

---

**Sheep Mountain Parkway – West Leg**

**Biological Resources Report**

---

**June 2013**



**City of Las Vegas**  
**Department of Public Works**

**Sheep Mountain Parkway – West Leg  
Biological Resources Report  
BLM Right-of-Way Number N-77772/A**

**June 2013**

*Prepared for:*



**Department of Public Works  
333 North Rancho Boulevard  
Las Vegas, NV 89106**

*and*



**3930 Howard Hughes Parkway, Suite 300  
Las Vegas, NV 89169**

*Prepared by:*



**7772 High Chaparral Street  
Las Vegas, NV 89113**

## TABLE OF CONTENTS

	Page No.
1.0 Introduction .....	1
2.0 Survey Area Location and Description .....	1
2.1 Location.....	1
2.2 General Description.....	1
3.0 Biological Resources of Interest .....	5
3.1 Federal Threatened or Endangered Species.....	5
3.2 BLM Sensitive Species.....	5
3.2.1 Plants.....	5
3.2.2 Wildlife.....	5
4.0 Survey Method.....	6
4.1 Desert Tortoise .....	6
4.2 Vegetation.....	7
4.3 Other Wildlife.....	7
5.0 Results .....	7
5.1 Desert Tortoise .....	7
5.2 Vegetation.....	9
5.2.1 Common Vegetation .....	9
5.2.2 Sensitive Species .....	9
5.2.3 Cactus and Yucca Species.....	9
5.3 Other Wildlife.....	9
6.0 Conclusions .....	10
7.0 References .....	10

## APPENDICES

Appendix A: Desert Tortoise Sign

Appendix B: Figures – Desert Tortoise Sign

Appendix C: Plant Species

## LIST OF FIGURES

	Page No.
Figure 1. Project Location.....	2
Figure 2. Sheep Mountain Parkway – West Leg.....	3
Figure 3. Biological Resources Survey Area .....	4

## LIST OF TABLES

	Page No.
Table 1. Tortoise Signs Observed.....	8

---

**ACRONYMS AND ABBREVIATIONS**

BLM	Bureau of Land Management
CC 215	Clark County Route 215
CI	confidence interval
CLV	City of Las Vegas
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
MCL	midline carapace length
mm	millimeters
NDOT	Nevada Department of Transportation
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resource Conservation Service
%	percent
RRCNCA	Red Rock Canyon National Conservation Area
ROW	right-of-way
SMP	Sheep Mountain Parkway
SNPLMA	Southern Nevada Public Land Management Act
U.S.	United States
US 95	U.S. Highway 95
USFWS	U.S. Fish and Wildlife Service

## 1.0 INTRODUCTION

The Sheep Mountain Parkway (SMP) was proposed in 2007 by the Federal Highway Administration (FHWA), Nevada Department of Transportation (NDOT), and the cities of Las Vegas and North Las Vegas as a transportation corridor extending from Interstate 15 west to U.S. Highway 95 (US 95) and south to Clark County Route 215 (CC 215). The proposed alternative alignments for the SMP transportation corridor were inside the Las Vegas Valley disposal boundary designated by the Southern Nevada Public Land Management Act (SNPLMA), except for the segment alternatives west of Puli Road. Biological resources data for the SMP were available for the alignments within the disposal boundary; the alignments outside the disposal boundary were surveyed in 2009.

Based on a number of external issues, SMP was placed on hold in 2010 and FHWA officially withdrew the project in 2012. The City of Las Vegas (CLV) submitted an amended application in 2012 to the Bureau of Land Management (BLM) to acquire right-of-way (ROW) across BLM-managed public land for the purpose of extending the existing western segment of the transportation corridor. The CLV proposes to complete the west segment (SMP-West Leg) from Fort Apache Road to the CC 215.

## 2.0 SURVEY AREA LOCATION AND DESCRIPTION

### 2.1 Location

The proposed transportation corridor is located in the northwest part of the Las Vegas Valley (Figure 1). The transportation corridor would extend from the existing SMP corridor at Puli Road north of Grand Teton Drive to the southern termini at CC 215 near Ann Road (Figure 2). The proposed ROW is generally located between the Kyle Canyon Detention Basin to the west and Puli Road to the east. The proposed ROW includes parts of Sections 11, 12, 14, 23, 25, and 26 in Township 19 South, Range 59 East, Mount Diablo Meridian.

The survey encompassed the project area south of the Red Rock Canyon National Conservation Area (RRCNCA) boundary and Grand Teton Drive to Tropical Parkway, and west from Puli Road to the Kyle Canyon Detention Basin and flood control levee/channel (Figure 3). The survey area covered approximately 630 acres. Section 25, which is east of Puli Road, is within the Las Vegas Valley land disposal boundary and had been surveyed previously; therefore, the project area (40 acres) within that section was not resurveyed. Section 26, which is west of Puli Road and south of Tropical Parkway, is outside the disposal boundary. This part of the project area (10 acres) was included in the survey completed for the mining and reclamation plan for the Lone Mountain Community Pit (BLM, 2008) and was not resurveyed.

### 2.2 General Description

The survey area is along the northwestern edge of the suburban expansion of the Las Vegas Valley, set on the valley floor off the east-facing alluvial slope of the La Madre Mountains. The area is at an elevation between 3,000 and 3,100 feet. The vegetation classification of the project area is the *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance (Peterson, 2008), which is dominated by creosote bush and white bursage. Soils are classified as Tencee and Dalian, very fine sandy gravelly loam (NRCS, 2013). These

Figure 1. Project Location

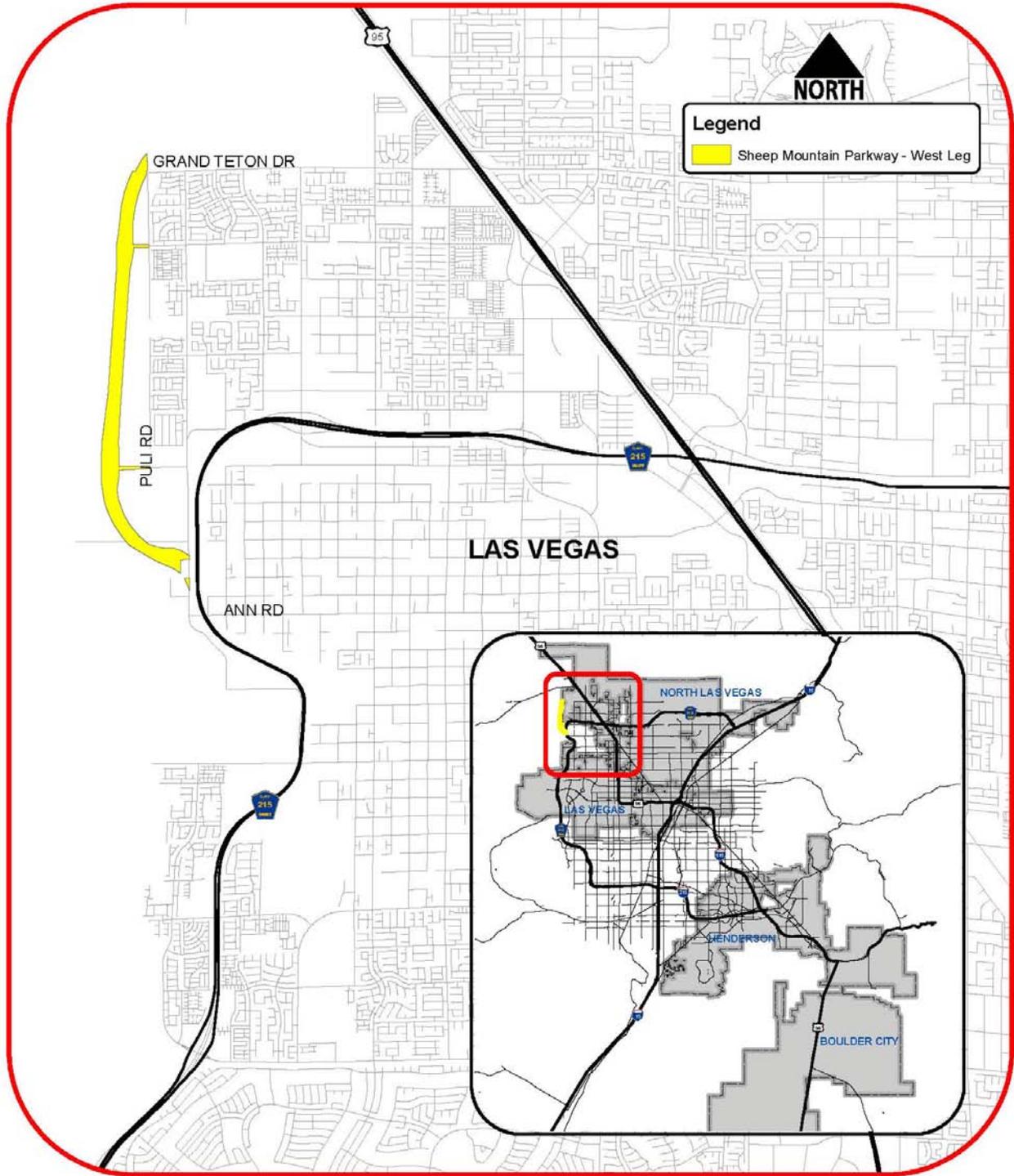


Figure 2. Sheep Mountain Parkway – West Leg

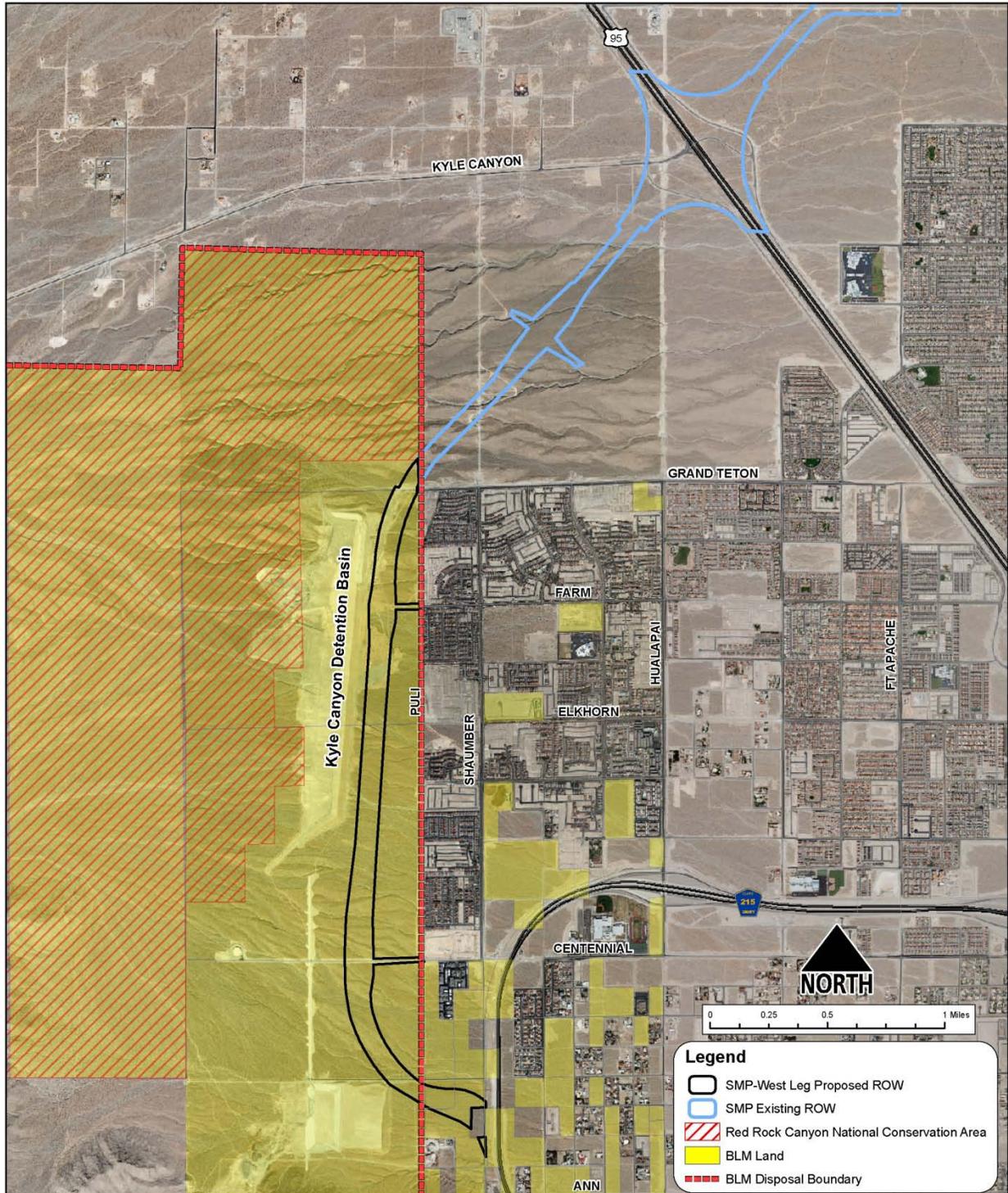
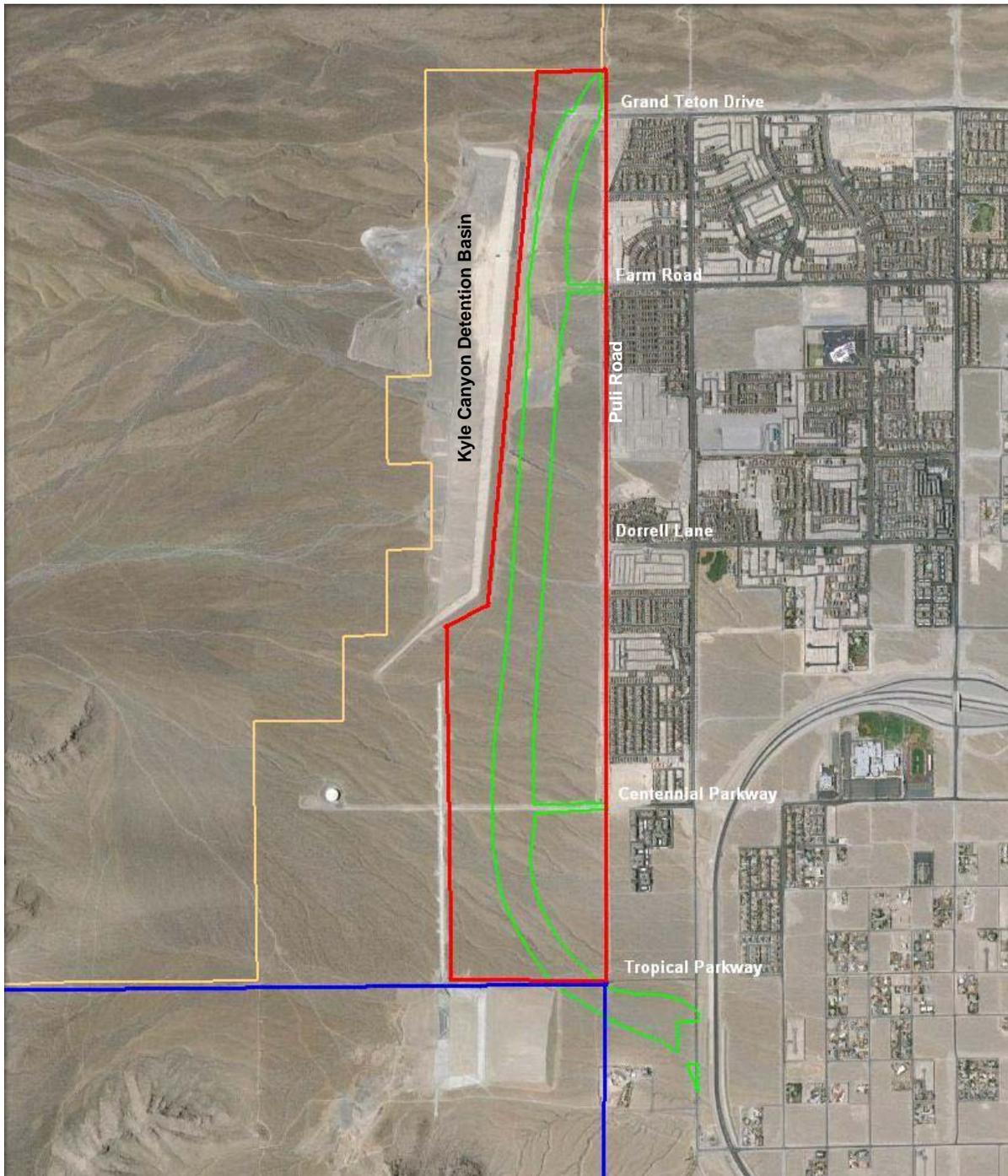


Figure 3. Biological Resources Survey Area



**LEGEND**

- Survey Area for Sheep Mountain Parkway-West Leg
- Proposed Right-of-Way for Sheep Mountain Parkway-West Leg
- Red Rock Canyon National Conservation Area Boundary
- Survey Area for Lone Mountain Community Pit

are well-drained soils found on 2 to 8 percent (%) slopes on alluvial fan remnants and skirts. The area is drained by a number of braided ephemeral washes with a few deeply incised washes. The Kyle Canyon Detention Basin and Gowan-Ann flood control levee and channel intercept storm flows and slow the rate of runoff across the area. The area is not located within a designated floodplain (FEMA, 2013).

### 3.0 BIOLOGICAL RESOURCES OF INTEREST

Knowledge of the project area, Nevada Natural Heritage Program (NNHP) data, and information from BLM and U.S. Fish and Wildlife Service (USFWS) sources were used to determine which protected plant and wildlife species could potentially occur in the project area.

#### 3.1 Federal Threatened or Endangered Species

The desert tortoise (*Gopherus agassizii*) was the only wildlife species federally listed under the Endangered Species Act as threatened or endangered that could occur in the project area. Throughout most of the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet, where precipitation ranges from 2 to 8 inches, the diversity of perennial plants is relatively high, and production of ephemerals is high. (USFWS, 2011)

There are no plants federally listed as a threatened or endangered species that occur in Clark County.

#### 3.2 BLM Sensitive Species

A species designated as “sensitive” by the BLM are taxa that are not already: (1) federally listed as threatened or endangered, or proposed as or a candidate species for such federal listing; or (2) listed by the State of Nevada as a protected species.

##### 3.2.1 Plants

The yellow twotone beardtongue (*Penstemon bicolor ssp. bicolor*) is the only BLM sensitive plant species known to occur in surrounding areas. This penstemon is commonly found at elevations between 2,500 to 5,480 feet in calcareous or carbonate soils in washes, rock crevices, outcrops, along roadsides, or similar places receiving enhanced runoff. The plant occurs in creosote-bursage, blackbrush, mixed-shrub, and the lower juniper zones. (NNHP, 2001)

##### 3.2.2 Wildlife

The wildlife species designated as sensitive by the BLM that could occur in the project area at the time the surveys were conducted in 2009 included the western burrowing owl (*Athene cunicularia*), chuckwalla (*Sauromalus ater*), and banded Gila monster (*Heloderma suspectum cinctum*). The Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis*) and Mojave Desert sidewinder (*Crotalus cerastes*) were added as BLM sensitive species in 2011. Brief descriptions of the species’ characteristics and habitat requirements follow.

The western burrowing owl nests and roosts in abandoned burrows, including those created by desert tortoises, and may also use natural cavities in rocks and openings in manmade structures. In the Mojave Desert, burrowing owls generally occur at low densities in scattered populations, and the presence of burrowing animals is a critical element of their habitat. Their diet consists primarily of large arthropods such as beetles, scorpions and grasshoppers, though small mammals such as mice, gophers and ground squirrels are also important food items. (NDOW, 2012)

The chuckwalla is restricted to rocky areas in desert flats, hillsides, and mountains where crevices are available for shelter and shade. They are primarily herbivorous, eating a variety of desert annuals and perennials, but they occasionally eat insects. (NDOW, 2012)

The banded gila monster is common in areas with saguaro cactus and along washes at elevations from near sea level to 4,100 feet. Its range is limited to regions that receive several inches of rain during the summer months and have mild winters and hot summers. The reptile uses old burrows and rocks for cover and spends a majority of its life underground. Gila monsters eat small mammals, eggs of ground-nesting birds and reptiles, lizards, insects and carrion (dead animals). (NDOW, 2012)

The Mojave shovel-nosed snake inhabits dry desert habitats with loose sand and often with little vegetation, such as washes, dunes, sandy flats, and rocky hillsides. It burrows underground in daytime but occasionally found by day in shaded areas. The snake eats insects, scorpions, spiders, centipedes, larval insects and moths, often while it is burrowing. (NDOW, 2012)

The Mojave Desert sidewinder is found from sea level to 6000 feet in a variety of desert habitats. It is most abundant in desert washes and flats with shrub cover and wind-blown sand, especially at the bases of bushes where it will partially bury itself when at rest. The snake eats small mammals and reptiles. (NDOW, 2012)

## **4.0 SURVEY METHOD**

### **4.1 Desert Tortoise**

Desert tortoise surveys were conducted in 2009 following the 1992 field survey protocol (USFWS 1992) for presence/absence. The purpose of this survey type is to determine impacts of potential land disturbance activities to the local tortoise population by identifying the number and location of tortoises and tortoise sign that occur within the project area. The project area is generally defined as the area that would be cleared or partially cleared, or where soils or vegetation would be damaged, fragmented, or disturbed. The project area covered by the survey is described in Section 2.1 and shown in Figure 2.

The project area was surveyed using transects approximately 30 feet wide for 100% coverage. Transects ranged from approximately 0.2 to 0.6 mile long and in both east/west and north/south directions. Surveyors meandered along the center line of transects to observe under and around vegetation where the ground surface was not clearly visible within the width of transects. There were no zone of influence transects because either the adjacent areas had previously been surveyed or there were manmade features as barriers to access. Observed sign (live tortoise, scat, burrow, carcass, tracks, etc.) within the project area were recorded using GPS and data sheets.

The USFWS revised the survey protocol for desert tortoise after the project area was surveyed. The revised protocol (USFWS, 2010) did not change the survey methodology for presence/absence for 100% coverage of the action area. The revised protocol defines the action area (versus project area) as all areas to be affected directly or indirectly, and not merely the immediate area involved in the action or the project footprint. The project (survey) area shown in Figure 3 is larger than the project footprint (proposed ROW) and accounts for adjacent areas that could potentially be directly or indirectly affected, and thus, adequately accounts for the action area.

## 4.2 Vegetation

Vegetation, including grasses, forbs, shrubs, trees, cacti, and yuccas, within the project area was recorded as transects were walked to identify tortoise sign. The plants observed were identified to their genus and species as best possible. Vegetation was recorded on note sheets; any observation of yellow twotone beardtongue, a BLM-designated sensitive plant, was recorded by GPS.

Cactus and yucca plants on BLM land are considered government property and are regulated under the Nevada BLM forestry program. Each surveyor kept a tally on note sheets of the number of individual cacti and yucca plants that were observed as transects were walked.

## 4.3 Other Wildlife

Species-specific surveys were not conducted for common wildlife or wildlife designated as sensitive by the BLM. Wildlife that were observed incidentally as transects were walked were recorded on note sheets.

# 5.0 RESULTS

## 5.1 Desert Tortoise

The survey covered the entire project area (action area) following 30-foot wide (approximately) belt transects for 100% coverage. The survey was conducted over seven days from May 30 to June 21, 2009. Prior to the revised protocol, the relative density or abundance of tortoises per square mile was calculated using the number of corrected tortoise signs observed per acre. Data collection and the survey time period were completed based on past acceptable practices under the 1992 protocol. The data are used to estimate the number of tortoises (abundance) within the action area following the calculation methodology presented in the revised protocol.

Under the revised protocol, the active period to conduct surveys is April and May; however, surveys outside the active period may be appropriate when only presence/absence is necessary. At the time the survey was completed, presence/absence was all that was necessary to assist with determining potential impacts and take because construction was years away. A clearance survey prior to construction was anticipated because the project area is outside the designated disposal boundary and would therefore be a likely mitigation measure to minimize potential take. Additionally, the survey was completed during air temperatures that were below 90°F (32°C) and following winter months (October through March) with slightly greater than average precipitation.

Table 1 summarizes the total numbers of tortoise signs observed during the survey. The list of individual desert tortoise sign is included in Appendix A. The figures in Appendix B show the locations of burrows (classes 1, 2, and 3) and where tortoises were observed in burrows and on the ground surface.

Table 1. Tortoise Signs Observed

Tortoise	Burrow	Carcass	Scat	Other*	Total
21	178	10	69	7	285
* Drinking sites, grazed vegetation, tracks					

To estimate the number of tortoises (abundance) within the action area, the USFWS has established a mathematical equation<sup>1</sup> that considers the number of tortoises observed above ground during the survey, with the probability that a tortoise is above ground and the probability of detecting that tortoise above ground. The revised protocol states that tortoises that are above ground include both those observed out of burrows (i.e., on the ground surface) and within burrows but still visible. The number of adult tortoises observed during the survey of the action area is entered in the part of the equation for the number of tortoises observed above ground. The USFWS defines an adult tortoise as having a midline carapace length (MCL) of greater than 160 millimeters (mm).

The live tortoises were not handled and were not approached when observed on the ground surface. The MCL of a tortoise observed on the surface was visually estimated. The MCL of a tortoise observed in a burrow was also estimated based on how much of the tortoise was visible and the dimensions of the burrow.

Of the 21 live tortoises observed, 7 were above ground and 14 were in burrows. Based on visual estimates of the MCL being greater than or less than 160 mm, 6 of the 7 tortoises observed above ground and 9 of the 14 tortoises observed in burrows were recorded as adults. In summary, there were 15 adult and 6 juvenile tortoises observed.

For the USFWS equation, the probability that a desert tortoise is above ground (Pa) is relative to the previous winter rainfall (October through March). With rainfall greater than 1.5 inches, Pa is 0.80. Total precipitation recorded at North Las Vegas (weather station closest to the project area) for October 2008 through March 2009 was 3.02 inches (WRCC, 2012). The probability of detecting a tortoise if observed above ground (Pd) is set at 0.63. Because the size of the action area is the same as the area surveyed, that value in the equation is 1.

Following the USFWS equation shown in the footnote with the values described above, the estimated number of tortoises within the action area is 30. A 95% confidence interval (CI) is calculated using additional equations (Table 3 from the 2010 protocol) in an Excel™ spreadsheet created by the USFWS.

---


$$\begin{matrix}
 \text{(Estimated number of tortoises)} \\
 \text{within action area}
 \end{matrix}
 = \frac{\begin{matrix} \text{(Number of tortoises} \\ \text{observed above ground)} \end{matrix}}{\begin{matrix} \text{Probability that} \\ \text{a tortoise is} \\ \text{above ground (P}_a\text{)} \end{matrix} \begin{matrix} \text{Probability of} \\ \text{detecting a tortoise,} \\ \text{if above ground (P}_d\text{)} \end{matrix}} \begin{matrix} \text{(Size of action area)} \\ \text{Size of area surveyed} \end{matrix}$$

<sup>1</sup>

The CI is used to indicate the reliability of an estimate and provides a range of values which is likely to include the estimate. Using the spreadsheet for transects of various lengths, the estimated number (abundance) is 37 tortoises with a range from 17 to 77 tortoises at the 95% CI. Based on the action area of 630 acres (2.55 square kilometers – km<sup>2</sup>), the density would range from 7 to 30 tortoises per

The survey completed for the mining and reclamation plan for the Lone Mountain Community Pit (BLM, 2008) covered the part of the project area (10 acres) that is south of Tropical Parkway and west of Puli Road. There were no live tortoises and no other tortoise signs recorded in this part of the project area.

The part of the project area (40 acres) east of Puli Road is inside the land disposal boundary. There were 2 tortoise burrows previously recorded in this part of the project area.

## 5.2 Vegetation

### 5.2.1 Common Vegetation

The vegetation classification of the project area is the *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance (Peterson, 2008), which, as the name suggests, is dominated by creosote bush and white bursage. Other more common desert plants in the project area included four-wing saltbush (*Atriplex canescens*), ephedra (*Ephedra* sp.), brittlebush (*Encelia* sp.), and bladder sage (*Salazaria mexicana*). The list of plant species observed in the project area is included in Appendix C.

### 5.2.2 Sensitive Species

One penstemon plant was observed in the project area in a braid to an ephemeral wash just off the west end of Farm Road. The plant was not flowering so it could not be identified with certainty as to its species of *bicolor* (yellow or rosy twotone beardtongue) or *palmeri* (Palmer's penstemon).

### 5.2.3 Cactus and Yucca Species

Cactus and yucca plants on BLM land are considered government property and are regulated under the Nevada BLM forestry program. The list of species with the numbers observed in the project area is included in Appendix C. Approximately 4,780 cactus and yucca plants were observed, with cottontop cactus (*Echinocactus polycephalus*), hedgehog cactus (*Echinocereus engelmannii*), and Mojave yucca (*Yucca schidigera*) in the greatest abundance. The density of cactus and yucca plants averaged across the project area was approximately 10 plants per acre, with higher numbers in the area south of the detention basin because of less existing ground disturbance.

## 5.3 Other Wildlife

The project area does not provide the typical habitat requirements of rocky areas with crevices for the banded gila monster or chuckwalla, and neither species was observed during field surveys. No snakes or signs of snakes (characteristic tracks of the sidewinder, other slither patterns, shed skin) were observed. There were a number of burrows and cavities eroded in wash banks that could be used by the western burrowing owl, but no owls were observed. Common wildlife observed during field surveys included white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit (*Lepus californicus*), zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), mourning

dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), and common raven (*Corvus corax*).

## 6.0 CONCLUSIONS

The project area supports desirable habitat for the desert tortoise as evidenced by the observations of a number of live tortoises, including juveniles. All condition classes of burrows were observed with many recorded in good condition with recent tortoise sign.

## 7.0 REFERENCES

- BLM (Bureau of Land Management). 2004. Las Vegas Valley Disposal Boundary Environmental Impact Statement, Final. December.
- BLM (Bureau of Land Management). 2008. Appendix O, Biological Resource Survey Report for the Lone Mountain Community Pit. Mining and Reclamation Plan for the Lone Mountain Community Pit, Las Vegas, Nevada. March 31, 2008.
- FEMA (Federal Emergency Management Agency). 2013. Map Service Center. Retrieved from <https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>
- NRCS (Natural Resource Conservation Service). 2013. Web Soil Survey website. Retrieved from <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>
- NDOW (Nevada Department of Wildlife). 2012. Nevada Animals – Reptiles, Birds. Retrieved from <http://www.ndow.org/Species/Reptiles/>
- NNHP (Nevada Natural Heritage Program). 2001. Rare Plant Fact Sheet, *Penstemon bicolor* ssp. *bicolor*. June 25, 2001.
- NNHP (Nevada Natural Heritage Program). 2013. Species Information – *Penstemon bicolor* ssp. *bicolor*. Retrieved from [http://heritage.nv.gov/taxon\\_detail/15340](http://heritage.nv.gov/taxon_detail/15340)
- Peterson, E.B. 2008. International Vegetation Classification Alliances and Associations Occurring in Nevada with Proposed Additions, 2008 Edition (First). Nevada Natural Heritage Program, Carson City, Nevada. March 11. Retrieved from <http://heritage.nv.gov/sites/default/files/Library/ivclist.pdf>
- USFWS (U.S. Fish and Wildlife Service). 1992. Field Survey Protocol for Any Federal Action that May Occur Within the Range of the Desert Tortoise. January 1992.
- USFWS (U.S. Fish and Wildlife Service). 2010. Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*). 2010 Field Season

USFWS (U.S. Fish and Wildlife Service). 2011. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

USFWS (U.S. Fish and Wildlife Service). 2012. Nevada's Protected Species by County. Updated December 13, 2012. Retrieved from [http://www.fws.gov/nevada/protected\\_species/species\\_by\\_county.html](http://www.fws.gov/nevada/protected_species/species_by_county.html).

WRCC (Western Regional Climate Center). 2012. Monthly Total Precipitation (inches), North Las Vegas, Nevada. Retrieved from <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv5705>.

**Appendix A:  
Desert Tortoise Sign**

---

**Tortoises Observed within Project Area, May-June 2009**

<b>Number</b>	<b>Sign</b>	<b>Easting</b>	<b>Northing</b>	<b>Comments*</b>
1	Tortoise	649638	4015564	in burrow; adult
2	Tortoise	649487	4015901	in burrow; adult; caliche cave; scat (1)
3	Tortoise	649367	4015563	in burrow; adult; scat (1)
4	Tortoise	649403	4015769	in burrow; adult; drinking site
5	Tortoise	649215	4015538	adult female
6	Tortoise	649201	4015477	juvenile
7	Tortoise	649198	4015589	adult male
8	Tortoise	649106	4015421	in burrow; adult
9	Tortoise	649101	4015384	in burrow; juvenile male
10	Tortoise	649061	4015852	in burrow; adult
11	Tortoise	649329	4016592	adult; scat (1)
12	Tortoise	649364	4016732	in burrow; juvenile
13	Tortoise	649396	4016693	in burrow; juvenile
14	Tortoise	649470	4016044	in burrow; juvenile
15	Tortoise	649501	4016074	in burrow; adult
16	Tortoise	649492	4018772	adult
17	Tortoise	649471	4018762	adult
18	Tortoise	649439	4018802	adult
19	Tortoise	649594	4017703	in burrow; adult
20	Tortoise	649575	4017843	in burrow; adult
21	Tortoise	649429	4017188	in burrow; juvenile
* (#)				
1 = scat was wet or freshly dried; obvious odor				

---

**Burrows Observed within Project Area, May-June 2009**

Number <sup>1</sup>	Sign	Easting	Northing	Class <sup>2</sup>	Comments <sup>3</sup>
1	Burrow	649642	4015534	2	
2	Burrow	649629	4015569	2	scat (2)
3	Burrow	649638	4015564	1	tortoise in burrow; adult
4	Burrow	649614	4015580	2	scat (2)
5	Burrow	649602	4015580	2	
6	Burrow	649638	4015616	2	
7	Burrow	649632	4015671	3	
8	Burrow	649624	4015680	2	
9	Burrow	649633	4015710	1	scat (1)
10	Burrow	649520	4015743	1	
11	Burrow	649563	4015222	3	burrow in wash bank; scat (3)
12	Burrow	649610	4015234	4	
13	Burrow	649401	4015238	1	scat (1)
14	Burrow	649403	4015231	3	collapsed
15	Burrow	649403	4015231	3	adjacent burrow; collapsed
16	Burrow	649484	4015428	3	collapsed
17	Burrow	649482	4015456	3	scat (3)
18	Burrow	649480	4015805	2	
19	Burrow	649495	4015818	1	drinking site
20	Burrow	649487	4015901	1	tortoise in burrow; adult; caliche cave; scat (1)
21	Burrow	649469	4015811	2	
22	Burrow	649352	4015215	3	
23	Burrow	649377	4015289	1	scat (1)
24	Burrow	649367	4015563	1	tortoise in burrow; adult; scat (1)
25	Burrow	649403	4015769	1	tortoise in burrow; adult; drinking site
26	Burrow	649403	4015769	1	adjacent burrow
27	Burrow	649378	4015901	2	scat (4)
28	Burrow	649356	4015894	3	collapsed
29	Burrow	649365	4015779	1	scat (1)
30	Burrow	649317	4015529	2	scat (2)
31	Burrow	649334	4015322	3	
32	Burrow	649346	4015222	3	
33	Burrow	649310	4015173	3	
34	Burrow	649280	4015263	1	2 adjacent caliche dens; scat (1)
35	Burrow	649293	4015349	5	
36	Burrow	649263	4015346	2	
37	Burrow	649284	4015556	2	scat (2)
38	Burrow	649321	4015902	2	
39	Burrow	649275	4015872	3	
40	Burrow	649259	4015696	2	
41	Burrow	649257	4015565	3	
42	Burrow	649200	4015308	4	
43	Burrow	649147	4015385	1	
44	Burrow	649211	4015878	2	scat (3)
45	Burrow	649225	4015906	2	scat (3)

Number <sup>1</sup>	Sign	Easting	Northing	Class <sup>2</sup>	Comments <sup>3</sup>
46	Burrow	649225	4015906	2	adjacent burrow; scat (4)
47	Burrow	649106	4015421	1	tortoise in burrow; adult
48	Burrow	649126	4015394	2	scat (3)
49	Burrow	649101	4015384	2	2 adjacent burrow
50	Burrow	649101	4015384	1	tortoise in burrow; juvenile; male
51	Burrow	649123	4015303	3	
52	Burrow	649077	4015280	2	
53	Burrow	649127	4015781	4	
54	Burrow	649061	4015852	1	tortoise in burrow; adult
55	Burrow	648985	4015514	2	
56	Burrow	648954	4015583	3	
57	Burrow	648963	4015896	4	
58	Burrow	648957	4015896	3	caliche den; scat (5)
59	Burrow	649037	4016404	4	
60	Burrow	649020	4016365	2	adjacent caliche den
61	Burrow	649011	4016087	4	adjacent caliche den
62	Burrow	649016	4016082	2	adjacent caliche den; scat (2)
63	Burrow	649037	4016166	4	
64	Burrow	649081	4016194	2	scat (2)
65	Burrow	649049	4016288	2	caliche den; scat (2)
66	Burrow	649074	4016444	2	scat (5)
67	Burrow	649081	4016438	2	
68	Burrow	649141	4016558	2	
69	Burrow	649164	4016497	2	caliche den
70	Burrow	649117	4016387	2	scat (2)
71	Burrow	649119	4016363	2	scat (3)
72	Burrow	649114	4016283	2	scat (3)
73	Burrow	649093	4016259	1	caliche den; scat (1)
74	Burrow	649080	4016163	5	
75	Burrow	649078	4016096	2	
76	Burrow	649174	4016190	2	
77	Burrow	649142	4016195	2	scat (4)
78	Burrow	649162	4016286	3	scat (4)
79	Burrow	649286	4016704	1	scat (2); drinking site
80	Burrow	649263	4016475	3	adjacent caliche dens; scat (4); carcass (5)
81	Burrow	649225	4016271	2	caliche den; scat (3)
82	Burrow	649260	4016266	2	adjacent caliche dens; scat (2)
83	Burrow	649247	4016132	2	
84	Burrow	649218	4015993	2	
85	Burrow	649291	4016098	2	scat (3)
86	Burrow	649293	4016475	2	
87	Burrow	649364	4016732	1	tortoise in burrow; juvenile
88	Burrow	649347	4016117	5	
89	Burrow	649349	4016263	5	2 adjacent burrows
90	Burrow	649385	4016553	2	
91	Burrow	649402	4016619	3	scat (5)

Number <sup>1</sup>	Sign	Easting	Northing	Class <sup>2</sup>	Comments <sup>3</sup>
92	Burrow	649396	4016693	1	tortoise in burrow; juvenile
93	Burrow	649462	4016855	2	
94	Burrow	649444	4016794	3	
95	Burrow	649440	4016770	2	scat (2)
96	Burrow	649422	4016542	3	
97	Burrow	649453	4016422	1	caliche den; scat (1)
98	Burrow	649413	4016303	3	scat (2)
99	Burrow	649411	4016255	2	
100	Burrow	649408	4016233	2	caliche den
101	Burrow	649443	4016017	2	scat (2)
102	Burrow	649470	4016044	1	tortoise in burrow; juvenile
103	Burrow	649446	4016058	3	
104	Burrow	649442	4016163	2	
105	Burrow	649508	4016518	2	
106	Burrow	649477	4016671	2	
107	Burrow	649475	4016824	5	
108	Burrow	649505	4016346	3	
109	Burrow	649512	4016189	2	4 adjacent caliche dens; scat (2)
110	Burrow	649499	4016109	2	2 adjacent burrows; scat (3)
111	Burrow	649501	4016074	1	tortoise in burrow; adult
112	Burrow	649481	4016034	2	caliche den
113	Burrow	649476	4016913	2	
114	Burrow	649576	4019077	2	
115	Burrow	649571	4018934	5	
116	Burrow	649579	4018873	2	
117	Burrow	649585	4018572	2	
118	Burrow	649592	4018446	2	scat (2)
119	Burrow	649493	4018781	1	tortoise nearby
120	Burrow	649494	4018973	3	
121	Burrow	649372	4018627	2	
122	Burrow	649372	4018548	5	
123	Burrow	649401	4018550	2	
124	Burrow	649401	4018515	3	2 adjacent burrows
125	Burrow	649418	4018454	1	tortoise nearby
126	Burrow	649445	4018520	1	scat (2); drinking site
127	Burrow	649506	4018232	3	
128	Burrow	649520	4018332	2	
129	Burrow	649590	4018211	2	
130	Burrow	649310	4017526	2	2 adjacent caliche dens; scat (3)
131	Burrow	649546	4017463	2	scat (2)
132	Burrow	649393	4017585	5	2 adjacent burrows
133	Burrow	649274	4017599	2	scat (3); carcass (5)
134	Burrow	649213	4017663	4	scat (5)
135	Burrow	649404	4017594	4	3 adjacent burrows; carcass (5)
136	Burrow	649422	4017587	2	scat (2)
137	Burrow	649461	4017632	2	

Number <sup>1</sup>	Sign	Easting	Northing	Class <sup>2</sup>	Comments <sup>3</sup>
138	Burrow	649353	4017717	3	
139	Burrow	649478	4017692	1	tortoise in burrow; adult
140	Burrow	649594	4017703	2	
141	Burrow	649252	4017771	2	
142	Burrow	649507	4019324	3	
143	Burrow	649347	4019140	3	caliche den
144	Burrow	649400	4019342	3	
145	Burrow	649461	4017776	2	
146	Burrow	649534	4017815	2	
147	Burrow	649558	4017963	2	
148	Burrow	649535	4017927	2	scat (3)
149	Burrow	649553	4017924	3	
150	Burrow	649575	4017843	1	tortoise in burrow; adult
151	Burrow	649449	4017454	2	5 adjacent caliche dens; scat (3)
152	Burrow	649278	4017272	2	
153	Burrow	649421	4017212	2	caliche den
154	Burrow	649442	4017223	2	
155	Burrow	649551	4017155	2	2 adjacent caliche dens
156	Burrow	649429	4017188	1	tortoise in burrow; juvenile
157	Burrow	649309	4017217	2	
158	Burrow	649306	4017143	2	
159	Burrow	649612	4016161	5	caliche den
160	Burrow	649625	4016364	5	caliche den

<sup>1</sup> Total listed is less than total observed because of number of adjacent burrows.

<sup>2</sup> Class descriptors:

- 1 = Currently active, with tortoise or recent tortoise sign
- 2 = Good condition. definitely tortoise; no evidence of recent use
- 3 = Deteriorated, definitely tortoise
- 4 = Deteriorated, possibly tortoise
- 5 = Good condition, possibly tortoise

<sup>3</sup> Scat (#) descriptors:

- 1 = Wet (but not from rain or dew) or freshly dried, obvious odor
- 2 = Dry with glaze and some odor; no bleaching; dark brown
- 3 = Dry without glaze or odor; light brown; tightly packed material
- 4 = Dry without glaze or odor; yellow; loose material; scaly appearance
- 5 = Dry without glaze or odor; bleached white; tightly packed material

<sup>3</sup> Carcass (#) descriptors:

- 1 = Fresh or putrid, tissue present
- 2 = Normal color, scutes adhered to bone
- 3 = Scutes peeling off bone
- 4 = Bones falling apart, growth rings on scutes are peeling
- 5 = Disarticulated and scattered

Easting/Northing coordinates are Universal Transverse Mercator North American Datum 83, Zone 11S

### Other Tortoise Sign Observed Individually within Project Area, May-June 2009

Number <sup>1</sup>	Sign	Easting	Northing	Comments <sup>2</sup>
1	Scat	649484	4015753	3
2	Scat	649400	4015776	1
3	Scat	649134	4016312	1
4	Scat	649192	4016423	2
5	Scat	649216	4015978	1
6	Scat	649397	4016266	1
7	Scat	649538	4016879	1
8	Scat	649473	4018899	1
9	Scat	649584	4018287	1
10	Scat	649517	4017411	1
11	Scat	649270	4017244	2
Number <sup>1</sup>	Sign	Easting	Northing	Comments <sup>3</sup>
1	Carcass	649197	4015371	2
2	Carcass	649080	4015883	5
3	Carcass	649432	4016257	4
4	Carcass	649483	4018970	3
5	Carcass	649489	4017547	4
6	Carcass	649448	4017584	5
7	Carcass	649476	4017409	5
8	Carcass	649336	4017480	5
Number <sup>1</sup>	Sign	Easting	Northing	Comments
1	Misc	649140	4016352	drinking site
2	Misc	649329	4017005	vegetation grazed
3	Misc	649400	4015776	drinking site

<sup>1</sup> Total listed is less than total observed because of collocation with other sign.

<sup>2</sup> Scat (#) descriptors:

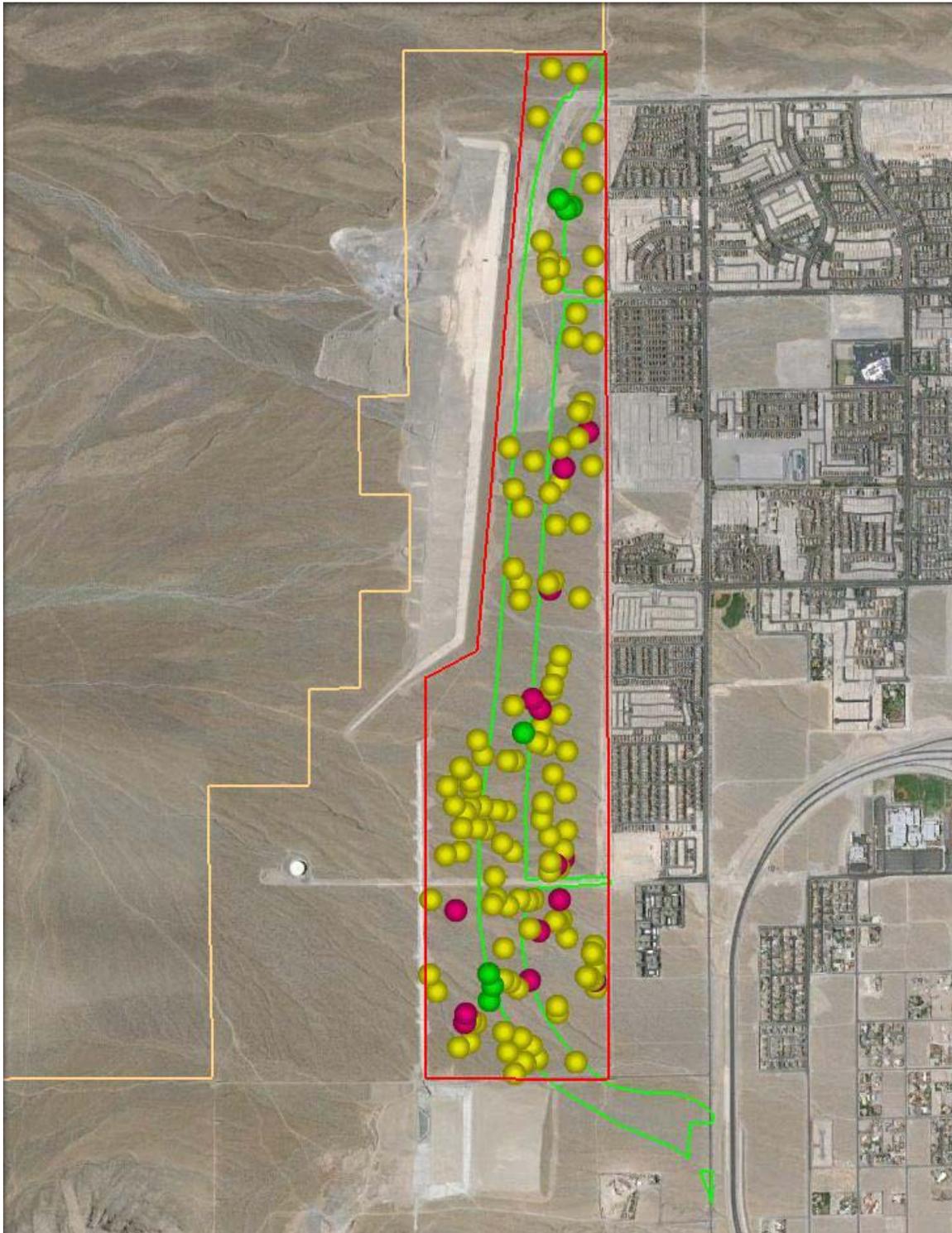
- 1 = Wet (but not from rain or dew) or freshly dried, obvious odor
- 2 = Dry with glaze and some odor; no bleaching; dark brown
- 3 = Dry without glaze or odor; light brown; tightly packed material
- 4 = Dry without glaze or odor; yellow; loose material; scaly appearance
- 5 = Dry without glaze or odor; bleached white; tightly packed material

<sup>3</sup> Carcass (#) descriptors:

- 1 = Fresh or putrid, tissue present
- 2 = Normal color, scutes adhered to bone
- 3 = Scutes peeling off bone
- 4 = Bones falling apart, growth rings on scutes are peeling
- 5 = Disarticulated and scattered

**Appendix B:  
Figures – Desert Tortoise Sign**

**Tortoises and Burrows Observed in Survey (Action) Area**



**LEGEND**

— Survey Area

— Proposed Project ROW

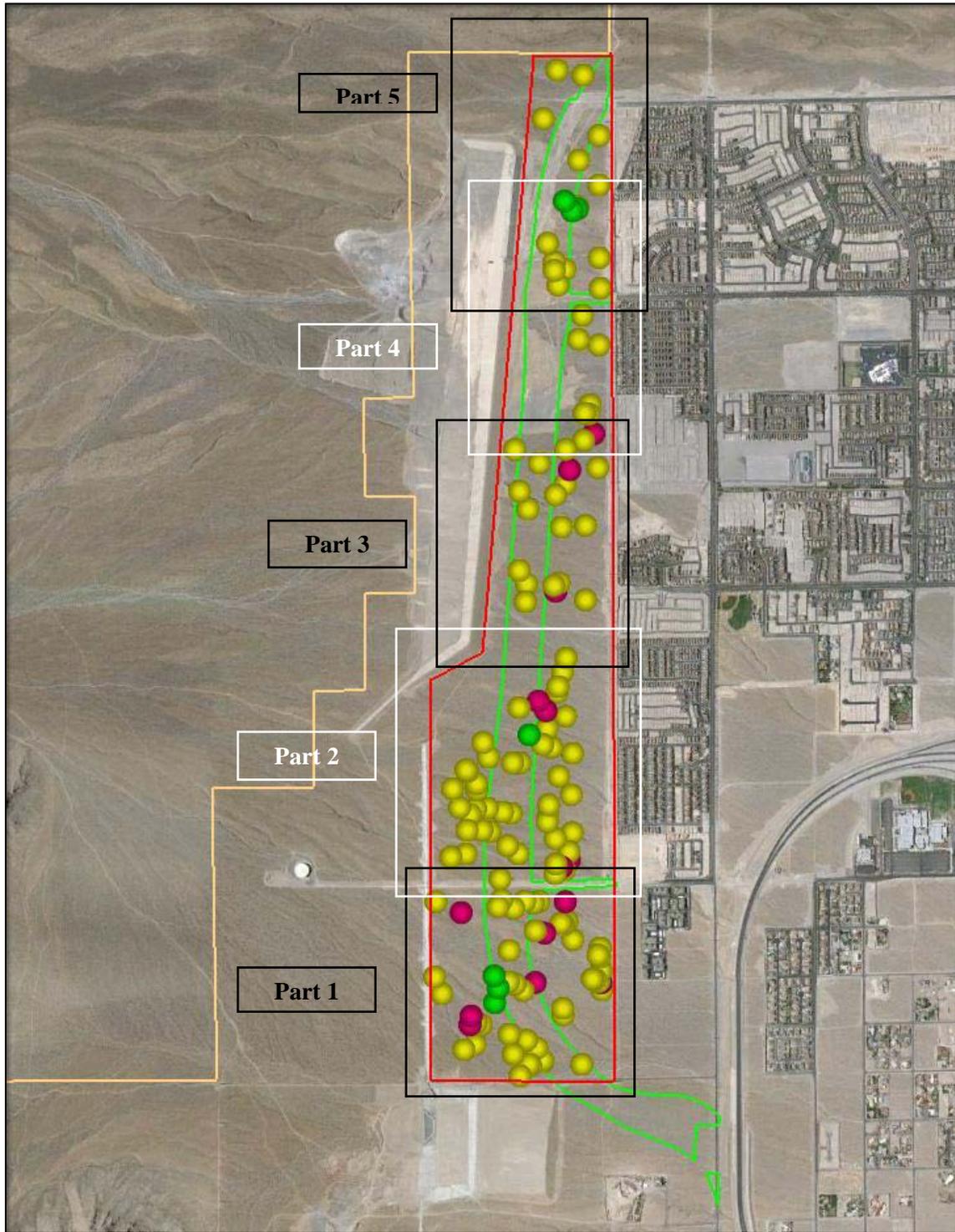
— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

Parts of the Survey (Action) Area



LEGEND

— Survey Area

— Proposed Project ROW

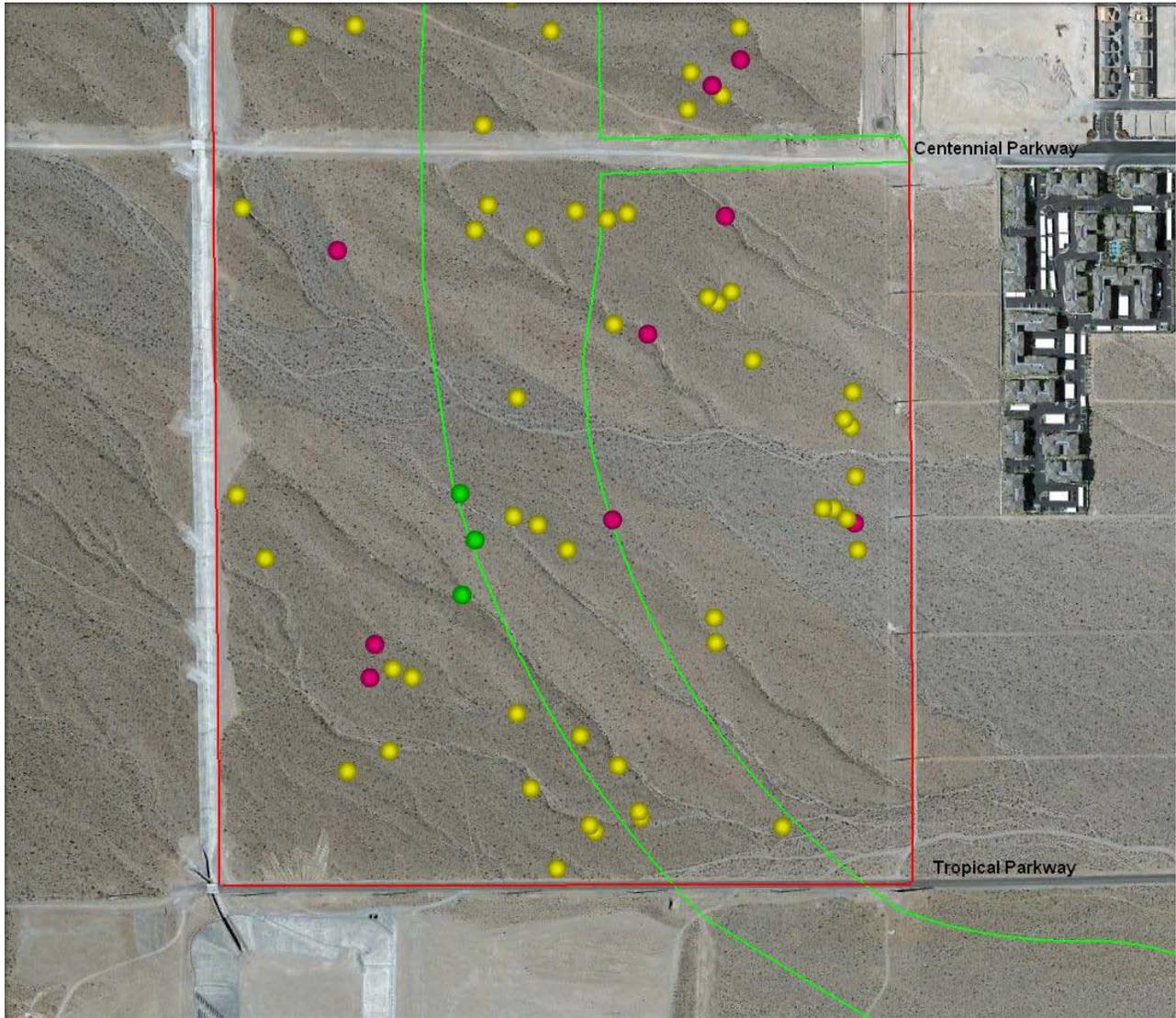
— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

**Part 1 of the Survey (Action) Area**



**LEGEND**

— Survey Area

— Proposed Project ROW

— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

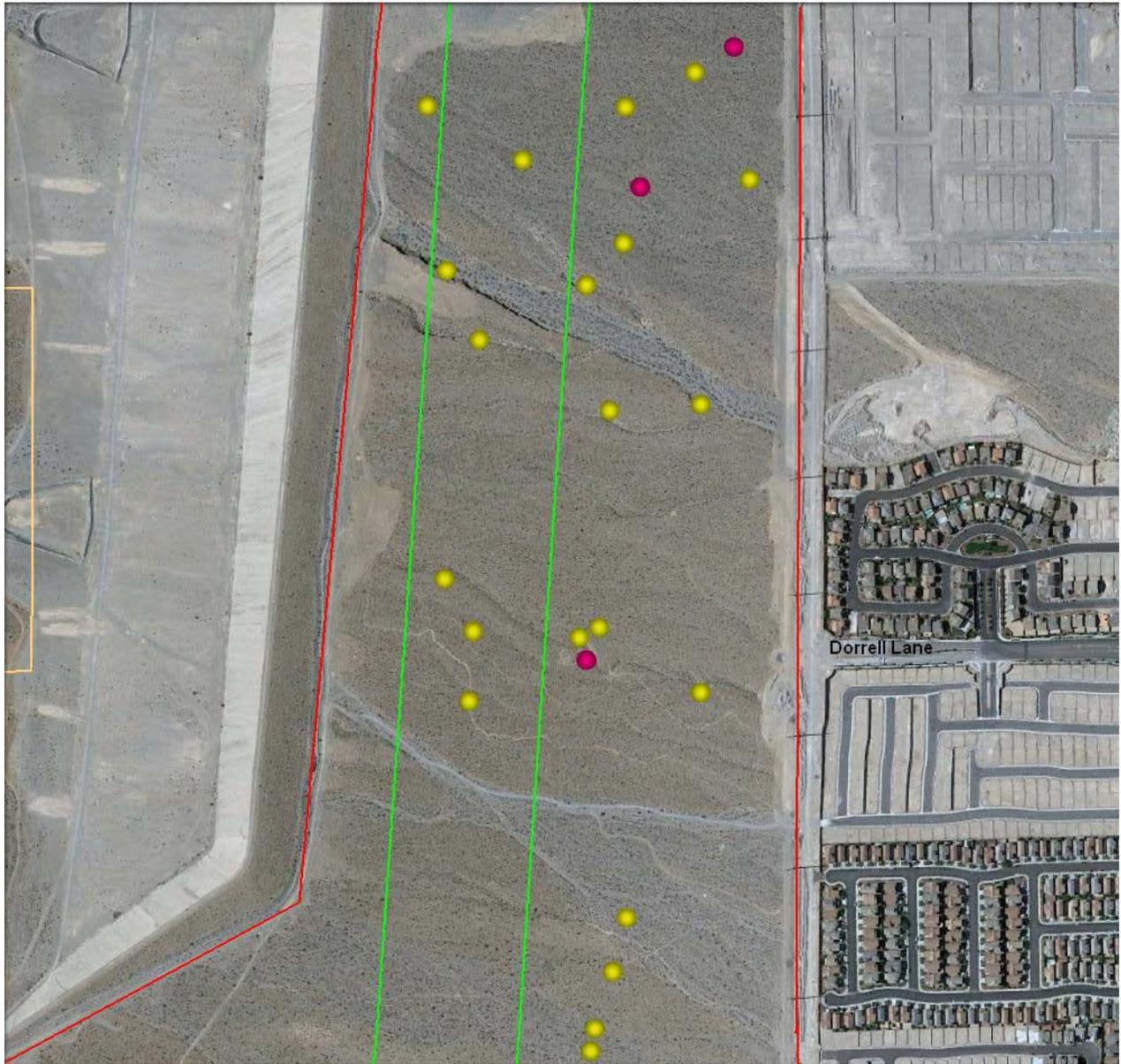
**Part 2 of the Survey (Action) Area**



**LEGEND**

- |   |  |  |
|---|--|--|
|  Survey Area |  Proposed Project ROW |  RRCNCA Boundary |
|  Tortoise    |  Tortoise in Burrow   |  Burrow          |

**Part 3 of the Survey (Action) Area**



**LEGEND**

— Survey Area

— Proposed Project ROW

— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

**Part 4 of the Survey (Action) Area**



**LEGEND**

— Survey Area

— Proposed Project ROW

— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

Part 5 of the Survey (Action) Area



**LEGEND**

— Survey Area

— Proposed Project ROW

— RRCNCA Boundary

● Tortoise

● Tortoise in Burrow

● Burrow

## **Appendix C: Plant Species**

## Common Plant Species Observed in the Project Area

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acamptopappus sphaerocephalus</i>	desert goldenhead	<i>Langloisia setosissima</i>	Great Basin sunbonnet
<i>Adenophyllum cooperi</i>	Cooper's dogweed	<i>Larrea tridentata</i>	creosote bush
<i>Ambrosia dumosa</i>	white bursage	<i>Lycium andersoni</i>	Anderson's wolfberry
<i>Amsinckia tessellata</i>	yellow fiddleneck	<i>Menodora spinescens</i>	spiny menodora
<i>Aristida sp.</i>	needlegrass	<i>Mentzelia albicaulis</i>	whitestem blazingstar
<i>Astragalus sp.</i>	milkvetch	<i>Mirabilis sp.</i>	four-o'clock
<i>Atriplex canescens</i>	four-wing saltbush	<i>Nicotiana obtusifolia</i>	coyote tobacco
<i>Baileya multiradiata</i>	desert marigold	<i>Oxytheca perfoliata</i>	roundleaf oxytheca
<i>Bebbia juncea</i>	sweetbush	<i>Pectocarya setosa</i>	moth combseed
<i>Bromus madritensis ssp rubens*</i>	red brome*	<i>Penstemon sp.</i>	penstemon
<i>Camissonia brevipes</i>	golden suncup	<i>Petalonyx</i>	sandpaper plant
<i>Cheanactis fremontia</i>	Fremont's pincushion		
<i>Chorizanthe brevicornu</i>	brittle spineflower	<i>Physalis crassifolia</i>	thick-leaved ground cherry
<i>Chorizanthe rigida</i>	rigid spineflower	<i>Plantago ovata</i>	psyllium
<i>Chrysothamnus sp</i>	rabbitbrush	<i>Pleuraphis rigida</i>	galleta grass
<i>Cryptantha nevadensis</i>	Nevada cryptantha	<i>Prunis fasciculata</i>	desert almond
<i>Encelia virginensis</i>	brittlebush	<i>Psathyrotes ramosissima</i>	velvet turtleback
<i>Ephedra sp.</i>	Ephedra	<i>Psilotrophe cooperi</i>	Cooper's paper daisy
<i>Ephedra torreyana</i>	Mormon tea	<i>Psorothamnus sp. (fremontii)</i>	indigo bush
<i>Eriogonum deflexum</i>	skeleton weed	<i>Salazaria mexicana</i>	bladder sage
<i>Eriogonum fasciculatum</i>	California buckwheat	<i>Salvia dorrii</i>	desert sage
<i>Eriogonum inflatum</i>	desert trumpet	<i>Schismus sp.*</i>	Mediterranean grass*
<i>Eriogonum trichopes</i>	little trumpet	<i>Senecio flaccidus</i>	California butterweed
<i>Erioneuron pulchellum</i>	fluffgrass	<i>Sphaeralcea ambigua</i>	desert globemallow
<i>Erodium cicutarium*</i>	redstem filaree*	<i>Sphaeralcea angustifolia</i>	copper globemallow
<i>Gaura sp.</i>	scarlet gaura	<i>Stephanomeria pauciflora</i>	brownplume wirelettuce
<i>Gilia sp.</i>	gilia	<i>Tamarix ramosissima*</i>	Saltcedar*
<i>Gutierrezia sarothrae</i>	broom snakeweed	<i>Thamnosma montana</i>	turpentine broom
<i>Hymenoclea salsola</i>	burrobush	<i>Thymophylla pentachaeta</i>	dogweed
<i>Krameria erecta</i>	ratany	<i>Xylorhiza tortifolia</i>	Mojave aster
<i>Krascheninnikovia lanata</i>	winter fat		

\* Non-native, invasive, or noxious species

### Cacti and Yucca Species Observed in the Project Area

Scientific Name	Common Name	Number Observed <sup>1</sup>
<i>Echinocactus polycephalus</i>	cottontop cactus	1,520
<i>Echinocereus engelmannii</i>	hedgehog cactus	1,280
<i>Escobaria vivipara</i>	beehive cactus	60
<i>Opuntia basilaris</i>	beavertail cactus	670
<i>Opuntia echinocarpa</i>	silver cholla	340
<i>Opuntia ramosissima</i>	pencil cholla	30
<i>Yucca brevifolia</i>	Joshua tree	80
<i>Yucca schidigera</i>	Mojave yucca	800 <sup>2</sup>
Total		4,780
Acres in Project Area		630
Average Density per Acre <sup>1</sup>		10 <sup>1</sup>
<sup>1</sup> Rounded to the nearest 10 <sup>2</sup> Visual estimate		