Appendix B-1
Biological Technical Report

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ELDORADO-IVANPAH TRANSMISSION PROJECT

BIOLOGICAL TECHNICAL REPORT

Prepared for:

Southern California Edison

Prepared by:

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May 2009

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INTRODUCTION

The proposed Southern California Edison (SCE) Eldorado-Ivanpah Transmission Project (project) proposes to replace the existing 115 kilovolt (kV) Eldorado-Coolwater-Dunn Siding transmission line with a new 230kV line between the existing Eldorado Substation and the proposed Ivanpah Substation (Figure 1). The purpose of the project is to transmit the power from solar energy generation plants proposed to be constructed in the Ivanpah Valley area.

SCE contracted with the Environmental Planning Group (EPG) to conduct biological investigations along the existing right-of-way, alternates to the right-of-way, at the site of a proposed Ivanpah Substation, and for proposed telecommunication facilities and supporting optic fiber placement associated with the project. The following report summarizes findings made by EPG biologists during the spring and fall of 2008.

PROJECT DESCRIPTION

The proposed project consists of replacement of an existing 115kV transmission line constructed in the early 1930s to provide electrical power for the construction of Hoover Dam. Replacement of the line will occur between the existing Eldorado Substation in the Eldorado Valley of southern Nevada and the proposed Ivanpah Substation in Ivanpah Valley in California. SCE will not rebuild between the Ivanpah and Mountain Pass substations. Modification of this link will consist only of placement of an optical communications line on the existing Nipton 33kV wood distribution poles. The existing 115kV line is composed primarily of steel lattice H-frame structures with three conductors, although there are also two- and three-pole wooden structures near the Eldorado Substation and at other locations along the line where some of the original steel structures have been replaced.

The new 230kV line will be constructed of steel lattice towers or steel poles. Due to the increased tower heights and span lengths, it is likely that the majority of the new towers will be placed in new locations that will require construction of new temporary or permanent spur roads from the existing main access road. The new transmission line will deviate from the existing SCE right-of-way at several locations either to provide a more efficient route, to cross other transmission lines, or to avoid resources.

The proposed Ivanpah Substation will be constructed west of Ivanpah Lake adjacent to the existing SCE right-of-way. In addition to an optical ground wire on the new 230kV transmission line, potential alternative routes for the telecommunications facilities associated with the Ivanpah Substation and the new 230kV transmission line include using new fiber optic cable on the existing Nipton 33kV distribution line between Mountain Pass Substation and Ivanpah Substation, optical ground wire on the Eldorado-Lugo 500kV line, undergrounding fiber optic

cable along existing roads, microwave communication systems, or other methods to be determined.

METHODOLOGY

Biologists for EPG visited the project area on the following dates: April 7 to 10, 14 and 15; August 25 and 26; and October 27 and 28, 2008. Biological resources were assessed within a 250-foot width along the transmission and telecommunication lines. The survey included the entire existing transmission line route from Eldorado Substation west to the proposed Ivanpah Substation site, and from the proposed Ivanpah Substation site west to the Mountain Pass Substation. Also surveyed was the proposed fiber optic route along the Nipton 33kV distribution line from the Ivanpah Substation site to Mountain Pass Substation, and the Nipton 33kV/Earth 12kV link from Mountain Pass Substation south to an existing AT&T microwave site. Additional areas surveyed include the proposed areas for alternative routes for the transmission line (Alternatives A – E), fiber optic communication route alternatives on the Eldorado-Lugo 500kV transmission line, and Nipton 33kV distribution line.

Surveys consisted of driving or walking all survey areas and identifying vegetation types and all plants and animals observed. Special attention was given to recording any state or federally listed plants and animals, Bureau of Land Management (BLM) sensitive species, and state-listed species of special concern. All transmission towers along the rights-of-way were scanned with binoculars to identify large stick nests, and all observations of wildlife and plants were recorded.

Photo points and locations of all species of special concern encountered were recorded with a hand-held global positioning system. Locations were recorded using the Universal Transverse Mercator, North American Datum (NAD 83).

Weather conditions April 7 to 10 were sunny, but cool (approximately 60 degrees Fahrenheit daytime high) and windy, with wind gusts above 35 miles per hour. Conditions on April 14 and 15 were sunny and warm, with temperatures to 85 degrees Fahrenheit. August 25 and 26, the weather was hot (near 100 degrees each day) with light intermittent breezes and localized thunderstorms, and cooler temperatures in the vicinity of the McCullough Mountains and the Ivanpah Valley. October 27 and 28, daytime highs were in the upper 80s and skies were clear.

In addition to field studies, EPG biologists also conducted an areally-limited regional literature search and consulted the Nevada Natural Heritage Program (NNHP) database, California Natural Diversity Database (CNDDB), California Department of Fish and Game - Nongame Wildlife Program, U.S. Fish and Wildlife Service (USFWS), and BLM Internet resources. The CNDDB search was performed for the following eight U.S. Geological Survey (USGS) quadrangles: State Line Pass, Clark Mountain, Ivanpah Lake, Desert, Mescal Range, Mineral Hill, Nipton, and Crescent Peak. No federal (Endangered Species Act [ESA]) Candidate species are currently listed for any of these quadrangles in the CNDDB database.

Eldorado-Ivanpah Transmission Project

Project Overview

Figure 1

Legend

220 kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative D1
- Milepost (Numbered)
- Milepost 0 (Next Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: MW Route
- Milepost (Numbered)
- Milepost 0 (Next Line)

Utilities

- Exisiting Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

Reference Features

- City/Town
- Airfield
- Interstate Highway
- State/Other Highway
- Local Road
- Railroad

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

0 0.5 1 2 3 4 Miles

DRAFT

April 2009

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Rare, invasive, and noxious plant surveys for this project were conducted in April and May 2008, and in April of 2009 by Mr. Glenn Clifton, GLC Consulting, Kingman, Arizona. Results and discussion of these surveys is found in Appendix C of this document.

VEGETATION RESOURCES

The Eldorado to Ivanpah Transmission Line and telecommunication routes occur in southern Nevada and southeastern California, from near Boulder City, Nevada in the east, and west to the Clark Mountains in southeastern California. The project occurs in an area defined as the Mojave Desert, and vegetation over most of the project is characteristic of the creosote bush-white bursage (*Larrea tridentata-Ambrosia dumosa*) series (Sawyer and Keeler-Wolf 1995). Exceptions to this occur in the area around the Mountain Pass Substation, which is sited in black bush (*Coleogyne ramosissima*) series habitat, with Utah juniper (*Juniperus osteosperma*) being an important element of the plant community. Species of *Yucca* (*Y. baccata*, *Y. brevifolia*, and *Y. schidigera*) are common and locally abundant in some areas; and several species of cacti, including *Opuntia* spp., *Cylindropuntia* spp., and others, are also present. The approach to the Mountain Pass substation from the east supports a few singleleaf piñon (*Pinus monophylla*). Other habitat types in the project area include saltbush (*Atriplex* spp.) scrub, Joshua tree (*Yucca brevifolia*) woodland, and catclaw acacia (*Acacia greggii*) scrub. Brief descriptions of the primary vegetation communities occurring within the project are given below, followed by more detailed discussions for each project segment, including the transmission line right-of-way, alternative areas, proposed and existing substations, telecommunications sites, and optic fiber cable routes. A listing of plant species observed on the project is found in Appendix B.

Vegetation Type Descriptions

Six main vegetation types are located within the project area, including saltbush scrub, creosote bush scrub/creosote bush-white bursage scrub, Mojave yucca desertscrub, Joshua tree woodland, black bush scrub, and catclaw acacia scrub (Figures 2a-2f). In addition, there are areas relatively devoid of native vegetation, including the dry lake beds, developed areas, paved roads, highways, and access roads and other disturbed areas associated with construction and mining operations.

Saltbush Scrub

Saltbush scrub typically has low plant species diversity, and on the project is dominated by saltbush species, white bursage, and big galleta (*Pleuraphis rigida*) located in alkaline soils around the perimeter of the dry lake beds. Vegetation is an intermittent to open canopy, generally less than 2 feet in height.

Creosote Bush Scrub/Creosote Bush-White Bursage Scrub

The creosote bush-white bursage series, which is dominated by creosote bush, is augmented by a variety of other shrubs, including four-wing saltbush (*Atriplex canescens*), all-scale (*A. polycarpa*), desertsenna (*Senna armata*), cheesebush (*Hymenoclea salsola*), sweetbush (*Bebbia juncea*), and other less common shrubs. Numerous annual plants and forbs are present to varying degrees, including pincushion flower (*Chaenactis fremontii*), bristly fiddleneck (*Amsinckia tessellate*), desert globemallow (*Sphaeralcea ambigua*), cryptantha (*Cryptantha* sp.), combseed (*Pectocarya* sp.), and Mediterranean grass (*Schismus barbatus*). Cacti are not common at lower elevation; they are more common at higher elevations and on steeper slopes. Cacti species present include Wiggins' cholla (*Cylindropuntia echinocarpa*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), California barrel cactus (*Ferocactus cylindraceus*), diamond cholla (*Cylindropuntia ramosissima*), and beavertail pricklypear (*Opuntia basilaris*).

Mojave Yucca Desertscrub

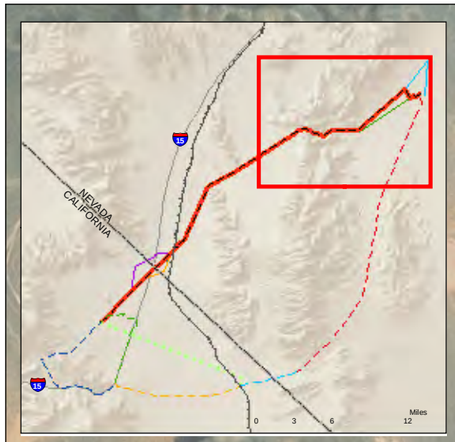
Mojave yucca (*Yucca schidigera*) is the dominant over-story plant in this plant community, which is ecotonal between creosote bush-white bursage scrub and Joshua tree woodland communities. This plant community has a greater abundance of plant species than creosote bush communities, including more species of cacti. Cactus species include California barrel cactus, cottontop cactus (*Echinocereus polycephalus*), Wiggins' and diamond chollas, Engelmann's hedgehog cactus, and beavertail pricklypear. Shrub species include Virgin River brittlebush (*Encelia virginensis*), with white bursage at the lower, and black bush at the upper limits of the plant community.

Joshua Tree Woodland

Joshua tree woodland occurs at middle elevations in the project area. Joshua tree woodland is dominated by Joshua trees as the over-story plant with Mojave yucca, ephedras (*Ephedra* sp.), cheesebush, California buckwheat (*Eriogonum fasciculatum*), and wolfberry (*Lycium andersonii*) present as common shrub species. Creosote bush and black bush typically occur at ecotonal boundaries with lower and upper bounding plant communities respectively.

Black Bush Scrub

This plant community, typical of mid-elevation desert mountains, is dominated by black bush and features emergent Utah juniper (*Juniperus osteosperma*), singleleaf piñon (*Pinus monophylla*), and numerous shrub species, which includes ephedra, annuals and perennial plants, including turpentinebroom (*Thamnosma montana*), goldenbush (*Ericameria* sp.), Mexican bladder sage (*Salazaria mexicana*), desert lupine (*Lupinus shockleyi*), freckled milkvetch



CWB
DEV
CS
DEV
Eldorado Substation
CWB
CWB
CS
DW
DW
DW
CS
DW
CWB
CWB
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2a

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.5 1 2

Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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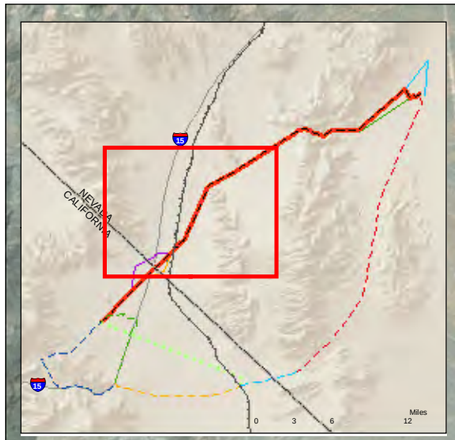

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2b

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.5 1 2
Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2c

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.5 1 2
Miles

Scale = 1:60,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2d

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

0 0.5 1 2
Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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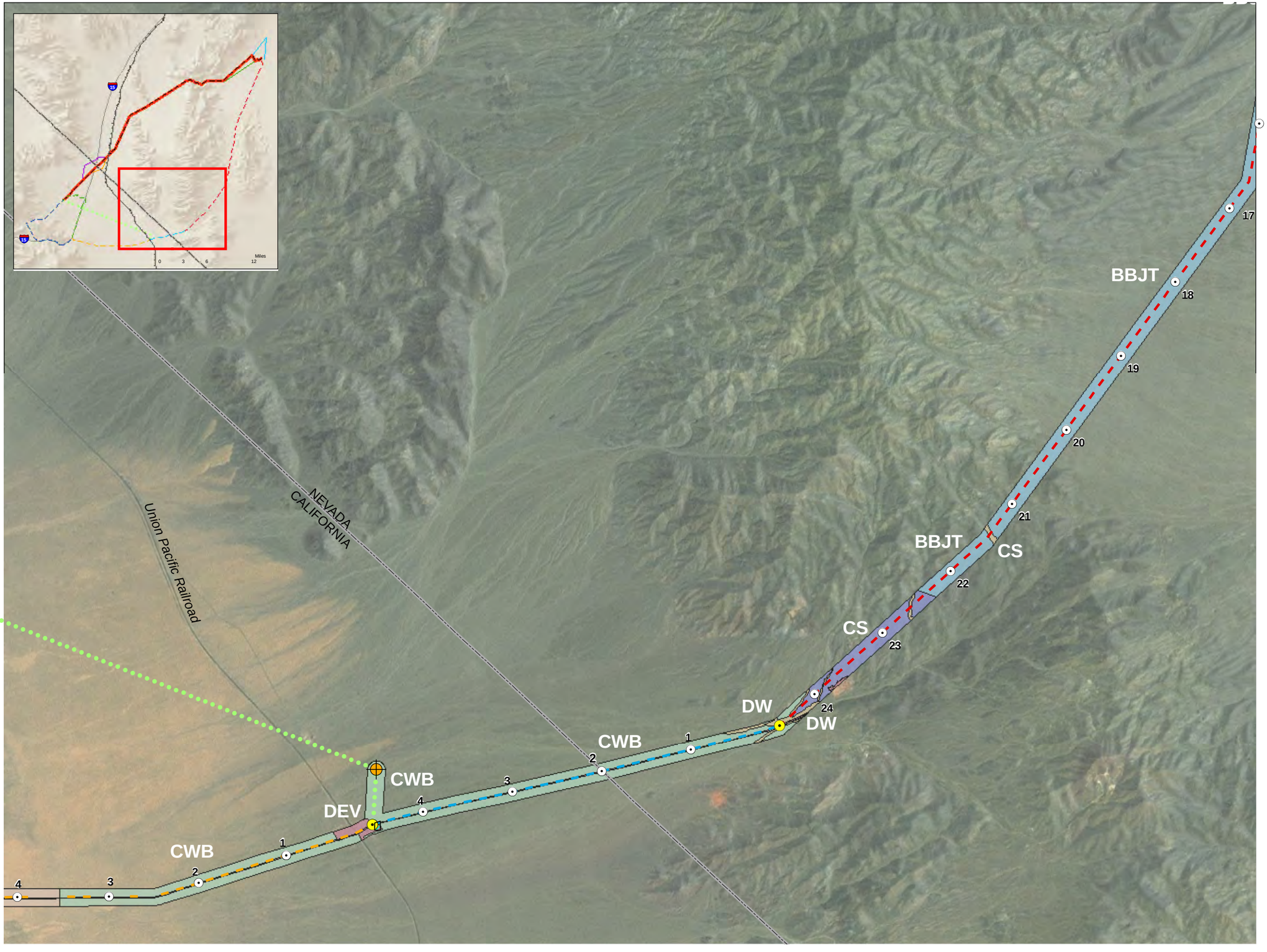

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2e

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.5 1 2
Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Eldorado-Ivanpah Transmission Project

Biological Technical Report

Vegetation Types

Figure 2f

Legend

Vegetation Types

- **JT** Joshua Tree Woodland
- **BBS** Black Bush Scrub
- **BBJT** Black Bush Scrub- Joshua Tree Woodland
- **BBJS** Black Bush-Juniper Scrub
- **CS** Creosote Scrub
- **CWB** Creosote-White Bursage Scrub
- **CYS** Creosote-Yucca Scrub
- **DW** Desert Wash
- **DEV** Developed
- **DST** Disturbed
- **DCS** Disturbed Creosote Scrub
- **DL** Dry Lake Bed
- **PPL** Pinon Pine-Juniper
- **SBS** Saltbush Scrub

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.5 1 2

Miles

Scale = 1:65,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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(*Astragalus lentiginosus*), and desert paintbrush (*Castilleja angustifolia*). Black bush scrub intergrades with creosote bush scrub at lower elevations and Joshua tree woodland at higher elevations.

Catclaw Acacia Series (Desert Wash Habitat)

Vegetation present within the numerous desert washes support widely scattered catclaw acacia and more commonly ephedra, cheesebush, and sweetbush. Mesquite mistletoe (*Phoradendron californicum*) occurs in some of the catclaw acacia in wash areas. Vegetation along canyon bottoms and washes in the McCullough Mountains is shrub-dominated with no emergent tree species. Shrubs present include catclaw acacia, wolfberry, California trixis (*Trixis californica*), Virgin River brittlebush, and California buckwheat.

Proposed Transmission Route

Eldorado Substation to the McCullough Mountains – In the Eldorado Valley, from the Eldorado Substation west to the beginning of the McCullough Mountains, the main vegetation type is the creosote bush-white bursage series of Sawyer and Keeler-Wolf (1995), which is dominated by creosote bush and augmented by a variety of other shrubs, including four-wing saltbush (*Atriplex canescens*), all-scale (*A. polycarpa*), desertsenna (*Senna armata*), cheesebush (*Hymenoclea salsola*), sweetbush (*Bebbia juncea*), and other less common shrubs (Appendix A, Photographs 1 through 4). Numerous annual plants and forbs were noted, including *Chaenactis fremontii*, *Amsinckia intermedia*, *Sphaeralcea ambigua*, *Cryptantha* sp., *Pectocarya* sp., and *Schismus* sp. Cacti are not common, but include Wiggins' cholla (*Cylindropuntia echinocarpa*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), California barrel cactus (*Ferocactus cylindraceus*), diamond cholla (*Cylindropuntia ramosissima*), and beavertail cactus (*Opuntia basilaris*). Numerous small desert washes are present within this area and support widely scattered catclaw acacia (*Acacia greggii*) and more commonly ephedra (*Ephedra* sp.), cheesebush, and sweetbush. Mesquite mistletoe (*Phoradendron californicum*) occurs in some of the catclaw acacia in wash areas.

Soils are generally sandy with some areas having rocks or cobbles. Numerous small washes are located in the area. Topographically, the Eldorado Valley is quite flat with elevations ranging from approximately 1,800 feet at the Eldorado Substation to 2,300 feet on the lower slope of the McCullough Mountains.

McCullough Mountains – Continuing west into the McCullough Mountains through a canyon pass north of McCullough Pass, rock outcrops became commonplace (Appendix A, Photographs 5 and 6) with increase in elevation. The existing access road through the pass follows an alluvial fan and desert wash up through the canyon, while the existing SCE 115kV transmission line is located on slopes and peaks to the north and south. The dominant vegetation type on slopes is the creosote bush series of Sawyer and Keeler-Wolf (1995), but plant diversity increases to include more individual cacti, mostly diamond and silver cholla, and Mojave yucca (*Y. schidigera*), as

well as many more subshrubs and forbs. Among these, threadleaf snakeweed (*Gutierrezia microcephala*), Palmer's penstemon (*Penstemon palmeri*), Virgin River brittlebush (*Encelia virginensis*), California trixis (*Trixis californicum*), tobacco (*Nicotiana obtusifolia*), and phacelias (*Phacelia* spp.) were commonly noted. Vegetation along canyon bottoms and washes in the McCulloughs is shrub-dominated with no emergent tree species. Shrubs present include catclaw acacia, wolfberry (*Lycium andersonii*), California trixis, Virgin River brittlebush, and California buckwheat (*Eriogonum fasciculatum*).

Elevation in this area ranges from approximately 2,300 feet at the lower slopes to 3,370 feet at the highest point where the access road attains the drainage divide at the saddle. Topographically, the area is fairly rugged and mountainous with deeply incised, rocky canyons and frequent cliffs.

Ivanpah Valley east of Primm – West of the McCullough Mountains, the transmission line descends into the eastern side of Ivanpah Valley and continues west to Primm, Nevada. The existing 115kV transmission line is generally located on broad, sandy alluvial fans where the creosote bush-white bursage series is augmented by all-scale, and on sandier soils, big galleta (*Pleuraphis rigida*). A variety of other plants are also present, including Mojave yucca, diamond and silver chollas, beavertail cactus, Engelmann's hedgehog, ephedras, and cheesebush. The winter-spring annual plants listed earlier for the Eldorado Valley are also present on this reach of the transmission line along with Great Basin langloisia (*Langloisia setosissima*) and desert dock (*Rumex* sp.). This portion of the transmission line right-of-way crosses numerous small to relatively large dry washes that flow out of the McCullough Mountains. Vegetation along these washes is not dramatically different from adjacent interfluvial areas. The primary difference is that individual plants along the wash borders tend to be larger than plants of the same species on interfluvial areas. Catclaw acacia is present but not abundant along washes, and it is rarely found on interfluvial areas.

The elevation in this area ranges from approximately 3,200 feet at the west base of the McCullough Mountains to 2,600 feet at Primm, where the existing line crosses Interstate 15 (I-15) and the dry lake bed. Topographically, this reach of the project consists of a gently sloping bajada between the west flank of the McCullough Mountains and Ivanpah Lake southwest of Primm.

Ivanpah Valley West of Primm to the Clark Mountains – West of I-15, the existing right-of-way traverses the playa of Ivanpah Lake, which is devoid of vegetation (Appendix A, Photograph 7). Elevation increases slowly southwest from Primm and off of the playa toward the Clark Mountains. Near Ivanpah Lake the creosote bush scrub is moderately disturbed in some areas with non-native species, including common Mediterranean grass (*Schismus barbatus*), filaree (*Erodium cicutarium*), compact brome (*Bromus madritensis*) and Russian thistle (*Salsola tragus*). However, the level of disturbance decreases as the transmission line leaves the Ivanpah Lake area and continues southwest. Once beyond the Playa, vegetation is dominated by the creosote bush-white bursage series, giving way to a distinctive black bush series, where Utah juniper is an important species, and Mojave yucca and cacti are present as the transmission line ascends into the Clark Mountains. The existing 115kV transmission line tops out at the Mountain

Pass Substation (in San Bernardino County, California) at an elevation of approximately 5,320 feet (Appendix A, Photograph 8). The plant community at this elevation is typical of mid-elevation desert mountains, and features emergent Utah juniper singleleaf piñon, ephedra (*Ephedra* sp.), and numerous shrubs, annuals, and perennial plants, including turpentinebroom (*Thamnosma montana*), goldenbush (*Ericameria* sp.), Mexican bladder sage (*Salazaria mexicana*), desert lupine (*Lupinus shockleyi*), freckled milkvetch (*Astragalus lentiginosus*), and desert paintbrush (*Castilleja angustifolia*). South of the Mountain Pass Substation, the black bush scrub transitions to a mixture of black bush scrub and Joshua Tree woodland.

Alternative Transmission Routes

Alternatives A and B

Vegetation present in Alternatives A and B, west and north of Eldorado Substation, is a virtual monoculture of creosote bush and white bursage; the creosote bush-white bursage series. Topography is of low relief, flat, with sandy to slightly rocky soils and numerous small washes. Other plants present in low abundance are brittlebush (*Encelia farinosa*), cheesebush, and the introduced common Mediterranean grass (Appendix A, Photograph 9).

Alternative C

This alternative occurs in an area of rugged, rocky topography with elevations approaching 4,000 feet. Vegetation is more diverse here than on Alternatives A and B, with barrel cactus, Mojave yucca, green ephedra (*Ephedra viridis*), orange globemallow, Virgin River brittlebush, and silver cholla occurring in addition to the ubiquitous creosote bush and white bursage (Appendix A, Photograph 10). Overall, vegetation in the area is relatively sparse. Red brome (*Bromus rubens*) and purple three-awn (*Aristida purpurea*) are common grasses within this alternative.

Alternatives D and E

Alternatives D and E are west of the McCullough Mountains and east of I-15 in an area peripheral to Primm, Nevada. There are numerous access roads and other disturbed areas associated with the developed area of Primm, the existing power plant and electrical and gas transmission lines. (Appendix A, Photograph 11). Topography is flat and soils are sandy and dominated by creosote bush and white bursage, with the exception of areas adjacent to the dry lake bed which are dominated by saltbush scrub.

Substations

Eldorado Substation

The Eldorado Substation is located in the broad, alluvial, closed-basin of the Eldorado Valley about 35 miles southeast of Las Vegas, Nevada. The elevation at the site is approximately 1,800 feet above sea level. Vegetation in the vicinity of this site consists almost entirely of creosote bush with very limited presence of white bursage. Winter-spring annuals were not in abundance on fine sandy soils when the site was visited in April 2008 (see Appendix A, Photographs 1 to 4).

Ivanpah Substation

The proposed Ivanpah Substation is located adjacent to the existing Eldorado-Mountain Pass 115kV transmission line. It is immediately southwest of the proposed location of the BrightSource solar facilities. The plant community at the Ivanpah Substation site is the creosote bush-white bursage series (Appendix A, Photograph 14). Other plant species that occur in association with the two dominants include Mojave yucca, ephedra, diamond cholla, silver cholla, beavertail cactus, and California buckwheat.

Matted cholla (*Grusonia parishii*), a California Native Plant Society (CNPS) list 2.3 species is present on this site (a 2.3 ranking indicates a moderate threat, but the species is not very rare in California).

Mountain Pass Substation

Mountain Pass Substation is approximately 2.0 miles north of I-15 and approximately 5.6 miles southwest of the proposed Ivanpah Substation in the Clark Mountains, at an elevation of approximately 5,320 feet (Appendix A, Photograph 15). Terrain is flat to gently rolling, with a steep drop-off in elevation about 0.6 mile east of the site at Antimony Gulch. Vegetation is dominated by black bush, with Utah juniper being fairly common. Species of yucca are common, including banana yucca, Mojave yucca, and Joshua trees. Nevada jointfir and Mormon tea (*Ephedra nevadensis* and *E. viridis*) are fairly common. Cattle saltbush (*Atriplex polycarpa*), threadleaf snakeweed, turpentinebroom, and globemallow are present in small numbers. Two species of pricklypear cacti were observed in the area; tulip pricklypear (*Opuntia phaeacantha*) and grizzlybear pricklypear (*O. polyacantha* var. *erinacea*). The approach to the substation from the east supports a few singleleaf piñon in Antimony Gulch.

Telecommunication Alternatives

Eldorado-Lugo 500kV Transmission Line – Eldorado Substation to Nipton, California

This portion of the line is being considered as one potential route to support the new optic fiber communications line for the project; the existing ground wire on the transmission line would be replaced with an optical ground wire (OPGW). In the vicinity of the Eldorado Substation the line passes through several miles of habitat that is dominated by creosote bush and white bursage. As the line climbs in elevation to the south, on the east flank of the South McCullough Mountains, vegetation diversity and density gradually increase. Shrubby vegetation, including jointfir (*Ephedra* sp.), Virgin River brittlebush, Mojave indigobush (*Psorothamnus arborescens*), Mexican bladdersage, Eastern Mojave buckwheat, and Mojave yucca are common. Burrobrush and catclaw acacia are common along washes. Cactus species are few, with the most common being Wiggins' cholla and California barrel cactus. As the line reaches about 3,200 feet, Joshua trees begin to appear in the vegetation community, and farther to the south with increased elevation they become a prominent feature of the landscape. Farther south, black bush appears and eventually becomes almost a monoculture above approximately 4,500 feet. Once the line begins its descent into the Ivanpah Valley, the vegetation reverts to typical Mojave desertscrub habitat dominated by a variety of shrub species, and with Joshua trees and eventually Mojave yucca becoming less common with the decrease in elevation towards the valley floor south of Nipton.

Nipton 33kV and Nipton Road Telecommunications Line Alternatives

Several of the fiber optic telecommunication line options would use portions of the existing Nipton 33kV distribution line between the Eldorado-Lugo 500kV transmission line near Nipton, California and the Mountain Pass Substation. At the point where the Eldorado-Lugo line crosses Nipton Road (Highway 164) the OPGW would transition to an underground fiber optic cable installed on the north side of Nipton Road in the existing road shoulder. The line segment continues to Nipton where it will then take one of two alternative routes: one alternative route segment would use the existing Nipton 33kV wood pole distribution line west of Nipton approximately 1 mile and then transition to a new underground fiber optic on the north side of Nipton Road to Interstate 15; the second alternative route would involve constructing a new line to a microwave tower located approximately 0.6 mile north of Nipton. The fiber optic cable and electrical power will be extended from the Nipton 33kV line in Nipton to the proposed microwave tower site. The microwave tower will be used to transmit the telecommunication data from Eldorado Substation to a corresponding microwave transmitter located within the proposed Ivanpah Substation.

The section of the telecommunication line in the southern Ivanpah Valley, along Nipton Road/Highway 164 between Nipton and I-15 is mostly dominated by creosote bush and white bursage, except on the fringe of the dry lake bed where saltbush (*Atriplex* sp.) and big galleta is dominant for a distance of about 1 mile. West of the south finger of Ivanpah Lake the line eventually climbs the bajada onto the east slope of the Ivanpah Mountains, where there is a slight

increase in plant diversity and density, but with vegetation remaining rather sparse. Plants beginning to appear in this area include Mojave yucca, burrobrush, and a few cacti.

From the intersection of Nipton Road and I-15 there are two alternatives for the telecommunication route.

One alternative, going north, would mostly use the existing Nipton 33kV line for overhead installation of the fiber optic cable. The existing Nipton 33kV line is located parallel to and approximately 30 to 40 feet east of 1-15. Approximately 0.5 mile north of Yates Well Road, the Nipton 33kV line crosses I-15 to the southeast corner of the golf course. Approximately 1.25 miles of new overhead pole line or underground fiber optic cable will be required on the south side of the golf course. This new section will be located along the existing roads and will connect the terminal end of the Nipton 33kV line on the southeast corner of the golf course with the terminal end of the Nipton 33kV line on the west side of the golf course. The line continues west and south from the golf course to the proposed Ivanpah Substation site.

The segment of the 33kV Nipton line near the proposed Ivanpah Substation (Ivanpah Substation to Mountain Pass Substation) continues southwest into the Clark Mountains. Vegetation in the vicinity of the Ivanpah Substation is predominantly creosote bush and white bursage with a few scattered Mojave yuccas. To the west where the line climbs the bajada, plant species diversity and vegetation density gradually increase, with shrub species making up the bulk of the vegetation cover. Some of the common plants observed in the area include ephedra, white bursage, Virgin River brittlebush, snakeweed (*Gutierrezia* sp.), wirelettuce (*Stephanomeria* sp.), Mexican bladdersage, Eastern Mojave buckwheat (*Eriogonum fasciculatum*), turpentinebroom, Mojave yucca, and a few creosote bushes. Catclaw acacia and burrobrush are the dominant plants within many of the xeric washes in the area.

The second alternative, going south, would require the construction of approximately 1.7 miles of new underground fiber optic cable from Nipton Road to the existing Nipton 33kV distribution line where the line would continue overhead west along I-15 to the Mountain Pass Interchange (Bailey Road), where it would turn north towards the Mountain Pass Substation. The elevation along this segment varies from about 3,700 feet just east of the I-15 turn to about 4,600 feet at the Mountain Pass interchange. Vegetation at the eastern end of this segment is dominated by creosote bush and white bursage with some Mojave yucca present, gradually changes to a slightly shrubbier Mojave desertscrub, and eventually becomes a mostly black bush dominated cover near the Mountain Pass interchange. The area south of Mountain Pass Substation features rolling topography draining south toward I-15. The dominant vegetation type is the black bush series (Appendix A, Photograph 12) with Joshua trees (*Yucca brevifolia*) conspicuously present, but a less dominant element (Appendix A, Photograph 13). Other plants include Mojave yucca, snakeweed, green ephedra, desert almond (*Prunus fasciculata*), burrobrush, and Utah juniper.

WILDLIFE RESOURCES

Wildlife populations in the project area consist of assemblages of species that are characteristic of low, arid Mojave Desertscrub plant communities. Although elements of piñon-juniper woodland are present at some sites in the project area, no vertebrate species that are characteristic of this woodland type were observed during site reconnaissance.

The following is a brief discussion of the vertebrate wildlife species that are likely to be present in the project area. This discussion is intended to address the vertebrate faunas along the project right-of-way, along alternative rights-of-way, at proposed substation sites, optic fiber communications routes, and at proposed microwave telecommunication sites.

Mammals

The mammalian fauna of the project area is dominated by small, mostly nocturnal species of rodents and bats. Some species, such as Kangaroo Rats and Pocket Mice have remarkable adaptations that facilitate their existence in a hot, arid region. Notably, they can survive on the water that is produced during metabolism of food they have eaten, and they have fur-lined cheek pouches which allow them to collect dry seeds and not lose any body moisture to the seeds. Diurnal mammals are fairly common and tend to be most active during cooler, wetter months and/or cooler portions of the daylight hours. Diurnal mammals include hares and rabbits, ground squirrels, and ungulates. Diurnal forms, although they may be seen abroad during daylight hours, may also be active after dark (e.g., Mule Deer Desert Bighorn and Coyote).

Table 1 contains an inventory of mammalian species with potential to occur in the Eldorado-Ivanpah project area. With respect to potential presence in Nevada and California, a review of literature and websites suggests that the Pocketed Free-tailed Bat, which has not been recorded in Nevada, is the only mammalian species not shared by both states.

TABLE 1
MAMMALIAN SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Habitat	Potential
Desert Shrew	*Notiosorex crawfordi*	Moister microhabitats (brush piles, under plant debris, woodrat nests) within desertscrub.	U
California Leaf-nosed Bat	*Macrotus californicus*	Desertscrub where they are active year -round. They require warm roosts in winter as they are intolerant of cold.	L
California Myotis	*Myotis californicus*	Dry, brushy habitats up to ponderosa pine forest. Probably roost mostly in cracks and crevices in canyon walls.	U
Western Small-footed Bat	*Myotis ciliolabrum*	Prefers moister areas; oak, juniper, chaparral, and riparian areas. Roosts in crevices, cracks, loose tree bark, caves, and mine tunnels.	U
Yuma Myotis	*Myotis yumanensis*	Most commonly associated with water and most likely to occur in the project area as a rare transient.	U

TABLE 1
MAMMALIAN SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Habitat	Potential
Little Brown Bat	*Myotis lucifugus*	Most often present in pine and pine-oak at 6,000-9,000 feet elevation near water. Has been found at 1,000 feet near the Colorado River.	U
Long-legged Bat	*Myotis volans*	Mostly coniferous forest, but has been found in the desert near water. Most likely a rare transient in the project area.	U
Fringed Bat	*Myotis thysanodes*	Desertscrub to pine forest, most common in pine and pine-oak. Probably uncommon to rare in the project area.	U
Long-eared Bat	*Myotis evotis*	Occurs primarily in forested areas, and is expected to be uncommon to rare in the project area	U
Western Pipistrelle	*Pipistrellus hesperus*	Found primarily in desertscrub and arid grasslands, but usually not far from a water source, which could be a stock tank.	L
Big Brown Bat	*Eptesicus fuscus*	Mostly in mid to higher elevation forests, but does occur in lower elevation habitats. Closely associated with man.	U
Western Red Bat	*Lasiurus blossevillii*	Generally less common in deserts and usually associated with water. Presence in the project area is probably as a spring or fall transient only.	L
Hoary Bat	*Lasiurus cinereus*	Found mostly in wooded habitats in summer. They roost in trees. Likely to occur in the project area only during spring or fall migration.	L
Spotted Bat	*Euderma maculatum*	Found in desertscrub to coniferous forest. This bat is rarely caught and its habits are poorly known.	U
Townsend's Long-eared Bat	*Corynorhinus townsendii*	Desertscrub to conifer woodland and pine forest. Least common in desertscrub and probably very uncommon in the project area.	U
Pallid Bat	*Antrozous pallidus*	Primarily a desertscrub species that prefers areas with rocky outcrops.	L
Pocketed Free-tailed Bat	*Nyctinomops femorosaccus*	Primarily a desertscrub dweller that roosts in caves and crevices of canyon walls. This species has not been recorded in Nevada.	U
Big Free-tailed Bat	*Nyctinomops macrotis*	These bats prefer to roost in rugged rocky areas in desertscrub. Their known range barely includes the project area and they are likely uncommon there.	U
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	Occupies desertscrub upslope into piñon-juniper woodland. This bat is famous for its roosting colonies containing millions of individuals in the southwest. Winters outside the United States.	L
Western Mastiff Bat	*Eumops perotis*	A resident of upper elevation desertscrub where it roosts in natural and man-made crevices. The project area is just barely within its known range.	U
Black-tailed Jack Rabbit	*Lepus californicus*	This species survives in some of the hottest, driest habitats in North America. In very arid areas, creosote bush forms a major portion of the diet.	O
Desert Cottontail	*Sylvilagus audubonii*	Desertscrub up to grassland and woodland. This rabbit occupies Death Valley.	L
Botta's Pocket Gopher	*Thomomys bottae*	The presence of tuberous roots and other plant material, along with soil suitable for digging, are the primary habitat requirements. From near sea level to over 11,000 feet above sea level.	L

TABLE 1 MAMMALIAN SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
Great Basin Pocket Mouse	*Perognathus parvus*	Arid and semi-arid areas, particularly where sagebrush is present. The project area is barely within the known range of this species.	U
Desert Pocket Mouse	*Chaetodipus penicillatus*	Desertscrub, primarily with mesquite and palo verde. This species is likely to be uncommon to rare in most of the project area.	U
Long-tailed Pocket Mouse	*Chaetodipus formosus*	Rocky areas in the Mojave and Colorado deserts.	L
Chisel-toothed Kangaroo Rat	*Dipodomys microps*	Primarily a Great Basin species that forages on the leaves of *Atriplex*. Species range barely includes the project area.	U
Merriam's Kangaroo Rat	*Dipodomys merriami*	An arid habitat generalist that occupies rocky, sandy, or clayey areas in desertscrub.	L
Desert Kangaroo Rat	*Dipodomys deserti*	Lives in sand dune areas with deep soils. Prefers very hot, arid areas and is present in Death Valley.	L
Western Harvest Mouse	*Reithrodontomys megalotis*	These mice occupy a wide range of habitats from near sea level to over 9,000 feet. They are more common in moister habitats, but have been observed in the same habitat occupied by Desert Kangaroo Rats.	L
Cactus Mouse	*Peromyscus eremicus*	Primarily found in desert areas with sandy soil and scattered vegetation.	L
Deer Mouse	*Peromyscus maniculatus*	Desertscrub to pine forests. The species is decidedly more common in higher elevation habitats, but is present in lowland desertscrub.	L
Canyon Mouse	*Peromyscus crinitus*	Arid shrublands of slickrock deserts, including canyon walls and cliffs. Feeds primarily on green vegetation and insects.	L
Southern Grasshopper Mouse	*Onychomys torridus*	Lowland desertscrub. This species may be able to survive on the water in its prey (beetles, grasshoppers, and scorpions).	L
Desert Wood Rat	*Neotoma lepida*	Lowland, rocky desertscrub upslope to black bush-Joshua tree and piñon-juniper.	O
Rock Squirrel	*Spermophilus variegatus*	Occurs from sea level to 8,000 feet. Prefers rocky canyons and cliffs in a variety of vegetation types.	L
Round-tailed Ground Squirrel	*Spermophilus tereticaudus*	Sandy, relatively flat desert from Death Valley up to about 3,400 feet above sea level.	L
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	Shrubby, rocky desertscrub areas with creosote bush-bursage or black bush-Joshua tree.	O
Coyote	*Canis latrans*	Ubiquitous from below sea level to near timberline. The presence of prey and water are probably the only limiting factors.	L
Gray Fox	*Urocyon cinereoargenteus*	Rocky desert canyons and hillsides up into piñon-juniper woodland. Occasionally in pine forest.	O
Kit Fox	*Vulpes macrotis*	Desertscrub and grassland. The primary habitat factor appears to be friable soils in which burrows can be constructed.	L
Ringtail Cat	*Bassariscus astutus*	Rocky canyons, hillsides, and peaks that are not heavily wooded. Absent from non-rocky desert areas.	L

TABLE 1 MAMMALIAN SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
American Badger	*Taxidea taxus*	Friable soils and presence of prey species (ground squirrels and pocket gophers primarily) seem to be the primary limiting factors for this species.	U
Western Spotted Skunk	*Spilogale putorius*	Semi-arid brushlands, rocky canyons and outcrops, riparian areas, and agricultural lands. The project area is likely too arid for this species.	U
Bobcat	*Lynx rufus*	Occupies a wide range of habitats from low deserts to high mountains. Most likely present in rocky canyons and on wooded hillsides.	L
Mountain Lion	*Puma concolor*	Rocky desert mountain ranges. They avoid open, lowland desert and are probably limited in the desert by prey availability, especially Mule Deer and Bighorn Sheep.	U
Wild Burro	*Equus asinus*	Desert hills and mountains with available forage and proximity to free water. Likely to be very uncommon in the project area.	O
Feral Horse	*Equus caballus*	Desert flats and hills with available forage and proximity to free water. Likely to be very uncommon in the project area.	U
Mule Deer	*Odocoileus hemionus*	Well vegetated washes and canyons in the desert. Likely to be uncommon in the project area.	U
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	Upper elevations of rugged desert mountain ranges. Desert Bighorn are known from the McCullough Range and the vicinity of the Mountain Pass Substation.	O
Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies			

Birds

The avifauna of the project area is composed of mainly terrestrial, non-aquatic species of songbirds, woodpeckers, hummingbirds, owls, raptors, and others (Table 2). Some species of more montane, upland habitats such as the Western Bluebird, Virginia's Warbler, Cassin's Kingbird, and Bushtit are likely to occur in the project area as transients rather than as breeding species, although they may breed very near the project area in the upper elevations of Clark Mountain where piñon-juniper woodland and a small amount of fir forest is present (Miller 1940). Of the species listed in Table 2, only the LeConte's Thrasher could be considered to be centered in, or characteristic of, the Mojave Desert; the remaining species in the table have much wider distribution and/or are more characteristic of other desert types (e.g., Cactus Wren is more typical of Sonoran Desert habitats) (Turner1994).

As was the case with mammals, most of the birds in Table 2 are shared by California and Nevada. Species known in the California portion of the project area, but not Nevada, include Western Bluebird and Virginia's Warbler, both known from Clark Mountain in California. Both of these species do breed in Nevada, but not in the project area (Floyd et al. 2007).

TABLE 2 BIRD SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA				
Common Name	**Scientific Name**	**Nevada**	**California**	**Potential**
New World Vultures				
Turkey Vulture	*Cathartes aura*	B	B	O
Eagles, Hawks, and Falcons				
Northern Harrier	*Circus cyaneus*	W	W	L
Golden Eagle	*Aquila chrysaetos*	R	R	U
Sharp-shinned Hawk	*Accipiter striatus*	W	W	U
Cooper's Hawk	*Accipiter cooperii*	R	R	O
Red-tailed Hawk	*Buteo jamaicensis*	R	R	O
Ferruginous Hawk	*Buteo regalis*	W	W	U
American Kestrel	*Falco sparverius*	R	R	O
Prairie Falcon	*Falco mexicanus*	R	R	L
Merlin	*Falco columbarius*	W	W	U
Quail and Allies				
Chukar	*Alectoris chukar*	R	R	O
Gambel's Quail	*Callipepla gambelii*	R	R	O
Plovers				
Killdeer	*Charadrius vociferus*	R	R	U
Pigeons and Doves				
Mourning Dove	*Zenaida macroura*	R	R	O
Cuckoos				
Greater Roadrunner	*Geococcyx californianus*	R	R	O
Owls				
Barn Owl	*Tyto alba*	R	R	L
Great Horned Owl	*Bubo virginianus*	R	R	L
Western Screech-owl	*Megascops kennicottii*	R	R	U
Burrowing Owl	*Athene cunicularia*	B	B	L
Nighthawks and Allies				
Lesser Nighthawk	*Chordeiles acutipennis*	B	B	L
Common Poorwill	*Phalaenoptilus nuttallii*	B	R	L
Swifts and Hummingbirds				
White-throated Swift	*Aeronautes saxatalis*	R	R	U
Black-chinned Hummingbird	*Archilochus alexandri*	B	B	U
Costa's Hummingbird	*Calypte costae*	B	B	U
Woodpeckers				
Northern Flicker	*Colaptes auratus*	W	W	L
Gilded Flicker	*Colaptes chrysoides*	B	R	U
Ladder-backed Woodpecker	*Picoides scalaris*	R	R	U
Flycatchers				
Say's Phoebe	*Sayornis saya*	R	R	O
Ash-throated Flycatcher	*Myiarchus cinerascens*	B	B	O
Cassin's Kingbird	*Tyrannus vociferans*	B	T	U
Western Kingbird	*Tyrannus verticalis*	B	B	U
Shrikes				
Loggerhead Shrike	*Lanius ludovicianus*	R	R	O
Vireos				
Gray Vireo	*Vireo vicinior*	T	T	U
Crows, Ravens, and Allies				
Common Raven	*Corvus corax*	R	R	O

TABLE 2 BIRD SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA				
Common Name	**Scientific Name**	**Nevada**	**California**	**Potential**
Larks				
Horned Lark	*Eremophila alpestris*	R	R	L
Swallows				
Cliff Swallow	*Petrochelidon pyrrhonota*	T	T	L
Violet-green Swallow	*Tachycineta thalassina*	T	T	O
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	T	T	L
Verdin and Bushtit				
Verdin	*Auriparus flaviceps*	R	R	L
Bushtit	*Psaltriparis minimus*	R	R	L
Wrens				
Cactus Wren	*Campylorhynchus brunneicapillus*	R	R	O
Rock Wren	*Salpinctes obsoletus*	R	R	O
Canyon Wren	*Catherpes mexicanus*	R	R	O
Kinglets and Gnatcatchers				
Ruby-crowned Kinglet	*Regulus calendula*	W	W	L
Blue-gray Gnatcatcher	*Polioptila caerulea*	B	B	U
Black-tailed Gnatcatcher	*Polioptila melanura*	R	R	L
Thrushes				
Western Bluebird	*Sialia mexicana*	----	T	U
Mockingbird and Thrashers				
Northern Mockingbird	*Mimus polyglottos*	R	R	O
Sage Thrasher	*Oreoscoptes montanus*	W	W	L
Bendire's Thrasher	*Toxostoma bendirei*	B	B	U
Le Conte's Thrasher	*Toxostoma lecontei*	R	R	L
Starlings				
European Starling	*Sturnus vulgaris*	R	R	O
Silky Flycatchers				
Phainopepla	*Phainopepla nitens*	B	B	U
Wood Warblers				
Virginia's Warbler	*Vermivora virginiae*	----	T	U
Yellow-rumped Warbler	*Dendroica coronata*	W	W	L
Black-throated Gray Warbler	*Dendroica nigrescens*	T	T	L
Tanagers				
Western Tanager	*Piranga ludoviciana*	T	T	L
Emberizid Finches				
Green-tailed Towhee	*Pipilo chlorurus*	W	W	L
Spotted Towhee	*Pipilo maculatus*	R	R	U
Brewer's Sparrow	*Spizella breweri*	T	T	O
Vesper Sparrow	*Pooecetes gramineus*	W	W	U
Black-throated Sparrow	*Amphispiza bilineata*	B	B	O
Sage Sparrow	*Amphispiza belli*	W	W	L
Savannah Sparrow	*Passerculus sandwichensis*	T	T	U
Lincoln's Sparrow	*Melospiza lincolnii*	T	T	U
White-crowned Sparrow	*Zonotrichia leucophrys*	W	W	O
Cardinals, Saltators, and Allies				
Black-headed Grosbeak	*Pheucticus melanocephalus*	T	T	L
Blue Grosbeak	*Passerina caerulea*	B	B	U
Lazuli Bunting	*Passerina amoena*	T	T	U

TABLE 2 BIRD SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA				
Common Name	**Scientific Name**	**Nevada**	**California**	**Potential**
Icterids, Blackbirds and Allies				
Western Meadowlark	*Sturnella neglecta*	R	R	O
Brewer's Blackbird	*Euphagus cyanocephalus*	W	W	U
Cardueline Finches				
House Finch	*Carpodacus mexicanus*	B	B	O
American Goldfinch	*Carduelis tristis*	W	W	U
Lesser Goldfinch	*Carduelis psaltria*	T	T	U
B – Breeding R – Resident W – Wintering T – Spring/Fall Transient Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies Sources: Cornell 2008; National Geographic Society 2002.				

Amphibians and Reptiles

The amphibian fauna of the project area is depauperate with two species potentially occurring in California and four in Nevada (Table 3). The Red-spotted Toad is likely to be present in the project area in both states as is the Bullfrog, but the latter requires a permanent water source. The Great Plains Toad and Woodhouse's Toad are not likely to be present in the California portion of the project area.

Conversely, the reptile fauna is very diverse in both states. It is estimated that the California portion of the project area hosts 15 species of lizards, 18 species of snakes, and 1 tortoise. The Nevada portion hosts 17 species of lizards, the same 18 snakes that are present in California, and the 1 tortoise that is also shared with California. Two lizards, the Sagebrush Lizard and the Ornate Tree Lizard, may be present in the Nevada portion of the project area but not the California portion.

TABLE 3 AMPHIBIAN AND REPTILE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
CALIFORNIA			
Amphibians			
Red-spotted Toad	*Bufo punctatus*	Occurs from desertscrub up to Petran Montane Conifer Forest; creeks, washes, rocky hillsides, cattle tanks	L
Bullfrog	*Rana catesbeiana*	Highly aquatic, remaining in or near permanent water; frequents prairie, woodland, chaparral, forests, desert oases, and farmland; enters marshes, ponds, lakes, reservoirs, and streams – usually quiet water with thick growth of cattails or other aquatic vegetation	U
Tortoises			
Mojave Population Desert Tortoise	*Gopherus agassizii*	Completely terrestrial desert species requiring firm but not hard ground for construction of burrows; frequents desert oases, riverbanks, washes, and rocky slopes	O

TABLE 3 AMPHIBIAN AND REPTILE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
Lizards			
Desert Iguana	*Dipsosaurus dorsalis dorsalis*	Creosote bush desert to subtropical scrub, most common in sandy habitats, but also occurs along rocky streambeds, on bajadas, silty floodplains, and on clay soils	L
Common Chuckwalla	*Sauromalus ater*	Rocky habitats such as boulder piles, outcrops, and lava fields	L
Long-Nosed Leopard Lizard	*Gambelia wislizenii wislizenii*	Arid and semiarid plains grown to bunch grass, alkali bush, sagebrush, creosote bush, or other scattered low plants; ground may be hardpan, gravel, or sand	O
Great Basin Collared Lizard	*Crotaphytus bicinctores*	Typically present in rocky, hilly terrain with sparse vegetation	O
Western Zebra-tailed Lizard	*Callisaurus draconoides rhodostictus*	Frequents washes, desert pavements of small rocks, and hardpan	O
Desert Horned Lizard	*Phrynosoma platyrhinos calidiarum*	Arid lands on sandy flats, alluvial fans, along washes, and at the edges of dunes, associated with creosote bush, saltbush, greasewood, cactus, and ocotillo in the desert	O
Yellow-backed Spiny Lizard	*Sceloporus magister uniformis*	Arid and semiarid regions on plains and lower slopes of mountains, found in Joshua-tree, creosote bush, and shad-scale deserts, mesquite-yucca grassland, juniper and mesquite woodland, subtropical thornscrub, and along rivers grown to willows and cottonwoods	L
Great Basin Fence Lizard	*Sceloporus occidentalis longipes*	A variety of habitats, generally above the lowest deserts, likely present in the Clark Mountains	L
Long-tailed Brush Lizard	*Urosaurus graciosus*	Mojave Desertscrub; brushy habitats along drainages and also on valley flats	L
Side-Blotched Lizard	*Uta stansburiana*	Arid or semiarid regions with sand, rock, hardpan, or loam with grass, shrubs, and scattered trees, often found along sandy washes	O
Western Red-tailed Skink	*Eumeces gilberti rubicaudatus*	Rocky areas associated with drainages and shrubby vegetation cover from high desert to piñon-juniper woodland	U
Great Basin Whiptail	*Aspidoscelis tigris tigris*	Inhabits deserts and semiarid habitats, usually where plants are sparse; also found in woodland, streamside growth, and in the warmer, drier parts of forests	O
Yucca Night Lizard	*Xantusia vigilis*	Found in arid and semi-arid habitats beneath surface debris, including rocks, vegetation, and particularly dead parts of species of *Yucca*, particularly Joshua tree	L
Desert Banded Gecko	*Coleonyx variegatus variegatus*	Resident of desertscrub communities	L
Gila Monster	*Heloderma suspectum*	Canyon bottoms and washes in desert or desert grassland	U
Snakes			
Western Thread Snake	*Leptotyphlops humilis*	Inhabits elevations from desertscrub up to chaparral; primarily nocturnal	U

TABLE 3
AMPHIBIAN AND REPTILE SPECIES
WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Habitat	Potential
Desert Glossy Snake	*Arizona elegans eburnata*	Below 6,000 feet in sparsely vegetated woodland, chaparral, grassland, or desertscrub with loose soil	L
Mojave Shovel-Nosed Snake	*Chionactis occipitalis occipitalis*	Dunes or washes in the Mojave Desert	U
Desert Nightsnake	*Hypsiglena torquata deserticola*	Inhabits desertscrub up into Petran Montane Conifer Forest; crepuscular to nocturnal	L
California Kingsnake	*Lampropeltis getula californiae*	Wide variety of habitats from deserts to forest; likely at least in the Clark Mountains	L
Red Coachwhip	*Masticophis flagellum piceus*	Sparsely vegetated areas from juniper woodland to low desert	L
Striped Whipsnake	*Masticophis taeniatus taeniatus*	Occurs in areas with ground cover consisting of dense vegetation or rock outcrops; from upper desertscrub to open pine-oak woodland elevations	L
Spotted Leaf-nosed Snake	*Phyllorhynchus decurtatus*	Open desert with finer loose soils, especially creosote bush desert	L
Great Basin Gopher Snake	*Pituophis catenifer deserticola*	Various habitats from mountain to low desert and coastal	L
Long-nosed Snake	*Rhinocheilus lecontei*	Desertscrub, prairie, tropical woodland to 5,500 feet	L
Mojave Patch-nosed Snake	*Salvadora hexalepis mojavensis*	Piñon-juniper woodland to low deserts on variety of soil types	L
Groundsnake	*Sonora semiannulata semiannulata*	Inhabit elevations from desertscrub up into woodland habitats	U
Smith's Black-headed Snake	*Tantilla hobartsmithi*	Found among rocks and brushy vegetation in canon bottoms and drainages from desert to open coniferous forest elevations	U
Sonoran Lyresnake	*Trimorphodon biscutatus lambda*	Canyons, rocky foothills, and slopes from desertscrub to Great Basin Conifer Woodland elevations	L
Western Diamondback Rattlesnake	*Crotalus atrox*	Wide range of habitats below 7,000 feet; predominantly nocturnal	L
Northern Mojave Rattlesnake	*Crotalus scutulatus scutulatus*	Desertscrub and semi-desert grassland habitats; predominantly nocturnal	L
Sidewinder	*Crotalus cerastes*	Desertscrub elevations; flat, open desert in the presence of sandy or loamy soils; predominantly in stabilized aeolian sands	U
Panamint Rattlesnake	*Crotalus stephensi*	Primarily a rock-dwelling species from creosote bush to piñon-juniper elevations	U

Sources: California Reptiles and Amphibians 2008; Stebbins 2003.

TABLE 3 AMPHIBIAN AND REPTILE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
NEVADA			
Amphibians			
Red-spotted Toad	*Bufo punctatus*	Occurs from desertscrub up to Petran Montane Conifer Forest; creeks, washes, rocky hillsides, cattle tanks	L
Bullfrog	*Rana catesbeiana*	Highly aquatic, remaining in or near permanent water, frequents prairie, woodland, chaparral, forests, desert oases, and farmland, enters marshes, ponds, lakes, reservoirs, and streams – usually quiet water with thick growth of cattails or other aquatic vegetation	U
Great Plains Toad	*Bufo cognatus*	Inhabits prairies or deserts, often breeding after heavy rains in summer in shallow temporary pools or quiet water of streams, marshes, irrigation ditches, and flooded fields; frequents creosote bush desert, mesquite woodland, and sagebrush plains	L
Woodhouse's Toad	*Bufo woodhousii*	Desertscrub, woodland, and agricultural habitats	U
Tortoises			
Mojave Population Desert Tortoise	*Gopherus agassizii*	Completely terrestrial desert species requiring firm but not hard ground for construction of burrows; frequents desert oases, riverbanks, washes, and rocky slopes	O
Lizards			
Desert Iguana	*Dipsosaurus dorsalis dorsalis*	Creosote bush desert to subtropical scrub, most common in sandy habitats but also occurs along rocky streambeds, on bajadas, silty floodplains, and on clay soils	L
Common Chuckwalla	*Sauromalus ater*	Rocky habitats such as boulder piles, outcrops, and lava fields	O
Long-nosed Leopard lizard	*Gambelia wislizenii*	Arid and semiarid plains grown to bunch grass, alkali bush, sagebrush, creosote bush, or other scattered low plants; ground may be hardpan, gravel, or sand	O
Great Basin Collared Lizard	*Crotaphytus bicinctores*	Typically present in rocky, hilly terrain with sparse vegetation	O
Western Zebra-tailed Lizard	*Callisaurus draconoides rhodostictus*	Frequents washes, desert pavements of small rocks, and hardpan	O
Desert Horned Lizard	*Phrynosoma platyrhinos*	Arid lands on sandy flats, alluvial fans, along washes, and at the edges of dunes; associated with creosote bush, saltbush, greasewood, cactus, and ocotillo in the desert	O
Great Basin Fence Lizard	*Sceloporus occidentalis longipes*	A variety of habitats, generally above the lowest deserts, likely present in the McCullough Mountains	L
Long-tailed Brush Lizard	*Urosaurus graciosus*	Desertscrub; brushy habitats along drainages and also on valley flats	L
Side-blotched Lizard	*Uta stansburiana*	Arid or semiarid regions with sand, rock, hardpan, or loam, with grass, shrubs, and scattered trees, often found along sandy washes	O
Western Red-tailed Skink	*Eumeces gilberti rubicaudatus*	Rocky areas associated with drainages and shrubby vegetation cover from high desert to piñon-juniper woodland	U

TABLE 3 AMPHIBIAN AND REPTILE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
Great Basin Whiptail	*Aspidoscelis tigris tigris*	Inhabits deserts and semiarid habitats, usually where plants are sparse; also found in woodland, streamside growth, and in the warmer, drier parts of forests	O
Yucca Night Lizard	*Xantusia vigilis*	Found in arid and semi-arid habitats beneath surface debris, including rocks, vegetation, and particularly dead parts of species of *Yucca*, particularly Joshua tree	L
Desert Banded Gecko	*Coleonyx variegatus variegatus*	Resident of desertscrub communities	L
Gila Monster	*Heloderma suspectum*	Canyon bottoms and washes in desert or desert grassland	U
Yellow-backed Spiny Lizard	*Sceloporus magister uniformis*	Arid and semiarid regions on plains and lower slopes of mountains, found in Joshua-tree, creosote bush, and shad-scale deserts, mesquite-yucca grassland, juniper and mesquite woodland, subtropical thornscrub, and along rivers grown to willows and cottonwoods	L
Sagebrush Lizard	*Sceloporus graciosus*	Brushy habitats; possibly in the McCullough Range	U
Ornate Tree Lizard	*Urosaurus ornatus*	Frequents mesquite, oak, pine, juniper, alder, cottonwood, and non-native trees such as tamarisk and rough-bark eucalyptus, but also may occur in treeless areas, especially attracted to river courses	L
Snakes			
Western Thread Snake	*Leptotyphlops humilis*	Inhabits elevations from desertscrub up to chaparral; primarily nocturnal	U
Desert Glossy Snake	*Arizona elegans eburnata*	Below 6,000 feet in sparsely vegetated woodland, chaparral, grassland, or desertscrub with loose soil	L
Mojave Shovel-nosed Snake	*Chionactis occipitalis occipitalis*	Dunes or washes in the Mojave Desert	U
Nightsnake	*Hypsiglena torquata*	Inhabits desertscrub up into Petran Montane Conifer Forest; crepuscular to nocturnal	L
California Kingsnake	*Lampropeltis getula californiae*	Wide variety of habitats from deserts to forest; likely at least in the McCullough Range	L
Red Coachwhip	*Masticophis flagellum piceus*	Sparsely vegetated areas from juniper woodland to low desert	L
Striped Whipsnake	*Masticophis taeniatus taeniatus*	Occurs in areas with ground cover consisting of dense vegetation or rock outcrops; from upper desertscrub to open pine-oak woodland elevations	L
Spotted Leaf-nosed Snake	*Phyllorhynchus decurtatus*	Open desert with finer loose soils, especially creosote bush desert	L
Great Basin Gopher Snake	*Pituophis catenifer deserticola*	Various habitats from mountain to low desert and coastal	L
Long-nosed Snake	*Rhinocheilus lecontei*	Desertscrub, prairie, tropical woodland to 5,500 feet	L

TABLE 3 AMPHIBIAN AND REPTILE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA			
Common Name	**Scientific Name**	**Habitat**	**Potential**
Mojave Patch-nosed Snake	*Salvadora hexalepis mojavensis*	Piñon-juniper woodland to low deserts on variety of soil types	L
Groundsnake	*Sonora semiannulata semiannulata*	Inhabit elevations from desertscrub up into woodland habitats	U
Smith's Black-headed Snake	*Tantilla hobartsmithi*	Found among rocks and brushy vegetation in canon bottoms and drainages from desert to open coniferous forest elevations	U
Sonoran Lyresnake	*Trimorphodon biscutatus lambda*	Canyons, rocky foothills, and slopes from desertscrub to Great Basin Conifer Woodland elevations	L
Western Diamondback Rattlesnake	*Crotalus atrox*	Wide range of habitats below 7,000 feet; predominantly nocturnal	L
Northern Mojave Rattlesnake	*Crotalus scutulatus scutulatus*	Desertscrub and semi-desert grassland habitats; predominantly nocturnal	L
Sidewinder	*Crotalus cerastes*	Desertscrub elevations; flat, open desert in the presence of sandy or loamy soils; predominantly in stabilized aeolian sands	U
Panamint Rattlesnake	*Crotalus stephensi*	Primarily a rock-dwelling species from creosote bush to piñon-juniper elevations	U
Sources: Stebbins 2003 Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies			

SPECIAL STATUS SPECIES

Some species of plants and animals are accorded special status by state and federal agencies largely because they are either scarce on a regional level, facing clearly defined threats, or in a position within the regional landscape to potentially become scarce. Special status species at the federal level include those listed as threatened or endangered under the ESA. BLM-designated sensitive species are designated by the BLM State Director's Office. Still other species are tracked by state heritage programs and assigned different levels of concern based on rarity and perceived level of threat.

In California, plant and animal taxa are tracked and monitored by the California Department of Fish and Game (CDFG) via their CNDDB. The State of California through the Fish and Game Code may also formally designate plants and animals as state-listed threatened or endangered. The CDFG also maintains a list of fully protected species which may not be taken or possessed at any time, and permits are required for scientific collecting and/or relocation (for the protection of livestock).

In the State of Nevada, at-risk taxa are tracked through the NNHP within the Department of Conservation and Natural Resources. The NNHP also assigns rank indicators to plant and animal species based on rarity and perceived level of threat. The State of Nevada can also fully protect wildlife species through the stipulations of Nevada Revised Statute (NRS) 501. The State of Nevada also protects "critically endangered" plant species as well as cacti and yuccas under NRS 527.

Special status species with the greatest probability of occurrence within the California and Nevada portions of the project area are listed in Tables 4 and 5. The California list was derived from an online search of the CNDDB coupled with additional review of published literature. Similarly, the Nevada list was derived from an online review of the NNHP listing of special status species in Clark County.

The narrative following the tables addresses those species that are either federal or state listed, or BLM sensitive species with highest degree of rarity and threat, and sensitive species that were identified by the BLM as being of special concern within the general project area. Species considered to have a low potential for occurrence (U = unlikely in Tables 4 and 5) are not discussed.

Sensitive Species – California Segment

American Badger

The American Badger (*Taxidea taxus*) is a BLM sensitive species in California, and does not have a CNDDB threat ranking as it is considered secure.

The American Badger (*Taxidea taxus*) is frequently found on the flats and alluvial fans next to desert mountains (Hoffmeister 1986). They occupy a diversity of habitats in California, particularly with the following elements: sufficient food, friable soils, and relatively open uncultivated land. Their diet consists primarily of burrowing rodents such as Pocket Gophers (*Thomomys* spp.), Ground Squirrels (*Spermophilus* spp.), Marmots (*Marmota* spp.), and Kangaroo Rats (*Dipodomys* spp.). They will also eat mice, woodrats (*Neotoma* spp.), reptiles, birds and their eggs, and bees and other insects (CDFG 1986).

Badger populations have declined drastically in California. They do not survive on cultivated land. Urban and agricultural development has probably had the greatest detrimental effect on badgers. They were also targets of deliberate killing for many years, and have suffered from rodent and predator poisoning (CDFG 1986).

No badgers or their burrows were observed during any of the project surveys or reconnaissance efforts for this project, but a badger was observed during field surveys for the Ivanpah Solar Electric Generating System in 2007 (California Energy Commission [CEC] 2008), so the species is confirmed in the immediate project area. They are more likely to occur on upper portions of bajadas where greater plant species diversity and cover provides better habitat for prey species.

Desert Bighorn Sheep

The subspecies of Desert Bighorn Sheep, *Ovis canadensis nelsoni*, that is present in the project area has no status except that the State of California affords it a ranking of S3 (21-100 element occurrences OR 3,000 – 10,000 individuals, or 2,000 – 10,000 acres of habitat), and the BLM considers it a sensitive species. Nelson's Bighorn Sheep is classified by the CDFG as a Big Game mammal, and annual hunting seasons allow for a very limited take of this species. The Clark Mountains and the entire California portion of the project right-of-way are in the CDFG Zone 3 for Desert Bighorn Sheep hunting.

Desert Bighorn are creatures of rugged, open mountainous terrain where adequate forage, water, and escape terrain are available. Bighorn, especially rams, will move between mountain ranges provided the distance of flat open desert to be crossed is not great or their route between ranges is not bisected by intense human activity (e.g., freeways). Ewes generally tend to be more sedentary and long movements by ewes between mountain ranges are unusual.

Within the project area in California, Nelson's Bighorn is likely confined to the rugged, upland topography associated with the Clark Mountain Range. Predation of Bighorn Sheep in the Kingston, Clark, and Granite mountains in California by Mountain Lion (*Felis concolor*), in recent years, has depressed Bighorn populations in these areas (Wehausen, J.D. 2006).

Wild Burros

Wild Burros (*Equus asinus*) receive protection under the 1971 federal Wild Free-Roaming Horses and Burros Act (16 USC 1331-1340). The act protects wild horses and burros within designated allotments on lands administered by the United States Forest Service and the BLM. The rationale is to maintain populations of these animals in ecological balance within the designated areas. The species is not listed as threatened or endangered by the USFWS (ESA) or the State of California. The California Fish and Game Code (No. 4600) provides additional protection for these animals (MacDonald 2006). The genus *Equus* evolved in North America contemporaneously with grassland habitats and only later expanded to South America and Europe.

As of 2006 there were only three remaining Wild Burro herds in California, none of which are considered genetically viable populations. The combined California populations consist of approximately 345 animals (MacDonald 2006). Wild burros are present on the California portion of this project. Recent burro scat was observed on the west edge of Ivanpah Lake during the August 2008 site visit.

TABLE 4
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
WILDLIFE				
Townsend's Big-eared Bat	*Plecotus townsendii*	Mines, caves, and buildings in Mojave desertscrub	BLM, S2, S3	U
Hoary Bat	*Lasiurus cinereus*	Areas with trees in Mojave desertscrub and piñon-juniper	S4?	U
Ringtail	*Bassariscus astutus*	Rocky and brushy terrain in foothills and desert; use mines	FPS	U
American Badger	*Taxidea taxus*	Mojave desertscrub	BLM, S4	L
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	Steep mountainous terrain	BLM, S3	L
Golden Eagle	*Aquila chrysaetos*	Open country	FPS	L
Western Burrowing Owl	*Athene cunicularia hypugaea*	Flat, open areas at low elevations; often associated with agricultural areas	BLM, S2	L
Gray Vireo	*Vireo vicinior*	Piñon-juniper	BLM, S2	L
Bendire's Thrasher	*Toxostoma bendirei*	Dense brushlands within Mojave desertscrub	BLM, S3	U
Crissal Thrasher	*Toxostoma crissale*	Mojave desertscrub	S3	U
Le Conte's Thrasher	*Toxostoma lecontei*	Sparsely vegetated desert	BLM‡	L
Virginia's Warbler	*Vermivora virginiae*	Chaparral and other brushy habitats at mid to higher elevations	S2, S3	U
Hepatic Tanager	*Piranga flava*	Forested areas	S1	U
Summer Tanager	*Piranga rubra*	Pine – oak woodland	S2	U
Gray-headed Junco	*Junco hyemalis* (*caniceps* group)	Mixed woodland, may occur in piñon-juniper habitat	S1	U
Desert Tortoise	*Gopherus agassizii*	Mojave desertscrub	FT, ST, S2	L
Gila Monster	*Heloderma suspectum*	Mojave desertscrub	BLM‡, S4	L
Kokoweef Crystal Cave Harvestman	*Texella kokoweef*	Kokoweef Cave endemic species	S1	U
PLANTS				
Mormon needle grass	*Achnatherum aridum*	Outcrops in shrub-steppe, piñon-juniper and Joshua tree habitats	S2.2	L
Small-flowered androstephium	*Androstephium breviflorum*	Mojave desertscrub	S1.3	O
White bearpoppy	*Arctomecon merriamii*	Mojave desertscrub	S2.2	L
Desert Ageratina	*Ageratina herbacea*	Rocky, piñon-juniper; New York and Clark mountains	S2.3	U
Mojave milkweed	*Asclepias nyctaginifolia*	Arroyos and dry slopes in Mojave desertscrub	S2	O
Cima milkvetch	*Astragalus cimae* var. *cimae*	Calcareous soils in piñon-juniper and Joshua tree habitats	S2.2	U
Scaly cloak fern	*Astrolepis cochisensis cochisensis*	Piñon-juniper and Joshua tree habitats	S2.3	L

TABLE 4
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Black grama	*Bouteloua eriopoda*	Dry, open, sandy to rocky slopes, flats, washes, scrub, woodland.	S3.2	O
Gilman's Cymopterus	*Cymopterus gilmanii*	Limestone or gypseous soils at 1,000 to 2,000 meters	S2.2	L
Utah vine milkweed	*Cynanchum utahense*	Sandy to gravelly soils in Mojave Desertscrub at 150-1,420 meters	BLM, S3.3	O
Howe's hedgehog cactus	*Echinocereus engelmannii* var. *howei*	Mojave desertscrub	BLM‡	U
Desert pincushion	*Escobaria vivipara* var. *deserti**	Limestone soils 1,000 to 2,400 meters	S2.2	†
Viviparous foxtail cactus	*Escobaria vivipara* var. *rosea***	Sandy to rocky soils	S1, S2	†
Nine-awned pappus grass	*Enneapogon desvauxi*	Rocky slopes or in crevices on calcareous soils in desert woodland; piñon-juniper at 1,275 to 1,825 meters	S2?	O
Limestone daisy	*Erigeron uncialis* var. *uncialis*	Limestone crevices between 2,100 and 2,900 meters	S2.2	U
Clark Mountain spurge	*Euphorbia exstipulata* var. *exstipulata*	Rocky slopes at 1,800 to 2,000 meters; only in the Clark Mountains	S1.3	U
Hairy Erioneuron	*Erioneuron pilosum*	Rocky slopes in piñon-juniper woodland	S2, S3	U
California barrel cactus	*Ferocactus cylindraceus*	Gravelly or rocky hillsides, canyons, and alluvial fans	BLM‡	O
Wright's bedstraw	*Galium wrightii*	Rocky habitat in shady canyons; piñon-juniper; Clark Mountains	S1.2	U
Pungent glossopetalon	*Glossopetalon pungens*	Limestone cliffs from chaparral to piñon-juniper; only in the Clark Mountains	BLM, S1.3	U
Parish club cholla	*Grusonia parishii*	Joshua tree habitat, this plant is present on the proposed Ivanpah Substation site	S2.3	O
Hairy-podded fine-leaf Hymenopappus	*Hymenopappus filifolius* var. *eriopodus*	Limestone soils in piñon-juniper habitat in the New York and Clark mountains	S1.3	L
Jaeger's ivesia	*Ivesia jaegeri*	Limestone crevices at 2,100 to 3,600 meters in the Clark Mountains	BLM, S1.3	U
Knotted rush	*Juncus nodosus*	Stream banks, lake shores, marshes, and swamps	S2.3	U
Hillside wheat grass	*Leymus salinus mojavensis*	Hillsides in desert mountains between 1,350 and 2,000 meters; pinyon-juniper	S1.3	L
Plains flax	*Linum puberulum*	Dry ridges of desert mountains at 1,000 to 2,500 meters	S2.3	L
Rough Menodora	*Menodora scabra*	Rocky soils of canyons in the New York and Clark Mountains	S2.3	L

TABLE 4
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Polished blazing star	*Mentzelia polita*	Limestone or gypseous soils between 1,200 and 1,500 meters in the Clark Mountains; associated with *Ephedra nevadensis* and *Rhus* spp.	S1.2	L
Red four o'clock	*Mirabilis coccinea*	Dry, rocky slopes and washes; piñon-juniper habitat	S2.3	L
Tough muhly	*Muhlenbergia arsenei*	Limestone rock outcrops and slopes; Clark Mountains	S1, S2	L
False buffalo grass	*Munroa squarrosa*	Open, gravelly, or rocky places from 1,500 to 1,800 meters; Clark Mountains	S1, S2	U
Beavertail pricklypear	*Opuntia basilaris* var. *brachyclada*	Occurs in chaparral habitats	BLM‡	U
Curved-spine beavertail	*Opuntia curvospina*	Mojave desertscrub	S1.2	L
Spiny cliffbrake	*Pellaea truncata*	Granitic or igneous outcrops from 1,200 to 1,900 meters; piñon-juniper habitat in the New York mountains	S2	L
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	Mojave desertscrub	S1.3	L
Stephens' penstemon	*Penstemon stephensii*	Mojave desertscrub or piñon-juniper woodland	BLM‡	L
Thompson's beardtongue	*Penstemon thompsoniae*	Piñon-juniper habitat on white calcareous soils; New York and Clark Mountains	S1.3	U
Aven Nelson's phacelia	*Phacelia anelsonii*	Sandy or gravelly soils in creosote bush, piñon-juniper, or Joshua tree habitats from 1,200 to 1,500 meters	S2.3?	O
Barneby's phacelia	*Phacelia barnebyana*	On limestone talus in the Clark Mountains between 1,600 and 2,700 meters	S2.3	L
Sky-blue phacelia	*Phacelia coerulea*	Open, sandy to rocky areas in Mojave desertscrub and piñon-juniper habitats from 1,400 to 2,000 meters	S2.3	O
Jaeger's phacelia	*Phacelia perityloides* var. *jaegeri*	Crevices on cliffs and rocky, often calcareous slopes from 1,900 to 2,300 meters in the Clark Mountains	S1.3	U
Chamber's physaria	*Physaria chambersii*	Limestone soils in piñon-juniper habitat from 1,500 to 2,500 meters in the Clark Mountains	S2.3	L
Small-flowered rice grass	*Piptatherum micranthum*	Gravel benches or rocky slopes from 700 to 2,950 meters	S2, S3	U
New Mexico locust	*Robinia neomexicana*	Canyons below 1,500 meters in piñon-juniper habitat in the Mid Hills	S1.3	U
Abert's sanvitalia	*Sanvitalia aberti*	Dry slopes at about 1,800 meters; New York and Clark Mountains	S1, S2	L
Many-flowered schkuhria	*Schkuhria multiflora* var. *multiflora*	Dry, sandy soils of Mojave desertscrub from 1,500 to 1,700 meters	S1.3	U

TABLE 4
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Johnson's beehive cactus	*Sclerocactus johnsonii*	Creosote bush habitat on granitic soils from 500 to 1,200 meters	S1.3	U
Rusby's desert mallow	*Sphaeralcea rusbyi* var. *eremicola*	Mojave desertscrub and Joshua tree habitats from 1,300 to 1,500 meters; Clark Mountains	BLM, S1.3	L

Status:
FT = Federally listed as Threatened (ESA)
BLM = Bureau of Land Management sensitive species; BLM? – not on BLM list of sensitive plants
FPS = State of California Fully Protected Species
ST = California listed Threatened

CNDDB State Ranking:
S1 = Less than 6 Eos, OR less than 1,000 individuals, Or less than 2,000 acres
S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
S2 = 6-20 Eos, OR 1,000-3,000 individuals, OR 2,000-10,000 acres
S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known
S3 = 21-100 Eos, OR 3,000-10,000 individuals, OR 10,000-50,000 acres
S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known
S4 = Apparently secure within California. NO THREAT RANK
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK

Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies

References: Benson, L. 1982; CDFG 2003; Jepson 2008.

*Formerly *Coryphantha chlorantha.*
** Formerly *Coryphantha vivipara* var. *rosea*
† Individuals of a species of *Escobaria* (*Coryphantha*) were located; species determination will require presence of flowers.
‡ BLM sensitive species not listed in the CNDDB database.

TABLE 5
SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR
IN THE NEVADA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
		WILDLIFE-MAMMALS		
California Leaf-nosed Bat	*Macrotus californicus*	Desertscrub, warm roost sites required in winter	BLM, ART	L
California Myotis	*Myotis californicus*	Dry, brushy habitats, roosts in cracks and crevices	BLM, ART	L
Small-footed Myotis	*Myotis ciliolabrum*	Moister areas; oak, juniper, chaparral, and riparian areas	BLM, ART	U
Little Brown Bat	*Myotis lucifugus*	Mostly pine and pine-oak, has occurred at 1,000 feet near the Colorado River	BLM, ART	U
Fringed Myotis	*Myotis thysanodes*	Desertscrub to pine forest, most common in pine forest	BLM, ART	U
Cave Myotis	*Myotis velifer*	Caves, mines, buildings, bridges, usually near water	BLM, ART	U
Townsend's Big-eared Bat	*Plecotus townsendii*	Mines, caves, and buildings in Mojave desertscrub	BLM, ART	L
Spotted Bat	*Euderma maculatum*	Low desert to coniferous forest, rocky cliffs near water	BLM, 501	U
Big Free-tailed Bat	*Nyctinomops macrotis*	Rugged, rocky areas in desertscrub	BLM, ART	L
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	Rugged, mountainous terrain, known to be present in the McCullough Range	BLM	O
		WILDLIFE-BIRDS		
Western Burrowing Owl	*Athene cunicularia hypugaea*	Flat, open, sparsely vegetated land with animal burrows	BLM, 501	L
Peregrine Falcon	*Falco peregrinus*	Cliffs with large gulfs of open air	BLM, 501	U
Prairie Falcon	*Falco mexicanus*	Cliffs and deep canyons	BLM	L
Phainopepla	*Phainopepla nitens*	Mesquite thickets along washes	BLM, 501	O
Loggerhead Shrike	*Lanius ludovicianus*	Open desertscub and in denser vegetation along washes	BLM	L
		WILDLIFE-REPTILES		
Desert Tortoise	*Gopherus agassizii*	Mojave desertscrub, especially on lowland flats	FT, 501	O
Chuckwalla	*Sauromalus ater*	Rocky outcrops in Mojave Desertscrub	BLM	O
Gila Monster	*Heloderma suspectum*	Mojave desertscrub	BLM, 501	L
		PLANTS		
White bearpoppy	*Arctomecon merriamii*	Creosote bush scrub, limestone outcrops, and dry lake beds	BLM, W	L
Scrub lotus	*Lotus argyraeus* var. *multicaulis*	Piñon-juniper woodland, uncommon	BLM, W	U
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	Rocky, calcareous soils in washes, on roadsides, or in scree at the base of outcrops – creosote bush or black bush desertscrub	BLM, ART	O
White-margined beardtongue	*Penstemon albomarginatus*	Sand dunes and/or deep, sandy soils	BLM, ART	O

TABLE 5
SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR
IN THE NEVADA PORTION OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential

Status Codes:

FT – Federally listed as threatened
BLM – BLM sensitive species
ST – Listed by the State of Nevada as threatened
W – Nevada Native Plant Society Watch List species; potentially vulnerable to becoming threatened or endangered
ART – NNHP At Risk Taxa
501 – Protected under NRS 501

* Species detected during rare plant and/or reconnaissance surveys in spring 2008

Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies

Golden Eagle

The Golden Eagle is relatively common in the western United States and can be found in a variety of habitats, but prefers open ground or low hills where visibility is good for hunting (Ehrlich et al. 1988; Glinski 1998). They nest on cliffs, large or small trees, and sometimes telephone poles (Glinski 1998). The Golden Eagle feeds primarily on mammals, preferring rabbits (*Lepus* spp.) and ground squirrels, but also will feed on snakes, birds, and large insects when mammals are unavailable (Ehrlich et al. 1988; Glinski 1998; Terres 1980).

Suitable nesting habitat for the Golden Eagle is present in the Clark Mountains, but primarily in rockier areas at higher elevations, and not within the project corridor. There is also potential for Golden Eagles nesting in the upper elevations of the McCullough Mountains, and there is a probable nesting record for the Highland Range (Floyd et al 2007), which is east of the Eldorado-Lugo 500kV alignment that is proposed for use to support the fiber optic telecommunications line. The lands through which the project passes are quite open, and provide suitable hunting habitat for the Golden Eagle. The Golden Eagle was recorded near the Ivanpah Substation site during biological surveys for the Ivanpah Solar Electric Generating System (ISEGS) site in 2008 (CEC 2008), and is thus known to be present in the area.

Western Burrowing Owl

The Western Burrowing Owl (*Athene cunicularia hypugaea*) is considered a sensitive species by the BLM in California, and the species has a CNDDB ranking of S2. These small owls use a variety of habitat types, including shortgrass prairie, open scrublands of mesquite (*Prosopis* spp.), creosote bush, or rabbit-brush (*Chrysothamnus* spp.), agricultural fields, airports, and golf courses (Terres 1980, Ehrlich et al. 1988, Dechant et al. 1999). In desert areas, habitat is typically treeless, open, and relatively level. Burrowing Owls often select burrows where surrounding vegetation is kept short by grazing, dry conditions, or burning (Hjertaas et al. 1995; Dechant et al. 1999). The Burrowing Owl is unique among North American owls in that they nest in burrows in the ground. They are semi-colonial and usually occupy burrows excavated by small mammals, often at the edges of active colonies of Prairie Dogs (*Cynomys* spp.) or Ground Squirrels. They may also use natural cavities in rocks and openings in man-made structures.

The project is within the greater limits of the known range of the Burrowing Owl, and is within the historic and current breeding ranges of the species (Shufford and Gardali 2008). A review of current information shows almost no recent breeding records in the eastern portion of the Mojave Desert that includes the project area (CDFG 2003; Institute for Bird Populations 2008; State of California 2008; Bates 2006). However, while no Burrowing Owls have as yet been observed within the limits of the California portion of the project, they were observed on the adjacent proposed ISEGS site in 2008 (CEC 2008). The ISEGS site is proximal to the proposed Ivanpah Substation site, thus the owls are documented in the immediate area.

Gray Vireo

The Gray Vireo is considered to be a sensitive species by the BLM in California, and has a CNDDB ranking of S2. The gray vireo is found in a variety of habitats from desertscrub up into piñon-juniper and oak juniper associations where it forages for insects among low vegetation. The gray vireo prefers dry slopes, and is unique among vireos in this respect (Terres 1980). The Gray Vireo may occur in the vicinity of the Mountain Pass Substation during the summer breeding season.

LeConte's Thrasher

LeConte's Thrasher (*Toxostoma lecontei*) is considered a sensitive species by the BLM in California. LeConte's Thrasher is very sparsely distributed in southern California, western Arizona, southern Nevada, and extreme southwestern Utah (Schram 1998). It is generally restricted to the lowest, hottest, and most barren desert plains, particularly in saltbush and creosote bush habitats (Terres 1980). LeConte's Thrashers feed primarily on large insects and other terrestrial invertebrates, and they occasionally eat lizards, other vertebrates, seeds, or fruit (Dobkin and Granholm 2005; Ehrlich et al. 1988). Populations of this species are very sparse, with densities in optimum habitat of five pairs or fewer per square mile (Remsen 1978). This species is very secretive and sensitive to human disturbance. Specific threats include off-highway vehicle (OHV) activity and clearing of shrubs for agriculture or other development (Dobkin and Granholm 2005).

LeConte's Thrashers are very likely to occur within the project area, mostly on lower portions of the bajada on the east side of the Clark Mountains where vegetation is sparse and where chollas provide suitable nesting sites.

Raptor Nests

There is a general lack of natural potential roosting habitat for raptors along most of the California portion of the project. There is some potential nesting habitat in the Clark Mountains near the Mountain Pass Substation where there are rocky cliffs and a few piñon pine. Electrical transmission line lattice towers probably provide most of the potential raptor nesting habitat in the area. A single raptor nest was observed being constructed by a pair of Red-tailed Hawks (*Buteo jamaicensis*) in a lattice tower in the east foothills of the Clark Mountains in April of 2008. No other stick nests were observed. Stick nests in lattice towers are often re-occupied or modified and re-used intermittently by raptors and corvids returning to an area annually. The nests are generally persistent in the towers for years. An apparent lack of stick nests in lattice structures along the existing transmission line may reflect depressed raptor populations in the area. A pre-construction survey for raptor/corvid nests in the existing lattice towers should be performed prior to initiation of construction.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712) provides protection for a majority of bird species occurring in the United States. The major goal of the MBTA as it was originally conceived was to put an end to the commercial trade in birds and their feathers that, by the early years of the twentieth century, had wreaked havoc on the populations of many native bird species (USFWS 2002). The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed under the Act. The statute does not discriminate between live or dead birds and also grants full protection to any bird parts, including feathers, eggs, and nests.

There have been several amendments to the original law (including the Migratory Bird Treaty Reform Act of 1998) and currently, penalties include a fine of not more than $15,000 or imprisonment of not more than 2 years for misdemeanor violations of the Act. The 1998 Act also amended the law to make it unlawful to take migratory game birds by the aid of bait if the person knows or reasonably should know that the area is baited. Violations of the 1998 baiting amendment are punishable under title 18 United States Code (with fines up to $100,000 for individuals and $200,000 for organizations), with imprisonment for not more than 1 year, or both.

The majority of bird species that occur in the United States as either residents or migratory species are covered by the MBTA. Common species that are not protected include the Rock Dove (*Columba livia*), the European Starling (*Sturnus vulgaris*), the House Sparrow (*Passer domesticus*), and gallinaceous bird species of the family Phasianidae. The Phasianidae includes species of grouse, turkey, and ptarmigan, most of which are managed as game animals (USFWS 2005). The MBTA protects individual birds, their nests, eggs, and parts. The principal potential impacts that might result in violation of this law are associated with activities that would destroy nests, eggs, and young birds during the nesting season. In the project area the avian nesting season for most species is from late February to early July.

Given the higher elevation and greater diversity (species and structure) in the plant community in the Mountain Pass area and on the southern portion of the Eldorado-Lugo 500kV, it may be that these areas are utilized more by transient, summer visitor, and permanent resident birds than lower elevation areas. Indeed, Clark Mountain has been identified as a rather unique situation in its upper elevations due to populations of more montane species, including Flammulated Owl (*Otus flammeolus*), Broad-tailed Hummingbird (*Selasphorus platycercus*), Hairy Woodpecker (*Picoides villosus*), Mountain Chickadee (*Poecile gambeli*), Hermit Thrush (*Catharus guttatus*), and Western Bluebird (*Sialia Mexicana*) (Miller 1940). With this information in hand, close attention will be paid to the avian community and any future impacts the project may have in these areas.

Pre-construction surveys for nesting birds should be conducted to preclude violation of the MBTA. Active nests may be avoided until the young have fledged or eggs and/or young may be moved by a licensed rehabilitation contractor. Performing vegetation clearing and other ground disturbing activities outside of the avian nesting season will minimize the potential for impacts to birds and violation of the MBTA.

Mojave Population Desert Tortoise

The Mojave population of the Desert Tortoise is federally listed as a Threatened species (Federal Register 1990), and a recovery plan was prepared in 1994 (USFWS 1994). A draft revised recovery plan was released in 2008 by the USFWS (USFWS 2008). The revision redraws most of the Recovery Unit boundaries, but the draft includes no proposed changes to the limits of designated Critical Habitat for the species. The State of California also lists the Mojave population of the Desert Tortoise as threatened (CDFG 2008). The CNDDB ranking for the Desert Tortoise is S2.

The Mojave population of the Desert Tortoise is found primarily in Mojave desertscrub, but it also occurs in the Lower Colorado River Subdivision of Sonoran desertscrub in southeastern California. They are generally associated with communities dominated by creosote bush (*Larrea tridentata*), with other sclerophyllous shrubs and small cacti present (Arizona Game and Fish Department [AZGFD] 2001). Some parts of their habitat may contain abundant Joshua trees. The Mojave Desert Tortoise prefers sandy loam or rocky soils in valleys, bajadas, and hills (AZGFD 2001). They may be found at elevations below sea level in Death Valley, California, and up to about 1,500 meters (4,922 feet) at Yucca Mountain, Nevada (Arizona Game and Fish Department 2001). Desert Tortoises are facing numerous threats to their survival. Livestock grazing, recreational OHV use, military training activities, urban development, and increases in predation are some of the factors that affect tortoise survival (Lovich 2003). Additional threats are takes of tortoises for commercial sale as pets, from vandalism (shooting, crushing, or mutilation), and for food (USFWS 1994).

The entire project area is within the range of the species, and most of the area provides some suitable habitat for tortoises. The California segment of the proposed project alignment does not pass through any federally designated (ESA) Critical Habitat for the Desert Tortoise. However, placement of the fiber optic telecommunications cable associated with the Nipton 33kV distribution line east of I-15 is wholly within Desert Tortoise Critical Habitat in the Ivanpah Recovery Unit. The length of this segment is approximately 13 miles. Placement of the telecommunications cable will involve minimal disturbance to this area. Installation of the line on the east to west portion of the line (10.5 miles) will be on existing wooden poles. Some pole replacement may be required if poles are not structurally sound. Except for a wire pulling station(s), installation can be accomplished primarily using pedestrian access. New poles will be required along the existing Nipton Moore Road, parallel with the Union Pacific Railroad (UPRR) tracks, to connect the Nipton line with the existing 500kV transmission line, approximately 2.5 miles south of Nipton.

A project protocol level survey for the Desert Tortoise was performed by Karl and Associates in May of 2008 for the main portions of the transmission line route. The project alternative routes will be surveyed in the spring of 2009, after the alternative corridors are more precisely defined. The 2008 Desert Tortoise survey results will be presented as a stand-alone report.

Gila Monster

The Gila Monster has no federal status under the ESA; it is a BLM sensitive species in California and is accorded a State of California Rank of S4 (Apparently Secure in California, no threat rank). The State of California considers the Gila Monster to be a species of special concern and it is listed and tracked by the CNDDB. While it appears that Gila Monster populations in the state are not faced with any immediate threat, their numbers are very low, with only 26 credible records from four counties in the past 153 years (Beaman and Lovich 2007).

Most records of Gila Monsters in California have come from areas characterized by steep, rocky topography associated with large, relatively high mountain ranges. Most localities are associated with canyons and riparian areas, including the lower Colorado River. Brown and Carmony (1991) stress that rough, rocky country is an important component of Gila Monster habitat and that the animal eschews flat plains thinly populated by creosote bush. Habitat of this type provides many opportunities for crevices under rocks and similar structures that can be used for winter hibernacula and/or summer dens. Trees and shrubbery are an important part of Gila Monster habitat that provide shade and cover, but also because such plants support larger populations of prey species.

Gila Monsters utilize dry washes and their edges, as well as mesquite thickets for foraging. Given that the Gila Monster is a comparatively slow-moving lizard, its prey consists mostly of defenseless baby animals and eggs which they detect by chemical cues and odors. Prey items include baby Cottontails, Round-tailed Ground Squirrels, and other small mammal species. Gambel's Quail and Desert Tortoise eggs are often taken, as well the eggs of doves and other birds. In Arizona, foraging activity occurs in two seasonal peaks that coincide with the nesting of quail and doves, and births of Cottontails during the spring months of April and May. A second surge in activity occurs in response to Cottontail births and dove nesting that begins with the onset of the summer rains (Brown and Carmony 1991). Beaman and Lovich (2007) suggest that summer rains may be important to the foraging ecology of the species in California.

With respect to the project area, the only potentially suitable Gila Monster habitat in California is the rougher terrain near Clark Mountain, and on the mountain slopes and canyons associated with telecommunications sites at Cima Peak and Mountain Pass.

Mormon Needle Grass

Mormon needle grass (*Achnatherum aridum*) has a CNDDB ranking of S2.2. Mormon needle grass is associated with rock outcrops or shrub-steppe habitats where Joshua tree or piñon-juniper woodland habitats on carbonate soils are present between approximately 3,940 and 5,100 feet (1,200 and 1,550 meters) elevation (CNPS 2001). Stems may approach 3 feet in height, with the inflorescence 2 to 7 inches in length, and may be partially enclosed by the upper leaf sheath. Plants flower in May or June (Jepson Interchange 2008).

Mormon needle grass was not observed during the project plant or reconnaissance surveys, but suitable habitat is present for the species in Antimony Canyon east of the Mountain Pass Substation.

Small-flowered Androstephium

Small-flowered androstephium (*Androstephium breviflorum*) has a CNDDB ranking of S1.3. Small-flowered androstephium is a perennial herb from a bulb, which occurs in creosote bush habitat in California. The pale pink flowers appear between March and June. The plants occur in dry habitats on dry sandy to rocky soils between 100 and 1,600 meters elevation (Flora of North America [FNA] 2009). The species is known only from Inyo, Riverside, and San Bernardino counties in California, but also occurs in several southwestern states (Jepson 2008; U.S. Department of Agriculture [USDA] 2009). This plant is present on the project near Milepost 2 of Alternative D, where at least 27 plants were documented (Figure C1c), and at the proposed Ivanpah Substation, where a few small individuals of this species were located on the Ivanpah Substation site in 2009.

White Bearpoppy

White bearpoppy (*Arctomecon merriamii*) has no federal status. It has a CNDDB ranking of S2.2. The white bearpoppy is an evergreen perennial herb. The leaves are basal, rounded-dentate, and moderately pilose, the hairs long and erect, which give the leaves a bluish-green appearance. The emerging flower stalks have the typical poppy family nodding habit of the flower bud, which becomes erect at maturity. The flowers, which have white petals on stalks 12 to 16 inches in height, appear in the spring (NNHP 2001a; CalFlora 2008). The white bearpoppy is found from Death Valley in southeastern California to the Meadow Valley Wash of southeastern Nevada (FNA 2009). The plants occur on generally barren, calcareous soils, alluvial gravels and carbonate rock outcrops at elevations of 2,000 to 6,280 feet (NNHP 2001a; FNA 2008). The species has not been observed within the project limits, but suitable habitat is present.

Mojave Milkweed

Mojave milkweed (*Asclepias nyctaginifolia*) has a CNDDB status of S2. Mojave milkweed occurs along arroyos and on dry slopes in the Mojave Desert between 1,000 and 1,700 meters elevation. The greenish-white flowers appear in May and June (Jepson 2008). Mojave milkweed was found at one location within the California segment of the project during the 2008 project rare plant survey, approximately .5- mile southwest of the proposed Ivanpah Substation site.

Scaly Cloak Fern

The scaly cloak fern (*Astrolepis c.* var. *cochisensis*) has a CNDDB ranking of S2.3. Scaly cloak fern is a perennial herb of small stature, generally between 1 and 4 inches in height, associated with limestone outcrops and associated rocky slopes between approximately 2,950 and 5,900 feet elevation in piñon-juniper woodland or in habitats that contain Joshua trees (CNPS 2001; Jepson 2008). The species occurs from California east to New Mexico.

Suitable habitat for the scaly cloak fern may be present in the vicinity of the Mountain Pass Substation, but the plant was not observed during the rare plant surveys conducted for the project in 2008 and 2009.

Black Grama

Black grama has a CNDDB ranking of S3.2. Black grama is a tufted perennial herb of the western United States and northern Mexico that has decumbent to erect stems to approximately 2 feet in height. Inflorescences are generally present between May and October (CNPS 2001; Gould 1951). Black grama most commonly occurs in dry habitats with sandy or rocky soils in flats, on slopes, along washes, and in scrub and woodland communities, including piñon-juniper habitat between 2,950 to 6,230 feet elevation (CNPS 2001; Gould 1951; Jepson 2008).

Black grama is present on the project, and was observed in more than one location in Antimony Canyon east of the Mountain Pass Substation during the 2008 project rare plant survey.

Gilman's Cymopterus

Gilman's cymopterus (*Cymopterus gilmanii*) has a CNDDB ranking of S2.2. Gilman's cymopterus is known only from Nevada and California, and occurs in Mojavean desertscrub habitat, often on carbonate substrates, between approximately 3,280 and 6,560 feet elevation (CNPS 2001). Flower stalks are usually less than 9 inches in height, with the greenish-purple flowers appearing between April and May (Jepson 2008).

Gilman's cymopterus was not observed during any of the project surveys, but there are CNDDB records for the species in the Clark Mountains, and suitable habitat may be present in the project area near the Mountain Pass Substation. There are also CNDDB records of the species at "Bear Poppy Saddle," which is approximately 4 miles west of the north end of Transmission Line Alternative C, and additional records to the north near Kally Mine and the vicinity of Stateline Pass. Gilman's cymopterus was not located anywhere on the project during the 2008 and 2009 rare plant surveys.

Utah Vine Milkweed

Utah vine milkweed has no federal status, but is listed by the BLM as a sensitive species. It is accorded a state ranking in California of S3.3 (see Table 4). The species is native to the Mojave Desert and is known from the states of Utah, Arizona, Nevada, and California

Utah vine milkweed is a member of the dogbane family (Apocynaceae). It is a small (up to approximately 1 meter), highly branched vine that grows up through other desert shrubs for support. It has small, narrow leaves, only a few centimeters long and bright yellow to orange flowers that grow in umbels. The plant typically grows on sandy to gravelly flats in creosote bush desert.

A single individual of this species was located near the Ivanpah Substation site during the 2008 project rare plant survey (see Appendix C, Figure C1d). Several individuals of this species were located near Milepost 3.6 of the Path 2: Section 2 telecommunications link during the 2009 project rare plant survey (see Appendix C; Figure C1f).

Viviparous Foxtail Cactus

The viviparous foxtail cactus has a CNDDB state ranking of S1/S2. This species was formerly known as *Coryphantha chlorantha*. The range of this species includes northwestern Arizona, southern Nevada, and southeast California (Benson 1982). This cactus occurs on limestone substrates in piñon-juniper woodland or on low hills and slopes in Mojavean desertscrub between 1,250 and 2,700 meters (4,100 and 8,860 feet) elevation (Benson 1982; CNPS 2001; Jepson 2008). The plants may have one to several heads, and produce magenta to purplish blooms in May or June (Benson 1982; CNPS 2001). The species is considered rare, and is threatened by over-collection (Hickman 1993; Jepson 2008). The viviparous foxtail cactus could occur in the Clark Mountains or the Mid Hills. There is a chance it could be present in the vicinity of the Mountain Pass Substation.

Nine-awned Pappus Grass

Nine-awned pappus grass (*Enneapogon desvauxi*) has a CNDDB ranking of S2?. Nine-awned pappus grass occurs on calcareous soils, usually associated with slopes or rocky crevices in desert woodland habitat between approximately 4,180 and 5,990 feet elevation. The species ranges from Colorado and southern California east to west Texas, and south to Peru. Plant stems may reach about 20 inches in height, with the inflorescences present in August and September (Gould 1951; Jepson 2008).

Nine-awned pappus grass was found during the project rare plant survey conducted in May of 2008. Two occurrences of this species were recorded, one near the proposed Ivanpah Substation site and a second approximately 2.2 miles southwest of the substation site (Appendix C; Figure C1d).

California Barrel Cactus

The California barrel cactus has no federal status under the ESA, is not listed on the California BLM list of sensitive species, is not afforded any status in the CNDDB (it is not tracked), and was considered too common to be included in the CNPS Inventory of Rare and Endangered Plants of California (2001). The Needles Office of the BLM has expressed some concern for the species in its district.

This cactus and its varieties occur widely in Arizona, Nevada, California, and Utah in desert habitats. The plants prefer gravelly to rocky hillsides, canyon walls, and wash margins in the desert between about 200 and 5,000 feet. In the current taxonomy there are two varieties that could be present in our project area; var. *lecontei* occurs from roughly between 2,500 and 5,000 feet while var. *acanthodes* occurs between 200 and 1,500 feet elevation.

This species was not on the target list for rare plant studies, but it was found along the project right-of-way in California west of Ivanpah Lake.

Parrish Club Cholla (Matted Cholla)

Parrish club cholla has no federal status, but is considered a sensitive species by the BLM. It is according a State of California ranking of S2.3 (see Table 4). The species is known from the Mojave and Sonoran Deserts of Arizona, California, and Nevada.

Parish club cholla grows in mats, hence the alternate common name of "matted cholla." The mats are close to the ground and this cactus never "emerges" from the shrubby desert vegetation surrounding it. Plants flower in late spring and early summer and are usually found on silty, sandy, or gravelly flats, dunelets, and hills.

Parish club cholla was found on the proposed Ivanpah Substation site and at four other locations in California during rare plant surveys in May 2008 (see rare plant survey, Appendix C).

Hairy-podded Fine-leaf Hymenopappus

Hairy-podded, fine-leaf hymenopappus (*Hymenopappus filifolius* var. *eriopodus*) has a CNDDB state ranking of S1.3. This species inhabits limestone soils among pines and/or junipers at elevations of about 1,600 to 1,700 meters (5,250 to 5,580 feet) (Jepson 2008). Plants may reach 8 decimeters (30 inches) in height and produce whitish flowers in May or June, and occasionally again in the fall (October) (Jepson 2008). This species is recorded in the Clark and New York mountains. This species is unlikely to occur within the transmission line right-of-way, but could occur near the Mountain Pass Substation.

Hillside Wheat Grass

Hillside wheat grass (*Leymus salinus mojavensis*) has a CNDDB state ranking of S1.3. Hillside wheat grass grows to about 14 decimeters (55 inches) in height with an inflorescence to 14 centimeters (5.5 inches) long, and flowers between May and June. This grass occurs on rocky hillsides in piñon-juniper habitat between 1,350 and 2,135 meters (4,430 and 7,000 feet) elevation (CNPS 2001; Jepson 2008). The only portion of the project right-of-way where this species might occur is the vicinity of the Mountain Pass Substation.

Plains Flax

Plains flax (*Linum puberulum*) has a CNDDB ranking of S2.3. Plains flax inhabits dry ridges of deserts, mesas, or mountains from California to Colorado and Texas (Jepson 2008). Plains flax is a perennial species to about 15 inches in height, which may occur between approximately 2,000 and 8,200 feet elevation (Epple and Epple 1995; Jepson 2008; Kearney and Peebles 1960). The flowers, which have yellow to orange petals, may bloom anytime between April and October (Epple and Epple 1995; Jepson 2008). Plains flax was not observed on the project during any of the project surveys, but is likely to be present in some areas.

Rough Menodora

Rough menodora (*Menodora scabra*) has a CNDDB ranking of S2.3. Rough menodora is a shrub to about 18 inches in height that produces light canary yellow flowers anytime between May and September, which are followed by distinctive translucent, paired fruit (Epple and Epple 1995; Kearney and Peebles 1960). Rough menodora occurs on rocky soils of slopes, dry mesas, foothills, and canyons between approximately 1,500 and 7,500 feet elevation (Jepson 2008; Kearney and Peebles 1960). In California, rough Menodora is recorded from the Clark, Eagle, and New York Mountains (Jepson 2008). A single individual of rough menodora was observed near milepost 3.7 of the Path 2: Section 3: Alt. 1 project segment during the 2009 project rare plant survey (Appendix C; Figure C1e).

Polished Blazing Star

The polished blazing star (*Mentzelia polita*) has a CNDDB state ranking of S1.2. Polished blazing star is a perennial plant to about 31 centimeters (1 foot) in height with white, peeling stems and linear to lanceolate leaves less than 7 centimeters (2.75 inches) in length. The white to pale yellow flowers appear in April or May (Charters 2008). The plants occur on limestone or gypseous soils between 1,200 and 1,500 meters (3,940 and 4,920 feet) elevation. The polished blazing star is known from the Clark Mountains (Charters 2008; Jepson 2008). This species could occur on suitable substrate on the project in the Clark Mountains.

Red Four-o'clock

Red four o'clock (*Mirabilis coccinea*) has a CNDDB ranking of S2.3. Red four o'clock has ascending to erect stems to nearly 2 feet in height. The fleshy, linear leaves are sessile, and the intense red blossoms may be present between May and July (Jepson 2008). This plant occurs on dry soils of rocky slopes and along washes, often associated with piñon-juniper habitat, between approximately 3,510 and 5,900 feet elevation (CNPS 2001; Jepson 2008). Red four o'clock was not observed during any of the project surveys, but suitable habitat for the species is present near the Mountain Pass Substation.

Tough Muhly

Tough muhly (*Muhlenbergia arsenei*) has a CNDDB state ranking of S1/S2. This perennial grass may reach 4 decimeters (16.0 inches) in height with a 12 centimeters (4.7 inches) long inflorescence that may be present from August to October. Tough muhly occurs on rock outcrops and limestone slopes in the Clark and New York mountains between 1,400 and 1,860 meters (4,590 and 6,100 feet) (CNPS 2001; Jepson 2008). Tough muhly could be present on the project near the Mountain Pass Substation.

Curve-spined Beavertail

The curve-spined beavertail cactus (*Opuntia curvospina*) has a CNDDB state ranking of S1.2. The curve-spined beavertail cactus, also known as the Searchlight pricklypear, is a recognized hybrid between *O. phaeacantha* and *O. chlorotica* that has been proposed as a distinct species (CNPS 2001; USDA 2009). The species occurs in Mojavean desertscrub, chaparral, and piñon-juniper woodland from 1,000 to 1,400 meters elevation (3,280 to 4,590 feet). Blooms appear on the plants between April and June (CNPS 2001). The curve-spined beavertail cactus could be present within the project limits in suitable habitat.

Spiny Cliffbrake

Spiny cliffbrake (*Pellaea truncata*) has a CNDDB ranking of S2. Spiny cliffbrake occurs in rock crevices, on cliffs, and in boulder piles of granite or other igneous rocks in piñon-juniper habitat between approximately 3,900 and 7,050 feet elevation (CNPS 2001; Jepson 2008). Spiny cliffbrake was not observed during any of the project surveys, but suitable habitat may be present in the steep, rocky terrain near the Mountain Pass Substation.

Rosy Two-toned Beardtongue

The rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*) has no federal status and is not listed as a BLM sensitive species in California (BLM 2004). The State of California assigns it a rank of S1.3 (less than six element occurrences with no identifiable threat).

This species is known from three occurrences in California: one east of Keany Pass on the Clark Mountain USGS Quad; one near Heart in the Castle Mountains on the Heart Peak USGS Quad; and one vague location on the Homer Mountain USGS Quad, all in San Bernardino County. The Keany Pass location was situated in a limestone wash, which follows most of the Nevada and Arizona sites for this plant – it is a calcareous soil obligate or near-obligate. Plants are perennial herbs up to about 5 feet tall, leaves have strongly toothed margins, and are clasping. The corolla is trumpet-shaped and the flowers are rose to rose-purple.

This species was on the target list for rare plant surveys in the California portion of the project area, but no individuals of this species were found during 2008 or 2009 project rare plants surveys.

Stephen's Penstemon

Stephens' penstemon (*Penstemon stephensii*) is considered a sensitive species by the BLM in California. Stephen's penstemon occurs on rocky slopes or in bedrock crevices, and along washes, usually associated with carbonate soils, in habitats from creosote bush scrub up to piñon-juniper at elevations ranging from approximately 3,800 to 6,070 feet elevation. The rose to magenta flowers may be present between April and June (CNPS 2001; Jepson 2008). Stephens' penstemon has not been observed during any of the project field surveys, but suitable habitat is present in the Project area.

Aven Nelson's Phacelia

Aven Nelson's phacelia (*Phacelia anelsonii*) has a CNDDB ranking of S2.3?. Aven Nelson's phacelia is an annual herb that occurs on carbonate, sandy, or gravelly soils in a variety of habitats between approximately 3,900 and 4,920 feet elevation (Jepson 2008). The species is known in southern California only from the New York Mountains, but the species range extends to southwest Utah. It is an erect annual plant to about 20 inches in height, with white or pale blue to lavender flowers that may be present in April or May (CNPS 2001; Jepson 2008).

Aven Nelson's phacelia was observed at four closely spaced localities on the project, about 1 mile northeast of the Mountain Pass Substation during the project rare plant survey conducted in May of 2008 (Appendix C; Figure C1e).

Barneby's Phacelia

Barneby's phacelia (*Phacelia barnebyana*) has a CNDDB ranking of S2.3. Barneby's phacelia occurs on limestone scree between 1,600 and 2,700 meters elevation in California and western Nevada. Barneby's phacelia is an erect annual plant to 30 centimeters in height with pale lavender petals (Jepson 2008). The only portion of the project where this species may occur is in the vicinity of the Mountain Pass Substation. The elevation at the substation is at the lower end of the known elevation range of the species. No individuals of this species were observed during the rare plant surveys of 2008 and 2009.

Sky-blue Phacelia

Sky-blue phacelia (*Phacelia coerulea*) has a CNDDB ranking of S2.3. Sky-blue phacelia is an ascending to erect annual plant to 40 centimeters in height that occurs in open creosote bush habitat on sandy to rocky substrates between about 1,400 and 2,000 meters elevation. The bell-shaped pale blue-to-purple flowers appear in April or May (Jepson 2008). Sky-blue phacelia was located at three locations along the project route during the 2009 rare plant survey (Appendix C; see Figures C1e and C1f). A combined total of at least 30 plants were documented at these sites.

Chamber's Physaria

Chamber's physaria (*Physaria chambersii*) has a CNDDB ranking of S2.3. Chamber's physaria is an herbaceous tufted plant that is usually no more than 6 inches in height. Leaves are basal and spatulate with an acute tip. Chamber's physaria is a limestone soil endemic species that occurs between approximately 4,920 and 8,500 feet elevation, usually associated with piñon-juniper habitat. The species is recorded from the Clark and Grapevine mountains in California, and occurs north to Oregon, east to Utah, and Arizona. The yellow flowers usually appear in April or May (CNPS 2001; Jepson 2008; Kearney and Peebles 1960). Chamber's physaria was not observed during the project rare plant survey, but there may be suitable habitat for the species in the Clark Mountains.

Abert's Sanvitalia

Abert's sanvitalia (*Sanvitalia aberti*) has a CNDDB state ranking of S1/S2. Abert's sanvitalia is an annual plant occurring on dry slopes in piñon-juniper woodland from 1,570 to 1,800 meters (5,150 to 5,900 feet) elevation (CNPS 2001; Jepson 2008). Plants may reach 29 centimeters (11 inches) in height (Jepson 2008). The yellow flowers are present in August or September. In California the species is known from the Clark and New York mountains (Jepson 2008). There is a small chance that Abert's sanvitalia might occur on the project in the vicinity of the Mountain Pass Substation.

Rusby's Desert Mallow

Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*) has a CNDDB state ranking of S1.3. Rusby's desert mallow occurs in Joshua tree woodland and Mojavean desertscrub habitats between 975 and 1,500 meters (3,200 and 4,920 feet) elevation (CNPS 2001; Jepson 2008). The species is relatively short for a *Sphaeralcea* sp., reaching only about 3 decimeters (12 inches) in height. Rusby's desert mallow occurs only in Death Valley and the Clark Mountains (Jepson 2008). There is some possibility this species could occur within the project limits near the Mountain Pass Substation.

Cactus and Yucca

The BLM normally requires transplanting or salvage of certain native plant species that would be lost to development on lands under their jurisdiction. Species typically involved in these efforts include all cacti except chollas (*Cylindropuntia* spp.), which are left on the site to regenerate from stem segments, *Yucca* spp., and ocotillo (*Fouquieria splendens*).

Sensitive Species – Nevada Segment

Bat Species

Table 5 lists nine bat species all of which are designated BLM sensitive species. These species are considered sensitive by the BLM because they typically consist of small and widely dispersed populations and they inhabit ecological refugia or specialized or unique habitats.

None of the bats listed in Table 5 were observed during field studies in May 2008. However, no specific effort was expended to document bat presence or absence. It is likely that any bats present in the project area would be associated with old mine or natural structures in the McCullough and Lucy Gray mountains.

Desert Bighorn Sheep

The subspecies of Desert Bighorn Sheep (*O. c. nelsoni*) that is present in the Nevada portion of the project area has no federal status. The Nevada office of the BLM considers it a sensitive species. The Desert Bighorn Sheep is managed as a big game animal in Nevada by the Nevada Department of Wildlife (NDOW), and an annual hunt allows for a very limited take of the species. The McCullough Mountains are within the NDOW Area 26 Unit 263 hunting area. The 2008 quota for Bighorn for Unit 263 is set at 10 animals, and the hunt period in Unit 263 is from November 10 through December 10. The NDOW would likely restrict construction of this project through the McCullough Mountains during the Bighorn hunting season.

Within the project area in Nevada, Nelson's Bighorn is likely mostly confined to the rugged, upland topography associated with the McCullough Range. Within that range are Bighorn special use areas that are of concern to wildlife and land managers. Lambing grounds are generally higher elevation portions of mountain ranges where ewes go in the winter or spring to drop their lambs. It is believed that the higher, less accessible terrain affords the ewes and lambs greater protection from certain predators such as Coyotes. Summer grounds are those portions of the mountain range occupied by sheep during the hot summer months. Summer grounds must provide adequate forage and not be at too great a distance from water. The only water development in the McCullough Mountains available to Bighorn Sheep in summer is the "Linda" guzzler, approximately 1.3 miles north of the north McCullough Pass. Because Bighorn mostly move during daylight, which is when construction would occur, there is potential for project activities to interfere with Bighorn accessing this resource. Construction of the portion of the line through the north McCullough Pass area should occur outside of the hot summer season (June through September) when Bighorn may be dependent on this water source.

The BLM Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands identifies the McCullough Mountains as a Category II (Crucial Habitat) area. Continuous suitable habitat for Bighorn Sheep exists from the McCullough Range to the southeast, including the nearby Highland Range Crucial Bighorn Habitat Area (approximately 7 miles south-southeast of the proposed transmission line alignment through the McCullough Mountains). The proximity of the two ranges, with the relatively narrow, high valley in between, is favorable to regular movements of Bighorn Sheep between the two ranges. The Eldorado-Lugo 500kV transmission line, which will support the optic fiber communications line, passes through this habitat between the two ranges, but does not enter either the South McCullough Wilderness Area or the Highland Range Crucial Bighorn Habitat Area. The population of Bighorn Sheep in the McCullough Range was estimated at greater than 237 animals in 2005 (NDOW 2006). Bighorn were observed along the project alignment in the north McCullough Pass area by SCE personnel in August of 2008. Bighorn may also be present on Sheep Mountain and the Lucy Gray Mountains. The transmission line right-of-way passes between these two ranges east of I-15 and north of Primm, Nevada.

Wild Burros

Wild Burros (*Equus asinus*) receive protection under the 1971 Federal Wild Free-Roaming Horses and Burros Act (16 USC 1331-1340). The Act protects wild horses and burros within designated allotments on lands administered by the United States Forest Service and the BLM. The Nevada office of the BLM has designated numerous Herd Management Areas (HMA) within the State of Nevada. There are no established BLM-HMAs near the Nevada portion of this project that would be affected by this action. It is not known whether Wild Burros are present in the Nevada segment of the project.

Western Burrowing Owl

The Western Burrowing Owl is not federally listed as threatened or endangered. It was formerly listed as a Category 2 Candidate species, but that classification was dropped in 1996, and it is now a federal species of concern. The Nevada office of the BLM considers it a sensitive species, and it is also protected by the State of Nevada under NRS 501 (NNHP 2004).

Burrowing Owls inhabit open areas in deserts, grasslands, and agricultural and range lands. They use well-drained areas with gentle slopes and sparse vegetation, and may occupy areas near human habitation such as golf courses and airports (Dechant et al. 1999; Ehrlich et al. 1988; Terres 1980). Burrowing Owls often select burrows where surrounding vegetation is kept short by grazing, dry conditions, or burning (Dechant et al. 1999; Hjertaas et al. 1995).

Burrowing Owls are semi-colonial and usually occupy burrows excavated by small mammals. In areas that lack colonial burrowing mammals, Burrowing Owls will use excavations made by other mammals such as Badgers, Woodchucks, Skunks, Foxes, Armadillos, and Coyotes. They also use Desert Tortoise burrows, and may use natural cavities in rocks. In addition to the nest burrow, these owls may also use several satellite burrows. Satellite burrows may serve as protection from predators and parasites (Dechant et al. 1999).

Widespread declines in the range and abundance of Burrowing Owls have been attributed to habitat loss and fragmentation, and to control and extermination of colonial burrowing mammals (Dechant et al. 1999; Hjertaas et al. 1995).

Burrowing Owls occur over much of Nevada, but their density is generally very low (Floyd et al. 2007). There is probably suitable habitat for the Burrowing Owl along portions of the project right-of-way, but the probability that they will occur on the project is considered low. The probability of their presence on the project would be linked to the abundance of suitable burrow habitat.

Prairie Falcon

The Prairie Falcon is a BLM sensitive species in Nevada because of a perceived downward trend in the species distribution and population numbers, and because the species typically consists of small and widely dispersed populations. The Prairie Falcon is on the "watch" list of the NNHP.

Prairie Falcons inhabit dry environments of North America from southern Canada into central Mexico and from the Great Plains west to the Pacific Coast. They are often found in open plains and shrub-steppe deserts that are punctuated by cliffs or bluffs (Steenhof 1998). Prairie Falcons forage widely, seeking areas of patchily distributed prey which includes several species of ground squirrels (*Spermophilus* sp.) during the summer months. When ground squirrels go underground to escape summer heat and drought, Prairie Falcons shift their foraging attention to other species, primarily birds such as Horned Larks and Meadowlarks (*Sturnella* sp.).

In the project area it is likely that individual pairs of Prairie Falcons are very widely dispersed. No Prairie Falcons were observed during biological site reconnaissance in April 2008. If they occur in the project area, it is most likely that nesting Prairie Falcons would be found in the McCullough Mountain Range or the Lucy Gray Mountains.

Phainopepla

The Phainopepla (*Phainopepla nitens*) is not federally listed as threatened or endangered. The Nevada office of the BLM considers it a sensitive species, and it is also protected by the State of Nevada under NRS 501 (NNHP 2004).

The Phainopepla is a member of the silky-flycatcher family, Ptilogonatidae, a primarily tropical family of birds. The Phainopepla is a readily identified resident of the southwest deserts. It possesses a sharp crest and eyes that have a red iris. The males are uniformly glossy black with a distinct white wing patch in flight. The Phainopepla primarily feeds on a variety of berries, but will supplement its diet with insects (Ehrlich et al. 1988; Terres 1980). In desertscrub habitats desert mistletoe berries are an important food source. In other areas they feed on juniper, elderberry, grape, buckthorn, Russian olive, and other berries (Martin et al. 1951). The first nest of the year is produced in low desertscrub or mesquite habitat. As the warmer weather approaches, the Phainopepla moves to higher elevations into piñon-juniper or oak forest where it will nest a second time. In Nevada, the Phainopepla is strongly associated with concentrations of western honey mesquite (*Prosopis glandulosa* var. *torreyana*) and catclaw acacia (*Acacia greggii*) that support desert mistletoe (Floyd et al. 2007).

The creosote bush-white bursage habitat on much of the project is mostly unfavorable to the presence of Phainopeplas. However, there is a moderate probability that the Phainopepla will occur within the project limits in areas with suitable habitat, such as desert washes where mistletoe often is present in catclaw acacias. Two Phainopeplas were observed on the project on October 27, 2008. A female was observed perched on vegetation in a small wash low on the east side of the north McCullough Pass, and a male was observed along the Eldorado-Lugo optic fiber alternative.

Loggerhead Shrike

The Loggerhead Shrike is not federally listed as threatened or endangered. The Nevada office of the BLM considers it a sensitive species.

The Loggerhead Shrike is found in a variety of habitats from low desert to middle elevations, including open country, thinly wooded or shrubby areas with clearings, meadows, pastures, old orchards, and thickets along roadsides (Terres 1980). The presence of medium to high perches used for hunting are an important habitat element for these birds. They prey primarily on invertebrates, but commonly take small birds, lizards, amphibians, and mice (Ehrlich et al.

1988). The birds commonly impale their prey on sharp twigs, spines of plants, or barbed wire for later consumption. The birds are evidently proficient at relocating cached prey.

Suitable habitat for the species in the project area occurs above areas dominated by creosote, where yuccas and other higher vegetation begin to appear in the plant community. Shrikes are less likely to be present near the Eldorado Substation and the area around the periphery of Roach Lake.

Raptor Nests

There is a general lack of natural roosting habitat for raptors along most of the Nevada portion of the project. There is some potential nesting habitat in the McCullough Mountains where there are rocky cliffs present. Electrical transmission line lattice towers probably provide most of the potential raptor nesting habitat in the area. Stick nests in lattice towers are typically re-occupied or modified and re-used intermittently by raptors and corvids returning to an area annually. The nests are generally persistent in the towers for years. An apparent lack of stick nests in lattice structures along the existing transmission line may reflect depressed raptor nesting activity in the area. Two Red-tailed Hawks (*Buteo jamaicensis*) were observed on October 28, 2008 along the Eldorado-Lugo 500kV transmission line between the section of the line south of State Highway 164 and the UPRR tracks. Both birds were using lattice towers as perches. There was no evidence of any stick nests in any of the lattice towers along the entire length of the Eldorado-Lugo route between the Eldorado Substation and the UPRR tracks, a distance of about 30 miles. A pre-construction survey for raptor/corvid nests in the existing lattice towers should be performed prior to initiation of construction.

Migratory Bird Treaty Act

A general discussion of the MBTA was given earlier in this document under the section for the California segment of the project.

The somewhat higher elevation and greater species diversity in the plant community where the project right-of-way passes through the McCullough Mountains, and along the Eldorado-Lugo optic fiber communications option, may support a greater diversity of transient, summer visitor, and permanent resident birds than other, lower portions of the project in Nevada.

Pre-construction surveys for nesting birds should be conducted to preclude violation of the MBTA. Active nests may be avoided until the young have fledged or eggs and/or young may be moved by a licensed rehabilitation contractor. Clearing of vegetation and other ground disturbing activities that may affect nesting birds outside of the nesting season will minimize the potential for impacts to birds and violation of the MBTA.

Mojave Population Desert Tortoise

The Mojave population of the Desert Tortoise is federally listed as a Threatened species (Federal Register 1990), and a recovery plan has been prepared (USFWS 1994). A draft revised recovery plan was released in 2008 by the USFWS (USFWS 2008). The revision redraws most of the Recovery Unit boundaries, but the draft includes no proposed changes to the limits of designated Critical Habitat for the species. The species is also provided protection by the State of Nevada under NRS 501 (NNHP 2004).

The Mojave population of the Desert Tortoise is found primarily in Mojave desertscrub, but it also occurs in the Lower Colorado River Subdivision of Sonoran desertscrub in southern Nevada. They are generally associated with communities dominated by creosote bush (*Larrea tridentata*), with other sclerophyllous shrubs and small cacti present (AZGFD 2001). Some parts of their habitat may contain abundant Joshua trees (*Yucca brevifolia*). The Mojave Desert Tortoise prefers sandy loam or rocky soils in valleys, bajadas, and hills (AZGFD 2001). They may be found at elevations below sea level in Death Valley, California, and up to about 1,500 meters (4,922 feet) at Yucca Mountain, Nevada (AZGFD 2001). Desert Tortoises are facing numerous threats to their survival. Livestock grazing, recreational OHV use, military training activities, urban development, and increases in predation are some of the factors that affect tortoise survival (Lovich 2003). Additional threats are takes of tortoises for commercial sale as pets, from vandalism (shooting, crushing, or mutilation), and for food (USFWS 1994).

The entire project area is within the range of the species, and most of the area provides some suitable habitat for tortoises. There is federally designated Critical Habitat for the Desert Tortoise southwest of the Eldorado Substation in the Eldorado Valley. The transmission line route passes through approximately 6 miles of Critical Habitat within the Piute-Eldorado Recovery Unit for the species (USFWS 1994; 2008).

Almost the entire 30-mile length of the portion of the Eldorado-Lugo 500kV Line that will support the optic fiber line (Eldorado Substation to Highway 164) is within suitable habitat for the Desert Tortoise. Only the higher elevations in black bush habitat are probably not favorable for tortoises. Approximately 2 miles south of the Eldorado Substation the Eldorado-Lugo line enters the Piute-Eldorado, Nevada unit of designated Critical Habitat for the Mojave population Desert Tortoise. The line is within this unit continuously for approximately 9 miles to the south. The southern portion of the section of the Eldorado-Lugo line in California southwest to the UPRR tracks (Highway 164 to the UPRR tracks) is within the Ivanpah unit of designated Critical Habitat for the species. This southern portion is also within the Mojave National Preserve.

Except for a small private in-holding at Ivanpah Road, the segment of the Nipton 33kV distribution line south of State Highway 164, and west of Nipton (I-15 to Nipton), is within both the Mojave National Preserve and the Ivanpah unit of designated Critical Habitat for the Mojave population Desert Tortoise. Approximately 2 miles of this segment is on the Ivanpah Lake playa, and is not considered suitable Desert Tortoise habitat. The western portion of this segment, where it climbs the bajada, is the best tortoise habitat along this segment of the Nipton line.

A project protocol level survey for the desert tortoise was performed by Karl and Associates in May of 2008 for the main portions of the transmission line route. The project alternative routes will probably be surveyed in the spring of 2009, after the alternative corridors are more precisely defined. The tortoise survey results will be presented as a stand-alone report.

Common Chuckwalla

The Common Chuckwalla is a former Category 2 Candidate for federal listing, but currently has no federal status. Because it inhabits ecological refugia or specialized or unique habitats, the BLM considers the Common Chuckwalla to be a sensitive species. The species is currently a "watch list" taxon with the State of NNHP.

Common Chuckwallas occupy rocky habitats of hillsides, canyons and flats, or large rocky outcrops where they seek shelter in crevices. The Chuckwalla is widely distributed in suitable habitats in the Sonoran and Mojave Deserts in Nevada, Utah, California, and Arizona; and the Mexican states of Sonoran and Baja California. Creosote bush is found throughout most of the range and the species is known to eat the flowers of creosote bush as well as those of indigo bush (*Psorothamnus* sp.), desert mallow (*Sphaeralcea ambigua*), and others (Stebbins 1954). Sherburn (1972), studying food habits of this species on the Nevada Test Site, found that *Sphaeralcea ambigua, Krameria parvifolia,* and *Stephanomeria pauciflora* were the dominant plants in Chuckwalla diets on a volume basis.

In the project area, suitable Chuckwalla habitat was found in the McCullough Mountains and in the mountains associated with most of the proposed telecommunications sites. Chuckwalla sign (scat) was found in the McCullough Mountains although no individual animals were observed.

Gila Monster

The Gila Monster is not federally listed as threatened or endangered. It was formerly listed as a Category 2 Candidate species, but that classification was dropped in 1996, and it is now a federal species of concern. The Nevada office of the BLM considers it a sensitive species, and it is also protected by the State of Nevada under NRS 501 (NNHP 2004).

The Gila Monster is one of two species in the family Helodermatidae, venomous lizards. The full range of the species includes extreme southwestern Utah west to southern California, through Arizona, to northern Sinaloa, Mexico (Beck 2005; Stebbins 2003). The two recognized subspecies of the Gila Monster are the Reticulated Gila Monster (*H. s. suspectum*) and the Banded Gila Monster (*H. s. cinctum*). The latter subspecies occurs in Nevada in Clark, Lincoln, and Nye counties (NNHP 2004).

Gila Monsters are largely species of the Sonoran Desert, and seem to prefer undulating rocky foothills, bajadas, and canyons, and tend to avoid open sandy plains. The Gila Monster is most common from sea level to approximately 4,100 feet (Beck 2005). It is the largest lizard in the

United States, measuring from 9 to 14 inches, snout to vent length, with the tail an additional one-third to one-half of the body length (Stebbins 2003, 1954). Gila Monsters are primarily diurnal, but because of their ability to eat large amounts of food, they do not need to forage often. It has been estimated that they may spend up to 98 percent of their time in their burrows (Ivanyi et al. 2000).

Suitable habitat for the Gila Monster, along dry washes, and in the upper rocky canyon habitat in the McCullough Mountains, is present within the project corridor and this species could be present in the project area.

White Bearpoppy

The white bearpoppy is a BLM sensitive species and the Nevada Native Plant Society has it on their watch list of potentially threatened species.

The white bearpoppy occurs on calcareous soils derived from limestone or gypsum, or on rock outcrops between 2,000 and 6,280 feet elevation. Substrates are generally dry, but the species may occur on damp soils. The bulk of the known range of the white bearpoppy is north and west of Las Vegas, with a disjunct record of the species north of Goodsprings, Nevada in the Bird Spring Range, approximately 20 miles north of the project (NNHP 2001a).

Suitable habitat for the white bearpoppy is present in the project area, but the species is considered unlikely to occur here since the known distribution of the species is some distance from the area. The species was not encountered during plant surveys conducted for the project in April and May of 2008.

Rosy Two-tone Beardtongue

The rosy two-tone beardtongue is a BLM sensitive species and it is considered an at-risk taxon by the NNHP.

The rosy two-tone beardtongue is found in rocky soils of calcareous, granitic, or igneous origin, in drainages, along roads, on scree at the bases of rock outcrops, and other places receiving enhanced runoff. The species is a disturbed ground colonizer, and may be important in soil stabilization. The plants are found in creosote bush-bursage, black bush, and mixed shrub associations, at elevations from 1,800 to 5,480 feet (Hickman 1993; NNHP 2001b; Smith 2005).

The rosy two-tone beardtongue is present on the project and was observed at several locations in the McCullough Mountains area during the April to May 2008 project plant survey. A single dormant penstemon, which may represent this species, was observed on the Eldorado-Lugo optic fiber alternative on October 27, 2008.

White-margined Beardtongue

The white-margined beardtongue is a former Category 2 Candidate for federal listing, is currently a federal species of concern, and is designated a sensitive species by the BLM in Nevada. It is also listed as an "at-risk" taxon by the NNHP.

White-margined beardtongue is known from the Mojave Desert of southern Nevada, southeastern California, and northwestern Arizona. The distribution is quite distinctive with plants occurring in four discrete areas, one each in Nye and Clark counties, Nevada, in Mojave County, Arizona near Yucca, and along I-40 near the Pisgah Railroad siding in San Bernardino County (Smith 2001).

White-margined beardtongue is a perennial forb that grows to 15 to 35 centimeters in height, has pale green, opposite leaves, and pink to lavender flowers with darker purple markings. The species is easy to identify in the field owing to the distinctive white margins on the leaves (Smith 2001). White-margined beardtongue was found on the Nevada segment of the project during rare plant surveys in April and May 2008 (see Appendix C).

Cactus and Yucca

The BLM normally requires transplanting or salvage of certain native plant species that would be lost to development on lands under their jurisdiction. Species typically involved in these efforts include all cacti except chollas (*Cylindropuntia* spp.), which are left on the site to regenerate from stem segments, *Yucca* spp., and ocotillo (*Fouquieria splendens*).

Rare, Invasive, and Noxious Plant Surveys

Rare, invasive, and noxious plant surveys for this project were conducted in April and May 2008, and in April of 2009 by Mr. Glenn Clifton, GLC Consulting, Kingman, Arizona. Results and discussion of these surveys is found in Appendix C of this document. A compiled list of plant species observed on the project during all reconnaissance and focused surveys is located in Appendix B.

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APPENDIX A

SITE PHOTOGRAPHS

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Photograph 1. Creosote bush-white bursage series. Looking west in the Eldorado Valley.

Photograph 2. Looking northeast in the Eldorado Valley across a vast expanse of creosote bush.

Photograph 3. Looking south in the Eldorado Valley.

Photograph 4. Looking west in the Eldorado Valley.

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Photograph 5. Looking east from the right-of-way in the McCullough Mountains.

Photograph 6. Looking west from the right-of-way in the McCullough Mountains.

Photograph 7. The dry bed of Ivanpah Lake.

Photograph 8. Looking west towards the Mountain Pass Substation – black bush and juniper habitat.

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Photograph 9. Looking northeast across the creosote bush; vegetation traversed by Alternatives A and B.

Photograph 10. Looking west across the rugged terrain traversed by Alternatives C and D.

Photograph 11. Cleared, disturbed lands at Alternative E.

Photograph 12. Looking north along the right-of-way for the Nipton 33kV transmission line.

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Photograph 13. Looking south along the Nipton 33kV right-of-way.

Photograph 14. Creosote bush scrub and Mojave yucca at the site of the Ivanpah Substation.

Photograph 15. The existing Mountain Pass Substation. Black bush is dominant here with scattered piñon and juniper.

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APPENDIX B

PLANT SPECIES INVENTORY

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PLANT SPECIES OBSERVED ON THE CALIFORNIA SEGMENT OF THE IVANPAH TO ELDORADO PROJECT

Scientific Name	Common Name
PTERIDACEAE	
Cheilanthes covillei	Coville's lipfern
Pentagramma triangularis ssp. *triangularis*	Gold-back fern
CUPRESSACEAE	
Juniperus osteosperma	Utah juniper
EPHEDRACEAE	
Ephedra nevadensis	Nevada jointfir
Ephedra viridis	Mormon tea
PINACEAE	
Pinus monophylla	Singleleaf piñon
AIZOACEAE	
Sesuvium verrucosum	Verrucose seapurslane
Trianthema portulacastrum	Desert horsepurslane
AMARANTHACEAE	
Amaranthus fimbriatus	Fringed amaranth
Tidestromia oblongifolia	Arizona honeysweet
ANACARDIACEAE	
Rhus aromatica var. *trilobata*	Skunkbush sumac
APIACEAE	
Lomatium nevadense var. *parishii*	Parish's biscuitroot
APOCYNACEAE	
Amsonia tomentosa	Woolly bluestar
ASCLEPIADACEAE	
Asclepias erosa	Desert milkweed
Asclepias nyctaginifolia	Mojave milkweed
Cynanchum utahense	Utah swallow-wort
ASTERACEAE	
Acamptopappus shockleyi	Shockley's goldenhead
Adenophyllum cooperi	Cooper's dogweed
Ambrosia acanthicarpa	Flatspine bur ragweed
Ambrosia dumosa	White bursage (burrobush)
Ambrosia eriocentra	Woolly fruit bur ragweed
Antheropeas wallacei	Woolly easterbonnets
Artemisia ludoviciana var. *albula*	White sagebrush
Baccharis brachyphylla	Shortleaf baccharis
Baccharis sergiloides	Desert baccharis
Baileya multiradiata	Desert marigold
Baileya pleniradiata	Woolly desert marigold
Brickellia californica	California brickellbush
Brickellia incana	Woolly brickellbush
Brickellia oblongifolia var. *linifolia*	Narrowleaf brickellbush
Chaenactis carphoclinia	Pebble pincushion
Chaenactis fremontii	Pincushion flower
Chaenactis macrantha	Bighead dustymaiden
Chaenactis stevioides	Esteve's pincushion
Chaetopappa ericoides	Rose heath
Chrysothamnus depressus	Longflower rabbitbrush

Scientific Name	Common Name
Chrysothamnus paniculatus	Mojave rabbitbrush
Cirsium neomexicanum	New Mexico thistle
Encelia virginensis	Virgin River brittlebush
Ericameria cooperi	Cooper's goldenbush
Ericameria laricifolia	Turpentine bush
Ericameria linearifolia	Narrowleaf goldenbush
Eriophyllum pringlei	Pringle's woolly sunflower
Eriophyllum wallacei	Woolly easterbonnets
Gutierrezia microcephala	Threadleaf snakeweed
Gutierrezia sarothrae	Broom snakeweed
Heliomeris multiflora var. *nevadensis*	Nevada goldeneye
Hymenoclea salsola	Burrobrush
Layia glandulosa	Whitedaisy tidytips
Machaeranthera arida	Arid tansyaster
Malacothrix glabrata	Smooth desert dandelion
Monoptilon bellidiforme	Daisy desertstar
Monoptilon bellioides	Mojave desertstar
Pectis papposa	Manybristle chinchweed
Porophyllum gracile	Slender poreleaf
Prenanthella exigua	Brightwhite
Psilostrophe cooperi	Whitestem paperflower
Rafinesquia californica	California plumeseed
Rafinesquia neomexicana	New Mexico plumeseed
Senecio multilobatus	Lobeleaf groundsel
Stephanomeria parryi	Parry's wirelettuce
Stephanomeria pauciflora	Brownplume wirelettuce
Stylocline micropoides	Woollyhead neststraw
Tetradymia stenolepis	Mojave cottonthorn
Thymophylla pentachaeta var. *belenidium*	Fiveneedle pricklyleaf
Uropappus lindleyi	Lindley's silverpuffs
Xylorhiza tortifolia	Mojave woodyaster
BIGNONIACEAE	
Chilopsis linearis	Desert willow
BORAGINACEAE	
Amsinckia tessellata	Bristly fiddleneck
Cryptantha angustifolia	Panamint cryptantha
Cryptantha barbigera	Bearded cryptantha
Cryptantha circumscissa	Cushion cryptantha
Cryptantha pterocarya var. *cycloptera*	Wingnut cryptantha
Cryptantha dumetorum	Bushloving cryptantha
Cryptantha gracilis	Narrowstem cryptantha
Cryptantha micrantha	Redroot cryptantha
Cryptantha nevadensis	Nevada cryptantha
Cryptantha pterocarya	Wingnut cryptantha
Pectocarya heterocarpa	Chuckwalla combseed
Pectocarya platycarpa	Broadfruit combseed
Pectocarya recurvata	Curvenut combseed
Pectocarya setosa	Moth combseed
Plagiobothrys arizonicus	Arizona popcornflower
Plagiobothrys jonesii	Mojave popcornflower
Tiquilia plicata	Fanleaf crinklemat

Scientific Name	Common Name
BRASSICACEAE	
Arabis perennans	Perennial rockcress
Arabis pulchra var. *gracilis*	Beautiful rockcress
Brassica tournefortii	Asian mustard
Caulanthus cooperi	Cooper's wild cabbage
Caulanthus crassicaulis	Thickstem wild cabbage
Descurainia pinnata var. *glabra*	Western tansymustard
Descurainia sophia	Herb sophia
Dithyrea californica	California shieldpod
Draba cuneifolia var. *integrifolia*	Wedgeleaf draba
Guillenia lasiophylla	California mustard
Hirschfeldia incana	Shortpod mustard
Lepidium lasiocarpum	Shaggyfruit pepperweed
Lepidium sp.	Pepperweed
Malcolmia africana	African mustard
Sisymbrium altissimum	Tall tumblemustard
Sisymbrium irio	London rocket
Sisymbrium orientale	Indian hedgemustard
Stanleya pinnata	Desert princesplume
Streptanthella longirostris	Longbeak streptanthella
Thysanocarpus curvipes	Sand fringepod
CACTACEAE	
Coryphantha sp.	Beehive cactus
Cylindropuntia acanthocarpa var. *coloradensis*	Colorado buckhorn cholla
Cylindropuntia echinocarpa	Wiggins' cholla
Cylindropuntia ramosissima	Branched pencil cholla
Echinocactus polycephalus	Cottontop cactus
Echinocereus engelmannii	Engelmann's hedgehog cactus
Escobaria sp.	Beehive cactus
Ferocactus cylindraceus	California barrel cactus
Grusonia parishii	Matted cholla
Mammillaria tetrancistra	Common fishhook cactus
Opuntia basilaris	Beavertail pricklypear
Opuntia chlorotica	Dollarjoint pricklypear
Opuntia phaeacantha	Tulip pricklypear
Opuntia polyacantha var. *erinacea*	Grizzlybear pricklypear
CAMPANULACEAE	
Nemacladus glanduliferus var. *orientalis*	Glandular threadplant
CARYOPHYLLACEAE	
Arenaria macradenia	Mojave sandwort
Silene antirrhina	Sleepy silene
CHENOPODIACEAE	
Atriplex canescens	Fourwing saltbush
Atriplex confertifolia	Shadscale saltbush
Atriplex elegans var. *fasciculata*	Wheelscale saltbush
Atriplex polycarpa	Cattle saltbush
Chenopodium incanum var. *occidentale*	Mealy goosefoot
Krascheninnikovia lanata	Winterfat
Monolepis nuttalliana	Nuttall's povertyweed
Salsola tragus	Prickly Russian thistle
Suaeda nigra	Mojave seablite

Scientific Name	Common Name
CUCURBITACEAE	
Cucurbita palmata	Coyote gourd
CUPRESSACEAE	
Juniperus osteosperma	Utah juniper
EPHEDRACEAE	
Ephedra nevadensis	Nevada jointfir
Ephedra viridis	Mormon tea
EUPHORBIACEAE	
Chamaesyce albomarginata	Whitemargin sandmat
Chamaesyce revoluta	Threadstem sandmat
FABACEAE	
Astragalus bernardinus	San Bernardino milkvetch
Astragalus didymocarpus var. *dispermus*	Dwarf white milkvetch
Astragalus lentiginosus var. *borreganus*	Borrego milkvetch
Astragalus lentiginosus var. *fremontii*	Fremont's milkvetch
Astragalus minthorniae var. *villosus*	Minthorn's milkvetch
Astragalus nuttallianus var. *imperfectus*	Turkeypeas
Dalea mollissima	Soft prairie clover
Lotus rigidus	Shrubby deervetch
Lotus salsuginosus var. *brevivexillus*	Coastal bird's-foot trefoil
Lotus strigosus var. *tomentellus*	Strigose bird's-foot trefoil
Lupinus brevicaulis	Shortstem lupine
Lupinus concinnus var. *orcuttii*	Orcutt's lupine
Lupinus flavoculatus	Yelloweyes
Lupinus shockleyi	Purple desert lupine
GERANIACEAE	
Erodium cicutarium	Redstem stork's bill
HELLEBORACEAE	
Delphinium parishii	Desert larkspur
HYDROPHYLLACEAE	
Eucrypta micrantha	Dainty desert hideseed
Nama demissum	Purplemat
Phacelia crenulata var. *ambigua*	Purplestem phacelia
Phacelia anelsonii	Aven Nelson's phacelia
Phacelia coerulea	Skyblue phacelia
Phacelia cryptantha	Hiddenflower phacelia
Phacelia distans	Distant phacelia
Phacelia fremontii	Fremont's phacelia
KRAMERIACEAE	
Krameria grayi	White ratany
LAMIACEAE	
Salazaria mexicana	Mexican bladdersage
Salvia columbariae	Chia
Salvia dorrii	Purple sage
Salvia mohavensis	Mojave sage
LOASACEAE	
Mentzelia albicaulis	Whitestem blazingstar
MALVACEAE	
Eremalche rotundifolia	Desert fivespot
Sphaeralcea ambigua	Desert globemallow
Sphaeralcea emoryi	Emory's globemallow

Scientific Name	Common Name
MIMOSACEAE	
Acacia greggii	Catclaw acacia
MENODORACEAE	
Menodora scabra	Rough menodora
Menodora spinescens	Spiny menodora
NYCTAGINACEAE	
Allionia incarnata var. *villosa*	Trailing windmills
Boerhavia wrightii	Largebract spiderling
Mirabilis laevis var. *villosa*	Wishbone-bush
Mirabilis multiflora	Colorado four o'clock
OLEACEAE	
Forestiera pubescens	Stretchberry
ONAGRACEAE	
Camissonia boothii var. *condensata*	Shredding suncup
Camissonia brevipes	Yellow cups
Camissonia campestris	Mojave suncup
Camissonia chamaenerioides	Longcapsule suncup
Camissonia claviformis var. *aurantiaca*	Browneyes
Camissonia refracta	Narrowleaf suncup
Oenothera caespitosa ssp. *crinita*	Tufted evening primrose
Oenothera primiveris ssp. *bufonis*	Desert evening primrose
Oenothera primiveris ssp. *primiveris*	Desert evening primrose
OROBANCHACEAE	
Orobanche cooperi	Desert broomrape
PAPAVERACEAE	
Argemone corymbosa	Mojave pricklypoppy
Eschscholzia glyptosperma	Desert poppy
Eschscholzia minutiflora	Pygmy poppy
PLANTAGINACEAE	
Plantago ovata	Desert Indianwheat
POLEMONIACEAE	
Aliciella hutchinsifolia	Desert pale gilia
Eriastrum diffusum	Miniature woollystar
Gilia cana ssp. *speciformis*	Showy gilia
Gilia clokeyi	Clokey's gilia
Gilia ophthalmoides	Eyed gilia
Gilia scopulorum	Rock gilia
Gilia sinuata	Rosy gilia
Gilia stellata	Star gilia
Gilia transmontana	Transmontane gilia
Ipomopsis polycladon	Manybranched ipomopsis
Langloisia punctata	Great Basin langloisia
Langloisia setosissima ssp. *punctata*	Great Basin langloisia
Langloisia setosissima ssp. *setosissima*	Moth langloisia
Linanthus aureus	Golden linanthus
Linanthus bigelovii (probable, but don't have the seeds of that taxon)	Bigelow's linanthus
Linanthus demissus	Desertsnow
Linanthus filiformis	Yellow gilia
Linanthus jonesii	Jones' linanthus
Loeseliastrum matthewsii	Desert calico
Loeseliastrum schottii	Schott's calico

Scientific Name	Common Name
POLYGONACEAE	
Chorizanthe brevicornu	Brittle spineflower
Chorizanthe rigida	Devil's spineflower
Eriogonum brachypodum	Parry's buckwheat
Eriogonum deflexum	Flatcrown buckwheat
Eriogonum fasciculatum var. *polifolium*	Eastern Mojave buckwheat
Eriogonum heermannii var. *floccosum*	Clark Mountain buckwheat
Eriogonum inflatum	Desert trumpet
Eriogonum maculatum	Spotted buckwheat
Eriogonum microthecum var. ?	Slender buckwheat
Eriogonum nidularium	Birdnest buckwheat
Eriogonum palmerianum	Palmer's buckwheat
Eriogonum pusillum	Yellowturbans
Eriogonum thomasii	Thomas' buckwheat
Eriogonum trichopes	Little deserttrumpet
Eriogonum umbellatum var. not in flower	Sulphur-flower buckwheat
Eriogonum wrightii	Bastardsage
Rumex hymenosepalus	Canaigre dock
PORTULACACEAE	
Claytonia parviflora complex	Streambank springbeauty
RESEDACEAE	
Oligomeris linifolia	Lineleaf whitepuff
ROSACEAE	
Coleogyne ramosissima	Black bush
Fallugia paradoxa	Apache plume
Prunus fasciculata	Desert almond
Purshia glandulosa	Desert bitterbrush
Purshia stansburiana	Stansbury cliffrose
Purshia tridentata	Antelope bitterbrush
RUBIACEAE	
Galium sp. several that were not flowering yet	Bedstraw
RUTACEAE	
Thamnosma montana	Turpentinebroom
SALICACEAE	
Salix gooddingii	Goodding's willow
SCROPHULARIACEAE	
Castilleja applegatei ssp. *martinii*	Wavyleaf Indian paintbrush
Castilleja angustifolia	Northwestern Indian paintbrush
Mimulus bigelovii	Bigelow's monkeyflower
Mimulus guttatus	Seep monkeyflower
Neogaerrhinum filipes	Yellow twining snapdragon
Penstemon palmeri	Palmer's penstemon
SOLANACEAE	
Datura wrightii	Sacred thorn-apple
Lycium andersonii	Water jacket
Lycium cooperi	Peach thorn
Nicotiana obtusifolia	Desert tobacco
Physalis crassifolia	Yellow nightshade groundcherry
Physalis hederifolia var. *fendleri*	Fendler's groundcherry
VERBENACEAE	
Verbena gooddingii	Southwestern mock vervain

Scientific Name	Common Name
TAMARICACEAE	
Tamarix aphylla	Athel tamarisk
Tamarix parviflora	Smallflower tamarisk
Tamarix ramosissima	Saltcedar
VISCACEAE	
Phoradendron californicum	Mesquite mistletoe
ZYGOPHYLLACEAE	
Kallstroemia californica	California caltrop
Kallstroemia parviflora	Warty caltrop
Larrea tridentata	Creosote bush
AGAVACEAE	
Yucca baccata	Banana yucca
Yucca brevifolia	Joshua tree
Yucca schidigera	Mojave yucca
CYPERACEAE	
Eleocharis parishii	Parish's spikerush
LILIACEAE	
Calochortus kennedyi	Desert mariposa lily
POACEAE	
Achnatherum hymenoides	Indian ricegrass
Achnatherum speciosum	Desert needlegrass
Aristida adscensionis	Sixweeks threeawn
Aristida purpurea var. *longiseta*	Fendler threeawn
Aristida purpurea complex	Purple threeawn
Avena fatua	Wild oat
Bouteloua barbata	Sixweeks grama
Bouteloua curtipendula	Sideoats grama
Bouteloua eriopoda	Black grama
Bromus rigidus	Ripgut brome
Bromus rubens	Red brome
Bromus tectorum	Cheatgrass
Bromus trinii	Chilean chess
Dasyochloa pulchella	Low woollygrass
Elymus elymoides var. *brevifolius*	Squirreltail
Enneapogon desvauxii	Nineawn pappusgrass
Eragrostis cilianensis	Stinkgrass
Hordeum murinum	Mouse barley
Koeleria nitida	Prairie Junegrass
Muhlenbergia porteri	Bush muhly
Pleuraphis jamesii	James' galleta
Pleuraphis rigida	Big galleta
Poa fendleriana	Muttongrass
Polypogon sp.	Rabbitsfoot grass
Schismus barbatus	Common Mediterranean grass
Sporobolus contractus	Spike dropseed
Sporobolus cryptandrus	Sand dropseed
Vulpia octoflora var. *hirtella*	Sixweeks fescue
Vulpia octoflora var. *octoflora*	Sixweeks fescue
THEMIDACEAE	
Androstephium breviflorum	Pink funnel lily
Dichelostemma capitatum	Bluedicks

PLANT SPECIES OBSERVED ON THE NEVADA SEGMENT OF THE IVANPAH TO ELDORADO PROJECT

Scientific Name	Common Name
AIZOACEAE	
Trianthema portulacastrum	Desert horsepurslane
AMARANTHACEAE	
Amaranthus crassipes	Spreading amaranth
Amaranthus fimbriatus	Fringed amaranth
Tidestromia oblongifolia	Arizona honeysweet
ANACARDIACEAE	
Rhus aromatica var. *trilobata*	Skunkbush sumac
APOCYNACEAE	
Amsonia tomentosa	Woolly bluestar
ASCLEPIADACEAE	
Asclepias nyctaginifolia	Mojave milkweed
ASTERACEAE	
Acamptopappus shockleyi	Shockley's goldenhead
Acamptopappus sphaerocephalus	Rayless goldenhead
Adenophyllum cooperi	Cooper's dogweed
Ambrosia dumosa	White bursage (burrobush)
Ambrosia eriocentra	Woolly fruit bur ragweed
Anisocoma acaulis	Scalebud
Antheropeas wallacei	Woolly easterbonnets
Baccharis brachyphylla	Shortleaf baccharis
Baileya multiradiata	Desert marigold
Baileya pleniradiata	Woolly desert marigold
Bebbia juncea var. *aspera*	Sweetbush
Brickellia arguta	Pungent brickellbush
Brickellia desertorum	Desert brickellbush
Brickellia incana	Woolly brickellbush
Brickellia oblongifolia var. *linifolia*	Narrowleaf brickellbush
Calycoseris parryi	Yellow tackstem
Calycoseris wrightii	White tackstem
Chaenactis carphoclinia	Pebble pincushion
Chaenactis fremontii	Pincushion flower
Chaenactis macrantha	Bighead dustymaiden
Chaenactis stevioides	Esteve's pincushion
Chaetopappa ericoides	Rose heath
Chrysothamnus paniculatus	Mojave rabbitbrush
Encelia farinosa	Brittlebush
Encelia virginensis	Virgin River brittlebush
Enceliopsis nudicaulis	Nakedstem sunray
Ericameria laricifolia	Turpentine bush
Ericameria linearifolia	Narrowleaf goldenbush
Eriophyllum pringlei	Pringle's woolly sunflower
Eriophyllum wallacei	Woolly easterbonnets
Glyptopleura marginata	Carveseed
Gutierrezia microcephala	Threadleaf snakeweed
Hymenoclea salsola	Burrobrush
Logfia depressa	Dwarf cottonrose

Scientific Name	Common Name
Machaeranthera arida	Arid tansyaster
Malacothrix glabrata	Smooth desertdandelion
Malacothrix sonchoides	Sowthistle desertdandelion
Monoptilon bellidiforme	Daisy desertstar
Monoptilon bellioides	Mojave desertstar
Palafoxia arida	Desert palafox
Porophyllum gracile	Slender poreleaf
Prenanthella exigua	Brightwhite
Rafinesquia neomexicana	New Mexico plumeseed
Stephanomeria exigua	Small wirelettuce
Stephanomeria pauciflora	Brownplume wirelettuce
Stylocline intertexta	Morefield's neststraw
Stylocline micropoides	Woollyhead neststraw
Thymophylla pentachaeta var. *belenidium*	Fiveneedle pricklyleaf
Uropappus lindleyi	Lindley's silverpuffs
Viguiera parishii	Parish's goldeneye
Xylorhiza tortifolia	Mojave woodyaster
BIGNONIACEAE	
Chilopsis linearis	Desert willow
BORAGINACEAE	
Amsinckia tessellata	Bristly fiddleneck
Cryptantha angustifolia	Panamint cryptantha
Cryptantha barbigera	Bearded cryptantha
Cryptantha circumscissa	Cushion cryptantha
Cryptantha pterocarya var. *cycloptera*	Wingnut cryptantha
Cryptantha pterocarya var. *stenoloba*	Wingnut cryptantha
Cryptantha dumetorum	Bushloving cryptantha
Cryptantha maritima	Guadalupe cryptantha
Cryptantha micrantha	Redroot cryptantha
Cryptantha nevadensis	Nevada cryptantha
Cryptantha utahensis	Scented cryptantha
Cryptantha virginensis	Virgin River cryptantha
Pectocarya heterocarpa	Chuckwalla combseed
Pectocarya platycarpa	Broadfruit combseed
Pectocarya recurvata	Curvenut combseed
Pectocarya setosa	Moth combseed
Plagiobothrys arizonicus	Arizona popcornflower
Plagiobothrys jonesii	Mojave popcornflower
Tiquilia canescens	Woody crinklemat
Tiquilia plicata	Fanleaf crinklemat
BRASSICACEAE	
Arabis pulchra	Beautiful rockcress
Caulanthus cooperi	Cooper's wild cabbage
Descurainia pinnata var. *glabra*	Western tansymustard
Descurainia sophia	Herb sophia
Dithyrea californica	California shieldpod
Draba cuneifolia var. *integrifolia*	Wedgeleaf draba
Guillenia lasiophylla	California mustard
Lepidium fremontii	Desert pepperweed
Lepidium lasiocarpum	Shaggyfruit pepperweed
Lepidium virginicum var. *pubescens*	Hairy pepperweed

Scientific Name	Common Name
Malcolmia africana	African mustard
Sisymbrium irio	London rocket
Streptanthella longirostris	Longbeak streptanthella
Thysanocarpus curvipes	Sand fringepod
CACTACEAE	
Cylindropuntia echinocarpa	Wiggins' cholla
Cylindropuntia ramosissima	Branched pencil cholla
Echinocactus polycephalus	Cottontop cactus
Echinocereus engelmannii	Engelmann's hedgehog cactus
Echinomastus johnsonii	Johnson's fishhook cactus
Escobaria vivipara var. *rosea*	Spinystar
Ferocactus cylindraceus	California barrel cactus
Grusonia parishii	Matted cholla
Mammillaria tetrancistra	Common fishhook cactus
Opuntia basilaris	Beavertail pricklypear
Opuntia polyacantha var. *erinacea*	Grizzlybear pricklypear
CAESALPINIACEAE	
Parkinsonia aculeata	Jerusalem thorn
Senna armata	Desertsenna
Senna armata	Desertsenna
CAMPANULACEAE	
Nemacladus glanduliferus var. *orientalis*	Glandular threadplant
CHENOPODIACEAE	
Atriplex confertifolia	Shadscale saltbush
Atriplex elegans var. *fasciculate*	Wheelscale saltbush
Atriplex hymenelytra	Desertholly
Atriplex polycarpa	Cattle saltbush
Chenopodium incanum var. *occidentale*	Mealy goosefoot
Grayia spinosa	Spiny hopsage
Krascheninnikovia lanata	Winterfat
Salsola tragus	Prickly Russian thistle
Suaeda nigra	Mojave seablite
CUCURBITACEAE	
Cucurbita palmata	Coyote gourd
CUSCUTACEAE	
Cuscuta californica var. *apiculata*	Chaparral dodder
EPHEDRACEAE	
Ephedra nevadensis	Jointfir
EUPHORBIACEAE	
Argythamnia neomexicana	New Mexico silverbush
Chamaesyce albomarginata	Whitemargin sandmat
Chamaesyce polycarpa	Smallseed sandmat
FABACEAE	
Astragalus didymocarpus var. *dispermus*	Dwarf white milkvetch
Astragalus lentiginosus var. *fremontii*	Fremont's milkvetch
Astragalus nuttallianus	Smallflowered milkvetch
Astragalus sabulonum	Gravel milkvetch
Dalea mollissima	Soft prairie clover
Lotus salsuginosus var. *brevivexillus*	Coastal bird's-foot trefoil
Lupinus concinnus var. *orcuttii*	Orcutt's lupine
Lupinus flavoculatus	Yelloweyes

Scientific Name	Common Name
Lupinus shockleyi	Purple desert lupine
Psorothamnus arborescens var. *minutifolius*	Johnson's indigobush
Psorothamnus fremontii	Fremont's dalea
Psorothamnus fremontii complex	Fremont's dalea
GERANIACEAE	
Erodium cicutarium	Redstem stork's bill
HELLEBORACEAE	
Delphinium parishii ssp. *parishii*	Parish's larkspur
HYDROPHYLLACEAE	
Eucrypta micrantha	Dainty desert hideseed
Nama demissum	Purplemat
Nama pusillum	Eggleaf fiddleleaf
Phacelia crenulata var. *ambigua*	Purplestem phacelia
Phacelia fremontii	Fremont's phacelia
Phacelia rotundifolia	Roundleaf phacelia
KRAMERIACEAE	
Krameria grayi	White ratany
LAMIACEAE	
Salazaria mexicana	Mexican bladdersage
Salvia columbariae	Chia
Salvia dorrii	Purple sage
LOASACEAE	
Mentzelia albicaulis	Whitestem blazingstar
Mentzelia obscura	Pacific blazingstar
Mentzelia tricuspis	Spinyhair blazingstar
Petalonyx thurberi	Thurber's sandpaper plant
MALVACEAE	
Sphaeralcea ambigua	Desert globemallow
Sphaeralcea angustifolia	Copper globemallow
Sphaeralcea emoryi	Emory's globemallow
Sphaeralcea parvifolia	Smallflower globemallow
MENODORACEAE	
Menodora spinescens	Spiny menodora
MIMOSACEAE	
Acacia greggii	Catclaw acacia
MOLLUGINACEAE	
Mollugo cerviana	Threadstem carpetweed
NYCTAGINACEAE	
Abronia villosa	Desert sand verbena
Allionia incarnata var. *villosa*	Trailing windmills
Boerhavia wrightii	Largebract spiderling
Mirabilis laevis var. *retrorsa*	Wishbone-bush
Mirabilis multiflora var. *pubescens*	Colorado four o'clock
ONAGRACEAE	
Camissonia boothii var. *condensata*	Shredding suncup
Camissonia brevipes	Yellow cups
Camissonia campestris	Mojave suncup
Camissonia chamaenerioides	Longcapsule suncup
Camissonia claviformis var. *aurantiaca*	Browneyes
Camissonia refracta	Narrowleaf suncup
Oenothera cavernae	Cavedwelling evening primrose

Scientific Name	Common Name
Oenothera caespitosa ssp. *marginata*	Tufted evening primrose
Oenothera deltoides ssp. *deltoides*	Birdcage evening primrose
Oenothera primiveris ssp. *bufonis*	Desert evening primrose
OROBANCHACEAE	
Orobanche cooperi	Desert broomrape
PAPAVERACEAE	
Argemone minuta ssp. *rotundata*	Flatbud pricklypoppy
Eschscholzia glyptosperma	Desert poppy
Eschscholzia minutiflora	Pygmy poppy
PLANTAGINACEAE	
Plantago ovata	Desert Indianwheat
POLEMONIACEAE	
Aliciella hutchinsifolia	Desert pale gilia
Aliciella subacaulis	Pinyon gilia
Eriastrum diffusum	Miniature woollystar
Eriastrum eremicum	Desert woollystar
Gilia cana ssp. *speciformis*	Showy gilia
Gilia hutchinsifolia	Desert pale gilia
Gilia ophthalmoides	Eyed gilia
Gilia scopulorum	Rock gilia
Gilia sinuata	Rosy gilia
Gilia stellata	Star gilia
Gilia subacaulis	Pinyon gilia
Gilia transmontana	Transmontane gilia
Ipomopsis polycladon	Manybranched ipomopsis
Langloisia setosissima ssp. *setosissima*	Moth langloisia
Linanthus aureus	Golden linanthus
Linanthus demissus	Desertsnow
Linanthus filiformis	Yellow gilia
Linanthus jonesii	Jones' linanthus
Linanthus sp. (like *bigelovii* but need seeds for I.D.)	Linanthus
Loeseliastrum matthewsii	Desert calico
Loeseliastrum schottii	Schott's calico
POLYGONACEAE	
Chorizanthe brevicornu	Brittle spineflower
Chorizanthe rigida	Devil's spineflower
Chorizanthe watsonii	Fivetooth spineflower
Eriogonum brachypodum	Parry's buckwheat
Eriogonum fasciculatum var. *polifolium*	Eastern Mojave buckwheat
Eriogonum inflatum	Desert trumpet
Eriogonum maculatum	Spotted buckwheat
Eriogonum palmerianum	Palmer's buckwheat
Eriogonum plumatella	Yucca buckwheat
Eriogonum pusillum	Yellowturbans
Eriogonum reniforme	Kidneyleaf buckwheat
Eriogonum thomasii	Thomas' buckwheat
Eriogonum trichopes	Little deserttrumpet
Rumex hymenosepalus	Canaigre dock
Rumex violascens	Violet dock
RANUNCULACEAE	
Anemone tuberosa	Tuber anemone

Scientific Name	Common Name
RESEDACEAE	
Oligomeris linifolia	Lineleaf whitepuff
SCROPHULARIACEAE	
Castilleja angustifolia	Northwestern Indian paintbrush
Neogaerrhinum filipes	Yellow twining snapdragon
Penstemon albomarginatus	Whitemargin beardtongue
Penstemon bicolor ssp. *roseus*	Pinto beardtongue
SOLANACEAE	
Datura wrightii	Sacred thorn-apple
Lycium andersonii	Water jacket
Lycium cooperi	Peach thorn
Nicotiana obtusifolia	Desert tobacco
Physalis crassifolia	Yellow nightshade groundcherry
Physalis hederifolia var. *palmeri*	Palmer's groundcherry
Quincula lobata	Chinese lantern
TAMARICACEAE	
VERBENACEAE	
Aloysia wrightii	Wright's beebrush
Tamarix ramosissima	Saltcedar
VISCACEAE	
Phoradendron californicum	Mesquite mistletoe
ZYGOPHYLLACEAE	
Larrea tridentata	Creosote bush
AGAVACEAE	
Yucca schidigera	Mojave yucca
POACEAE	
Achnatherum speciosum	Desert needlegrass
Aristida adscensionis	Sixweeks threeawn
Aristida purpurea	Purple threeawn
Bouteloua aristidoides	Needle grama
Bouteloua barbata	Sixweeks grama
Bromus madritensis	Compact brome
Bromus rubens	Red brome
Bromus tectorum	Cheatgrass
Cynodon dactylon	Bermudagrass
Dasyochloa pulchella	Low woollygrass
Enneapogon desvauxii	Nineawn pappusgrass
Eragrostis cilianensis	Stinkgrass
Hordeum murinum	Mouse barley
Muhlenbergia porteri	Bush muhly
Pleuraphis rigida	Big galleta
Poa bigelovii	Bigelow's bluegrass
Schismus barbatus	Common Mediterranean grass
Sporobolus cryptandrus	Sand dropseed
Sporobolus flexosus	Mesa dropseed
Tridens muticus var. *elongatus*	Slim tridens
Vulpia octoflora var. *hirtella*	Sixweeks fescue
THEMIDACEAE	
Androstephium breviflorum	Pink funnel lily

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APPENDIX C

RARE, INVASIVE, AND NOXIOUS PLANT SURVEYS

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RARE PLANTS

Rare, invasive, and noxious plant surveys for this project were conducted on April 7, 8, 13, 14, May 1, and September 24, 2008, and April 7 and 13-17, 2009 by Mr. Glenn Clifton, GLC Consulting, Kingman, Arizona. Mr. Clifton developed a target species list by consulting lists of state and federally listed species and similar species lists maintained by the California Native Plant Society (CNPS), the California Natural Diversity Database, the Nevada Natural Heritage Program, the Nevada Native Plant Society, and the Bureau of Land Management (BLM) in California and Nevada. Following development of the target list (Table C1), Mr. Clifton initiated field surveys.

Field surveys were conducted along the project right-of-way and at all ancillary facilities that were on maps provided by Southern California Edison (SCE). Surveys were conducted by driving and walking the right-of-way, and driving along the right-of-way until suitable habitat for one or more of the target species was encountered, then searching that habitat for the species in question. Areas not surveyed included existing substation facilities, the Ivanpah Lake dry playa, and disturbed ground areas and paved roads and parking lots near Primm, Nevada.

All rare plant localities were recorded using a handheld global positioning system unit. Locations were recorded in Universal Transverse Mercator (UTM), North American Datum (NAD 83). Point locations for individuals or small groups of plants were recorded. For larger patches of plants, the width of the patch was recorded by taking a GPS reading at the beginning and end of the patch. Unless patches were very large with many plants, the numbers of plants present at a location was also recorded.

TABLE C1
RARE PLANT TARGET LIST
WITH THE CNPS LIST ON WHICH EACH SPECIES IS LOCATED

Common Name	Scientific Name	CNPS List
LIST 1		
Cima milkvetch	*Astragalus cimae*	1B.2
Limestone daisy	*Erigeron uncialis*	1B.2
Pungent glossopetalon	*Glossopetalon pungens*	1B.2
Jaeger's ivesia	*Ivesia jaegeri*	1B.3
Polished blazing star	*Mentzelia polita*	1B.2
White-margined beardtongue	*Penstemon albomarginatus*	1B.2
Jaeger's phacelia	*Phacelia perityloides* var. *jaegeri*	1B.3
Rusby's desert mallow	*Sphaeralcea rusbyi* var. *eremicola*	1B.2
LIST 2		
Desert ageratina	*Ageratina herbacea*	2.3
Coyote gilia	*Aliciella triodon*	2.2
White bear poppy	*Arctomecon merriamii*	2.2
Mojave milkweed	*Asclepias nyctaginifolia*	2.3
Scaly cloak fern	*Astrolepis cochisensis*	2.3
Red grama	*Bouteloua trifida*	2.3
Viviparous foxtail cactus	*Escobaria vivipara* var. *rosea*	2.2
Gilman's cymopterus	*Cymopterus gilmanii*	2.3
Nine-awned pappus grass	*Enneapogon desvauxii*	2.3
Juniper buckwheat	*Eriogonum umbellatum* var. *juniperinum*	2.3

TABLE C1
RARE PLANT TARGET LIST
WITH THE CNPS LIST ON WHICH EACH SPECIES IS LOCATED

Common Name	Scientific Name	CNPS List
Hairy erioneuron	*Erioneuron pilosum*	2.3
Clark Mountain spurge	*Euphorbia exstipulata*	2.1
Wright's bedstraw	*Galium wrightii*	2.3
Parish's club cholla	*Grusonia parishii*	2.3
Hairy-podded five-leaf hymenopappus	*Hymenopappus filifolius* var. *eriopodus*	2.3
Knotted rush	*Juncus nodosus*	2.3
Hillside wheat grass	*Leymus salinus mojavensis*	2.3
Plains flax	*Linum puberulum*	2.3
Rough menodora	*Menodora scabra*	2.3
Wing-seed blazing star	*Mentzelia pterosperma*	2.2
Tough muhly	*Muhlenbergia arsenic*	2.3
Delicate muhly	*Muhlenbergia fragilis*	2.2
False buffalo grass	*Munroa squarrosa*	2.2
Cliff brake	*Pellaea truncate*	2.3
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	2.3
Thompson's beardtongue	*Penstemon thompsoniae*	2.3
Utah beardtongue	*Penstemon utahensis*	2.3
Aven Nelson's phacelia	*Phacelia anelsonii*	2.3
Barneby's phacelia	*Phacelia barnebyana*	2.3
Sky-blue phacelia	*Phacelia coerulea*	2.3
Goodding's phacelia	*Phacelia pulchella* var. *gooddingii*	2.3
Chamber's physaria	*Physaria chambersii*	2.3
Small-flowered rice grass	*Piptatherum micranthum*	2.3
Abert's sanvitalia	*Sanvitalia abertii*	2.2
Many-flowered schkuhria	*Schkuhria multiflora*	2.3
Mormon needle grass	*Stipa* (*Achnatherum aridum*) *arida*	2.3
List 4		
Clark Mountain agave	*Agave utahensis* var. *Nevadensis*	4.2
Antelope horns	*Asclepias asperula*	4.3
Black grama	*Bouteloua eriopoda*	4.2
Revolute spurge	*Chamaesyce revolute*	4.3
Utah vine milkweed	*Cynanchum utahense*	4.3
Ash Meadows daisy	*Enceliopsis nudicaulis*	4.3
Dwarf goldenbush	*Ericameria nana*	4.3
Munz's bedstraw	*Galium munzii*	4.3
California mock-pennyroyal	*Hedeoma nana* var. *californica*	4.3
Utah mortonia	*Mortonia utahensis*	4.3
Caespitose evening primrose	*Oenothera caespitosa crinita*	4.2
Rock goldenrod	*Petradoria pumila*	4.3
Desert portulaca	*Portulaca halimoides*	4.2

CNPS Codes:
- List 1B: Plants rare, threatened or endangered in California and elsewhere
- List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
- List 4: Plants of limited distribution, a watch list

Threat Codes:
- 0.1 Seriously endangered in California (high degree/immediacy of threat)
- 0.2 Fairly endangered in California (moderate degree/immediacy of threat)
- 0.3 Not very endangered in California (low degree/immediacy of threats or no current threats known)

Of the target species listed in Table C1, two were found in Nevada; *Penstemon albomarginatus* and *Penstemon bicolor* ssp. *roseus*. Eight different target species, none from List 1.B, were found in the California portion of the project area (Table C2). Figures C1a to C1f show the locations of the target species located by the surveys.

TABLE C2
RARE PLANT SPECIES THAT WERE FOUND DURING FIELD SURVEYS

Common Name	Scientific Name	Number of Plants[1]
NEVADA		
White-margined beardtongue	*Penstemon albomarginatus*	NR
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	42
CALIFORNIA – LIST 2 PLANTS		
Small-flowered androstephium	*Androstephium breviflorum*	NR
Mojave milkweed	*Asclepias nyctaginifolia*	1
Viviparous foxtail cactus	*Coryphantha* sp.	NR
Nine-awned pappus grass	*Enneapogon desvauxii*	2
Parish's club cholla	*Grusonia parishii*	4
Rough menodora	*Menodora scabra*	1
Aven Nelson's phacelia	*Phacelia anelsonii*	NR
Sky-blue phacelia	*Phacelia coerulea*	1
CALIFORNIA – LIST 4 PLANTS		
Borrego milkvetch	*Astragalus lentiginosus* var. *borreganus*	4
Clark Mountain buckwheat	*Eriogonum heermannii* var. *floccosum*	NR
Black grama	*Bouteloua eriopoda*	NR
Utah vine milkweed	*Cynanchum utahense*	1

Number of Plants:
1 – specific UTMs for these observations will be provided to the BLM.
NR – number not recorded – see text under individual species.

White-margined beardtongue – This species was found in the eastern Ivanpah Valley west of the Lucy Gray Mountains and northeast of Primm. Numerous plants were found, all within the area identified by Smith (2001) as Site 9 for *Penstemon albomarginatus*. The plants found during the spring of 2008 are, apparently, part of this previously known population of the species.

Rosy two-toned beardtongue – 42 individuals of this species were found in Nevada, all in the McCullough Mountains. The plants were found at 18 different locations with the number of plants per location ranging between 1 and 11 individuals. The locations of these plants coincide very closely with previously mapped locations for this species (Nevada Natural Heritage Program 2006) and it is likely the plants found during spring 2008 represent previously documented occurrences of this species.

Mojave milkweed – An individual occurrence of this species was recorded in the project right-of-way a little less than 1 mile southwest of the proposed Ivanpah substation.

Viviparous foxtail cactus – *Coryphantha* sp. was found at nine locations with more than one plant present at some locations. Rare plant biologist Mr. Glenn Clifton included both species of

Coryphantha (i.e., *C. chlorantha* and *C. vivipara rosea*) in the project list. However, the plants he found were not in flower and, therefore, could not be ascribed to either species. Others have combined these two species into *Escobaria vivipara* var. *rosea*.

Nine-awned pappus grass – This species was found approximately 2-3 miles southwest of the proposed Ivanpah Substation. Individual plants were found at two locations.

Parish's club cholla- Four individuals of this species were found on and immediately south of the proposed Ivanpah Substation. Plants were found by both the rare plant biologist and biologists conducting general site reconnaissance at different times. It is assumed, therefore, that the same plants were found by both biologists. For that reason we report here only those plants recorded by the rare plant biologist.

Aven Nelson's phacelia – This species was found scattered over a fairly large area just north of the Mountain Pass Substation. Rare plant biologist Glenn Clifton noted, "This is the largest population that has been seen in California." None of the plants were under existing towers.

Sky-blue phacelia – A single individual of this plant was found near the Mountain Pass Substation

Black grama – This plant was found less than .5 mile north of the Mountain Pass Substation.

Utah vine milkweed – This species was found right at the northern edge of the proposed Ivanpah Substation.

INVASIVE SPECIES AND NOXIOUS WEEDS

Noxious weeds by definition are species of weedy, generally non-native, aggressive, and overly competitive plants that have been officially placed on agency lists of noxious weeds. Noxious weeds in the State of Nevada are designated by the Nevada State Department of Agriculture. In California, such designations are made by the California Department of Food and Agriculture.

Noxious Weeds on the California Segment of the Project

The State of California noxious weed list has weeds segregated by pest rating into four groups:

A. Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.
B. Eradication, containment, control, or other holding action at the discretion of the Commissioner.
C. State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in cropseed.

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1a

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
- MENSCA *Menodora scabra*
- PENALB *Penstemon albomarginatus*
- PENBICROS *Penstemon bicolor* var. *roseus*
- PHAANE *Phacelia anelsonii*
- PHACOE *Phacelia coerulea*

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.25 0.5 1

Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

SOUTHERN CALIFORNIA EDISON

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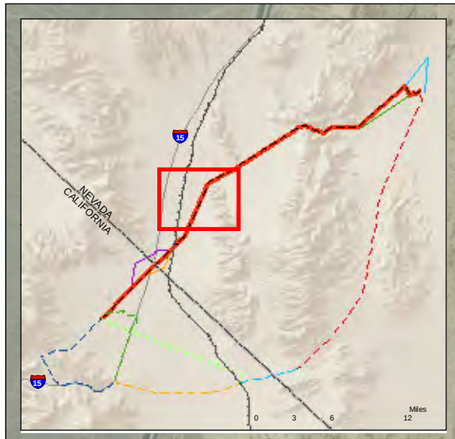

15

19

20

21

PENALB

22

23

PENALB

24

Union Pacific Railroad

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1b

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
- MENSCA *Menodora scabra*
- PENALB *Penstemon albomarginatus*
- PENBICROS *Penstemon bicolor* var. *roseus*
- PHAANE *Phacelia anelsonii*
- PHACOE *Phacelia coerulea*

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.25 0.5 1

Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

SOUTHERN CALIFORNIA EDISON

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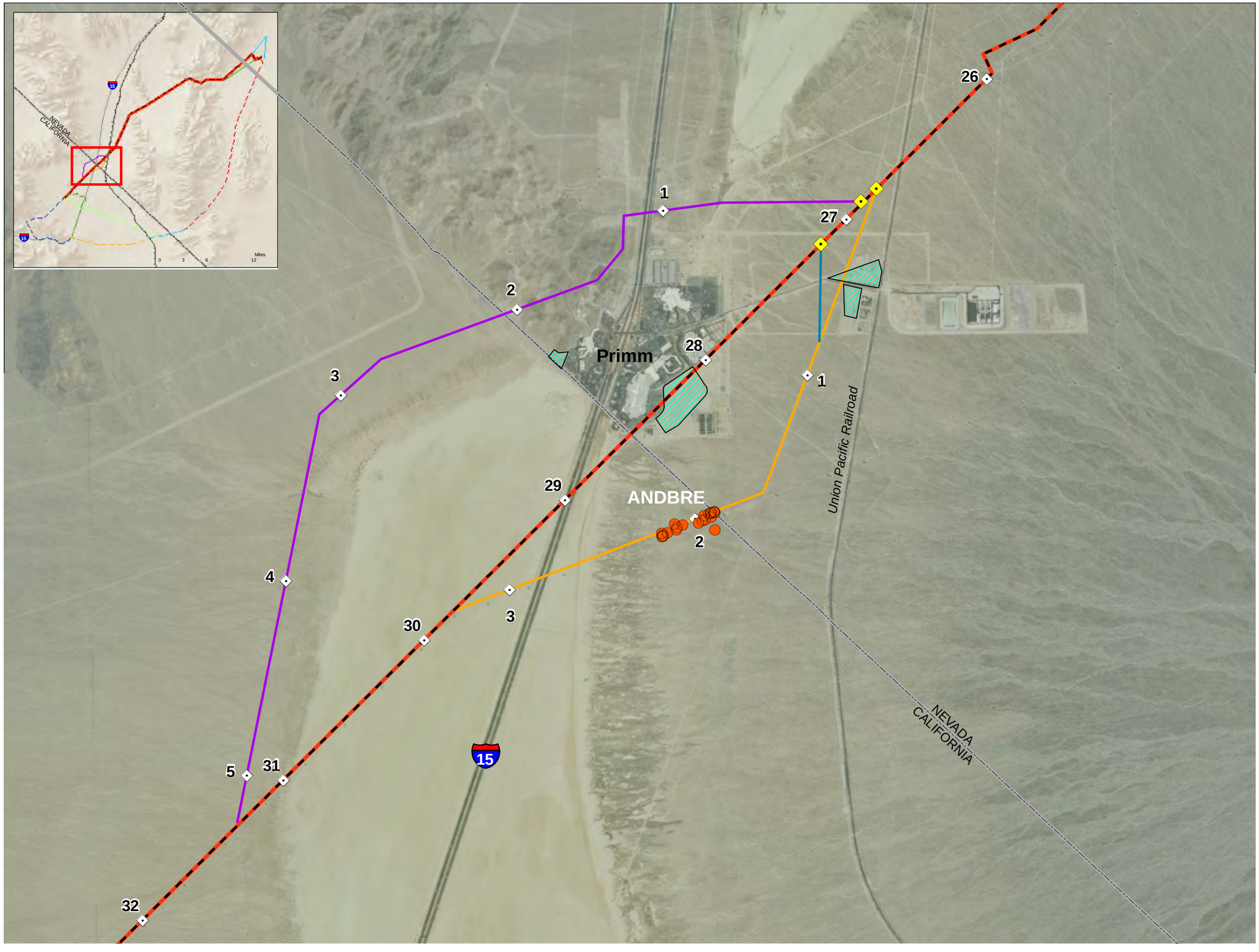

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1c

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
- MENSCA *Menodora scabra*
- PENALB *Penstemon albomarginatus*
- PENBICROS *Penstemon bicolor* var. *roseus*
- PHAANE *Phacelia anelsonii*
- PHACOE *Phacelia coerulea*

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

0 0.25 0.5 1

Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Ivanpah Substation (Proposed)

CORsp.

CYNUTA

GRUPAR

ENNDES

13

ASCNYC

GRUPAR

12

CORsp.

ENNDES

11

PHACOE

10

8

34

7

6

5

4

15

3

2

1

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1d

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
- MENSCA *Menodora scabra*
- PENALB *Penstemon albomarginatus*
- PENBICROS *Penstemon bicolor* var. *roseus*
- PHAANE *Phacelia anelsonii*
- PHACOE *Phacelia coerulea*

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

N

0 0.25 0.5 1

Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

SOUTHERN CALIFORNIA EDISON

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Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1e

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
- MENSCA *Menodora scabra*
- PENALB *Penstemon albomarginatus*
- PENBICROS *Penstemon bicolor* var. *roseus*
- PHAANE *Phacelia anelsonii*
- PHACOE *Phacelia coerulea*

220kV Transmission Rebuild

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

0 0.25 0.5 1
Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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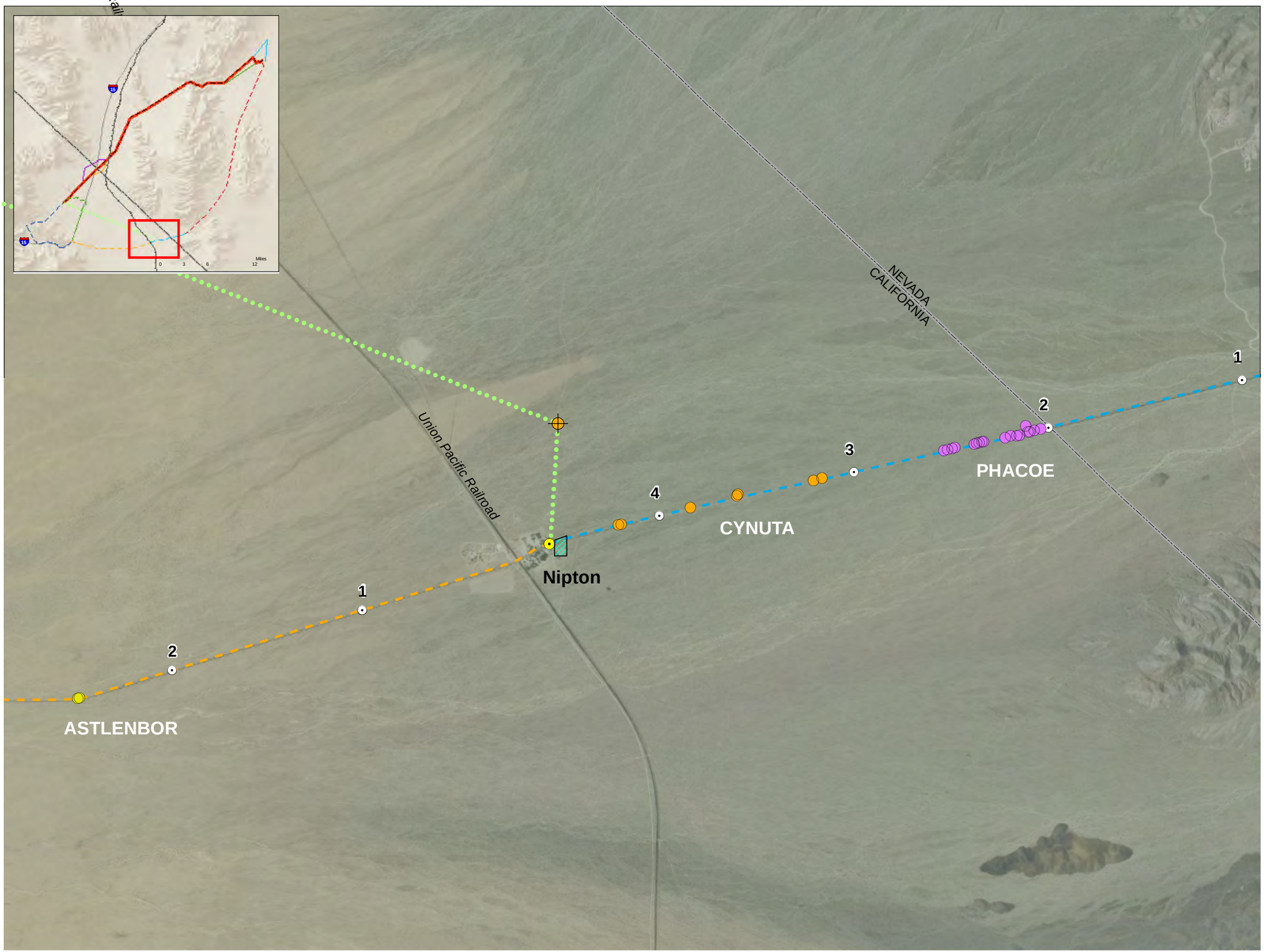

Eldorado-Ivanpah Transmission Project

Biological Technical Report

Rare Plants

Figure C1f

Legend

Rare Plants

- ANDBRE *Androstephium breviflorum*
- ASCNYC *Asclepias nyctaginifolia*
- ASTLENBO *Astragalus lentiginosus* var. *borreganus*
- BOUERI *Bouteloua eriopoda*
- CORsp. *Coryphantha* sp.
- CYNUTA *Cynanchum utahensis*
- ENNDES *Enneapogon desvauxii*
- ERIHEEFLO *Eriogonum heermannii* var. *floccosum*
- GRUPAR *Grusonia parishii*
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220kV Transmission Rebuild

- Proposed Route
- Alternative A
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- Alternative C
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- Alternative E
- Milepost (Numbered)
- Milepost 0 (New Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: Proposed MW Route
- Milepost (Numbered)
- Milepost 0 (New Line)

Utilities

- Existing Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

0 0.25 0.5 1
Miles

Scale = 1:30,000

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Q Temporary "A" action outside of nurseries at the state-county level pending Determination of permanent rating. Species on List 2 "Federal Noxious Weed Regulation" are given an automatic "Q" rating when evaluated in California.

In meetings between SCE and the Needles Field Office of the BLM, the BLM expressed concern about saltcedar (*Tamarix ramosissima*), Sahara mustard (*Brassica tournefortii*), cheatgrass (*Bromus tectorum*), other species of *Bromus*, and *Schismus* spp. None of these plants are on the California State Noxious Weed List, although most of these plants are invasive and all are non-native to the region. There are several species of *Bromus* that are native to North America, but most of the species currently included in the flora of the southwestern United States are not native. *Bromus tectorum* and another common species *B. madritensis rubens* are native to Europe and Eurasia, respectively.

Saltcedar was encountered during surveys at one location in California just barely within the proposed right-of-way at the state line. Mr. Clifton did not specify the location of his observation, but we surmise he observed the same patch of saltcedar east of Interstate 15 near Ivanpah Lake that was documented in the biological resources report for the Brightsource Solar Project.

Bromus tectorum and *B. madritensis rubens* were both found in the California segment of the project. *Bromus madritensis rubens* (red brome) was noted to be particularly common on the south side of Ivanpah Lake, but the species is widely distributed in the project area and generally established to the point that control of it is impractical. *Bromus tectorum (*cheatgrass) is less widely distributed, but still established to the point that control or eradication is not feasible. *Bromus tectorum*, while it does occur in the project area, is much more common farther north in the ecotone between the Mojave and Great Basin Desert and in the Great Basin Desert proper.

Schismus barbatus (Mediterranean grass) was noted by the biological resources reconnaissance team to be widely distributed in the project area, particularly on fine-soiled creosote bush-white bursage flats.

Brassica tournefortii (Sahara mustard) was not observed in California by either the rare plant biologist or the biological reconnaissance team.

Of the species that are included on the California Noxious Weed List, only *Salsola tragus* (Russian thistle) and *Orobanche cooperi* (desert broomrape) were observed during field studies in April and May 2008. Russian thistle may occur at almost any location in the project area where soils have been disturbed. Russian thistle is not a native species and is included in Group C on the California Noxious Weed List. Desert broomrape is parasitic on *Ambrosia* spp. (bursage), *Hymenoclea salsola* (cheese bush), and *Encelia* spp. (brittlebush) and is likely to occur anywhere in the project area these species occur. Desert broomrape is a native species that occurs in Utah, Arizona, southern California, and Baja California (Baldwin et al. 2002) and is included in Group A on the California State Noxious Weed List.

Noxious Weeds on the Nevada Segment of the Project

The State of Nevada Noxious Weed List is divided into three categories (Bartz 2006):

> Category A weeds are generally not found or are limited in distribution throughout the State. Such weeds are subject to:
>
> 1. Active exclusion from the state and active eradication wherever found.
> 2. Active eradication from the premises of a dealer of nursery stock.
>
> Category B weeds are generally established in scattered populations in some counties of the State. Such weeds are subject to:
>
> 1. Active exclusion where possible
> 2. Active eradication from the premises of a dealer or nursery stock.
>
> Category C weeds are generally established and widespread in many counties of the state. Such weeds are subject to active eradication from the premises of a dealer or nursery stock.

In meetings between SCE and the BLM Las Vegas Field Office, concern was expressed about the possible occurrence of Sahara mustard (*Brassica tournefortii*), a species that is native to the Mediterranean region of Europe (Baldwin et al. 2002) and north Africa (Munz 1974) and is included on the Nevada State Noxious Weed List in Category B.

An individual plant of *Brassica* cf. *tournefortii* was found on the west side of the McCullough Mountains on 7 April 2008. The plant was found by the biology reconnaissance team in an area dominated by creosote bush, white bursage, and Wiggins' cholla on fairly level terrain. The UTMs (NAD 83) for this plant are 11S E 0664134 – N 3958802. No other individual of this plant was recorded by either the biology reconnaissance team or the rare plant biologist. Saltcedar was observed at one location in Nevada on Alternative C at a manmade depression next to the State Line. Saltcedar is on the Nevada State Noxious Weed List in Category C. A summary of noxious weed species observed on the project are given in Table C3.

TABLE C3
NOXIOUS WEED SPECIES DOCUMENTED ON THE PROJECT

Common Name	Scientific Name	CIPI Invasiveness Rating	Control	Project Segment
Wild oat	*Avena fatua*	Moderate	Control	CA
Asian mustard	*Brassica tournefortii*	High	Eradicate	CA & NV
Compact brome	*Bromus madritensis* var. *rubens*	High	Not feasible	CA & NV
Cheatgrass	*Bromus tectorum*	High	Not feasible	CA
Chilean chess	*Bromus trinii*	Not rated*	Not rated*	CA
Bermudagrass	*Cynodon dactylon*	Moderate	Control	NV
Redstem stork's bill	*Erodium cicutarium*	Limited	Not feasible	CA & NV
African mustard	*Malcolmia africana*	Not rated*	Not rated*	CA & NV
Russian thistle	*Salsola tragus*	Limited	Eradicate	CA & NV
Mediterranean grass	*Schismus barbatus*	Limited	Not feasible	CA & NV

TABLE C3
NOXIOUS WEED SPECIES DOCUMENTED ON THE PROJECT

Common Name	Scientific Name	CIPI Invasiveness Rating	Control	Project Segment
London rocket	*Sysimbrium irio*	Moderate	Control	NV
Saltcedar	*Tamarix ramosissima*	High	Eradicate	CA & NV

*USDA listing as invasive, not rated.

CIPI Ratings:

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent, but generally not severe, ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

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APPENDIX D

DESERT TORTOISE REPORT 2008

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Alice E. Karl, Ph.D.
P.O. Box 74006
Davis, California
95617

May 18, 2009

Dr. E. Linwood Smith
Environmental Planning Group, Inc.
4141 North 32nd Street, Suite 102
Phoenix, Arizona 85018

Re: Eldorado-Transmission Project, 2008 Desert Tortoise Survey of the Proposed Route

INTRODUCTION

Southern California Edison (SCE) is proposing to develop the Eldorado-Ivanpah Transmission Project (Project) near Primm, Clark County, Nevada. The Project includes the replacement of the existing 115kV transmission line with a new double-circuit 220kV line between the Eldorado Substation (Nevada) and Ivanpah Substation (California) ("proposed route"). In addition, several alternative routes are under examination, as are two substation sites and several telecommunications routes. The latter would require new lines and/or the upgrade of existing facilities.

The purpose of the present survey was to identify the presence of desert tortoise on and adjacent to the proposed (i.e., preferred) transmission line route and to map sign concentrations. These data will enter into an ultimate analysis of all Project effects on desert tortoise, which will be used to support consultation with state and federal agencies and several plans and permits. The 2008 survey was the initial survey in an ultimate suite of surveys that will be finished in 2009, including more on the proposed route. This report presents a summary of 2008 results. A thorough analysis of desert tortoise impacts will be completed following the data collection for the rest of the proposed route and other Project elements in 2009.

ENVIRONMENTAL SETTING

The proposed route extends for approximately 41 miles from the Eldorado Substation in Clark County, Nevada, to the Mountain Pass Substation in San Bernardino County, California (Figure 1). The route is located in the same right-of-way as the existing transmission line and was assumed to be 200 feet wide to accommodate new spur roads and some flexibility in tower placement.

Topography along the route ranges from playas (Roach and Ivanpah dry lakes) in Ivanpah Valley, through bajadas and to mountains. Elevations range from approximately 2,000 feet in the valley to approximately 3,400 feet in McCullough Pass and 5,200 feet near Mountain Pass Substation.

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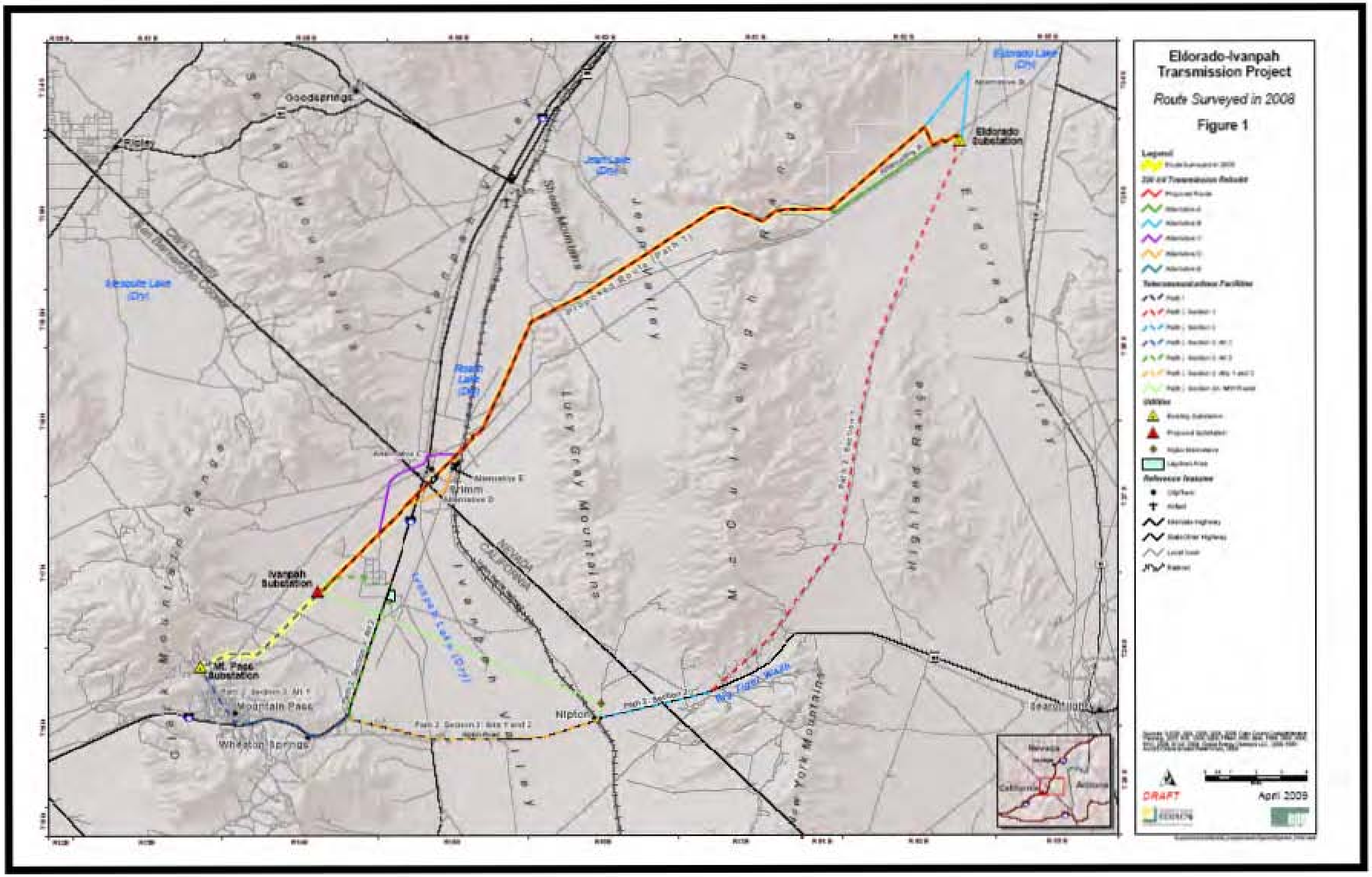
Eldorado-Ivanpah
Trarsmission Project
Route Surveyed in 2008
Figure 1
Goodsprings
Eldorado Lake (Dry)
Eldorado Substation
Mesquite Lake (Dry)
Roach Lake (Dry)
Proposed Route (Path 1)
Primm
Ivanpah Substation
Mt. Pass Substation
Mountain Pass
Wheaton Springs
Nipton
Ivanpah Lake (Dry)
Lucy Gray Mountains
New York Mountains
Searchlight
NEVADA
CALIFORNIA
DRAFT
April 2009

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SURVEY METHODS

Surveys were conducted between 13 and 23 May 2008, inclusive. Pedestrian transects were completed consistent with the U.S. Fish and Wildlife Service (USFWS) "protocol" desert tortoise transects (USFWS 1992[1]). One-hundred percent of the transmission line right-of-way (ROW) was surveyed using parallel, 30-foot-wide belt transects; the ROW was assumed to be 200 feet (seven transects). In addition, 30-foot-wide, "Zone-of-influence" (ZOI) transects were walked on both sides of the ROW at 100, 300, 600, 1200, and 2400 feet from the outer edges of the ROW. The only exception was on Ivanpah and Roach dry lakes, where ZOIs on unvegetated portions of the lake (not tortoise habitat) were not walked.

On all transects, all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains) observed was measured, mapped and described relative to condition, size, and (where applicable) gender. Current and recent weather conditions were recorded to identify the potential for tortoise activity and the topography, drainage patterns, soils, substrates, plant cover, anthropogenic disturbances, and aspect-dominant, common and occasional plant species were described and mapped. Mapping sign and habitat features was achieved using Global Positioning System (GPS) units. All transect data were recorded on specially-designed forms (Attachment 1). Every mile of ROW was photographed, as well as zone-of-influence transects.

Six very experienced personnel walked the survey, each with between six and 30 years experience searching for and studying tortoises on many types of surveys, including tortoise mark-recapture plots, telemetry studies, behavioral studies, and linear surveys. In addition, Environmental Planning Group (EPG) supplied three biologists who were familiar with conducting field surveys and knew many of the species. Less experienced surveyors were familiarized with desert tortoise sign and only walked the ROW initially, in order to learn about desert tortoises and where to look for sign. In the ROW they were always adjacent to experienced surveyors. Inexperienced personnel conducted some ZOI transects after the initial learning period, but their transects were always adjacent to those of more experienced surveyors.

The weather was clear, warm, and calm during the surveys, with maximum daily air temperatures of approximately 100 degrees Fahrenheit (38 degrees Celsius).

Although the goal of the survey was to search for desert tortoise, other special-status species known to be in the survey area were also sought. An inventory was also kept of all species observed. These results will be reported during the comprehensive report for the Project.

SURVEY RESULTS

[1] United States Department of the Interior Fish and Wildlife Service. 1992. Field Survey Protocol for Any Federal Action That May Occur within the Range of the Desert Tortoise. Available online at http://ventura.fws.gov/es/protocols/de_tortoise_fsp.pdf

A total of 302 tortoise sign was observed, including 19 tortoises, 177 burrows,74 scat, 20 carcasses or carcass parts and 12 other types of sign (e.g., tracks, drinking depressions) (Table 1, Figure 2). Most of the sign was observed in Nevada, on the east side of the McCullough Mountains, on the northern edge of the Lucy Gray range, and southeast of Roach Lake.

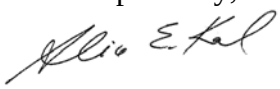
CONTINUED PROJECT SURVEYS AND FUTURE ANALYSIS

The data presented in this letter report are only part of the data set that is currently being collected for the Project. Because of gaps in that data set, the analysis of Project impacts to desert tortoises from the 2008 data alone is premature. Surveys will be completed in 2009 for the remainder of the proposed route, alternatives, substations, telecommunications alternatives, laydown areas, pulling and tensioning sites, and other Project features. Based on the complete data set, as well as discussions with SCE on the Project description (about which I have almost no information), a comprehensive report will be written to include all Project data and analyze the following:

- Project impacts to the affected desert tortoise population from the Project in its entirety and from individual Project elements
- Project impacts to desert tortoise recovery
- Cumulative impacts based on other energy developments in the area
- Project impacts to other special-status species observed

A mitigation plan will be developed based on Project effects and standard and suggested agency practices. Habitat compensation will be analyzed based on the requirements of both Nevada and California resource agencies.

Respectfully,



Alice E. Karl, Ph.D.

TABLE 1

ELDORADO-IVANPAH TRANSMISSION PROJECT
RESULTS OF 2008 DESERT TORTOISE SURVEYS
ON THE PROPOSED ROUTE

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
Desert Tortoise	667507	3958333	Burrow	4	various	7-10 possible burrows in caliche. Cleaned out, no other tortoise sign. Rodent scat in some.
	654603	3952873	Burrow	5	210	Opposite bush from Sign No. LB04
	653680	3952392	Burrow	2	370	
	642422	3937852	Burrow	2	280	
	640181	3935608	Burrow	5	280	
	678319	3963352	Burrow	5	180	
	676079	3962639	Burrow	4	310	Berm of roadside
	669796	3959727	Burrow	3	530	Caliche burrow, TY-2/3 scat outside and inside, 13mm
	668667	3959766	Burrow	4	260	
	668584	3959363	Burrow	2	290	
	669850	3959303	Burrow	4	230	Caliche burrow, bank of wash, raised 0.5m
	669316	3959207	Burrow	4	240	Caliche burrow, bank of wash, no other sign
	669156	3959204	Burrow	6	180	
	668886	3959189	Burrow	4	260-330	3 caliche burrows together rodent and canine scat, no other tort.
	651770	3949908	Burrow	3	200	
	639575	3935000	Burrow	4	230	No other sign, can't see end
	651646	3947447	Burrow	3	270	
	651728	3947580	Burrow	3	240	1 foot deep, under *Larrea tridentata*
	652351	3949241	Burrow	3	300	~5' south is another tortoise burrow - 190 mm wide
	652539	3949722	Burrow	6	220	Rocky upper bajada, next to old canid(?) burrow

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	650268	3945811	Burrow	4	280	Canid scat, possibly modified by canid?
	671219	3958572	Burrow	2		Caliche, scat
	671176	3958550	Burrow	2		Caliche
	670921	3958516	Burrow	2		Caliche
	670877	3958757	Burrow	2/4	340	Caliche
	670507	3958811	Burrow	2	340	
	670383	3958846	Burrow	2/4		Caliche, series of 3 caves, clean and flat, goes back at least 3m
	670844	3958925	Burrow	1	220	
	671327	3958939	Burrow	1	320	With tortoise
	667316	3958196	Burrow	1	205	2 burrows and 1 pallet(205) burrows under boulders, 1 goes back at least 1.5m another is shallow, pallet in gravelly soil.
	667433	3958223	Burrow	>2 and 4	Not Measured	With 1 scat (18mm); series of 7 caliche caves
	667711	3958393	Burrow	1	340	With tracks
	669951	3958920	Burrow	4	170	Small but goes back 0.4m
	664709	3959011	Burrow	3	215	
	666624	3958554	Burrow	4	340	Dug out under large boulder, tortoise shaped, but sloppy inside
	661421	3957017	Burrow	4	130	Very small, entrance deteriorated
	658795	3955302	Burrow	6	340	
	653498	3952257	Burrow	5	245	Now used by something else
	654274	3952619	Burrow	2	255	
	654676	3952864	Burrow	5	300	Collapsed
	651756	3949864	Burrow	5	400	Cobbly soil, slightly caved in inside
	649187	3944552	Burrow	3	260	
	649902	3945681	Burrow	3	290	
	650414	3946816	Burrow	3	180	
	639152	3934527	Burrow	4	340	Cobbly wash, has flat bottom
	638827	3934310	Burrow	6	360	Caved in and full of webs, looks like tortoise

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	640223	3935525	Burrow	1	310	With tortoise, fresh tracks on mound
	651619	3950044	Burrow	1	225	With tortoise; burrow is 12 m from dirt road
	651718	3950257	Burrow	2	205	
	652162	3951064	Burrow	2	230	
	652337	3951446	Burrow	3	240	
	652501	3951864	Burrow	3	200	
	652697	3951772	Burrow	2	340	In road berm under 220kV like enroute to transect
	653230	3952037	Burrow	6	320	
	653761	3951611	Burrow	3	340	Burrow is 5m off 220kV access road to a tower and has a 0.25 inch mesh fence halfway around it (photo)
	652910	3950591	Burrow	1	225	With tortoise inside
	652824	3950413	Burrow	2	255	
	652725	3950172	Burrow	1	250	
	652280	3950522	Burrow	5	245	
	652287	3950536	Burrow	3	260	
	652569	3951233	Burrow	3	240	
	652699	3951485	Burrow	2	245	
	652879	3951888	Burrow	1	155	
	653193	3952046	Burrow	1	250	With tortoise, dirt-bike trail runs over it and may have collapsed part of the burrow at an earlier date (photo)
	653438	3952170	Burrow	2	240	
	654275	3952594	Burrow	1	300	Under a group of 8 *Yucca schidigera*
	654495	3952824	Burrow	2 & 1	160	2 burrows- 1 short, the other 0.5 m deep under LAARTR 2 m apart, short burrow is Class 1
	654385	3952794	Burrow	2	240	
	654196	3952684	Burrow	1	240	With tortoise
	653944	3952547	Burrow	3	150	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	653934	3952541	Burrow	1	160	Deep for a small tortoise, 1.5m with dirt-bike tracks criss-crossing it(photo)
	653402	3952264	Burrow	5	265	
	653367	3952254	Burrow	1	300	With scat (2) 17mm
	652891	3952031	Burrow	5	300	
	652877	3952022	Burrow	3	265	
	652462	3951204	Burrow	2	330	2 burrows and a pallet within 2m of each other. In a 0.5 m high berm under wires of 220 kV line
	652451	3951173	Burrow	5	330?	Collapsed
	652288	3950847	Burrow	1	290	
	665964	3958723	Burrow	2	470	Caliche burrow, scat outside TY-3, 15 and 17 mm
	654679	3952874	Burrow	2	332	
	654524	3952798	Burrow	3	335	In bank
	654527	3952791	Burrow	4	190	
	653794	3952444	Burrow	3	275	
	652227	3951009	Burrow	3	360	NTY scat (16 mm) on burrow apron
	652097	3950746	Burrow	3	380	
	672672	3959643	Burrow	3	281	NTY-3 scat
	667699	3957854	Burrow		392	
	667927	3958020	Burrow	2	290	
	667193	3957954	Burrow	1	290	Under boulder with tracks
	667147	3957962	Burrow	4	192	
	666912	3958079	Burrow	5	318	
	672424	3959382	Burrow	3	268	Seen en route to transect
	673588	3960029	Burrow	5	272	
	672105	3958345	Burrow	2	282	
	674014	3959737	Burrow	2	262	
	675334	3960796	Burrow	5	220	Seen en route to transect
	674587	3960341	Burrow	6	230	
	673307	3959388	Burrow	3	400	Probably same tortoise as Sign Nos. KB15, 16, 17

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	673309	3959389	Burrow	3	360	Cluster of 3 burrows, probably same tortoise as Sign Nos. KB14, 16, and 17
	673306	3959385	Burrow	2	350	Probably same tortoise as Sign Nos. KB14, 15, 17
	673284	3959380	Burrow	2	330	Probably same tortoise as Sign Nos. KB14, 15, 16
	678251	3961898	Burrow	3	325	In a kit fox den
	677994	3962191	Burrow	6	230	
	675696	3961222	Burrow	3	309	
	672643	3959547	Burrow	5	270	Probably same tortoise as Sign No. KB22.
	672653	3959557	Burrow	3	310	Same wash as KB21
	672927	3959779	Burrow	3	260	
	672704	3959655	Burrow	1	301	With tortoise
	669899	3958152	Burrow	3/4	279	Caliche
	654640	3952886	Burrow	2	263	
	654604	3952870	Burrow	1	309	Fresh tracks inside burrow
	652602	3951798	Burrow	4	280	
	651683	3949826	Burrow	3	260	
	650323	3946722	Burrow	5	210	
	650677	3946485	Burrow	2	340	Modified canid
	651925	3949271	Burrow	5	260	
	651920	3949942	Burrow	5	295	Old scat inside
	652302	3950924	Burrow	1	285	With tracks
	652386	3951117	Burrow	3	280	
	652442	3951264	Burrow	5	290	
	652307	3951282	Burrow	2	235	
	662665	3958120	Burrow	4	270	Dug by canid , but tortoise shape inside, wouldn't need much work to make nest
	659652	3956040	Burrow	4	160	*Neotoma lepida* debris outside
	654432	3952296	Burrow	5	205	
	654691	3952429	Burrow	2	270	
	654768	3952476	Burrow	1	320	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	654999	3952573	Burrow	2	280	
	655026	3952585	Burrow	2	150	
	655186	3952671	Burrow	3	140	
	655399	3952787	Burrow	1	275	
	655630	3952899	Burrow	3	305	
	656276	3953216	Burrow	2	145	
	656737	3953438	Burrow	3	290	
	654228	3952508	Burrow	2	135	
	654581	3952689	Burrow	2	325	
	654809	3952797	Burrow	3	350	
	651559	3950431	Burrow	5	180	
	654709	3953743	Burrow	1	290	
	652306	3952129	Burrow	1	240	
	656202	3953911	Burrow	2	170	
	653607	3952465	Burrow	5	210	Mouth broken down inside looks like tortoise
	666661	3957865	Burrow	4	310	Under boulders, looks like used by tortoise
	666349	3958312	Burrow	1	350	
	671615	3959035	Burrow	2	24	
	671290	3959041	Burrow	4	400	Caliche cave, tort shape, no other sign
	672125	3959956	Burrow	4	290	Caliche cave, no tracks or scat, very tort shaped
	672401	3959747	Burrow	4	340	Excellent cave, recently had a lot of *Neotoma* debris cleaned out
	672267	3959513	Burrow	2	380	4 caves, also 320, 340, 400 mm, scat and recently used
	672964	3960115	Burrow	3	310	Modified canid dig
	675470	3962517	Burrow	3	230	
	675629	3963133	Burrow	2	320	Caliche cave; scat inside
	675640	3963122	Burrow	3	360	
	649457	3943900	Burrow	3	320	Modified fox den
	650012	3944608	Burrow	3	210	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	650255	3944959	Burrow	2	340	Modified fox den
	649528	3944343	Burrow	3	350	
	648857	3943648	Burrow	5	280	Mostly filled in and old
	649907	3945931	Burrow	2	250	
	649783	3945662	Burrow	5	290	Mostly filled in
	649242	3944681	Burrow	2	270	Modified fox den, old tracks
	649238	3944678	Burrow	1	370	Modified fox den, fresh tracks
	649024	3944482	Burrow	6	260	Probably old tortoise, mostly filled in
	648971	3944419	Burrow	3	250	
	648990	3944266	Burrow	3	210	
	649991	3945475	Burrow	4	320	Kit fox den that appears to have been modified by a tortoise
	649819	3945893	Burrow	2	290	
	649882	3945976	Burrow	1	Not Measured	Tortoise resting inside
	667421	3958265	Burrow	3	176	
	641281	3936412	Burrow	3	304	Originally made by canid
	649081	3944182	Burrow	3	291	
	649203	3944401	Burrow	3	280	
	649122	3944317	Burrow	3	310	
	667598	3958209	Burrow	2	355	
	666881	3958346	Burrow	3	280	
	667301	3958594	Burrow	3	280	
	672672	3959643	Burrow	3	281	With NTY3 adult scat inside
	669950	3958420	Burrow	4	170	0.4 m long
	668565	3959105	Carcass	4 years	180	Half of carcass, unknown gender
	671195	3958559	Carcass	4 years	Adult	Disarticulated
	670779	3958541	Carcass	>4 years	>230	40% intact
	670610	3958514	Carcass	>4 years	>240	60% intact
	636190	3931629	Carcass		130	Freshly dead (3 photos); 2 burrows (360 and 340)
	652348	3950246	Carcass	4 years	~240	Female, 70% intact
	652846	3951532	Carcass	>4 years	Unknown	8 pieces of bone frags
	668768	3958852	Carcass	>4 years	190	Plastron only

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	665264	3959126	Carcass	>4	Unknown	Scattered under tower 1380
	668086	3958094	Carcass	>4 years	Large adult	Half carcass, probably male, very broken, possibly lion
	667852	3958233	Carcass	>1 year	Small adult/subadult	One pectoral scute
	669965	3958152	Carcass	>4 years	Adult	Female
	669620	3958820	Carcass	>4 years	220	Probably female
	652429	3951377	Carcass	1-2 years	92	Plastron fractured; May have been dropped from tower or run over
	652134	3950742	Carcass	>2 years	220	Female
	675638	3962673	Carcass	2-3 years	210	Female, badly broken, mountain lion?
	676621	3963180	Carcass	>4 years	Adult	Single piece of shell bone
	673110	3959825	Carcass	2-3 years	230	Little sign of trauma, very blond
	673927	3960728	Carcass	1 year	182	Female shell
	667301	3958594	Carcass	2-3 years	190	
	669458	3959755	Tortoise		200	Female, standing in open
	654247	3952675	Tortoise		188	Probable male (longish tail and gular)
	653632	3952364	Tortoise		275	Male
	667598	3957797	Tortoise		280	Male, face looks good except slightly bloody below R nares
	666094	3958701	Tortoise		199	Eating between large boulders in rocky wash; female
	649145	3944558	Tortoise		215	Female
	654331	3952569	Tortoise		>250	Male; associated burrow is 290 mm
	648828	3944997	Tortoise		230	Healthy looking male
	653633	3952479	Tortoise		200	
	666107	3958403	Tortoise			In burrow, mouth of burrow 270mm
	650064	3946173	Scat	NTY-3	18	
	669801	3958979	Scat	TY-2	15	
	655386	3953250	Scat	TY-2	21	
	652715	3951876	Scat	TY-2	17	
	650293	3946725	Scat	NTY-3	16	
	650233	3946590	Scat	NTY-3	18	
	650192	3946495	Scat	NTY-4	13	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	649076	3944493	Scat	NTY-4	18	
	651785	3947726	Scat	NTY	20	In runnel
	651984	3949363	Scat	TY-2	25	gravelly slope
	666576	3959090	Scat	NTY-3	23	Very pale
	665972	3959135	Scat	TY-2	15	
	666163	3959014	Scat	TY-1	12	
	666599	3958955	Scat	TY-2	17	
	651987	3950331	Scat	TY-2	13	Another scat, NTY-4, 14mm at same location
	651992	3950386	Scat	TY-2	11	
	652728	3951842	Scat	TY-2/3	16	En route to transect, near Tower No. 1316
	650405	3946821	Scat	NTY-3	17	
	650009	3946268	Scat	NTY-3	12	
	650148	3946611	Scat	TY-2	15	
	651569	3949885	Scat	NTY-3	17	Pale, but tight and dark inside
	651603	3949970	Scat	TY-2	13	
	651927	3950573	Scat	TY-2	16 & 10	2 scat, stuck together, same event
	651947	3950625	Scat	TY-2	21	
	653846	3952167	Scat	TY-2	13	En route to transect
	652972	3951622	Scat	TY-1	12	Incidentally seen off the transect
	669139	3958959	Scat	TY-1	15	
	650290	3946625	Scat	NTY-3	20	
	650062	3946116	Scat	TY-2	15	
	640929	3936345	Scat	TY-1	19	
	667870	3958027	Scat	TY-2	Juvenile	Possible chuckwalla, but location, length, width suggest tortoise
	668306	3958304	Scat	TY-2	17	Off Transect
	667855	3958234	Scat	TY-2	18	
	667722	3958159	Scat	TY-2	19	
	667544	3958040	Scat	TY-3/NTY-3	13	
	667014	3957996	Scat	NTY-4	13	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	667023	3958203	Scat	TY-2	18	
	672944	3959985	Scat	NTY-4	16	
	669781	3958166	Scat	TY-2	13	
	668479	3958203	Scat	TY-2	16	
	667623	3958412	Scat	TY-3	19	
	666577	3958608	Scat	TY-2	14	Slope of cobble hill
	666134	3958688	Scat	TY-3	16	Between rocky hills
	653749	3952410	Scat	TY-2	15	
	651781	3949619	Scat	NTY-3	21	A lot of soil in it
	651733	3949509	Scat	TY-2	17	
	650398	3946538	Scat	TY-3	19	Contains thick stems
	651654	3949483	Scat	NTY-4	16	
	651991	3950583	Scat	TY-2	15	
	654854	3952049	Scat	TY-2	18	
	651483	3952368	Scat	TY-2	18	
	651528	3951227	Scat	TY-2	13	2 pieces
	651589	3951374	Scat	TY-2	20	
	653015	3952154	Scat	TY-2	18	
	666477	3957868	Scat	TY-2	16	En route to transect
	676590	3963236	Scat	NTY-4	22	Almost white
	676714	3963727	Scat	NTY-4	19	White scat, in wash and could have been washed here
	649882	3945877	Scat	TY-2	12	
	649088	3944654	Scat	NTY-4	16	
	649519	3945205	Scat	TY-2	15	
	649855	3945925	Scat	TY-2	21	
	664557	3958352	Scat	TY-2	15	Gravel and cobble ridge
	667647	3958451	Scat	NTY-3	15	
	653467	3952270	Scat	TY-2	19	
	667020	3959346	Scat	TY-2	12	
	667728	3959022	Scat	TY-2	17	
	667494	3958991	Scat	TY-1	9	
	667478	3958989	Scat	NTY-4	20	

Species	Easting[1]	Northing	Sign Type[2]	Class[3]	Width/Size[4]	Surveyor's Additional Notes
	667301	3958594	Scat	NTY-3	15	
	640995	3936295	Scat (2)	TY-2	9	
	652706	3951883	Scat (2)	TY-2	13	
	653467	3952270	Scat (2)	TY-2	19	
	653512	3952297	Scat (3)	TY-2	16	
	640984	3936280	Scat (5)	TY-2	9, 16	
	670251	3958185	Tracks	1	190	In gravel wash with caliche caves
	639902	3934237	Tracks		150	
	648630	3944033	Tracks		150	Fresh
	640941	3936388	Tracks		190	
	640393	3935625	Tracks		280	19mm scat, TY-2, 2m away
	648300	3943373	Tracks		202	Fresh
	651890	3950017	Tracks		240	Fresh
	654513	3952340	Tracks		235	
	649659	3944092	Tracks		26	Fresh
	649648	3944543	Tracks		198	
	648397	3943547	Tracks	1	176	
	648251	3943465	Tracks	1	163	En route to transect

1. All coordinates are Universal Transverse Mercator North American Datum 83, Zone 11S.
2. Number in parentheses is number of sign.
3. See Appendix 1 for key to sign type.
4. All units are millimeters unless otherwise noted.

KEY TO SIGN CLASSES

(Alice Karl, 2001)

BURROWS

1 - DEFINITELY TORTOISE - FRESH (TRACKS, TORTOISE INSIDE, FRESHLY DISTURBED SOIL ON MOUND/RUNWAY)

2 - DEFINITELY TORTOISE - USED THIS SEASON (CLEARED OF ANNUALS, BUT NO FRESHLY DISTURBED SOIL)

3 - DEFINITELY TORTOISE – NOT USED THIS SEASON (PROBABLY HAS ANNUALS GROWING IN RUNWAY)

4 - POSSIBLY TORTOISE – IN GOOD CONDITION BY UNSURE OF SPECIES USING BURROW

5 - DEFINITELY TORTOISE – DETERIORATED SUCH THAT IT WOULD REQUIRE SUBSTANTIAL REMODELING TO BE USABLE

6 - POSSIBLY TORTOISE – DETERIORATED

SCAT

TY1 - WET OR FRESH, DARK, ODORIFEROUS

TY2 - DRIED, POSSIBLE GLAZE ON PART; UNEXPOSED SURFACES DARK BROWN; SLIGHT ODOR

TY3 - DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; VERY SLIGHT ODOR

NTY3- DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; NO ODOR (DISTINGUISHES FROM TY3)

NTY4- DRIED, LOOSENING, PALE OR BLEACHED

CARCASSES – GENERAL INDICATORS FOR TIME SINCE DEATH

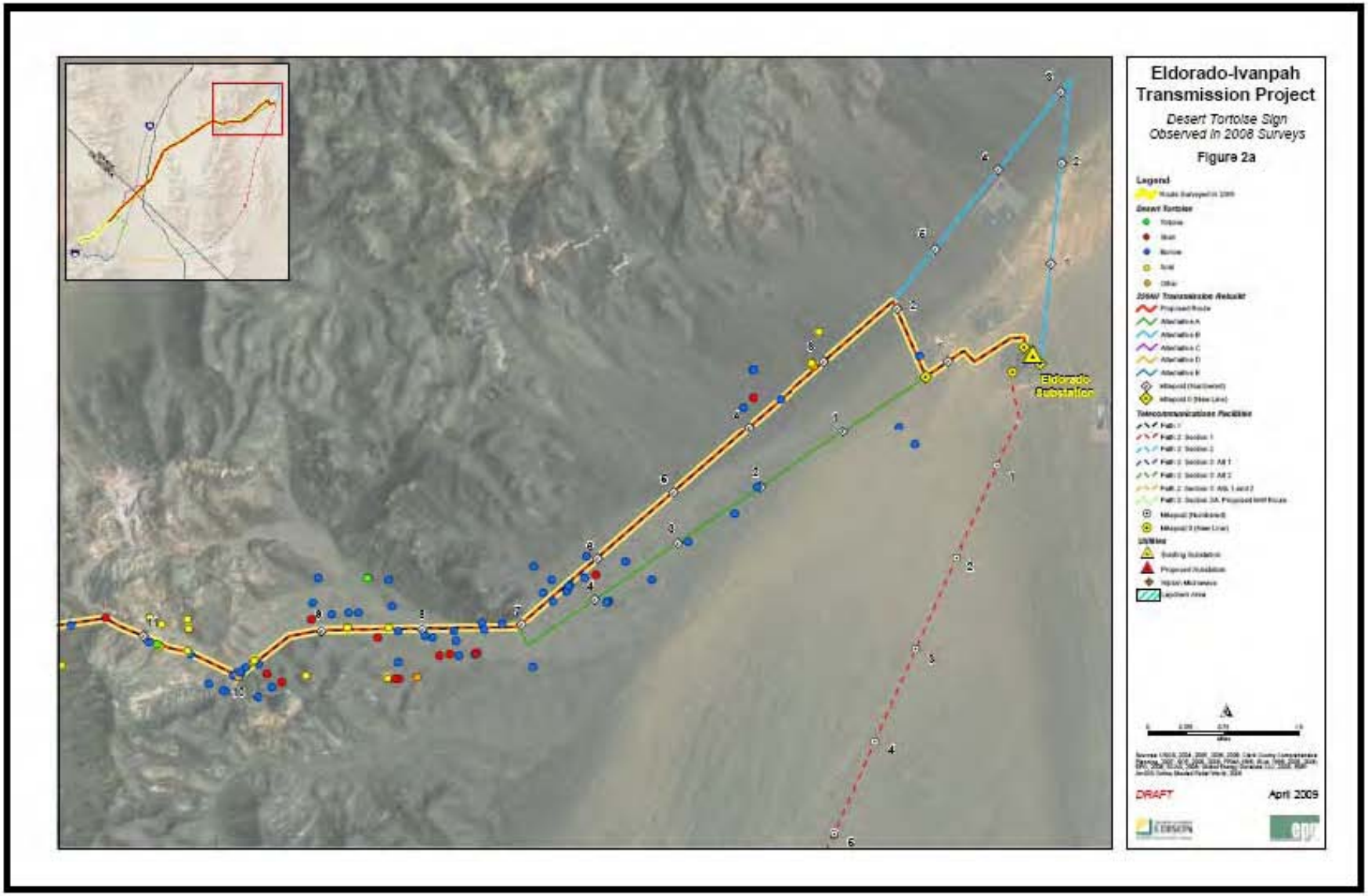
<1 YR - UNEXPOSED SCUTES NORMAL COLOR AND SHEEN, ADHERE TIGHTLY. EXPOSED SCUTES PALING AND MAY BE LIFTING OR OFF. UNEXPOSED BONE WAXY AND SOLID.

1-2 YRS - UNEXPOSED SCUTES NORMAL COLOR WITH SLIGHT SHEEN, MOSTLY TIGHTLY ATTACHED. EXPOSED SCUTES SLIGHTLY PALE WITH NO SHEEN AND NO TO SLIGHT GROWTH RING PEELING. NO ODOR. UNEXPOSED BONE SILKY.

2-3 YRS - UNEXPOSED SCUTES PALE AND WITHOUT SHEEN BUT NO GROWTH RING PEELING. EXPOSED SCUTES PALE WITH SLIGHT PEELING. SCUTES LOOSE, OFF AND/OR TIGHT. BONE SUTURES GENERALLY TIGHT.

4 YRS - UNEXPOSED SCUTES NORMAL COLOR TO SLIGHTLY PALE, NO SHEEN, NO PEELING. EXPOSED SCUTES LOOSE, PALE, DULL, WITH MODERATE PEELING. SUTURES SEPARATING AND BONE SURFACE IS FISSURED, EDGES ARE ROUGHENED (FISSURED UNDER HAND LENS) AND CHIP FAIRLY EASILY

>>4 YRS- DISARTICULATED AND DISARTICULATING. BONE EDGES CHIP AND MAY CRUMBLE EASILY. SCUTES ARE PEELING AND CURLED


Eldorado-Ivanpah
Transmission Project
Desert Tortoise Sign
Observed in 2008 Surveys
Figure 2a
Legend
Eldorado
Substation
DRAFT
April 2009

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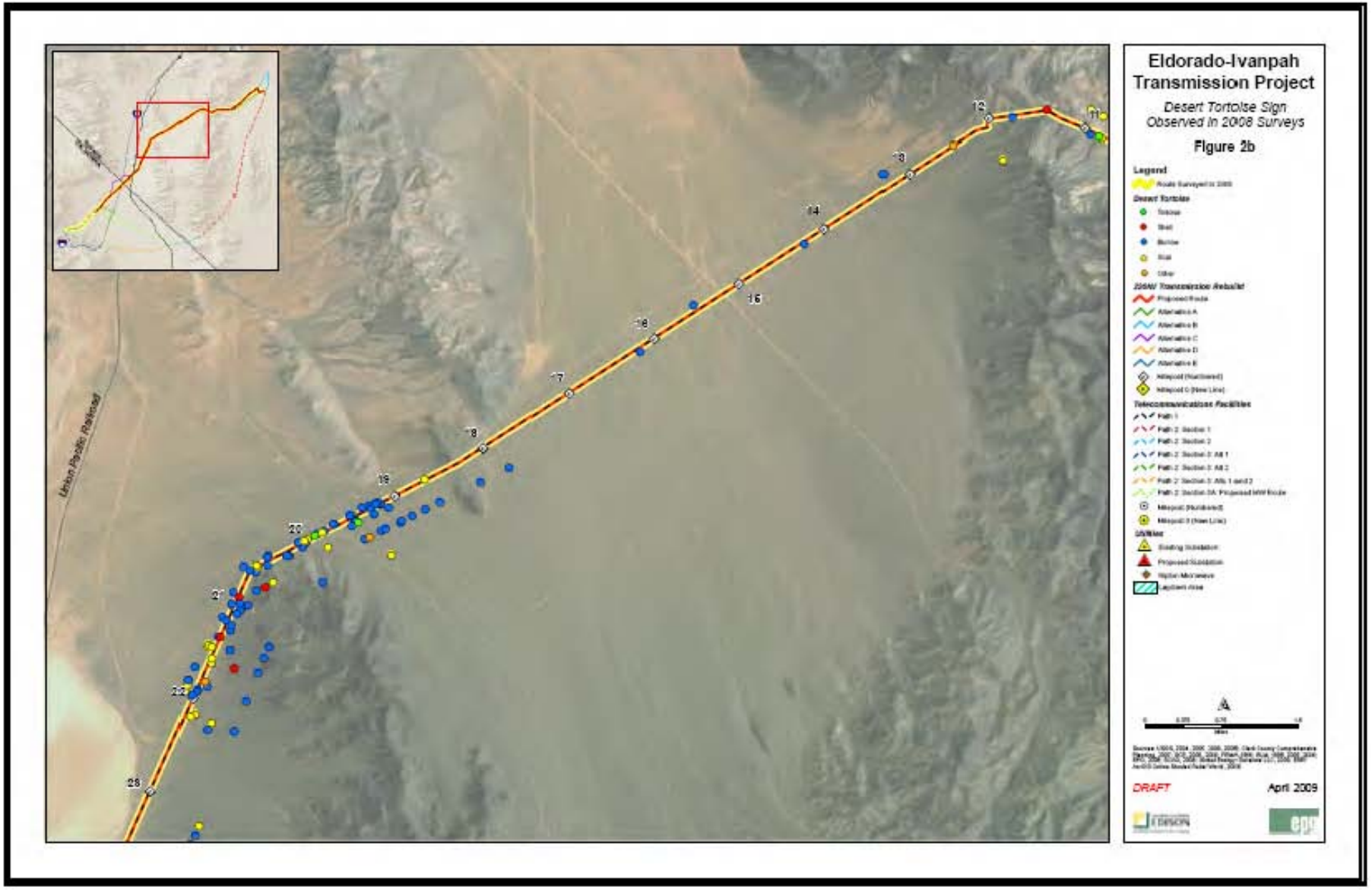
Eldorado-Ivanpah
Transmission Project
Desert Tortoise Sign
Observed in 2008 Surveys
Figure 2b
Legend
Desert Tortoise
Live
Shell
Burrow
Scat
Other
Telecommunication Facilities
Utilities
DRAFT
April 2009
Union Pacific Railroad
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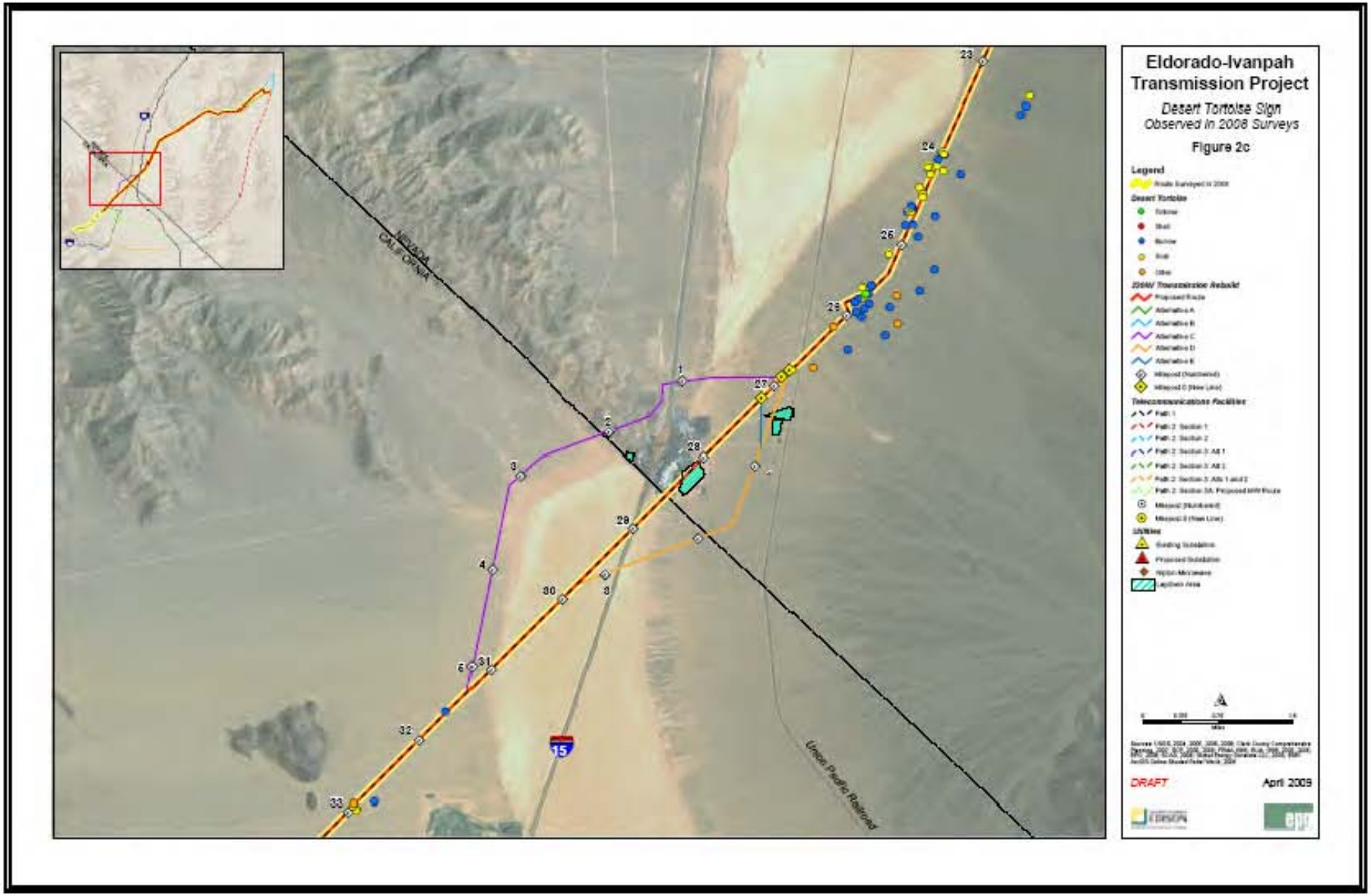
Eldorado-Ivanpah
Transmission Project
Desert Tortoise Sign
Observed in 2008 Surveys
Figure 2c
Legend
Desert Tortoise
Telecommunications Facilities
Utilities
DRAFT
April 2009
NEVADA
CALIFORNIA
Union Pacific Railroad
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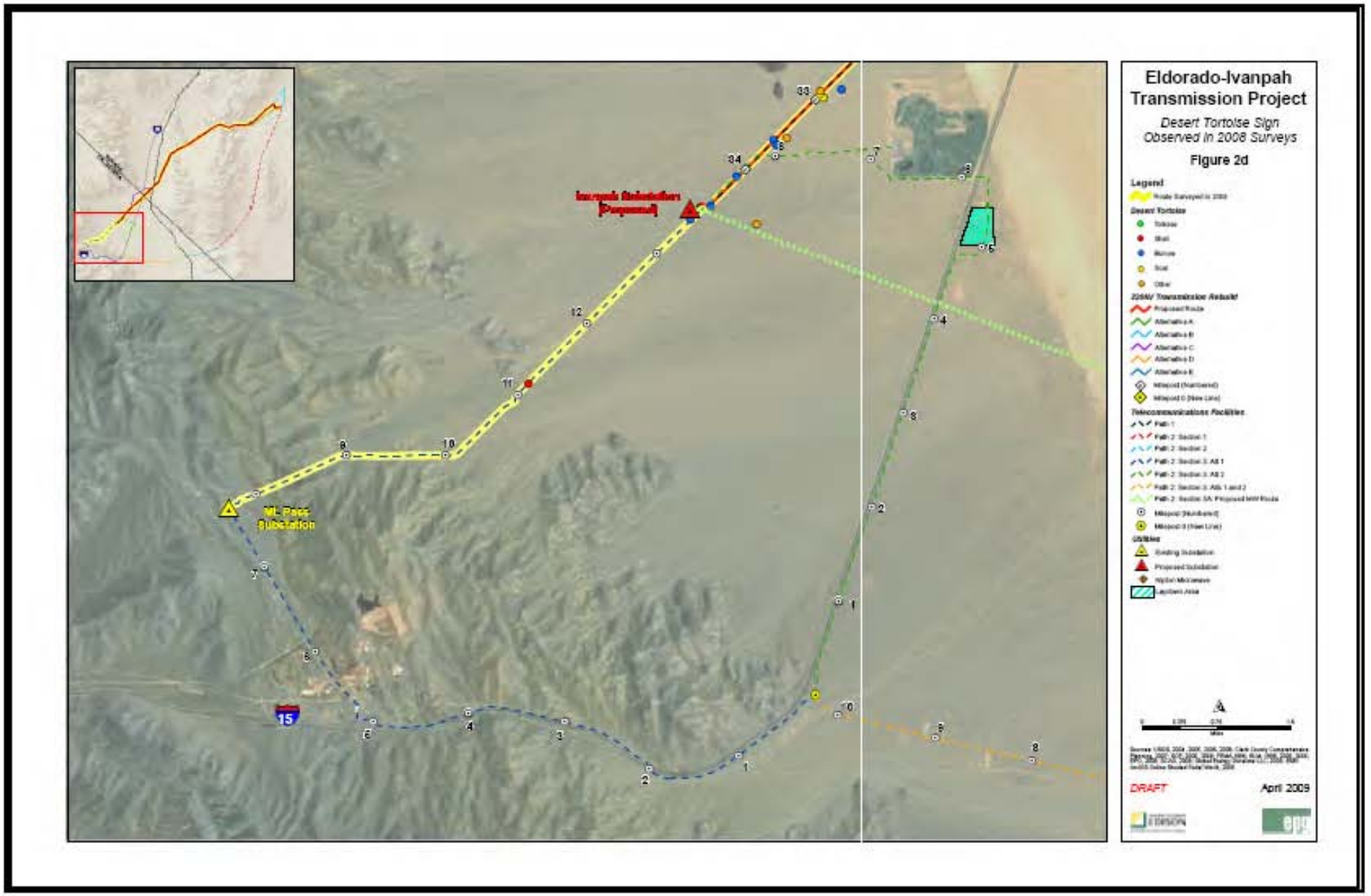
Eldorado-Ivanpah
Transmission Project
Desert Tortoise Sign
Observed in 2008 Surveys
Figure 2d
Legend
Desert Tortoise
220kV Transmission Rebuild
Telecommunications Facilities
Utilities
DRAFT
April 2009
Ivanpah Substation
Proposed
ML Pass
Substation
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KEY TO SIGN CLASSES

(Alice Karl, 2001)

BURROWS

1 - DEFINITELY TORTOISE - FRESH (TRACKS, TORTOISE INSIDE, FRESHLY DISTURBED SOIL ON MOUND/RUNWAY)
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3 - DEFINITELY TORTOISE – NOT USED THIS SEASON (PROBABLY HAS ANNUALS GROWING IN RUNWAY)
4 - POSSIBLY TORTOISE – IN GOOD CONDITION BY UNSURE OF SPECIES USING BURROW
5 - DEFINITELY TORTOISE – DETERIORATED SUCH THAT IT WOULD REQUIRE SUBSTANTIAL REMODELING TO BE USABLE
6 - POSSIBLY TORTOISE – DETERIORATED

SCAT

TY1 - WET OR FRESH, DARK, ODORIFEROUS
TY2 - DRIED, POSSIBLE GLAZE ON PART; UNEXPOSED SURFACES DARK BROWN; SLIGHT ODOR
TY3 - DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; VERY SLIGHT ODOR
NTY3- DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; NO ODOR (DISTINGUISHES FROM TY3)
NTY4- DRIED, LOOSENING, PALE OR BLEACHED

CARCASSES – GENERAL INDICATORS FOR TIME SINCE DEATH

<1 YR - UNEXPOSED SCUTES NORMAL COLOR AND SHEEN, ADHERE TIGHTLY. EXPOSED SCUTES PALING AND MAY BE LIFTING OR OFF. UNEXPOSED BONE WAXY AND SOLID.

1-2 YRS - UNEXPOSED SCUTES NORMAL COLOR WITH SLIGHT SHEEN, MOSTLY TIGHTLY ATTACHED. EXPOSED SCUTES SLIGHTLY PALE WITH NO SHEEN AND NO TO SLIGHT GROWTH RING PEELING. NO ODOR. UNEXPOSED BONE SILKY.

2-3 YRS - UNEXPOSED SCUTES PALE AND WITHOUT SHEEN BUT NO GROWTH RING PEELING. EXPOSED SCUTES PALE WITH SLIGHT PEELING. SCUTES LOOSE, OFF AND/OR TIGHT. BONE SUTURES GENERALLY TIGHT.

4 YRS - UNEXPOSED SCUTES NORMAL COLOR TO SLIGHTLY PALE, NO SHEEN, NO PEELING. EXPOSED SCUTES LOOSE, PALE, DULL, WITH MODERATE PEELING. SUTURES SEPARATING AND BONE SURFACE IS FISSURED, EDGES ARE ROUGHENED (FISSURED UNDER HAND LENS) AND CHIP FAIRLY EASILY

>>4 YRS- DISARTICULATED AND DISARTICULATING. BONE EDGES CHIP AND MAY CRUMBLE EASILY. SCUTES ARE PEELING AND CURLED

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ATTACHMENT 1

Sample Desert Tortoise and Special-Status Species Data Form and Key for the Eldorado-Ivanpah 2008 Desert Tortoise Surveys

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Attachment 1. Sample Desert Tortoise and Special-Status Species Form, Front Side

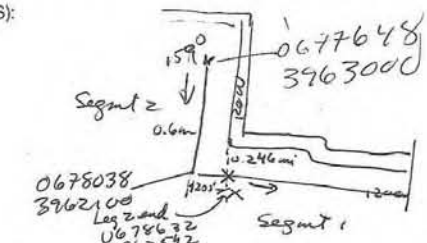
SCE BRIGHTSOURCE PROJECT
2008 DESERT TORTOISE SURVEYS

DATE: May 16, 08
TIME (START) Segmt 1 1406 - 1441
(FINISH) Segmt 2 - 1707
WEATHER: Clear
WIND SPEED ENE 3-6
T_{AIR}(°C) 33.5 $T_{GD\ SURF}$.(°C) 48.5
RECENT WEATHER Clear

OBSERVER Karl
LOCATION:
REGION El Dorado Substn
TRANSECT: ROW LOCATION Mile 1+2
ZONE (distance and direction from ROW) 1200 S
Segmt 1 Starting ~~Tower~~ Due S of N-S dog-leg
UTM(NAD 83) 0678568 E 3962698 N
Ending ~~Tower~~ @ Substn. -
UTM 0679632 E 3963337 N
TRANSECT WIDTH 30'
TRANSECT LENGTH 0.77 + 0.67 = 6.44 = 1.08 mi

GENERAL SITE DESCRIPTION:
VEGETATION, SHRUB LAYER (INCLUDING HERBACEOUS PERENNIALS):
ASPECT DOMINANTS LATR
COMMON SPECIES AMDU
OCCASIONAL SPECIES
% COVER Low - ~1%
DIVERSITY (RICHNESS) Low
AVERAGE HEIGHT (BY LAYER) 1700'

Leg 1 (E-W)

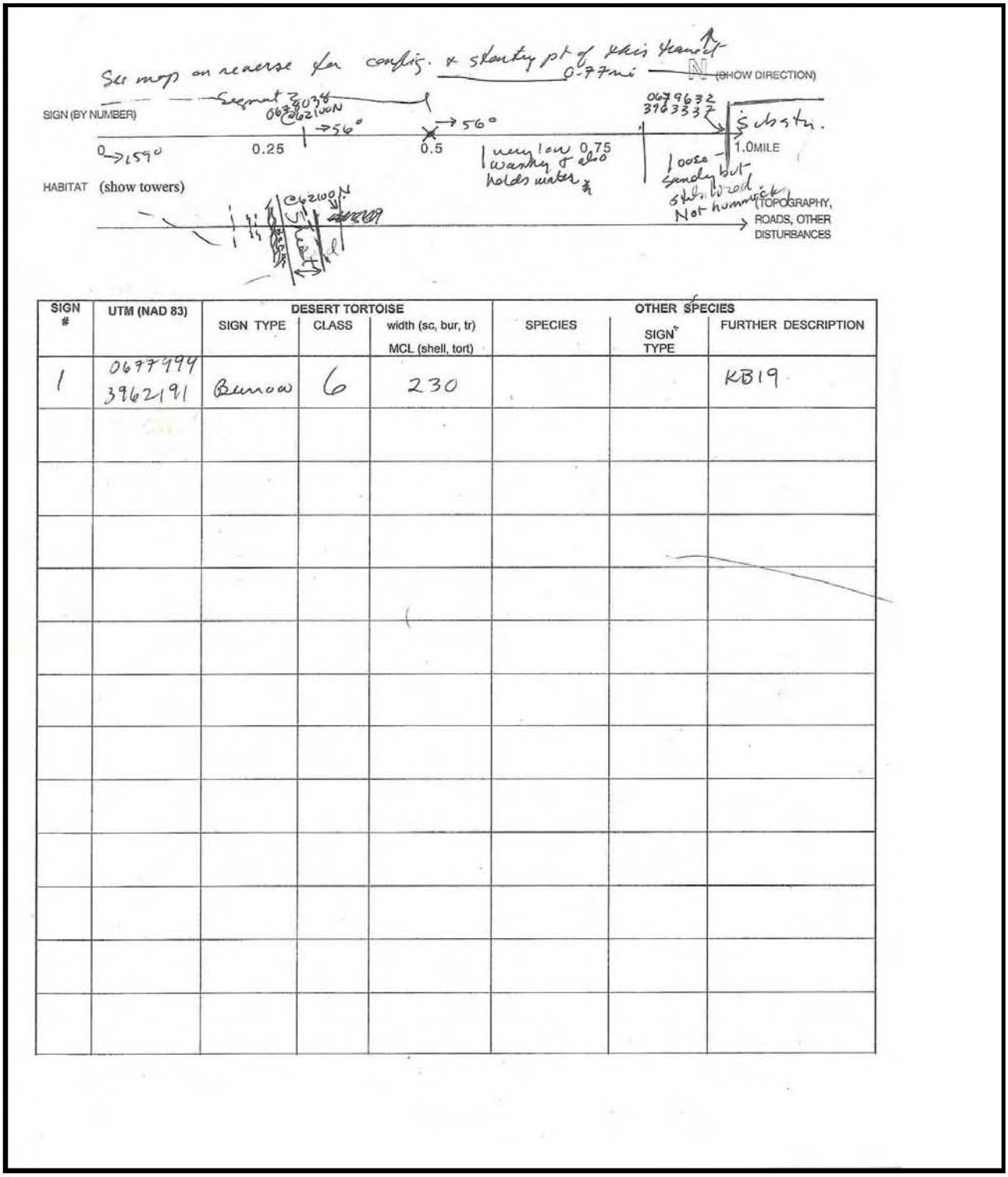


Leg 2 is like Leg 2 on 2400

VEGETATION, UNDERSTORY:
ABUNDANT SPECIES
TOPOGRAPHY
LANDFORM Valley
DRAINAGE TYPE Percolation + sheet
ELEVATION (STATE METERS OR FEET)
SUBSTRATE:
COLOR Pale, mottled dk gray in rills only
COARSE PARTICLES (TYPE, % COVER) Scattered sm. basaltic cobbles & rds
SOIL CONSISTENCE 0/G gravel w/ occa. cobbles (~15-20% Qua). Rest is scatt. fine grav
loose to soft sand. Stabilized
To east is just scattered gravel, ~25-40% total cover
PRESENCE OF PREDATORS:
Kit fox (den + digs)
HUMAN RELATED DISTURBANCES (ON SITE AND ADJACENT)
Substn; T-lines
SITE PICTURE: (Take a picture of the form first, then describe wht you are photographing on the project.) None
COMMENTS:

AEK 1987: REV 1992

Reverse Side of Data Form



SIGN #	UTM (NAD 83)	DESERT TORTOISE			OTHER SPECIES		
		SIGN TYPE	CLASS	width (sc, bur, tr) MCL (shell, tort)	SPECIES	SIGN TYPE	FURTHER DESCRIPTION
1	0677494 3962191	Burrow	6	230			KB19

APPENDIX F
GEOLOGY, MINERAL RESOURCES, AND SOILS TECHNICAL REPORT