

**DESERT TORTOISE PRESENCE/ABSENCE
PRE-PROJECT SURVEY
FOR IRON AGE MINE
SAN BERNARDINO COUNTY, CALIFORNIA**

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EXECUTIVE SUMMARY

Iron Age Mine, LLC, a part of US Iron LLC, has submitted a Plan of Operations to the Bureau of Land Management (BLM) and a Mine Reclamation application to the County of San Bernardino proposing to remove iron ore tailings left at the Iron Age Mine site by a previous mining operation. The Iron Age Mine site is located in the Dale Mining District in the Pinto Mountain Range, San Bernardino County, California, and is approximately 18 miles east/southeast of the city of Twentynine Palms and occurs in desert tortoise habitat. Approximately 97 acres will be impacted by tailings removal, a plant site, and access roads, of which approximately 76 acres have been previously impacted by historic mining activities. The site consists of 34 acres of patented (private) land and 63 acres of unpatented claims under the jurisdiction of the BLM.

In order to identify the presence of the species and potential impacts, protocol presence/absence surveys for desert tortoise were conducted on April 11-13, 2012. The surveys implemented the United States Fish and Wildlife Service's *Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats* (USFWS 2010). No live desert tortoise or desert tortoise sign were observed at the proposed mill site location, along the proposed haul road re-alignment, or at the tailings removal area. The surveys identified two potential desert tortoise burrows at the south end of the study area, outside of the project site. The proposed project would impact a total of 21 acres of suitable desert tortoise habitat; 15.7 of those acres occur within the Pinto Mountains critical habitat unit and 5.3 acres occur outside of the critical habitat unit.

Recommendations to minimize and avoid potential impacts to the desert tortoise are included in this report.

1.0 INTRODUCTION

1.1 PROJECT LOCATION

The Iron Age Mine site is located in the Pinto Mountain Range, San Bernardino County, California, and is approximately 18 miles east/southeast of the city of Twenty-Nine Palms (see Figure 1). The mine is located south of State Highway 62 (SH 62) and is accessible by an unnamed road approximately one and a half miles east of Iron Age Road (see Figure 2). The Iron Age Mine holdings relevant to the Plan of Operations consist of patented claims (private land) and unpatented claims owned by Iron Age Mine LLC on public lands managed by the BLM Barstow office. As such, Iron Age Mine LLC has submitted a Plan of Operations to the BLM. The extent of the claims includes approximately 60.6 acres of patented claims within portions of Sections 20 and 29, Township 1 South, Range 13 East, San Bernardino Base and Meridian, USGS New Dale 7.5-minute quadrangle and 330 acres of unpatented claims (public land) within portions of Sections 7, 17, 18, 20 and 29 including two 5-acre mill site claims in Section 7. The mine road re-alignment extends into additional unpatented placer claims within Sections 7, 17, 18 and 20.

The site is located in an unincorporated area of San Bernardino County. The site is located in desert tortoise (*Gopherus agassizii*) habitat. The desert tortoise is a federal and state endangered species.

1.2 PROJECT DESCRIPTION

Iron Age Mine, LLC proposes to remove tailings left behind by a previous mining operation at its Iron Age Mine site. Operations would consist of removing iron ore tailings from existing stockpiles on approximately 59 acres, plant operations and roads on 5 acres on patented land, trucking ore product to the mill sites along the 3.4 mile long re-aligned haul road (17 acres), and loading and shipping the material on street legal trucks at the mill sites (8.5 acres) on SR 62. Waste material not meeting iron ore specs will be conveyed and backfilled into the existing quarry.

The total disturbance area, of which 76 acres have been previously disturbed, is approximately 97 acres including the existing and planned roadway. Approximately 78 of the 97-acre project area will be reclaimed of which approximately 70 acres will be revegetated (46 acres of BLM and 24 acres of patented lands). The access road (17 acres) and the onsite access roads (2 acres) will remain in place. The approximately 8 acres of backfilling on patented land will not be conducive for revegetation due to the iron ore surface and lack of topsoil available. Approximately 26 acres of the patented land not within the 97-acre project site, will not be disturbed by this Plan, much of which has been disturbed by pre-SMARA activities and left as is.

1.3 DESERT TORTOISE LIFE HISTORY

The desert tortoise is a medium-sized, terrestrial turtle in the family Testudinidae. The shell is light brown to very dark brown with brown to orange or yellow in the centers of scutes, particularly in young animals. The skin is dry and scaly with thick, stumpy, elephantine hind legs. A strong projection, the gular horn, located at the anterior end of the plastron, is most

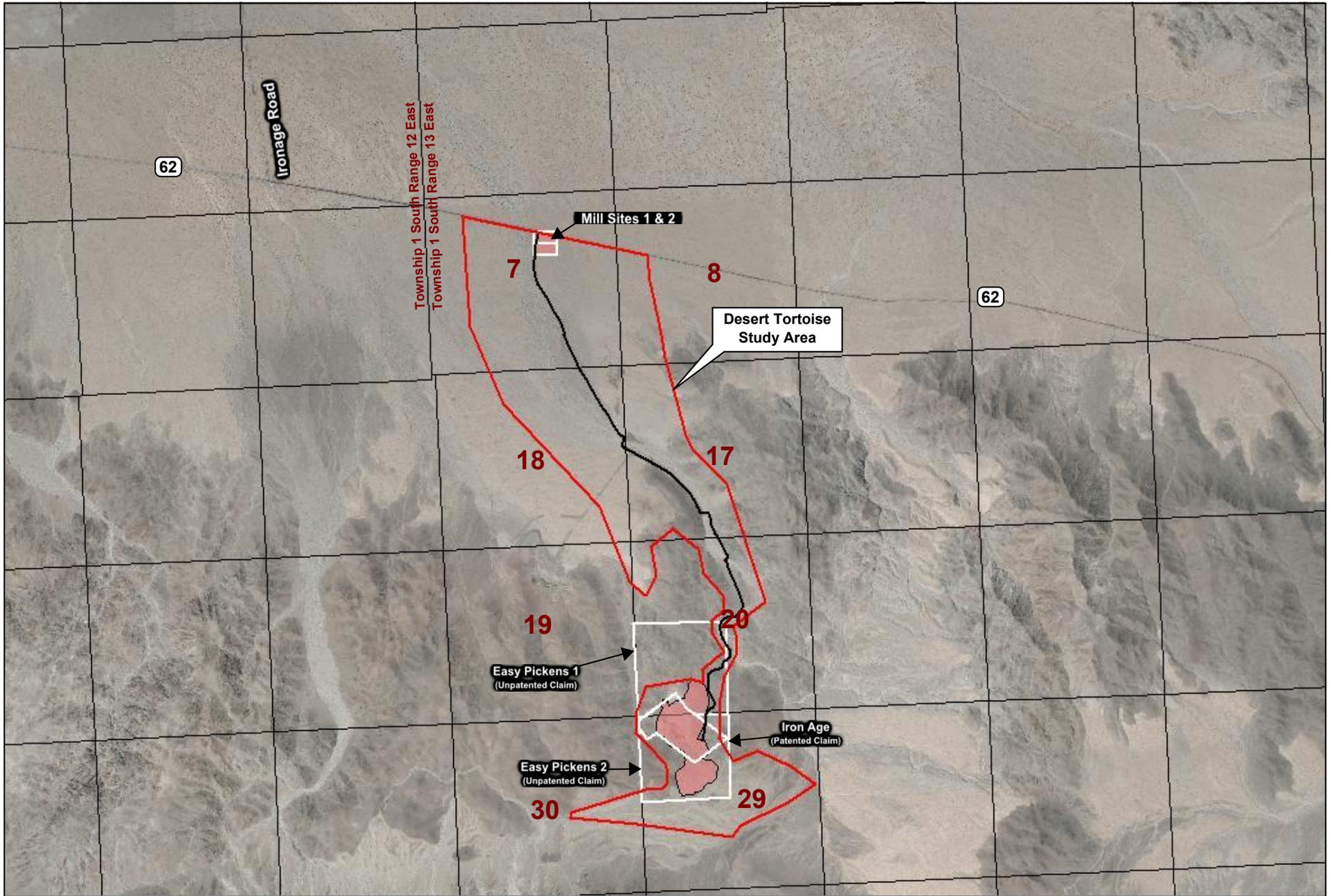


Regional Vicinity

Iron Age Mine Desert Tortoise Presence/Absence Report
 San Bernardino County, California

Figure 1

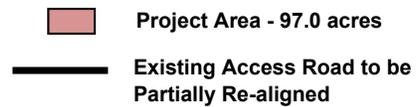




Project Location

Iron Age Mine Desert Tortoise Presence/Absence Report
 San Bernardino County, California

Figure 2



pronounced in adult males. Adult males also have shorter claws, longer, thicker tails, a concave plastron, and pronounced chin glands. They weigh 0.04-10+ lbs (20-5000+ g) and range in size from about 1.4 inches (35 mm; carapace length) at hatching to 11-16 inches (280-400 mm; carapace length) as adults. No other terrestrial turtle occurs within the range of the desert tortoise.

Desert tortoises are long lived with delayed sexual maturity. Some individuals begin reproducing when 7.4 inches (180 mm) long (median carapace length, MCL), which they attain at about 12-15 years old. The majority do not begin reproducing until they reach 8.2 inches (208 mm approximately 12-20 years old; Turner and Berry 1984, Turner et al. 1986). Maximum longevity in the wild is likely to be about 50 to 70 years, the norm being 25 to 35 years (Germano 1992, 1994).

The average clutch size is 4.5 eggs (range 1-8), with 0-3 clutches deposited per year (Turner et al. 1986). Clutch size and number probably depend on female size, water, and annual productivity of forage plants in the current and previous year (Turner et al. 1984, 1986; Henen 1997). The ability to alter reproductive output in response to resource availability may allow individuals more options to ensure higher lifetime reproductive success. The interaction of longevity, late maturation, and relatively low annual reproductive output causes tortoise populations to recover slowly from natural or anthropogenic decreases in density. To ensure population stability or increase, these factors also require relatively high juvenile survivorship (75-98% per year), particularly when adult mortality is elevated (Congdon et al. 1993). Most eggs are laid in spring (Apr -Jun) and occasionally in fall (Sept-Oct). Eggs are laid in sandy or friable soil, often at the mouths of burrows. Hatching occurs 90-120 days later, mostly in late summer and fall (mid Aug-Oct). Eggs and young are untended by the parents.

Tortoise sex determination is environmentally controlled during incubation (Spotila et al. 1994). Hatchlings develop into females when the incubation (i.e., soil) temperature is greater than 89.3° F (31.8° C) and males when the temperature is below that (Spotila et al. 1994). Mortality is higher when incubation temperatures are greater than 95.5° F (35.3° C) or less than 78.8° F (26.0° C). The sensitivity of embryonic tortoises to incubation temperature may make populations vulnerable to unusual changes in soil temperature (e.g., from changes in vegetation cover), but there are no data available from the field that can be used to test this hypothesis.

Tortoise activity patterns are primarily controlled by ambient temperature and precipitation (Nagy and Medica 1986, Zimmerman et al. 1994). In the East Mojave and Colorado Deserts, annual precipitation occurs in both summer and winter, providing food and water to tortoises throughout much of the summer and fall. Most precipitation occurs in winter in the West Mojave Desert resulting in an abundance of annual spring vegetation, which dries up by late May or June. Tortoises in this region are primarily active between May and June, with a secondary activity period from September through October. Tortoises may also be active during periods of mild or rainy weather in summer and winter. During inactive periods, tortoises hibernate, aestivate, or rest in subterranean burrows or caliche caves, and spend approximately 98% of the time in these cover sites (Marlow 1979, Nagy and Medica 1986). During active periods, they usually spend nights and the hotter part of the day in their burrow; they may also rest under shrubs or in shallow burrows (called pallets). Tortoises use an average of 7-12 burrows at any

given time (Barrett 1990, Bulova 1994, TRW Environmental Safety Systems Inc. 1997); some burrows may be used for relatively short periods of time and then are replaced by other burrows. Tortoises sometimes share a burrow with several other tortoises (Bulova 1994).

Tortoises eat primarily annual forbs, but also perennials (e.g., cacti and grasses). Forage species selected by tortoises in the west Mojave Desert include: *Astragalus didymocarpus*, *Astragalus layneae*, *Camissonia boothii*, *Euphorbia albomarginatus*, *Lotus humistratus*, and *Mirabilis bigelovii* (Jennings 1993). In the east Mojave Desert, tortoises showed a preference for *Camissonia boothii*, *Cryptantha angustifolia*, *Malacothrix glabrata*, *Opuntia basilaris*, *Rafinesquia neomexicana*, *Schismus barbata*, *Stephanomeria exigua* and other species (Avery 1998). On rare occasions they have been observed eating other items such as caterpillars, lizards, and cow dung, but these make up a very small proportion of their diets (Jennings 1993, Esque 1994, Avery 1998). Although they will eat exotic plants, tortoises generally prefer native forbs when available (Jennings 1993, Avery 1998, cf. Esque 1994). The dietary preference may place them at risk for a nitrogen and water deficit. Droughts frequently occur in the desert, resulting in extended periods of low water availability. Periods of extended drought place tortoises at even greater water and nitrogen deficit than during moderate or high rainfall years (Peterson 1996, Henen 1997). During a drought, more nitrogen than normal is required to excrete nitrogenous wastes, thus more rapidly depleting nitrogen stored in body tissues. Plants also play important roles in stabilizing soil and providing cover for protection from predators and heat.

The tortoise mating system is probably polygynous, and may be polyandrous, although DNA fingerprinting to analyze patterns of paternity has not been conducted. Choice of mate is mediated by aggressive male-male interactions and possibly by female choice (Niblick et al. 1994). Recent findings indicate that tortoises in the West Mojave Desert may exhibit prebreeding dispersal movements, typical of other vertebrates, ranging from 1 to 10 miles (0.6-16 km) away in a single season (Sazaki et al. 1995). The advantage of pre-breeding dispersal may be to find a more favorable environment (physical, biotic, social) in which to reproduce. However, the risk is increased mortality from predation, exposure, starvation, or anthropogenic factors (e.g., motor vehicle mortality).

Tortoise activities are concentrated in core areas, known as home ranges. These home ranges overlap; because tortoises do not defend a specific, exclusive area, they do not maintain territories. Home range sizes have been measured at 10-450 acres (4-180 hectares) and vary with sex, age, season, and density or availability of resources (USFWS 1994). Whereas home range sizes may vary from year to year, it is not known at what rate tortoises change their home range location and size over the course of their life. Over their entire life span, an individual tortoise may require considerably larger areas than that used in individual years.

There are many natural causes of mortality, but their extents are difficult to evaluate and vary from location to location. Several native predators are known to prey on tortoise eggs, hatchlings, juveniles, and adults including: coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), badger (*Taxidea taxus*), skunks (*Spilogale putorius*), common ravens (*Corvus corax*), golden eagles (*Aquila chrysaetos*), and Gila monsters (*Heloderma suspectum*).

1.4 HABITAT REQUIREMENTS

The greatest population densities of desert tortoise are found in creosote bush scrub with lower densities occurring in Joshua tree woodland and Mojave-saltbush-allscale scrub. Major topographical features used by tortoises include flats, valleys, bajadas, and rolling hills generally from 2000-3300 ft (600-1000 m) in elevation and occasionally above 4100 ft (1250 m; Weinstein 1989). Tortoises typically avoid plateaus, playas, sand dunes, steep slopes (>20%) and areas with many obstacles to free movement. They prefer surfaces covered with sand and fine gravel versus coarse gravel, pebbles, and desert pavement (Weinstein 1989). Friable soil is important for digging burrows, but when friability (e.g., diggability) is similar, productivity of plants is more important (Wilson and Stager 1992). Food availability, soil diggability, longitude (higher densities in West Mojave Desert), and degree of stream-washing were the habitat characteristics that were most useful in discriminating between areas with high densities of tortoises and those with no tortoises.

1.5 PURPOSE AND OBJECTIVES

The purpose of this survey is to provide baseline data regarding the presence or absence of desert tortoise within the proposed tailings and operations areas and within a 50-foot ROW for the proposed haul road.

The objectives for this study are as follows:

- Conduct protocol presence/absence surveys for desert tortoise at the tailings and overburden mounds mining area, proposed mill site area, and along the proposed haul road at the Iron Age Mine Site.
- Document the results of the survey and present them via this report.

2.0 METHODS

The presence/absence studies conducted by biologists representing Lilburn Corporation implemented the United States Fish and Wildlife Service's *Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats* (USFWS 2010). The presence/absence surveys were conducted on April 11-13, 2012. Representative site photos are included in Appendix A.

2.1 PERSONNEL

All biologists conducting the survey have had experience in desert tortoise presence/absence surveys, clearance surveys, and have attended the Desert Tortoise Council's Desert Tortoise Workshop. The authorized biologist for this project was Juan Hernandez.

2.2 SURVEY METHODOLOGY

Protocol presence/absence surveys were conducted in the approximately 1,527-acre project study area which included the required perimeter belt transects parallel to the 3.4-mile long haul road and around the tailings and mill areas (see Figure 3). The existing tailings and mine areas, the

mill site location, and the haul road re-alignment were surveyed for 100% coverage. Surveys were conducted by walking transects 10 meters (30 feet) apart. All tortoise sign (live tortoises, shells, bones, scutes, limbs, scats, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, mineral licks, etc.) observed during the pedestrian surveys were mapped using Global Position Systems (GPS). When no tortoise or tortoise sign were encountered within the project action area, three additional 30-foot belt transects were surveyed at 200 meters, 400 meters, and 600 meters around the perimeter of the project site. Perimeter belt transects are used to determine if the project overlaps part of a tortoise's annual home range and the possibility that a resident tortoise was outside the project area at the time surveys were conducted. The perimeter belt transects are only used for the presence/absence determination.

3.0 RESULTS

This section summarizes the findings of the desert tortoise presence/absence survey and provides a general description of the plant communities identified within the survey area.

3.1 PLANT COMMUNITIES

The following plant communities were identified within the project study area: creosote bush series, big galleta series, brittlebush series, and catclaw acacia series. Other habitat types identified within the study area included disturbed habitat predominantly devoid of vegetation and streambeds either unvegetated or vegetated by upland species (see Figure 4).

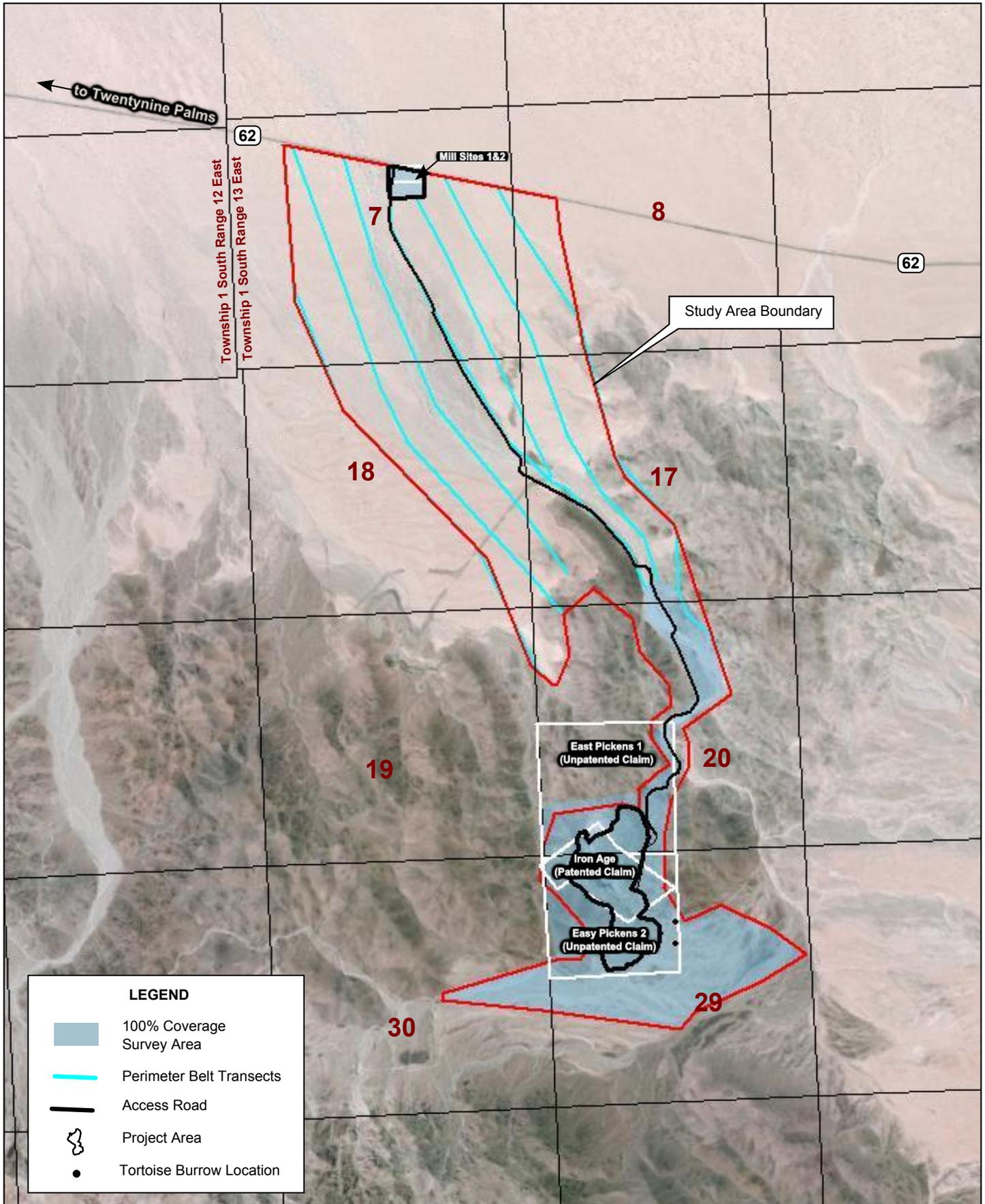
Habitat in the 97-acre project area is predominantly disturbed habitat, 76 acres. Other habitat found on the remaining 21 acres within the project area includes: creosote bush series, brittlebush series, catclaw acacia series, and unvegetated stream.

3.2 DESERT TORTOISE PRESENCE/ABSENCE

No live desert tortoise or desert tortoise sign were observed at the proposed mill site location, along the proposed haul road alignment, or within the mine and tailings area. Two burrows were observed south of the proposed mining area (see Table 1 and Figure 3). Per the USFWS protocol survey guidelines, a mirror was used to direct sunlight into the burrow openings to locate desert tortoise sign; no sign was identified in either burrow.

3.3 DESERT TORTOISE HABITAT

Proposed project activities at the mill site, quarry area, haul road right-of-way alignment, and tailings removal sites will impact a total of 97 acres. The 97-acre area is considered within desert tortoise habitat. Of the 97 acres, approximately 76 acres are severely disturbed by the stockpiling of iron ore tailings, the existing quarry, and the existing haul road and do not constitute suitable habitat for desert tortoise. Therefore, the proposed project would only impact 21 acres of suitable habitat for desert tortoise. Approximately 15.7 acres of suitable desert tortoise habitat occur within the Pinto Mountain Critical Habitat Unit for desert tortoise as designated by the U.S. Fish and Wildlife Service and BLM designated Desert Wildlife Management Area (DWMA).

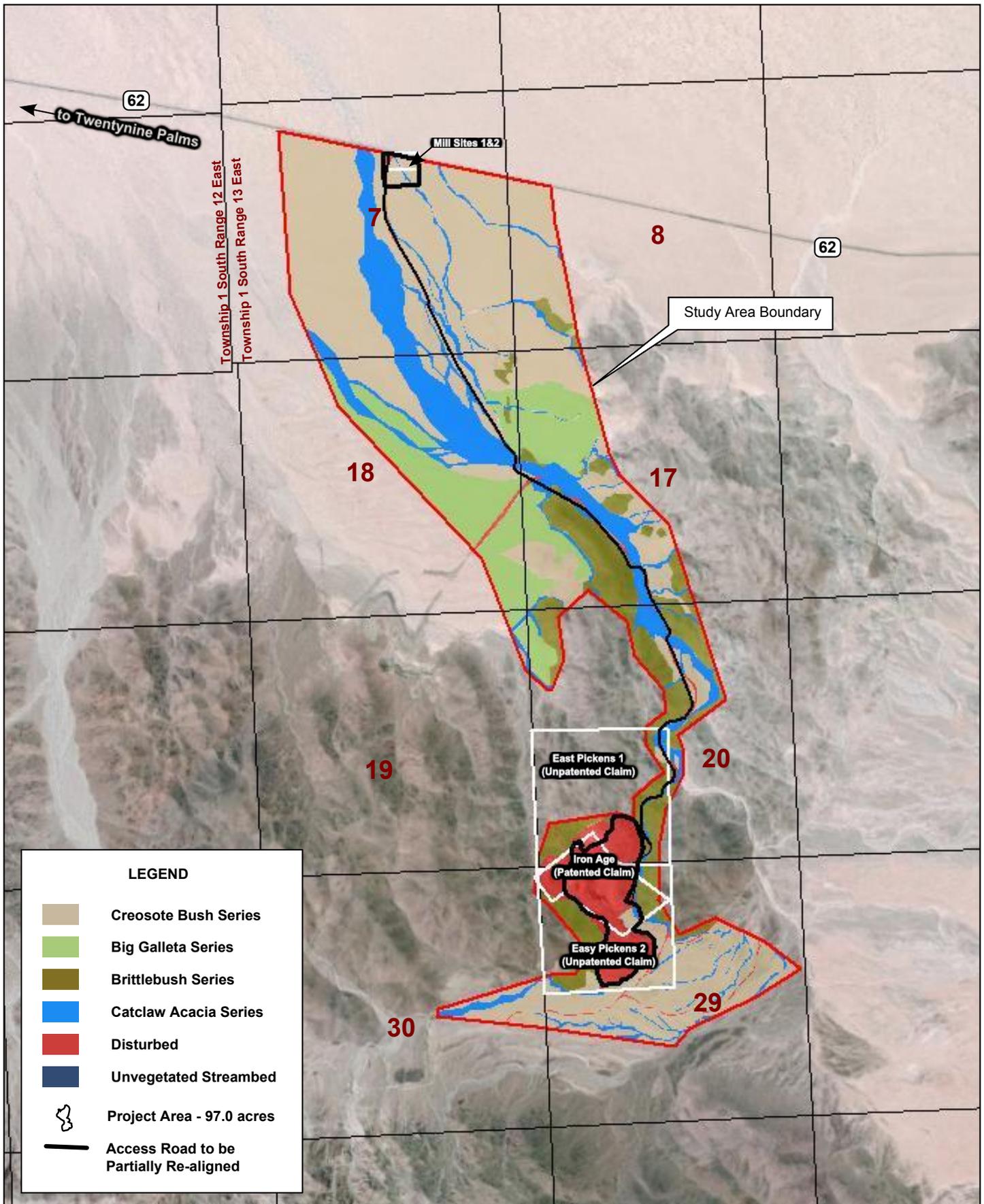


Desert Tortoise Presence/Absence Survey Area

Iron Age Mine Desert Tortoise Presence/Absence Report
San Bernardino County, California

Figure 3





Study Area Vegetation Map

Iron Age Mine Desert Tortoise Presence/Absence Report
San Bernardino County, California

Figure 4

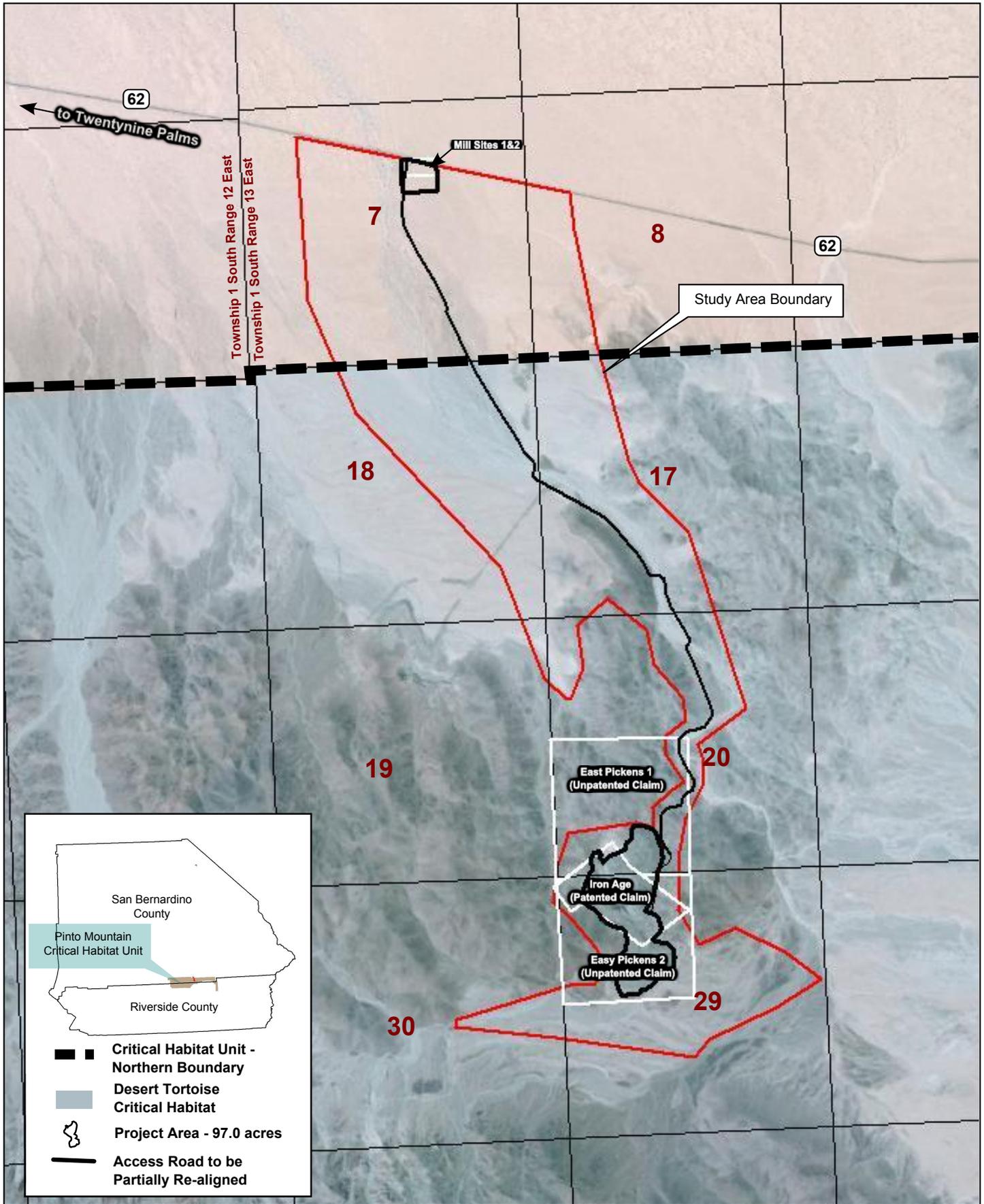
Table 1
Desert Tortoise Sign Observation Results

Class*	Burrows	Carcass	Comments
1			
2			
3			
4	1		
5	1		
Total	2		
*Desert Tortoise Sign Classification			
Burrow Classes		Carcass Classes	
1-Currently Active 2-Good Condition, definitely tortoise, no recent use 3-Deteriorated, including collapsed, definitely tortoise 4-Good Condition, possibly tortoise 5-Deteriorated, including collapsed possibly tortoise		1-Fresh or Putrid 2-Normal color, scutes adhered to bone 3-Scutes peeled off bone 4-Bones falling apart 5-Disarticulated	

3.4 DESERT TORTOISE CRITICAL HABITAT

The tailings stockpiles, quarry, and portions of the proposed haul road re-alignment, amounting to approximately 84.2 acres, occur within the USFWS designated Pinto Mountain critical habitat unit for the desert tortoise and BLM designated DWMA (see Figure 5). Since the BLM would authorize the activity associated with the proposed project a Section 7 Consultation of the Federal Endangered Species Act would need to be conducted between the BLM and the USFWS. The proposed project requires approval of a Plan of Operations for the tailings removal operations and the haul road re-alignment from the BLM.

Critical habitat as defined in section 3(5)(A) of the Federal Endangered Species Act (Act) is “(i) the specific areas within the geographic area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed...upon a determination...that such areas are essential for the conservation of the species.” The physical and biological habitat features are referred to as primary constituent elements. Primary constituent elements of desert tortoise habitat include: sufficient space to support viable populations within each of the [five] recovery units and provide for movements, dispersal, and gene flow; sufficient quantity and quality of forage spaces and the proper soil conditions to provide for the growth of such species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality. The 2011 USFWS *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* has designated five regional recovery units: Western Mojave, Eastern Mojave, Northeastern Mojave, Colorado Desert and Upper Virgin River. Critical habitat units, are identified within the larger recovery units. Critical habitat units are specific areas identified to support the physical and biological features that are



Critical Habitat Impacts

Iron Age Mine Desert Tortoise Presence/Absence Report
San Bernardino County, California

Figure 5

essential for the conservation of the species and that may require special management considerations or protection. The Iron Age Mine site occurs in the Pinto Mountains critical habitat unit of the Western Mojave recovery unit.

The tailings, quarry area, and portions of the proposed haul road alignment, amounting to 84.2 acres, occur within the Pinto Mountain critical habitat unit for the desert tortoise. Of the 84.2 acres, 68.5 acres, comprising the iron ore tailings, quarry, and existing haul road do not exhibit the constituent elements of critical habitat for the desert tortoise. The tailings mounds are characterized by hard compacted soils rich in iron ore and are bare of vegetation. The tailings do not support vegetation, or support the proper soil conditions including substrates for burrowing, nesting, or other shelter required by the desert tortoise. The quarry is characterized by steep rock slopes devoid of vegetation. Because 68.5 acres of the habitat have been severely disturbed by the stockpiling of iron ore tailings and mining and is not suitable for desert tortoise, the proposed project would only result in impacts to 15.7 acres of critical habitat suitable for desert tortoise.

The proposed project would impact a total of 21 acres of suitable desert tortoise habitat; 15.7 of those acres occur within the Pinto Mountains critical habitat unit and 5.3 acres occur outside of the critical habitat unit.

3.4.1 BLM DESIGNATED HABITAT MANAGEMENT AREAS

The Project Area occurs within the BLM designated Pinto Mountain Desert Wildlife Management Area (DWMA). Desert Wildlife Management Areas have been established to protect high quality habitat for the threatened desert tortoise. The Pinto Mountain DWMA consist of 183 square miles surrounded on the west, south, and east by Joshua Tree National Park and bounded on the north by SH 62. The DWMA directly overlies the Pinto Mountain critical habitat unit identified by the FWS. The area is identified to contain Category I desert tortoise habitat. Category I habitat is defined as habitat capable of sustaining viable tortoise populations. The DWMA is managed for desert tortoise conservation and recovery.

4.0 CONCLUSIONS

The presence/absence survey conducted by Lilburn Corporation at the Iron Age Mine site and within a 600-foot perimeter area, documented a total of two burrows south of the proposed project area. No tortoise sign was observed within either burrow.

5.0 RECOMMENDATIONS

Lilburn Corporation recommends the following to avoid and minimize impacts to desert tortoise:

- Comply with BLM and USFWS conditions and compensation requirements.
- Consult with the California Department of Fish and Wildlife regarding the results of this survey.
- Have an authorized biologist conduct a tortoise educational program for personnel at the project site; the program should discuss conservation measures as well as pre-entrance

and pre-construction surveys before personnel obtain access to the site roads and work areas.

- Authorized biologists or monitors should be present on-site during all activities on portions of the project that intersect with or are adjacent to tortoise habitat, to ensure take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in any such conduct) will not occur.
- An authorized biologist should survey the project area for the presence of desert tortoise no more than 14 days prior to the commencement of project activities within desert tortoise habitat. If necessary, the biologist should relocate tortoise a minimum distance necessary to ensure their safety. In general, desert tortoise should be moved no more than 1,000 feet for juveniles and adults, and 300 feet for hatchlings.
- Any desert tortoise burrows within 50 yards of the proposed project area should be flagged for avoidance.
- An authorized biologist should inspect potential desert tortoise burrows including collapsed burrows for occupancy.
- If a desert tortoise and burrow are within 50 yards of the project area, the animal and burrow may be fenced for no more than 3 days to confine the desert tortoise to its burrow and the area adjacent to its burrow.
- Should it prove necessary to excavate a desert tortoise from its burrow to move it from harm's way, excavation should be performed using hand tools either by, or under the direct supervision of an authorize biologist.
- To insure safety, all desert tortoise moved should be monitored for at least two days or until the end of the project activities for that area, whichever period is longer.
- Disturbance should be confined to the smallest practical area, considering topography, placement of pipelines, location of burrows, public health and safety, and other limiting factors. To the extent possible, project activities should be limited to previously disturbed areas. If possible, vegetation should be crushed rather than bladed to allow for root sprouting of shrubs.
- Temporary barriers such as plywood sheeting used to cover the trench or excavation and/or temporary desert tortoise fencing should be used to exclude desert tortoises and other wildlife species from entering trenches or other excavations left open overnight or unattended during the day.
- Vehicle speeds should not exceed 15 miles per hour through desert tortoise habitat.
- A distance of 25 yards should be maintained between moving vehicles traveling to or from project activities.
- Work should cease a minimum of one hour before sunset on rainy or overcast days allowing workers to travel the access road when visibility is not impaired by darkness.
- No cross-country travel with motorized vehicles outside of the project area by project personnel should be permitted.
- Workers should inspect for desert tortoise under vehicles prior to moving them.

- All trash and food items should be promptly contained within closed, common raven-proofed containers and will be removed daily from the project site to reduce the attractiveness of the area to common ravens (*Corvus corax*).
- No firearms, dogs, or other pets should be allowed in desert tortoise habitat within the project area.

6.0 REFERENCES

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APPENDIX A
SITE PHOTOS

US Iron Age Mine Site San Bernardino County, California Representative Site Photos



Catclaw acacia series ephemeral drainage.



Creosote bush series vegetation.

US Iron Age Mine Site San Bernardino County, California Representative Site Photos



Disturbed existing haul road that will be used as part of the proposed haul road right-of-way.

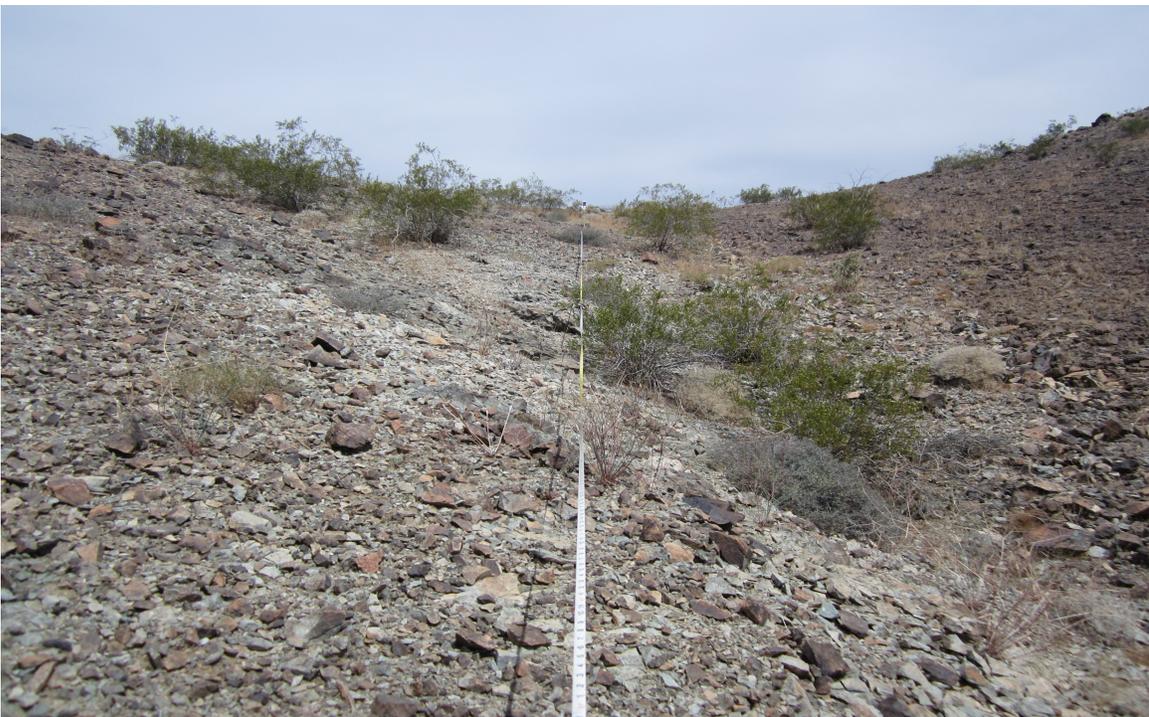


Creosote bush series vegetation facing south east.

US Iron Age Mine Site San Bernardino County, California Representative Site Photos



Class 5 Burrow. Class 5 burrows are deteriorated and include collapsed burrows. They are possible tortoise burrows.



Brittlebush series vegetation.