove, which must drink frequently (NatureServe 2009). This is provided on the project area by an inundated ditch near the city's water pump facility, and the ponded areas throughout the project area could serve as water sources for the common ground-dove. This dove feeds primarily on small seeds gathered from roadsides, fields, weed patches, and grassy areas (NatureServe 2009). Potential suitable habitat for common ground-doves occurs throughout the project area, and common ground-doves potentially could occur in the project area during summer.

3.4.11 Yellow-billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) is a candidate species for listing as a federal threatened or endangered species. Candidate species are taxa for which the USFWS has sufficient scientific information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities (USFWS 2010a). Yellow-billed cuckoos are summer residents in New Mexico, breeding in dense riparian woodlands with thick undergrowth that support abundant insect prey populations, especially caterpillars (NatureServe 2009). Yellow-billed cuckoos have been recorded during the summer breeding season (March to August) in the Gila National Forest and at the White Sands Missile Range, located approximately 38 miles north and 90 miles northeast of the project area, respectively. Non-breeding habitat includes lowland deciduous woodlands, willow and alder thickets, second-growth woods, deserted farmlands, and orchards (BISON-M 2010). The desert willow riparian habitat along the Mimbres River provides potential suitable habitat for foraging and migration, and yellow-billed cuckoos potentially could occur in the project area.

3.4.12 Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is a USFWS Species of Concern. Burrowing owls inhabit grasslands and open shrublands, and sometimes occupy areas of human disturbance including vacant lots, golf courses, and airports (BISON-M 2010). Burrowing owls nest in abandoned mammal burrows or natural cavities surrounded by sparse vegetation, most often in burrows of large colonial rodents such as prairie dogs (Klute et al. 2003). They may also use burrows of ground squirrels, foxes, coyotes, and badgers (BISON-M 2010, Klute et al. 2003). Western burrowing owls are locally common summer breeding residents in New Mexico, and rare, local permanent residents throughout southeastern New Mexico (BISON-M 2010; also see Figure 3 in Klute et al. 2003), including the White Sands Missile Range (BISON-M 2010) located approximately 90 miles northeast of the project area.

Western burrowing owls were observed in the western, northern, and eastern portions of the project area, where kangaroo rat (*Dipodomys sp.*) mound complexes were observed. Suitable open foraging habitat exists throughout the project area. The kangaroo rat complex in the eastern portion of the project area was clearly being utilized by the burrowing owls. Feathers, whitewash and burrowing owl tracks were observed around the burrows. It is likely that western burrowing owls breed in the project area, and it is possible that burrowing owls are year-round residents in the project area.

3.4.13 Southwestern Willow Flycatcher

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a federal and state endangered species. Southwestern willow flycatchers breed in dense groves of riparian shrubs and low trees, including willows, buttonbush, tamarisk, and Russian olive, often with a scattered overstory of cottonwood (BISON-M 2010). The Middle Rio Grande in New Mexico is an important breeding area for southwestern willow flycatchers in the state, and includes designated critical habitat around Elephant Butte Reservoir located approximately 70 miles northeast of the project area (USFWS 2010c). Southwestern willow flycatchers occur throughout New Mexico during migration between their North American breeding habitat and wintering grounds in southern Mexico and Central America (Sogge et al. 2010). Migrating willow flycatchers occur statewide in New Mexico (BISON-M 2010) and use a wider array of forest and shrub habitats than their breeding and wintering habitats, although riparian vegetation is thought to be preferred (Sogge et al. 2010). The project area supports riparian vegetation along the Mimbres River, and migrating southwestern willow flycatchers potentially could occur in the project area.

3.4.14 Bell's Vireo

The Bell's vireo (*Vireo bellii*) is a USFWS Species of Concern and a state threatened species. They breed in dense riparian shrublands or woodlands along lowland stream courses, with willows, mesquite, and seepwillow. Bell's vireos are local summer residents in New Mexico in the lower Rio Grande, lower Gila, lower San Francisco, and lower Pecos valleys (BISON-M 2010). Bell's vireo potentially could occur in the project area during spring and fall migration.

3.4.15 Gray Vireo

The gray vireo (*Vireo vicinior*) is a state threatened species. They inhabit arid juniper woodlands on foothills and mesas to the north, and oak woodlands with a well-developed grass component in the southern part of their New Mexico range. Gray vireos breed in close ecological proximity to solitary and Bell's vireos. Gray vireos are widespread and locally common summer residents in southern New Mexico, northward to the San Juan and upper Rio Grande valleys (BISON-M 2010). Gray vireos potentially could occur in the project area during spring and fall migration.

3.4.16 Baird's Sparrow

Baird's sparrow (*Ammodramus bairdii*) is a USFWS Species of Concern and a state threatened species. This grassland sparrow, distinguishable from other sparrows by the buffy-orange color on its streaked face and crown, breeds in the northern Great Plains. Baird's sparrows are regular migrants through New Mexico, and rare winter residents near White Sands National Monument about 90 miles northeast of the project area (BISON-M 2010). Potential suitable habitat (i.e. desert grassland) exists throughout the project area, and Baird's sparrows potentially could occur in the project area in winter and during migration.

3.5 Mammals

Two species of mammals are listed in Luna County (Table 3.1). Both species could potentially occur in the project area based on suitable habitat and population distribution.

3.5.1 Townsend's Big-eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) is a USFWS Species of Concern. This medium-sized bat occurs in a variety of xeric to mesic habitats, including desert scrub, sagebrush, and deciduous and coniferous forests. Townsend's big-eared bat populations are strongly correlated with the availability of caves or cave-like roosting habitat (e.g. old mines), used for diurnal roosting, breeding, and hibernation. During nocturnal foraging, Townsend's big-eared bats may rest in abandoned buildings (BISON-M 2010). The project area has no diurnal roosting habitat (i.e. caves and cave-like structures) for Townsend's big-eared bats; however, a small concrete block building adjacent to the heavy equipment shed may provide nocturnal roosting habitat for Townsend's big-eared bat, and bat droppings were observed in crumbling holes that provide access to the building for bats. The cooling towers also may provide nocturnal roosting habitat for Townsend's big-eared bat. Townsend's big-eared bat potentially could occur in the project area for nocturnal foraging and roosting.

3.5.2 Desert Pocket Gopher

The desert pocket gopher (*Geomys arenarius*) is a USFWS Species of Concern. Desert pocket gophers are most common in soft alluvial soils of arroyo bottoms and floodplains, and other habitats such as agricultural lands with sandy or loamy soils. The desert pocket gopher does not tolerate soil with high clay or gravel content. Isolated populations in Luna County are known from the White Sands area and the eastern half of the Deming Plain (BISON-M 2010). Sandy soils characterize most of the project area, and desert pocket gophers potentially could occur in the project area.

3.6 Plants

Two species of plants are listed in Luna County (Table 3.1). One species potentially could occur in the project area based on suitable habitat and species distribution.

3.6.1 Desert Night-blooming Cereus

The desert night-blooming cereus (*Cereus greggii* var. *greggii*) is a USFWS Species of Concern. This slender cactus of desert grasslands and Chihuahuan desert scrub typically is found growing up through shrubs for support, most commonly creosote bush and mesquite. The desert night-blooming cereus grows in sandy to gravelly soils on level to gently broken terrain and flowers nocturnally in June. Agricultural use and land development have negatively impacted this species, and overharvesting by private and commercial collectors have eliminated entire populations. Two Luna County populations are documented: one population in the southwestern corner of the county; and one population approximately 10 to 15 miles due north of the project area (NMRPTC 2010).

The sandy soils and level topography of the project area provide suitable substrate for the desert night-blooming cereus. Creosote bush and mesquite in the project area could provide structural support and protection for this species. It is possible that the desert night-blooming cereus could occur in the project area. A focused botanical survey would be required to detect the presence of the desert night-blooming cereus within the project area.

4.0 Mitigation Measures

4.1 Threatened, Endangered and Sensitive Species

4.1.1 Herpetofauna

The project area does not have suitable habitat for the Chiricahua leopard frog (*Rana chiricahuensis*); therefore, no mitigation is recommended. The Great Plains narrowmouth toad (*Gastrophryne olivacea*) is not likely to occur in the project area; therefore, no mitigation is recommended.

The reticulate Gila monster (*Heloderma suspectum suspectum*) potentially could occur in the project area. Because Gila monsters use underground burrows for thermal shelter, ground-disturbing activities associated with the proposed project have the potential for negative impacts to the Gila monster. Several kangaroo mound complexes were located in the project area, and the project area has the potential to support other burrowing animals including foxes, badgers, coyotes, and jackrabbits.

Surveys for underground burrows are recommended prior to conducting ground-disturbing activities in order to avoid direct project impacts to reticulate Gila monsters. Burrows should be inspected for recent signs of activity, and the species occupying each active burrow should be determined, if possible.

4.1.2 Birds

All 16 species of threatened, endangered and sensitive bird species discussed in Section 3.0 are also protected by the Migratory Bird Treaty Act (MBTA). Mitigation measures recommended for MBTA species, as discussed in Section 4.2, are generally sufficient for avoiding impacts to threatened, endangered and sensitive birds in the project area.

The western burrowing owl (*Athene cunicularia hypugaea*) uses underground burrows for roosting and nesting, and may occur in the project area year-round. Ground disturbing activities associated with the proposed project have the potential for negative impacts to the burrowing owl. Several kangaroo mound complexes are located in the project area, and the project area has the potential to support other burrowing animals including foxes, badgers, coyotes, and jackrabbits. Active burrowing owl nest burrows were observed in kangaroo mound complexes in the eastern and northern portions of the project area.

Surveys for burrowing owls and potential burrow sites are recommended prior to conducting ground-disturbing activities in order to avoid direct project impacts to western burrowing owls. Burrows should be inspected for recent signs of nesting or roosting activity by burrowing owls, including nest decoration (e.g. feathers, scat, insect parts, and grass clippings), fresh whitewash, and recent pellets at burrow entrances.

4.1.3 Mammals

Townsend's big-eared bat (*Corynorhinus townsendii*) potentially could use a small concrete building adjacent to the heavy equipment shed and the water cooling towers located in the eastern portion of the project area, adjacent to Arrowhead Drive, as a roosting site during nighttime foraging. The project is not expected to affect the water cooling towers; however, if the concrete building is removed as a result of project activities, demolition during the day would avoid direct impacts to Townsend's big-eared bat.

The project area has potential suitable habitat for desert pocket gophers (*Geomys arenarius*); however, pocket gopher mound complexes were not observed in the project area. Ground disturbing activities potentially could impact desert pocket gophers. Mitigation measures are not likely to be required for this USFWS Species of Concern.

4.1.4 Plants

The desert night-blooming cereus (*Cereus greggii* var. *greggii*) potentially could occur in the project area. Prior to conducting vegetation clearing, an inspection of shrubs suitable of providing structural support and protection to this cactus, particularly mesquite, could be conducted to determine if the desert night-blooming cereus occurs in the project area. Individual plants, if they are located, could be relocated to areas of the project area where the vegetation community will not be disturbed.

4.2 Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA), which prohibits the unauthorized "take" of listed native species. Take is defined as "any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof" (16 U.S.C. 703). Migratory birds include diverse species such as sparrows, warblers, flycatchers, hummingbirds, waterfowl, shorebirds, raptors, and more. For a complete list of protected migratory birds, see "General Provisions; Revised List of Migratory Birds," 75 Federal Register 39 (1 March 2010), pp. 9282-9314.

Scheduling project construction outside the breeding season of most migratory birds (typically March to July for many southwestern terrestrial species) is generally the easiest way to avoid prohibited take of species protected under the MBTA. For project activities occurring during the breeding season, pre-construction clearance surveys for nesting migratory birds are recommended to avoid incidental take under the MBTA. Most non-nesting adult birds are highly mobile and thus able to avoid direct impacts from project activities.

An active great-horned owl (*Bubo virginianus*) nest is located in the heavy equipment shed north of the main tailings pile. The project is not expected to affect the shed; however, if the building is removed because of project activities, demolition should occur in late summer or fall, after young have fledged and prior to the initiation of a new nest, to avoid direct impacts to the great-horned owl. Great-horned owls can start breeding as early as November in the southern portion of their range, continuing through early February, with the young typically fledging from late April through June (BISON-M 2010).

4.3 Noxious Weeds

One New Mexico Noxious Weed List Class C species, tamarisk (*Tamarix* sp.), was identified in the project area. Tamarisk is limited to the artificial ditch near the City of Deming water pumping facility, and does not appear capable of invading the dry soils of the surrounding desert grassland ecosystem. An unidentified starthistle plant was observed adjacent to Peru Mill Road in the central portion of the project area. Due to the season and condition of the plant, the TRC biologist was unable to determine if this plant is a species that is listed on the New Mexico Noxious Weed List. Standard best management practices, such as washing vehicles and equipment before they enter the project area, will be used to prevent the introduction of noxious weed species to the project area. No other noxious weeds or potential noxious weeds were observed in the project area.

5.0 Agency Consultation

Letters describing the proposed project and requesting comments were sent to:

Eric Hein, Terrestrial Ecosystems Branch Chief
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office (NMESFO)
2105 Osuna Road NE
Albuquerque, NM 87113

Terra Manasco
Assistant Chief, Conservation Services Division
New Mexico Department of Game and Fish
One Wildlife Way
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Copies of the response letters received are provided in Appendix B.

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APPENDIX A

Project Area Photographs

Photo 1 Groundwater well located in the central-eastern portion of the project area, surrounded by Soapweed yucca (*Yucca palmilla*) and grasses.

Photo 2 Remnants of a housing trailer in the central-eastern portion of the project area, looking northeast. Russian thistle (*Salsola tragus*) and soapweed yucca (*Yucca palmilla*) are visible in the background.

Photo 3 Concrete block building utilized by roosting bats.

Photo 4 Occupied great-horned owl (*Bubo virginianus*) nest in the rafters of the heavy equipment shed. Two adults were observed with one downy-feathered young.

Photo 5 Ponded area due to recent rains in the central portion of the project area, directly east of Peru Mill Road. Russian thistle (*Salsola tragus*), broom snakeweed (*Gutierrezia sarothrae*) and silverleaf nightshade (*Solanum elaeagnifolium*) are visible around the area.

Photo 6 Ponded area due to recent rains in the central-eastern portion of the project area, looking northwest. Russian thistle (*Salsola tragus),* soapweed yucca (*Yucca palmilla*) and hairyseed bahia (*bahia absinthifolia*) are visible around the area.

Photo 7 Ponded area near (or possibly in) gravel pit in the central-eastern portion of the project area, looking north. Russian thistle (*Salsola tragus)* and broom snakeweed (*Gutierrezia sarothrae*) are visible around the area.

Photo 8 Juvenile spadefoot (*spea*) toads near a ponded area.

Photo 9 Tamarisk (*Tamarix* sp.), a Class C noxious weed, growing in a ditch near the City of Deming water pumping facility.

Photo 10 View of vegetation in the northern portion of the project area, looking southwest. Dominant vegetation shown here is silverleaf nightshade (*Solanum elaeagnifolium*) and Russian thistle (*Salsola tragus*).

Photo 11 View of northeastern portion project area, looking northwest, where tobosa grass (*Hilaria mutica*) becomes dominant (tobosa grass in background).

Photo 12 View of central and eastern portions of the project area, looking east. Broom snakeweed (*Gutierrezia sarothrae*) is the dominant species.

Photo 13 View of an area in the eastern project area, looking northeast. Vegetation was sporadic in this area, exposing soils. Broom dalea (*Psorothamnus scoparius*) is observed in the background, Russian thistle in the foreground (*Salsola tragus*).

Photo 14 View of central-eastern portion of project area, looking northeast. Dominant vegetation in this area included Hairyseed bahia (*bahia absinthifolia*) as shown here.

Photo 15 Mimbres River channel at southwestern corner of project area, looking downstream (west).

Photo 16 Desert willow (*Chilopsis linearis*) riparian woodland along the Mimbres River.

Photo 17 View south of Arrowhead Drive. Vegetation shown here includes broom snakeweed (*Gutierrezia sarothrae*) and Russian thistle (*Salsola tragus*).

Photo 18 View of inactive nest in honey mesquite (*Prosopis glandulosa*) in northern part of project area, looking northeast.

Photo 19 View of burrowing owl perched on Mormon tea *(Ephedra sarothrae)* in the eastern parcel of project area, looking northeast.

Photo 20 View of kangaroo rat *(Dipodomys* sp.) mound complex in the eastern parcel of the project area. Complex was being actively used by western burrowing owls (*Athene cunicularia hypugaea*). View looking northwest.

Photo 21 View of kangaroo rat (*Dipodomys* sp.) mound complex utilized by nesting western burrowing owls (*Athene cunicularia hypugaea*) in the northern portion of the project area. View looking northwest.

Photo 22 View of Texas horned lizard (*Phrynosoma cornutum*) in the central portion of the project area.

Appendix B

Project Notification Letters and Response

TRC
7761 Shaffer Parkway
Suite 100
Littleton, CO 80127

303.792.5555 PHONE
303.792.0122 FAX

www.TRCsolutions.com

August 25, 2010

Terra Manasco
Assistant Chief, Conservation Services Division
New Mexico Department of Game and Fish
One Wildlife Way
PO Box 25112
Santa Fe, NM 87504

Re: Proposed Industrial Park Development, City of Deming, Luna County, New Mexico (Project No. 176130)

Ms. Manasco:

The City of Deming, Luna County, New Mexico proposes to develop an industrial park for renewable energy generation. The project area is an approximately 985-acre site located approximately 3.5 miles northwest of Deming that previously was used as a zinc processing mill. The site is part of the Peru Hill Mill Property, a participant in the U.S. Environmental Protection Agency's Brownfields Program. A map of the project area is attached. The City of Deming is applying for an Economic Development Grant from the Department of Commerce to fund site improvements to the project area.

TRC Environmental Corporation (TRC) recently completed a biological resource survey of approximately 625 acres of the project area on behalf of Sundrop Fuels, a potential tenant of the City's proposed Peru Mill Industrial Park. We requested an informal consultation with your staff in order to identify any state-managed species that may occur in the project area, and determine what mitigation measures, if any, may be necessary to avoid or minimize impacts to state-managed biological resources in the proposed area. You responded in a letter dated July 30, 2010, and provided recommendations to minimize or eliminate impacts to wildlife. This letter is to inform you of the increased project area (by an additional 360 acres, located to the immediate northeast of the previously surveyed area) and to request any additional information, concerns or recommendations your office may have concerning the project.

If you require additional information or wish to discuss the project, please feel free to contact me at (303) 395-4044 or ksimpson@trcsolutions.com.

Sincerely,

KE Simpson

Karen E. Simpson
Project Manager and Senior Scientist
TRC Environmental Corporation

TRC

7761 Shaffer Parkway
Suite 100
Littleton, CO 80127

303.792.5555 PHONE
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August 25, 2010

Eric Hein
Terrestrial Ecosystems Branch Chief
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office (NMESFO)
2105 Osuna Road NE
Albuquerque, NM 87113

Re: Proposed Industrial Park Development, City of Deming, Luna County, New Mexico (Project No. 178827)

Mr. Hein:

The City of Deming, Luna County, New Mexico proposes to develop an industrial park for renewable energy generation. The project area is an approximately 985-acre site located approximately 3.5 miles northwest of Deming that previously was used as a zinc processing mill. The site is part of the Peru Hill Mill Property, a participant in the U.S. Environmental Protection Agency's Brownfields Program. A map of the project area is attached. The City of Deming is applying for an Economic Development Grant from the Department of Commerce to fund site improvements to the project area.

TRC Environmental Corporation (TRC) recently completed a biological resource survey of approximately 625 acres of the project area on behalf of Sundrop Fuels, a potential tenant of the City's proposed Peru Mill Industrial Park. We requested an informal consultation with your staff in order to identify federally protected species that may occur in the project area, and determine what mitigation measures, if any, may be necessary to avoid or minimize impacts to state managed biological resources in the proposed area. You responded via email dated June 14, 2010, and stated the Service did not have any comments regarding the project. This letter is to inform you of the increased project area (by an additional 360 acres immediately to the northeast of the previously surveyed area) and to request any additional information, concerns or recommendations your office may have concerning the project.

If you require additional information or wish to discuss the project, please feel free to contact me at (303) 395-4044 or ksimpson@trcsolutions.com.

Sincerely,

KE Simpson

Karen E. Simpson
Project Manager and Senior Scientist
TRC Environmental Corporation

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Tod Stevenson

Robert S. Jenks, Deputy Director

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DEPARTMENT OF GAME & FISH

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July 20, 2010

TRC Environmental Corporation
Stephanie M. Owens
7761 Shaffer Parkway, Suite 100
Littleton, CO 80127

Re: Proposed Industrial Park Development, City of Deming, Luna County, New Mexico (Project No. 176130); NMDGF # 13413

Dear Stephanie M. Owens,

The Department of Game and Fish (Department) has reviewed your request for information regarding the above-referenced project, and provides the following recommendations to minimize or eliminate impacts to wildlife.

There is a large metal building at the old concentrator plant. This building currently has both a nesting pair of Great Horned Owls and Barn Owls occupying the building. If the build is to be removed or refurbished the construction should take place before or after the nesting season. Burrowing owls where also observed at the site. We recommend that a preliminary survey be conducted during the times burrowing owls are likely to occur which is from April – September before any ground disturbing activities occur. We have enclosed a copy of our recommended survey protocol for your use. Should burrowing owls be documented in the project area we recommend you contact the Department or the USFWS for further recommendations regarding relocation or avoidance of impacts.

For your convenience, we have enclosed a copy of New Mexico Wildlife of Concern for Luna County (Biota Information System of New Mexico, BISON-M, New Mexico Dept. of Game and Fish electronic database). Species accounts, habitat associations and county species lists (use the "Database Query" option) can be accessed from the BISON-M database via the World-wide Web at http://www.bison-m.org. The Department recommends that you contact the U.S. Fish and Wildlife Service for current listing of federally listed species.

Thank you for the opportunity to review and comment on your project. If you have any questions, please contact Patrick Mathis, Southwest Area Habitat Specialist at (575) 532-2108 or patrick.mathis@state.nm.us.

Sincerely,

Terra Manasco
Assistant Chief, Conservation Services Division
Technical Guidance Section

TLM/pm

xc: Wally Murphy, Ecological Services Field Supervisor, USFWS
Luis Rios, SW Area Operations Chief, NMDGF
Pat Mathis, SW Area Habitat Specialist, NMDGF

NEW MEXICO WILDLIFE OF CONCERN
COUNTY LUNA

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at http://www.fws.gov/ifw2es/NewMexico/SBC.cfm. For information on state-listed plants, contact

Common Name	Scientific Name	NMGF	US FWS	critical habitat
Great Plains Narrowmouth Toad	Gastrophryne olivacea	E		
Chiricahua Leopard Frog	Rana chiricahuensis	s	T	
Reticulate Gila Monster	Heloderma suspectum suspectum	E		
Brown Pelican	Pelecanus occidentalis	E		
Neotropic Cormorant	Phalacrocorax brasilianus	T		
Bald Eagle	Haliaeetus leucocephalus	T	T	
Common Black-Hawk	Buteogallus anthracinus	T	SOC	
Aplomado Falcon	Falco femoralis	E	Exp	
Peregrine Falcon	Falco peregrinus	T	SOC	
Mountain Plover	Charadrius montanus	s	SOC	
Common Ground-Dove	Columbina passerina	E		
Yellow-billed Cuckoo	Coccyzus americanus	s	C	
Mexican Spotted Owl	Strix occidentalis lucida	s	T	Y
Burrowing Owl	Athene cunicularia		SOC	
Violet-crowned Hummingbird	Amazilia violiceps	T		
Lucifer Hummingbird	Calothorax lucifer	T		
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y
Loggerhead Shrike	Lanius ludovicianus	s		
Bell's Vireo	Vireo bellii	T	SOC	
Gray Vireo	Vireo vicinior	T		
Botteri's Sparrow	Aimophila botterii	s		
Baird's Sparrow	Ammodramus bairdii	T	SOC	
Varied Bunting	Passerina versicolor	T		
Long-legged Myotis Bat	Myotis volans interior	s		
Fringed Myotis Bat	Myotis thysanodes thysanodes	s		
Western Red Bat	Lasiurus blossevillii	s	SOC	
Pale Townsend's Big-eared Bat	Corynorhinus townsendii pallescens	s	SOC	
Desert Pocket Gopher	Geomys arenarius	s	SOC	
Ringtail	Bassariscus astutus	s		
Western Spotted Skunk	Spilogale gracilis	s		
Hooded Skunk	Mephitis macroura milleri	s		
Cook's Peak Woodlandsnail	Ashmunella macromphala	T	SOC	
Fairy Shrimp	Streptocephalus moorei	s		