APPENDIX F-M

Biological Assessment

BIOLOGICAL ASSESSMENT FOR THE DESERTXPRESS PROJECT

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Introduction

The purpose of this Biological Assessment (BA) is to address the effect of the DesertXpress Project on federally listed threatened, endangered, or proposed listed species pursuant to Section 7 of the Endangered Species Act (ESA), and their designated critical habitat. This BA is prepared in accordance with legal requirements set forth under Section 7 of the federal ESA (16 U.S. Government Code 1536 (c)) and follows the standards established in the U.S. Fish and Wildlife Service (USFWS) ESA guidance. The Federal Railroad Administration (FRA), the federal lead agency for the proposed action, intends to authorize and permit the proposed action under Section 7 of the Endangered Species Act and intends this BA to initiate formal consultation with USFWS regarding the proposed action.

The FRA has authority to regulate the safety of railroads, including the proposed project under 49 U.S.C. 20101 et seq. FRA also manages financial assistance programs for rail capital investments, for which this project would be eligible. The Bureau of Land Management (BLM) has approval authority over the use of public lands under their control under 43 U.S.C. 1761, the Federal Land Policy and Management Act (FLPMA). The Surface Transportation Board (STB) has jurisdiction, pursuant to 49 U.S.C. 10501(b), over the construction, acquisition, operation, and abandonment of rail lines, railroad rates and services, and rail carrier consolidations and mergers. The Federal Highway Administration (FHWA) has jurisdiction over the use of and/or modification of Interstate highway right of way under 23 CFR 1.23. The BLM, STB, and FHWA are cooperating agencies for the project. Additional information regarding the regulatory authorities of the lead and cooperating federal agencies can be found in the Draft Environmental Impact Statement (DEIS) sections 1.4 *Major Authorizing Laws and Regulations* and 1.5 *Relationships to Other Federal Agency Policies, Plans, and Programs*.

DesertXpress Enterprises, LLC (Applicant) proposes to construct and operate a privately financed interstate high-speed passenger train between southern California and Las Vegas. The proposed action is to construct and operate a fully grade-separated, dedicated, double-track passenger-only railroad along an approximately 200-mile corridor, from Victorville, California, to Las Vegas, Nevada Figures 1 – 7 in Appendix A are overview maps of the proposed project. The Applicant proposes to construct the vast majority of the railroad immediately alongside Interstate 15 (I-15) and/or within existing railroad corridors/rights-of-way. The project also crosses public lands managed by the BLM.

A list of federally threatened, endangered, or proposed listed plant and wildlife species that have the potential to occur in the vicinity of the proposed action was obtained from the USFWS Ventura Ecological Services Office. The following federally listed (F) and state-listed (California) (S) proposed (P), threatened (T), and endangered (E) species were suggested for this assessment.

- Desert tortoise (*Gopherus agassizii*)—FT
- Least Bell's vireo (*Vireo bellii pusillus*)—FE
- Southwestern willow flycatcher (*Empidonax trallii extimas*)—FE

Suitable nesting and foraging habitat for least Bell's vireo and southwestern flycatcher within the vicinity of the proposed action occurs only within the Mojave River floodplain near Victorville, California. The proposed action does cross the Mojave River near Barstow (Figure 2 in Appendix A). However, suitable nesting and foraging habitat for least Bell's vireo and southwestern flycatcher does not occur along this portion of the river. Due to the lack of suitable nesting or foraging habitat in the project area, the proposed action will not affect least Bell's vireo or southwestern willow flycatcher. These species will not be discussed further in this BA. Suitable habitat for desert tortoise was determined to occur throughout the proposed action area in both California and Nevada. Critical habitat for desert tortoise occurs within the proposed action area in California.

Description of the Proposed Action

The proposed action includes the construction, operation and maintenance of approximately 200 miles of rail alignment, passenger stations, maintenance facilities, autotransformers and substations, electrical transmission lines, and temporary construction areas. These elements are further described below and illustrated in the DEIS and Supplemental Draft Environmental Impact Statement (SDEIS).

Following completion of the Final Environmental Impact Statement (FEIS) and issuance of the Records of Decision (ROD), the Applicant will complete additional project design during an approximately 12 month period. Once the additional design has been completed, the proposed project will be constructed within a period of approximately 48 months including simultaneous construction on multiple project spreads.

Rail Alignment Features

The components of the rail alignment includes a 75 foot wide permanent right-of-way which would include the rail bed with tracks spaced 15 feet apart, concrete barriers, overhead electrical distribution and transmission lines, fencing, and access/maintenance area. This 75 foot permanent right-of-way would also include culverts, bridges, or aerials at drainage crossings to allow the conveyance of surface flows across the project rail alignment right-of-way. The placement of these drainage crossings would match those of I-15 when the alignment is adjacent to the roadway. The drainage design for other portions of the alignment would be developed as part of the project design-build phase.

Station and Operations, Maintenance, and Storage Facilities

The proposed action includes the following permanent physical facilities in addition to the rail alignment.

Victorville Passenger Station

The Victorville Passenger Station 3b is proposed at the southwestern portion of the I-15/Dale Evans Parkway interchange. This facility includes the permanent station buildings, parking lot and structures, and utilities within the proposed project footprint. The boundary of the facility would be fenced with permanent desert tortoise fencing.

Victorville Operations, Maintenance, and Storage Facility (OMSF)

The Victorville OMSF would be located immediately south of Victorville Passenger Station. The facility would include a train washing facility, repair shop, parts storage, and operations control center. The boundary of the facility would be fenced with permanent desert tortoise fencing.

Autotransformers and Substations

The Electrical Multiple Unit (EMU) technology propulsion power would be delivered along the project right-of-way by an overhead contact electrical distribution system with poles and conductor. A series of autotransformers are proposed along the alignment and preliminary engineering identified the need for a total of 17 autotransformers, spaced at 10 to 12 mile intervals along the alignment. These autotransformers help to maintain and regulate the voltage along the line. Each autotransformer would require a physical footprint of about one-tenth to one-fifth of an acre and may be partially located within the 75 foot permanent right-of-way.

Maintenance-of-Way Facility

The proposed action also includes a maintenance-of-way (MOW) facility. The MOW facility would be located on a 2.4 acre site containing a 5,200 square foot building, plus tail tracks, a radio signal tower, fuel storage, and other related facilities that would serve as a headquarters for DesertXpress employees charged with daily inspection of tracks and associated facilities to ensure ongoing safe operations.

Utility Corridors

The proposed action includes three utility corridors, including connections at the Victorville OMSF and Baker MOW to connect the project to electricity sources. The utility corridor associated with the Victorville OMSF and the Baker MOW would be approximately 6 miles and 1.2 miles in length, respectively. Each of the utility corridor right-of-way would have a width of 100 feet. The permanent access road contained in the corridor would be approximately 10 feet wide. The utility line towers would range in height from 95 feet to 135 feet, depending upon land mark clearance. Tower spacing would range from 440 feet to 940 feet depending on tower height and necessary clearance. Each tower footprint would be approximately 24 square feet to 59 square feet in size, depending on the height of the tower. The utility towers would use a typical voltage of 230Kv transmission, with 66Kv for power distribution.

Temporary Construction Areas (TCA)

Construction of the proposed action would require the use of the temporary construction areas. The TCAs would be used during construction for project lay-down and temporary storage of construction materials. The entire TCA would be bladed and graded with all vegetation removed. The temporary impact areas would be rehabilitated and restored once construction is completed (Table 1).

Table 1. Temporary Construction Areas with Temporary Impacts to Desert Tortoise Habitat

TCA No.	Location	Size (acres)	Segment(s) Served
2C1	Southwest of Barstow, along the northeast side of the I-15 / Highway 58 interchange	1.01	2C
5	East of Yermo, along north side of I-15 at Yermo Road/I-15 interchange	5.23	2A
6	Along south side of I-15, southwest of the I-15/Field Road interchange	5.81	3B
7	Along north side of I-15 near the Basin Road interchange	3.50	3B
9	Northeast of Baker, between I-15 and Baker Blvd, adjacent to the Baker MOW	8.40	3B
10	North of I-15 at Cima Road	5.67	3B
4C1	Along I-15, near Mountain Pass south of Clark Mountains	5.18	4C
4C2	North of Mountain Pass in Clark Mountains, 1.25 miles north of I-15	0.65	4C
4C3	North of Mountain Pass in Clark Mountains, 1.7 miles north of I-15	0.65	4C
4C4	North of Mountain Pass in Clark Mountains, 7 miles north of I-15	9.70	4C
4C5	North of Primm, northwest of I-15	6.09	4C
13	Along east side of I-15, 3.5 miles north of Jean	9.09	5B
Source:	CirclePoint, 2010.		

Proposed Action

The Proposed Action is a 200-mile rail corridor between Victorville and Las Vegas consisting of rail alignments, station and maintenance facilities, substations, and transmission lines each of which is described in more detail below and depicted in Figures 1–87 in Appendix B. The proposed action facilities within the urbanized portion of Barstow, Baker, and Las Vegas are not included in this analysis because they do not contain desert tortoise habitat.

Segment 1

Segment 1 rail alignment is proposed along the north/west side of the I-15 corridor. Segment 1 would connect with the Segment 2C Side Running rail alignment near Lenwood Road approximately 7 miles southwest of the community of Lenwood. This segment also includes:

- Victorville Station 3b;
- Victorville OMSF 2 facility;
- autotransformers 2 and 3 (no desert tortoise habitat impacts); and
- a 230 kV utility corridor.

Segment 2C/2A

The Segment 2C Side Running rail alignment is proposed along the north/west side of the I-15 through Lenwood, central Barstow, and eastward to Yermo and connects to Segment 3b. The rail alignment would maintain a side-running configuration along the west/north side of the I-15 freeway through central Barstow and would cross over the Mojave River on a new bridge immediately adjacent to the existing southbound I-15 bridge.

In the vicinity of the I-15/Fort Irwin Road interchange just west of Yermo the rail alignment would divert from the existing I-15 freeway corridor (outside of the existing right-of-way) and would follow a northerly course around the community of Yermo for approximately 9 miles. The rail alignment would reconnect with the I-15 freeway corridor approximately 1 mile east of the I-15/Yermo Road interchange, where the Segment 2A rail alignment would connect with the Segment 3B rail alignment.

This segment also includes:

- a new bridge structure at the Mojave River;
- TCAs 2C1 and 5; and
- Autotransformer Site 4 and Site 5a.

Segment 3B

The Segment 3B rail alignment would be located alongside theI-15 freeway, predominately along the north side, within the existing freeway right-of-way from Fort Irwin Road to Mountain Pass, a distance of about 85 miles. Grade-separated elevated structures would be incorporated for crossing roadways and at the I-15 interchanges, from the on-off ramps. In the Mountain Pass area, the Segment 3B rail alignment would connect with the Segment 4C rail alignment.

This segment also includes:

- TCAs 6, 7,8 (no desert tortoise habitat impacts), 9, and 10;
- Autotransformer Site 6, Site 7, Site 8, Site 9, Site 10, Site 11, Site 12; and
- Baker MOW.

Segment 4C

The Segment 4C rail alignment would be approximately 21 miles long. The rail alignment would leave the I-15 freeway right-of-way at Mt. Pass and extend northeast, passing through three new dual track tunnels through the Clark Mountain range. The Segment 4C rail alignment would travel northwardly from the Clark Mountains and would turn east to cross the California-Nevada state line and connect back to the I-15 freeway corridor north of Primm. North of Primm, the Segment 4C rail alignment would connect with the Segment 5B rail alignment.

This segment also includes:

- TCAs 4C1, 4C2, 4C3, 4C4, and 4C5; and
- Autotransformer Site 13 and Site 14.

Segment 5B

The Segment 5B rail alignment would be located on the east side of I-15 within the freeway right-of-way between Primm and Jean. In this segment, the rail alignment would cross back to the west side of I-15 at the existing UPRR tracks south of Sloan. Upon crossing over to the west side of I-15, the Segment 5B rail alignment would connect with the Segment 6B rail alignment.

This segment also includes:

- TCA 13; and
- Autotransformer Site 15.

Segment 6B

The Segment 6B rail alignment would be located along the west side of the I-15 freeway primarily within the freeway right-of-way. Segment 6B would be constructed at-grade until reaching the I-15/Blue Diamond Road interchange in the Las Vegas metropolitan area, where the rail alignment would transition to an elevated structure through Las Vegas. No desert tortoise habitat would be impacted as a result of project implementation from 0.5 mile south of the I-15 and St. Rose Parkway interchange to the project terminus in Las Vegas.

This segment also includes:

- Autotransformer Site 16b and Site 17 (no desert tortoise habitat impacts).

Categories of Impacts

For the purposes of this biological assessment, impacts have been placed into three categories:

Permanently disturbed areas – These include those project elements that would remain after project construction. These areas would permanently convert desert tortoise habitat, critical habitat or Desert Wildlife Management areas to transportation use. These include the 75 foot wide permanent rail alignment, the Victorville Station, the Victorville OMSF, autotransformers and substations, Baker MOW, Sloan MSF, and the access road and tower pads for the utility corridors.

Temporary disturbance areas – These include the temporary construction area along the proposed right-of-way (approximately 162.5 feet on either side of the permanent rail alignment). These areas would include topsoil removal and stockpile, blading and grading, and construction activity including vehicular and equipment use and equipment stockpiling. Project components that are described in the SDEIS and the FEIS as temporary construction areas area are within project permanent disturbance areas, including some of the TCAs. These areas have been incorporated into the analysis of permanent impacts.

Action Area

USFWS defines an action area as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (*50 CFR 402.02*). The proposed action area is located in San Bernardino County, California, and Clark County, Nevada. Most of the proposed

action area is located within or adjacent to the I-15 right-of-way and BLM lands in California and Nevada.

The action area includes the 75-foot-wide permanent rail corridor, the temporary construction area that extends approximately 162.5 feet beyond permanent rail corridor, the permanent disturbance associated with the Victorville Station 3b, Victorville OMSF2, Baker MOW and the utility corridors.

The action area also includes a 300 foot buffer beyond the limit of the rail alignment temporary disturbance and the Victorville Station 3b, Victorville OMSF, and the Baker MOW permanent disturbance due to potential direct adverse effects associated with project construction noise, dust, and potential desert tortoise relocations. Within portions of the project alignment that abut the I-15 facility, the buffer would not be extended over the roadway.

The action area includes Project Segments 1-6 ending 0.25 mile south of the I-15 / St. Rose Parkway interchange in Clark County, Nevada. The SDEIS and FEIS indicated the project terminus is near Flamingo Road in Las Vegas, Nevada. Since these areas do not impact desert tortoise or other federally listed species, they are not included in the BA analysis or the Section 7 consultation.

Environmental Baseline Conditions

The environmental baseline includes State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the consultation in progress. Unrelated Federal actions affecting the same species or critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are Federal and other actions within the action area that may benefit listed species or critical habitat. The environmental baseline for the project is described in the DEIS and SDEIS Section 3.14 Biological Resources and DEIS Section 3.16 Cumulative Impacts.

The past and present impacts from all Federal, State, or private actions in the action area have substantially affected the environmental baseline. The construction, operation, and improvements to the I-15 roadway and right-of-way have reduced the quality and use of the adjacent desert tortoise habitat. The BrightSource ISEGS facility located in the Ivanpah Valley consists of approximately 3,300 acres of permanent ground disturbance within suitable desert tortoise habitat. The suitable habitat within this somewhat isolated (by the Clark Mountains and the I-15 corridor) portion of the Northeastern Recovery Unit has undergone considerable development resulting in the permanent loss of suitable desert tortoise habitat. The proposed action of the DesertXpress project includes a portion of the ISEGS designated relocation area and comes within 0.25 mile of an ISEGS short-distance translocation area.

Table 2. Summary of Vegetation Communities and Other Land Use Types in the Project Study Area

Vegetation Community Type	Associated Species	Description	Occurrence in Project Study Area
Creosote Bush Shrubland	A group of alliances: creosote bush may be the only shrub, other alliances are characterized by shared dominance with white	Various substrates and settings, including sandy substrates, alluvial fans, bajadas; may occur on disturbed sites	Very common throughout project study area

Vegetation Community Type	Associated Species	Description	Occurrence in Project Study Area
	bursage and/or brittlebush; also desert holly, saltbush species, and many other shrubs may be present in low densities		
Desert Holly Shrubland	Creosote bush, other saltbush species, white bursage, brittlebush	The most drought-tolerant scrub, occurring on rocky slopes, bajadas, playa edges	Uncommon in the project study area
Joshua Tree Wooded Shrubland	A variety of shrubs, including big sagebrush, creosote bush, California buckwheat, brittlebush, blackbrush	Alluvial fans, flat to gently sloping areas	Occurs between Baker and Mountain Pass
Saltbush Complex	Other saltbush species, creosote bush, white bursage, rabbitbrush	Includes several alliances dominated by different saltbush species; many substrates and settings: sandy soils, washes, playas, playa edges, alkaline sites	Very common throughout project study area
Blackbrush Shrubland	California buckwheat, shadscale, white bursage, Ephedra sp., and a variety of other desert shrubs	Alluvial slopes, rocky slopes, bajadas	Occurs only in the Mountain Pass area
Mesquite Shrubland (Intermittently Flooded)	Saltbush species, sandbar willow, iodinebush	Rarely flooded edges of washes, floodplains, playa edges	Rare; occurs at a few sites west of Mountain Pass
Barren (Disturbed, graded)	May have sparse growth of mostly non-native species, especially invasive annual grasses	Various substrates and settings	Common along the median and shoulders of Interstate 15 roadway
Agriculture (alfalfa, grazing)	Alfalfa, a variety of pasture grasses	Generally flat alluvial areas	Occurs at the western end of the alignment east of Victorville
Rural development	N/A	Usually flat to gently sloping sites, valley floors	Predominantly at the western end of the alignment east of Victorville
Urban	N/A	Usually flat to gently sloping sites, valley floors	Cities of Victorville, Baker, Barstow, Primm, and Las Vegas, including adjacent urbanized areas

Listed Species & Critical Habitat in the Action Area

Desert Tortoise

Regulatory Status and Distribution

The Mojave population of the desert tortoise is federally and California state listed as threatened. In Nevada, desert tortoises are classified as a state protected and threatened species. The Mojave population includes those animals occurring in north and west of the Colorado River, in southeastern California, southern Nevada, northwestern Arizona, and southwestern Utah.

The range of the Mojave population of the desert tortoise includes a portion of the Mojave Desert and the Colorado Desert subdivision of the Sonoran Desert at elevations below 5,000 feet. The Mojave Desert is located in southern California, southern Nevada, northwestern Arizona, and southwestern Utah. It is bordered on the north by the Great Basin Desert, on the west by the Sierra Nevada and Tehachapi Ranges, on the south by the San Gabriel and San Bernardino Mountains and the Colorado Desert, and on the east by the Grand Wash Cliffs and Hualapai Mountains of Arizona (USFWS 1994).

Life History

The desert tortoise is most commonly found within desert scrub vegetation type, primarily in creosote bush scrub vegetation, but also in succulent scrub, cheesebush scrub, blackbrush scrub, hopsage scrub, shadscale scrub, and saltbush scrub (USFWS 1994). Within these vegetation types, desert tortoises can survive and reproduce where their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow. Throughout most of the Mojave region, tortoises occur most commonly on gently sloping terrain with soils ranging from sand to sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, tortoises can also be found in steeper, rockier areas.

Desert tortoises spend the majority of time underground in burrows that are excavated in dry, often loamy soils under creosote or other large shrubs or in the banks of desert washes. Burrows range from pallets that barely cover a single tortoise to burrows over 10 feet long. The entrances of burrows are identifiable by their half-moon shape, which corresponds to the profile of the tortoise shell.

Above-ground activity is closely related to the amount and timing of precipitation and the emergence of annual plants, which make up the majority of the desert tortoise diet. Generally, tortoises are active during the late winter and spring, though they may be active during the morning or early evening of summer months whenever summer rains offer the chance to replenish water reserves. By October, most tortoises have begun winter hibernation.

Courtship and mating generally occurs during the spring. Between May and July, females lay between 3 and 14 ping-pong ball–size eggs in sandy or friable soil, often at the entrance to burrows. Hatching occurs 90 to120 days later, mostly in late summer and fall (mid-August to October). Eggs and young are untended by the parents and thus are quite vulnerable; pre-reproductive mortality

averages 98% (Turner et al. 1987, Morafka et al. 1997). Maximum longevity in the wild is likely to be about 50 to 70 years, the norm being 25 to 35 years (Germano 1992, 1994), though most tortoises do not survive to sexual maturity (CDFG 2005). Their longevity helps compensate for their variable annual reproductive success, which is correlated with environmental conditions (USFWS 1994).

Threats

Reasons for the determination to federally list the desert tortoise as threatened included significant population declines from a number of threats, mainly loss of habitat caused by construction projects such as roads, housing, and energy developments, and by conversion of native habitat to agriculture. Grazing and off-highway-vehicle activity have degraded additional habitat. Also identified as threats to desert tortoises are illegal collection by humans for consumption or pets, upper respiratory tract disease, predation on juvenile desert tortoises by common ravens (*Corvus corax*) and coyotes (*Canis latrans*), and collisions with vehicles on paved and unpaved roads (CDFG 2005, USFWS 1994).

Survey Methodology

Survey methods were developed in coordination with state and federal biologists during the December 19, 2006, meeting described above. Surveys were conducted in 2007 for a total of 50 miles in California. No surveys were conducted in Nevada. The USFWS did not recommend conducting tortoise surveys along the portions of the project that are within the I-15 right-of-way, but they requested that tortoise surveys be conducted in a representative number of drainage crossings along I-15 that may allow tortoise movement between habitat on either side of I-15. Tortoise surveys were conducted at 29 drainage crossings in the project study area. The drainage bed and banks at these crossings were surveyed using 30-foot-wide pedestrian transects at distances of 500 feet upstream and downstream on either side of I-15 (a total of 1,000 feet per drainage) for a total of 21,000 feet (approximately 4 miles).

Surveys were conducted by two biologists walking meandering transects within a 300-foot wide corridor from the centerline of the alignment alternative. (The 300-foot width of the corridor was the initial width of the construction corridor. The width was later changed to 400 feet, as described later in this document.) Where the alignment was immediately adjacent to the interstate, surveys were only conducted within a 150-foot wide corridor on the habitat opposite the interstate. In areas where the corridor extends beyond railroad tracks, the survey area only included the area between the centerline of the alignment and the railroad tracks.

All observed tortoises and tortoise sign (e.g., suitable burrows, pallets, scat, tracks, eggshells, and carcasses) were recorded on survey forms and location coordinates were collected using a Global Positioning System (GPS) unit. The observed tortoise sign has been mapped along the project alignment (Appendix C).

Occurrence in the Action Area

The entire proposed action area lies within the range of the desert tortoise Mojave population. The limited desert tortoise survey resulted in observations of 2 carcasses, 6 Class 1-3 burrows, 14 Class 4-6 burrows, 1 Class 1 pallet, 2 Class 2 pallets, and 2 Class 5 carcasses.

Recovery Units

The project occurs across three Mojave Desert tortoise recovery units. These include the Western Mojave Recovery Unit and Eastern Mojave Unit in California and the Northeastern Mojave Recovery Unit in portions California east of Mt. Pass and Nevada.

Critical Habitat

Critical habitat has been designated for the desert tortoise (*59 FR 5820–5866*; February 8, 1994). Critical habitat for desert tortoise within the action area is located on the north side of I-15 east of Barstow in the Superior-Cronese Critical Habitat Unit, north side of I-15 west of Barstow, and on the north and south side of I-15 east of Mountain Pass in the Ivanpah Critical Habitat Unit. No critical habitat in Nevada would be affected by the proposed action. The project is anticipated to temporarily and permanently impact critical habitat adjacent to the I-15 right-of-way.

Mojave Desert tortoise critical habitat consists of the following primary constituent elements:

- sufficient space to support viable populations within each of the six recovery units and provide for movements, dispersal, and gene flow;
- sufficient quantity and quality of forage species 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.

Effects of the Proposed Action

This section presents the potential direct, indirect, and cumulative effects of the proposed action on desert tortoise within the action area. This includes the effects of interrelated and interdependent actions.

Direct and Indirect Effects

Direct effects are defined as the direct or immediate effects of a proposed action on a species or its habitat. Direct effects may result from the action and may include the effects of interrelated and interdependent actions. Indirect effects are effects that are caused by or will result from the proposed action and are later in time, but still reasonably certain to occur. An *interrelated action* is an activity that is part of the proposed action and depends on the proposed action for its justification. An *interdependent action* is an activity that has no independent utility apart from the action under consultation.

Direct effects of the project consist of both temporary and permanent effects. The primary direct and indirect permanent effect of construction-related activities includes injury or mortality of individual desert tortoises and removal of foraging habitat.

Direct permanent effects would occur within the 75 foot wide permanent rail alignment, the Victorville Station, the Victorville OMSF, autotransformers and substations, Baker MOW, Sloan MSF, and the access road and tower pads for the utility corridors. In these areas vegetation would be removed and permanently lost. This would constitute permanent conversion of the area from vegetative habitat to a transportation facility. Desert tortoises in these areas would be permanently displaced and their natural movement corridors would be disrupted.

Direct temporary effects would occur within the temporary construction area (outside the permanent right-of-way). Temporary effects would include topsoil removal and stockpile, blading and grading, and construction activity including vehicular and equipment use of the area. In addition, temporary direct effects would include soil compaction, construction dust, water and surface water run-off from the construction area, and construction-related noise and vibrations from construction equipment. The limits of these temporary direct effects are expected to extend approximately 300 feet beyond the direct temporary construction area. These may result in the avoidance of the area by desert tortoises temporarily reducing available forage and access to burrows.

Direct temporary effects resulting from desert tortoise being relocated from the temporary construction area may adversely impact other desert tortoise already residing in the area by temporarily modifying behavior, competing for burrows and forage. This may result in reduced habitat productivity adjacent to the proposed project alignment during construction. The natural and project-related restoration of the temporary construction area and desert tortoise dispersion may reduce the impacts to habitat productivity over time.

Direct temporary effects resulting from the construction activity and presence of the construction crews is increased predation from ravens and coyotes attracted to the action area. Ravens and coyotes are known to prey on juvenile tortoises and increased predator densities in the action area may result in direct mortality of the juvenile desert tortoise.

A permanent indirect effect of constructing and operating the proposed action is increased predation and mortality from perching and nesting ravens. Once the facility has been constructed, the proposed action will provide electrical distribution poles in areas that currently have limited raven perching and nesting opportunities. This may increase raven predation on juvenile desert tortoise along the alignment.

As discussed above, disturbance of soils within the temporary construction areas could result in increased wind erosion of the soil. Transport of soil and sand can result in the degradation of soil and vegetation over a wider area than just area directly impacted. Large amounts of dust can have negative effects on the physiology of plants and may affect their productivity, resulting in diminished foraging potential for desert tortoises. Additionally, degradation of the soil would have negative effects on the ability of desert tortoises to create burrows. The softening of soils in the vicinity of the action area would lessen the stability of burrows and increase the likelihood of collapse. The potential of increased dust as a result of the proposed action would have an adverse effect on both desert tortoise foraging and burrowing potential.

Permanent and temporary indirect effects resulting from the introduction of non-native grasses and forbs may include the reduction in desert tortoise forage and forage value. Many non-native grasses and forbs are adapted to and promoted by soil disturbance and seeds are commonly transported on vehicles and by wind and water. Non-natives often out-compete native species because of high germination potential and high seed production, and they can become locally dominant. The

associated decline in forage species diversity would be likely to detrimentally affect desert tortoises in both the short and long term. Furthermore, non-native grasses and forbs can provide fuel to support wildfires.

A permanent indirect effect of many rail lines is the potential for wildland fire which may impact natural habitat. The proposed project would have little potential for such fires. Because the proposed project is a high speed train, its construction and operation are substantially different than typical freight trains. The proposed project would be constructed and fences within a 75 foot permanent right-of-way that are cleared of vegetation and maintained in this state to accommodate high speed train traffic. Due to the lack of vegetation within the right-of-way the project will have a very low potential for starting wildland fires along the rail alignment.

A permanent indirect effect resulting from the modification to the natural drainages, particularly within Segment 4C, is the potential for downstream impacts to the natural hydrology and Mojave wash scrub of the alluvial fan. This could modify and reduce the desert tortoise forage base within the ephemeral drainages downstream from the project alignment. Furthermore, maintenance and clean-out of the project culverts, bridges and aerials could result in additional modification of restored tortoise habitat adjacent to the permanent rail right-of-way and downstream through sediment transport and erosion.

In California, construction of the proposed action would result in direct temporary impacts on 3,286.43 acres of suitable desert tortoise habitat (Table 3). The proposed action would result in the direct permanent loss of 1,269.23 acres of suitable desert tortoise habitat (Table 3). The proposed action would also result in temporary and permanent net loss of ruderal vegetation in California (Table 4). The total ground disturbing activity within desert tortoise habitat in California is 4,570.33 acres (Table 3 and Table 4).

In Nevada, construction of the proposed action would result in direct temporary impacts on 812.61 acres of suitable desert tortoise habitat (Table 5). The proposed action would result in the direct permanent loss of 240.58 acres of suitable desert tortoise habitat (Table 5).

The proposed action would result in 1,400.29 acres of direct temporary and 452.95 acres of direct permanent impacts to designated critical habitat for desert tortoise (Table 6). The permanent impact to the Ivanpah Critical Habitat Unit and the Superior-Cronese Critical Habitat Unit is 0.032% of each unit's total acreage. The majority of these impacts are to designated critical habitat immediately adjacent to the existing I-15 roadway. The critical habitat impacted by the proposed action is providing a limited functionality due to the proximity to the I-15 corridor. This proximity results in increased raven and coyote predation on juvenile tortoise, a modified vegetation structure due to the presence of weeds, and habitat that is not protected from disturbance or human caused mortality. The implementation of the proposed action is not expected to change the critical habitat function to serve the intended conservation purpose or inhibit the ability of the primary constituent's elements to be functionally established within the critical habitat.

Table 3. Temporary and Permanent Impacts on Suitable Desert Tortoise Habitat in California

Project Component	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Rail Alignment		
1	321.05	33.45
2C	120.95	30.68
2A	327.98	77.58
3B	1,859.15	640.45
4C	578.03	135.67
TCA		
2C1	1.01	--
5	5.23	--
6	5.81	--
7	3.50	--
9	8.40	--
10	5.67	--
4C1	5.18	
4C2	0.65	--
4C3	0.65	--
4C4	9.70	--
Autotransformers		
2	--	0.04
4	--	0.08
5a	--	0.13
6	--	0.08
7	--	0.08
8	--	0.08
9	--	0.03
10	--	0.08
11	--	0.08
12	--	0.08
13	--	0.08
MSF/MOW/Station		
Baker MOW	3.45	3.96
OMSF 2	27.23	98.31
Victorville Station	--	209.78
Utility Corridor		
Baker Utility Corridor	2.80	2.34
Victorville Utility Corridor	36.15	36.17
Total	3,286.44	1,269.23

Table 4. Temporary and Permanent Impacts on Ruderal Vegetation in California

Project Component	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Rail Alignment		
2C	5.15	1.95
2A	0.01	--
3B	7.57	--
Total	12.72	1.95

Table 5. Temporary and Permanent Impacts on Desert Tortoise Habitat in Nevada

Project Component	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Rail Alignment		
4C	121.93	32.03
5B	555.51	175.50
6	119.99	32.75
TCA		
4C5	6.09	--
13	9.09	--
Autotransformers		
14	--	0.08
15	--	0.08
16b	--	0.16
Total	812.61	240.58

Table 6. Temporary and Permanent Impacts on Critical Habitat

Critical Habitat Unit	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Superior Cronese CHU	868.81	249.97
Ivanpah CHU	531.48	202.98
Total	1,400.29	452.95

Barriers to Desert Tortoise Movement

Segment 4C includes approximately 18.7 miles of the proposed action alignment that deviates from the existing I-15 corridor and traverses undeveloped public lands east of I-15. This proposed section of the alignment would result in reducing the ability of desert tortoise in this area to move across the proposed project alignment. The 18.7-mile portion of Segment 4C would create a barrier to desert tortoise movement, and potentially isolating the block of habitat between the proposed action alignment and I-15. The installation of appropriately constructed culverts along the proposed route would mitigate some of these impacts; however, desert tortoise access to and utilization of the isolated block of habitat is expected to be reduced. This reduction would reduce the availability of forage and population interaction.

Temporary and Permanent Impacts on Desert Wildlife Management Areas

Construction of the proposed action could result in a total of 1,339.34 acres of DWMAs (393.66 acres of the Shadow Valley DWMA and 934.68 acres of Superior-Cronese DWMA). This includes 726.36 acres of temporary and 208.32 acres of permanent impacts to the Superior-Cronese DWMA and 290.64 acres of temporary and 103.02 acres of permanent impacts to the Shadow Valley DWMA (Table 7). All of the impacts to DWMAs will occur within California.

Table 7. Temporary and Permanent Impacts on Desert Wildlife Management Units

Desert Wildlife Management Unit (DWMA)	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Superior-Cronese	726.36	208.32
Shadow Valley	290.64	103.02
Total	1017.00	322.34

Interrelated Actions

An interrelated activity is one that is part of the proposed action and depends on the proposed action for its justification. There are no interrelated effects for the proposed action.

Interdependent Actions

Interdependent actions have no independent utility apart from the action under consultation. There are no interdependent actions resulting from the proposed action.

Cumulative Effects

Cumulative effects are those impacts of future State, local, and private actions that are reasonably certain to occur in the project area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Endangered Species Act, and, therefore, are not considered cumulative to the proposed project. There are no known actions that are likely to occur in the project area.

Proposed Mitigation

Adopted Conservation Measures

The following proposed mitigation is based on mitigation measures in the EIS.

General Mitigation Measures

- All personnel working within the project area will attend an environmental awareness training program. The program will be presented by qualified biologists and include information on the life history of special-status species that may be encountered during construction activities, the legal protection for each species, the definition of "take" for listed species, measures to protect special-status species, reporting requirements, specific measures that each worker will need to

employ to avoid adverse impacts on individual sensitive species, a detailed description of environmental project commitments as described in the decision records (i.e., Record of Decision), right-of-way grants, and Biological Opinion, and penalties for violation of federal and state environmental laws.

The following measures will be implemented during project construction:

- Qualified biologists will be on site during any construction activity within or near special-status species habitat to ensure the implementation and compliance of environmental commitments and avoidance measures.
- Qualified biologists will have the authority to stop work if dangers to desert tortoises, or other special-status wildlife species arise, and to allow work to proceed after the hazard has been removed. The USFWS Las Vegas and Ventura Ecological Services Offices, BLM Field Offices, and CDFG must be notified of any desert tortoise injury or death resulting from project-related activities.
- As part of the monitoring, the biologists will check construction areas immediately before construction activities each day to ensure that no special-status wildlife species have moved into the construction area. If tortoises are discovered within the construction area, they will be relocated to adjacent tortoise habitat approximately 300 feet of the limit of disturbance.
- The desert tortoise monitors will ensure proper implementation of protective measures, record and report desert tortoise and tortoise sign observations in accordance with approved protocol, report incidents of noncompliance in accordance with the biological opinion and other relevant permits and authorizations, and move desert tortoises from harm's way and place these animals in adjacent tortoise habitat approximately 300 feet of the limit of disturbance.
- All construction activities will be confined to the designated work areas. Grubbing of vegetation will only be done to the extent necessary for construction and will be limited to areas designated for that. Overnight parking and storage of equipment and materials will be limited to previously disturbed areas or areas identified in the BLM right-of-way grant.
- All vehicle traffic will be restricted to existing paved roads and the project alignment within the permanent or temporary construction area. Disturbance beyond the construction area would be prohibited except in emergency situations.
- Construction vehicles within sensitive species habitat will not exceed 15 miles per hour.
- A litter-control program will be implemented during construction. The program will include the use of covered, raven-proof trash receptacles, daily removal of trash from work areas to the trash receptacles, and proper disposal of trash in a designated solid waste disposal facility. Precautions will also be taken to prevent trash from blowing out of construction vehicles.
- DesertXpress will promptly remove all road-killed animals with the project construction area and the permanent rail alignment to reduce the adverse effects associated with predation of desert tortoise by ravens.
- No pets or firearms will be permitted in the work area.
- Both pre- and post-construction photographs will be taken to document sensitive habitat conditions within the limits of project disturbance.
- During construction, DesertXpress will perform weekly inspections and weed removal/control during the growing season of all construction areas, rail alignment and facilities. Following the

completion of construction activities, from March through August, DesertXpress will continue monitoring and removal monthly during the first 2 years of operation and quarterly for the life of the facility. Weed removal and control will consist of physical control methods (e.g., hand pulling, hoeing, etc.) or herbicide application. Application of herbicides used in weed treatment will be in accordance with BLM approval.

Desert Tortoise

Fencing and Clearance Surveys

To ensure the clearance of all desert tortoises from all potential habitat areas, USFWS authorized tortoise biologists will conduct clearance surveys as required by the USFWS.

Desert tortoise relocation from the project area will include:

1. The installation of temporary desert tortoise fencing around the perimeter prior to the commencement of on-site construction. Installation of the fencing will be monitored by a qualified biologist to ensure that desert tortoises are not killed or injured during this activity. Temporary desert tortoise fencing will be installed in areas of construction that are beyond the perimeter of the right-of-way or in areas where construction staging will occur. Desert tortoise guards will be installed at construction area entry points and permanent rail alignment maintenance access points. After installation, the fence will be regularly inspected to ensure its integrity. The project proponent will ensure that cross-country travel for construction purposes outside of the areas of desert tortoise fencing is prohibited.
2. Only biologists authorized by the USFWS will handle desert tortoises and will follow the guidelines established by the Desert Tortoise Council (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/). Desert tortoises found within the project area will be removed to undisturbed suitable habitat beyond the construction site and relocated within their own territory, where they may be familiar with alternate burrows. If no burrows are available, artificial burrows will be created following the Desert Tortoise Council's guidelines.
3. After installation of the temporary fencing, the entire project will be surveyed for desert tortoises by a qualified biologist. Following the procedures and precautions outlined in the Desert Tortoise Council's guidelines, all desert tortoise pallets and burrows within the survey areas will be examined and excavated by hand, either by or under the direct supervision of an authorized biologist, and collapsed to prevent re-entry.
4. A qualified biologist(s) will be present during all initial top soil removal, blading, or grading activities within the project area. During project implementation, all workers will inform the qualified biologist if a desert tortoise is found within or near project areas. All work in the vicinity of the desert tortoise, which could injure or kill the animal, will cease and it will be observed until it is moved from harm's way by the authorized biologist.
5. Workers will inspect for desert tortoises under vehicles and equipment before such equipment is moved. If a desert tortoise is present, the worker will wait for it to move from under the vehicle or the authorized biologist will be contacted to remove it.

DesertXpress will replace any previously installed permanent desert tortoise exclusionary fencing along I-15 that is removed during project construction.

Install Culverts under Railroad Tracks

The project proponent will install culverts under the proposed railroad line that match existing I-15 or UPRR culverts. Where the project deviates from existing transportation facilities, the project proponent will install culverts at natural drainage features and at regular intervals to allow for wildlife passage, including desert tortoises to pass under the proposed rail grade. The culverts would be designed through coordination with USFWS, BLM, CDFG, and NDOT, to ensure the meet agency wildlife standards. The construction and operation of the proposed action would not result in loss of desert tortoise habitat or degradation of habitat value downstream from the project alignment.

Minimization measures for potential impacts to the downstream habitat from Segment 4C are shown on Figures 1 and 2 in Appendix D. These minimization measures include the use of tunnels, aerial crossing structures, at grade overcrossing structures, and culverts. At a minimum all ephemeral drainages equal to or greater than 4 feet wide are being avoided by these types of structures. Where tunnels and aerial crossing structures are used drainages less than 4 feet in width are also being avoided. If support piles or piers are necessary to support over crossing structures these structures will be located outside of the drainage being over crossed. Biological monitors will be present during construction to insure that impacts to drainages are avoided according to plan or where an impact is unavoidable the impact is minimized and the natural substrate of the ephemeral drainage that has been disturbed is reestablished to original grade and with natural substrate materials within the drainage channel. In addition to the ephemeral drainages over crossed, ephemeral drainages established (created) or re-established as part of the project's compensatory mitigation for replacement of impacted waters of the U.S. or State will be monitored by an agency approved biologist for a minimum of 5-years to ensure that agency approved performance standards are met.

All fill material excavated from the proposed tunnels would be used in the permanent rail bed or exported off-site to an appropriate landfill. No desert tortoise habitat outside of the construction area is expected to be disturbed as a result of constructing these facilities.

Topsoil Removal and Stockpile

The construction area topsoil would be removed and stockpiled prior to initiating construction and replaced within areas of temporary disturbance once construction is complete. A vegetation and topsoil removal and restoration plan would be developed and implemented to reduce impacts on biological resources.

Install of Erosion Control Measures

The installation and maintenance of rice wattles, straw wattles and silt fencing along the temporary construction area will prevent the sediment from being transported off of the right-of-way during construction. Permanent stabilization measures will be deployed upon completion of construction along washes and in other areas of potential erosion.

Compensate for the Loss of Desert Tortoise Habitat in California

The project proponent will provide compensation for the disturbance of desert tortoise habitat (Table 8). Compensation ratios for the disturbance of habitat within California will be:

- 5:1 for impacts on suitable habitat located within Desert Wildlife Management Areas (DWMAs);

- 1:1 for impacts on suitable habitat located outside DWMAs; and
- 0.5:1 for impacts on disturbed non-urban habitat.

Table 8. Compensatory Mitigation for Impacts to Desert Tortoise Habitat in California

Classification	Acreage	Ratio	Compensatory Acreage
DWMA	1,339.34	5:1	6,696.70
Natural Vegetation Outside DWMA	3,263.58	1:1	3,263.58
Ruderal Vegetation	14.68	0.5:1	7.34

Suitable habitat is defined as having biological and physical characteristics to support desert tortoise and desert tortoise populations and having a reasonable potential for tortoise to occur. Suitable habitat that occurs in patches that are too small to support desert tortoise or lack adequate connectivity to larger habitat patches are not considered suitable habitat.

These mitigation requirements for the disturbance of desert tortoise habitat are based on a formula presented in the West Mojave Plan (Bureau of Land Management 2005: 2-36) and a telephone conversation between William Kohn and Stephanie Meyers of ICF Jones & Stokes and Lorenzo Encinas, a natural resource specialist with the Bureau of Land Management Barstow field office, on November 10, 2008. For the purposes of this project, changes to the compensation formula must be reviewed and approved by the BLM. The compensation could be used by the BLM for:

- installation of desert tortoise exclusion fencing;
- desert tortoise habitat restoration, including revegetation and removal of exotic plant species within the Superior-Cronese, Shadow Valley, and Ivanpah Valley DWMAs;
- purchase desert tortoise habitat within the Western Recovery Unit or the Eastern Recovery Unit; and,
- Contribute funds to a USFWS approved common raven regional management account.

Compensate for the Loss of Desert Tortoise Habitat in Nevada

For project-related loss of habitat in Nevada, the project proponent will follow the mitigation measures outlined by the Nevada USFWS Ecological Offices for the protection of desert tortoises. In accordance with the USFWS guidance, mitigation fees for disturbance to Mojave Desert tortoise habitat on BLM-administered public lands in Nevada will be paid by the project proponent.

The compensatory mitigation for the temporary and permanent disturbance of 1,053.19 acres of suitable desert tortoise habitat in Nevada would be based on the appropriate acreage fee at the time of the project begins construction in Nevada.

Conclusions and Determination

The following section summarizes the effects of the proposed action on federally listed species and the proposed compensatory mitigation acreages based on the identified effects.

Desert Tortoise

In California, the proposed action would directly affect acres of suitable habitat for desert tortoise. Direct effects on habitat for desert tortoises would be compensated at ratios of 5:1, 1:1, or 0.5:1, for impacts to DWMAs, natural habitat outside of DWMAs, and for disturbed non-developed habitat respectively (Table 8). In Nevada, the proposed action would temporarily affect 812.61 acres and permanently affect 240.58 acres of suitable desert tortoise habitat.

Because of the effects on suitable habitat and the potential mortality of desert tortoises, the proposed action *may effect* and is *likely to adversely affect* desert tortoises. The proposed action *may effect* and *is likely to adversely affect* designated critical habitat for desert tortoise.

Direct effects on desert tortoises will be minimized and compensated through the implementation of Conservation Measures described above in the "Adopted Conservation Measures" section.

The Applicant is proposing to develop the detailed project plans through the design build process. The design build process will develop detailed engineering design after the Record of Decision has been signed. Prior to any surface-disturbing construction activity, the Applicant would develop detailed engineering design by project segment. During this process, the Applicant may reduce the size of the project construction impact and therefore reduce the amount of impact to suitable desert tortoise habitat. The Applicant proposes to delay payment of the desert tortoise mitigation fees until after a project segment has been designed. Payment of desert tortoise mitigation fees would be submitted for each segment once the final design has been completed and the exact area of construction impacts has been determined.

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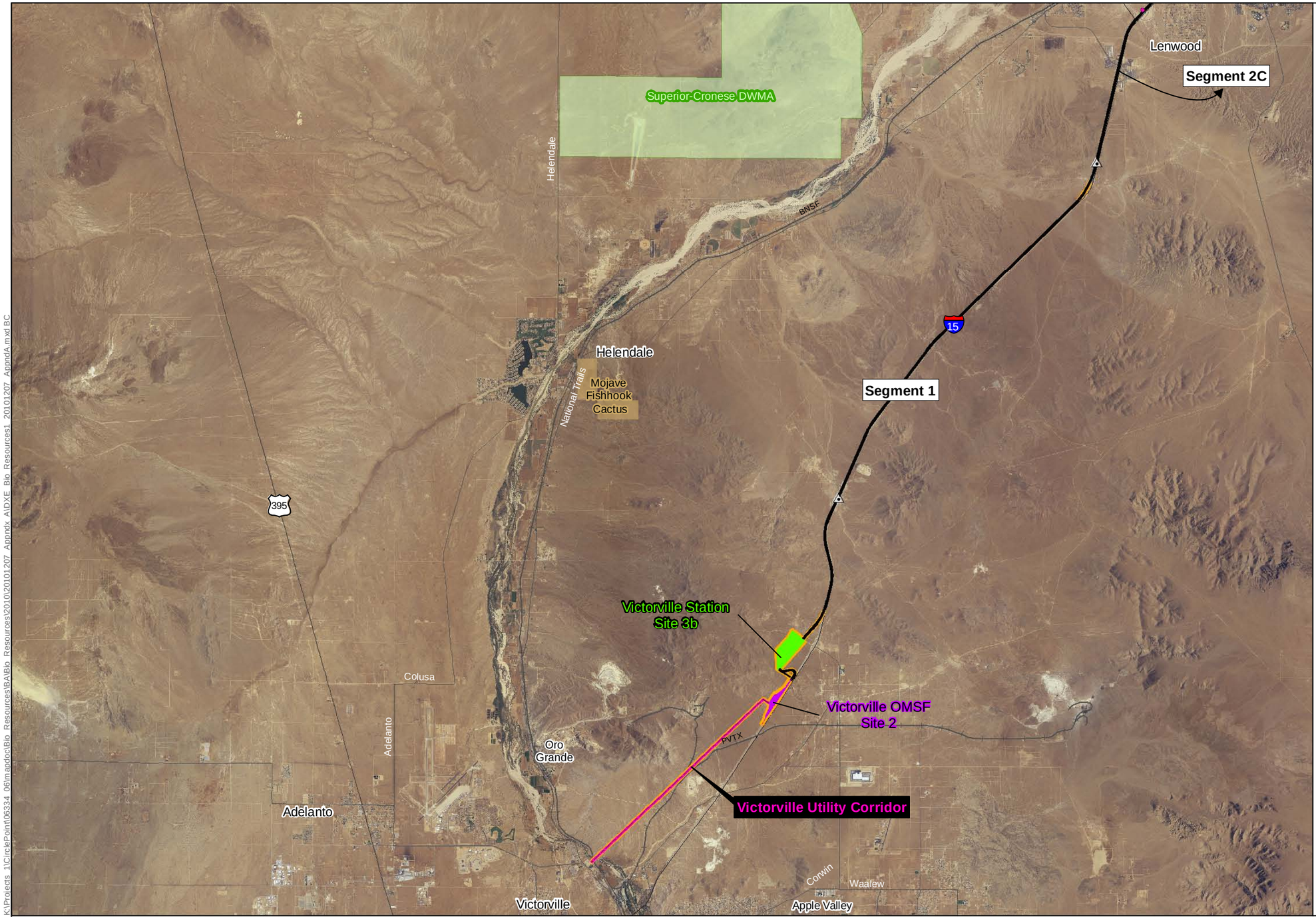
Appendix A

Project Alignment Overview Maps



Appendix A

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- DesertXpress Alignment
- Project Outside of Transportation Right-of-Way

Ancillary Facility Sites

- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 2 4

Miles
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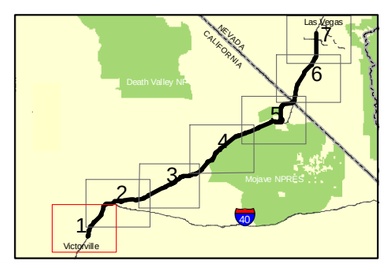

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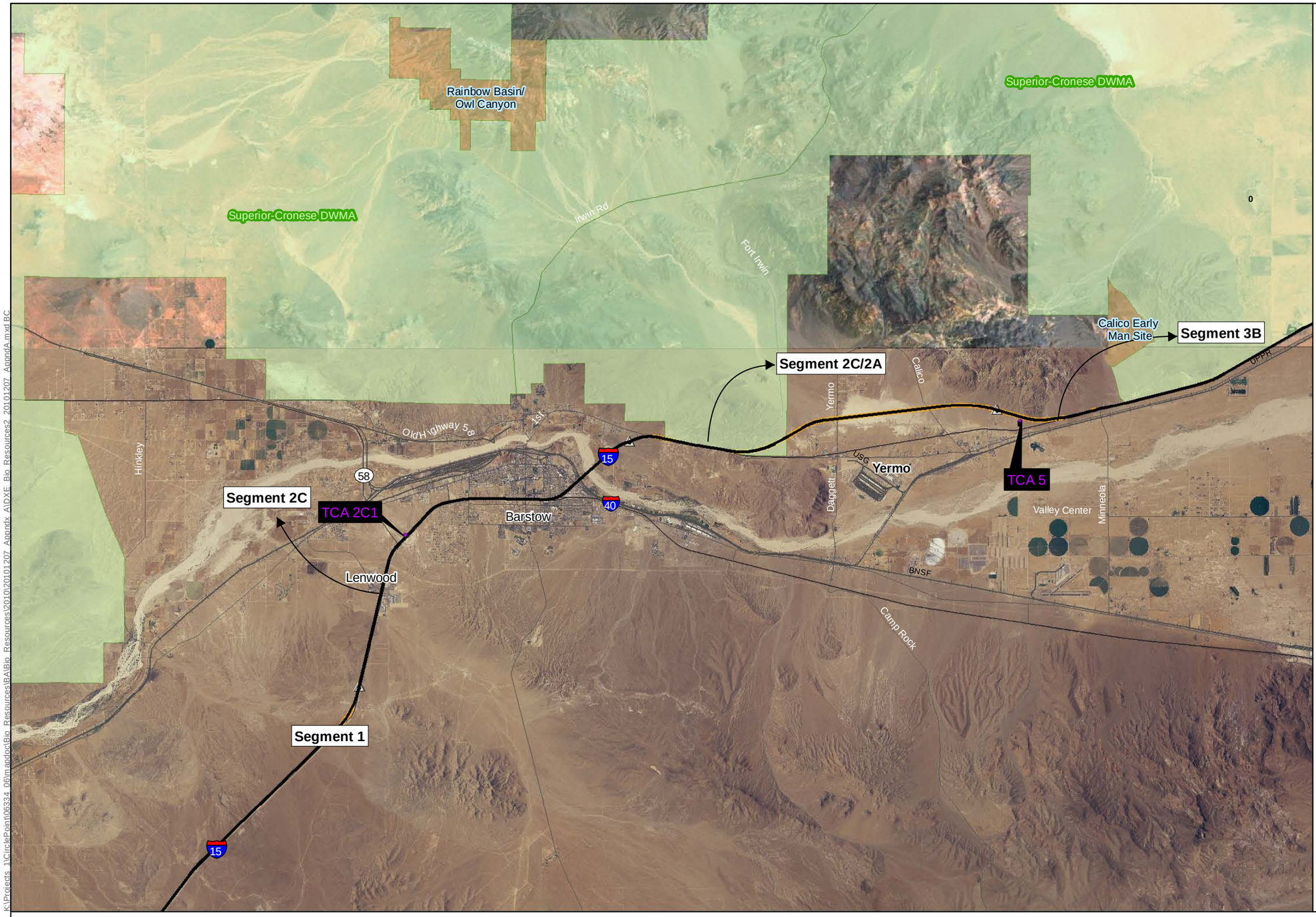
U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

Sheet 1



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Kilometers
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NORTH

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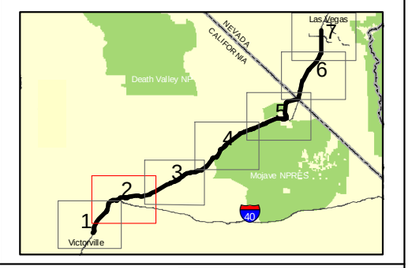
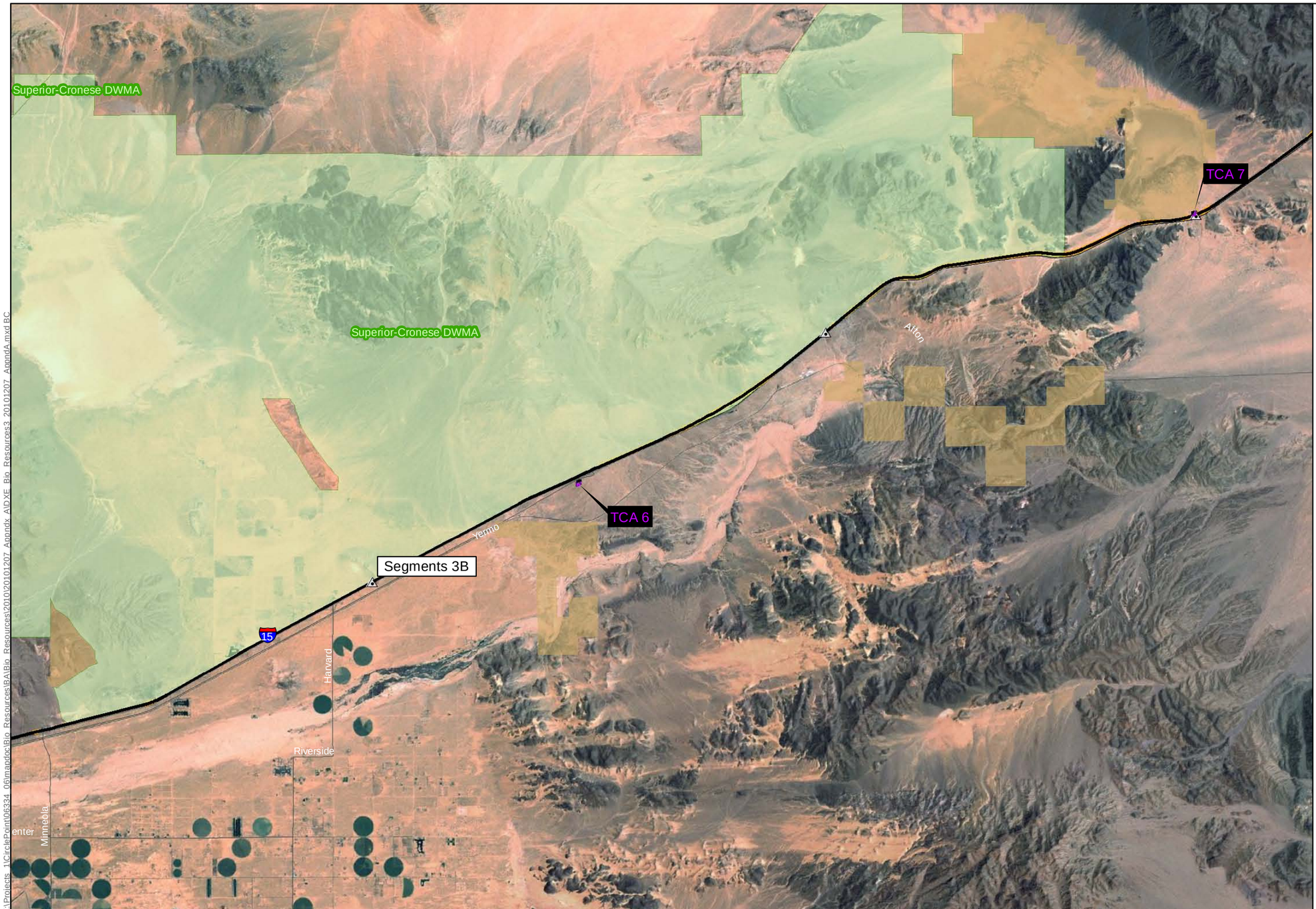


U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

Sheet **2**



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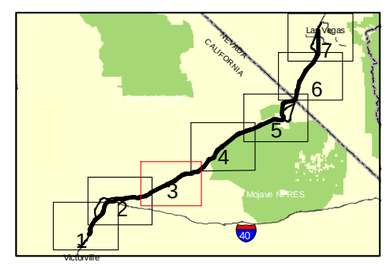
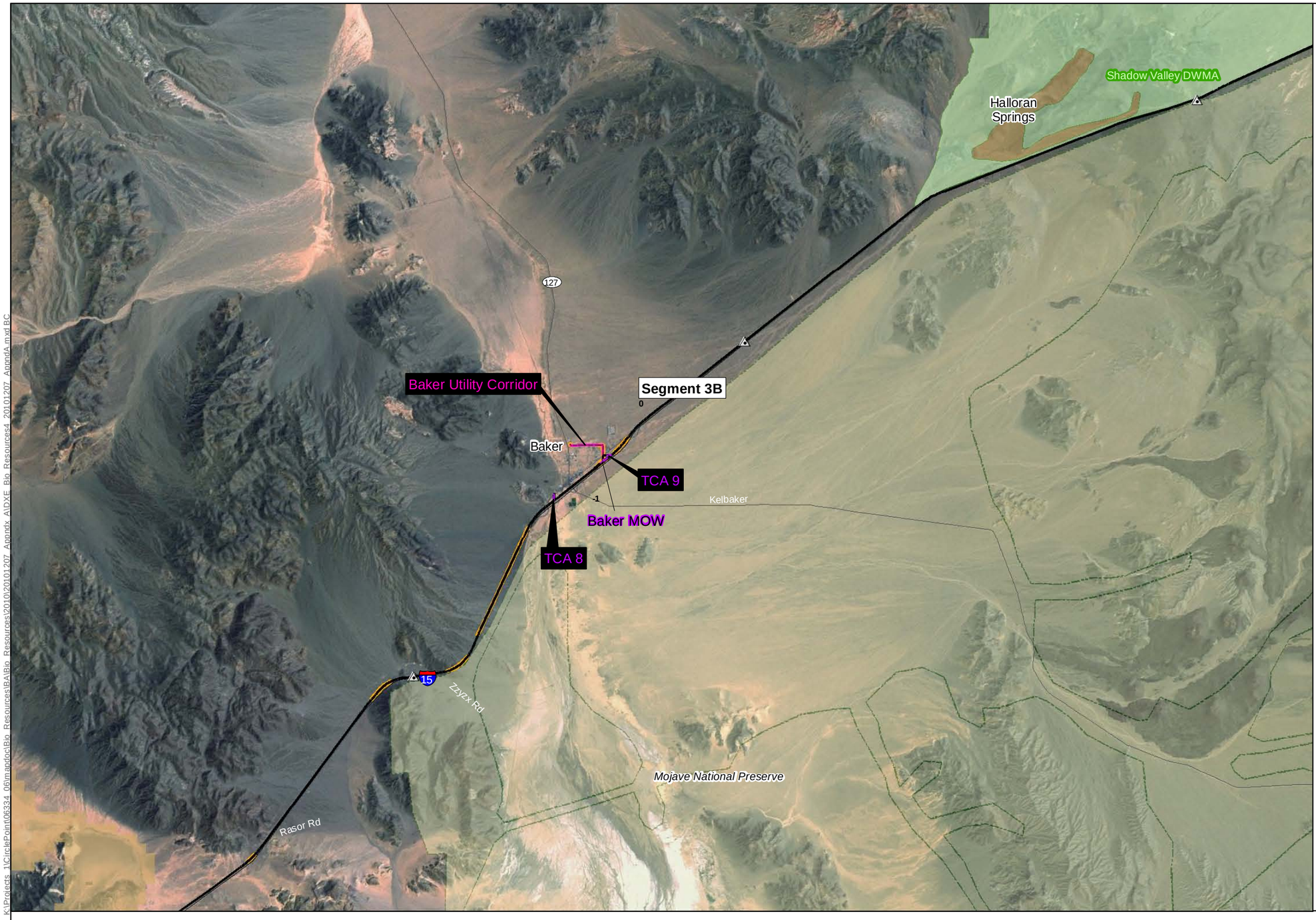


U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

Sheet 3



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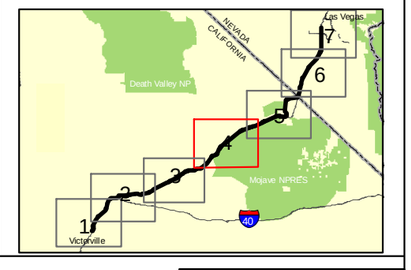
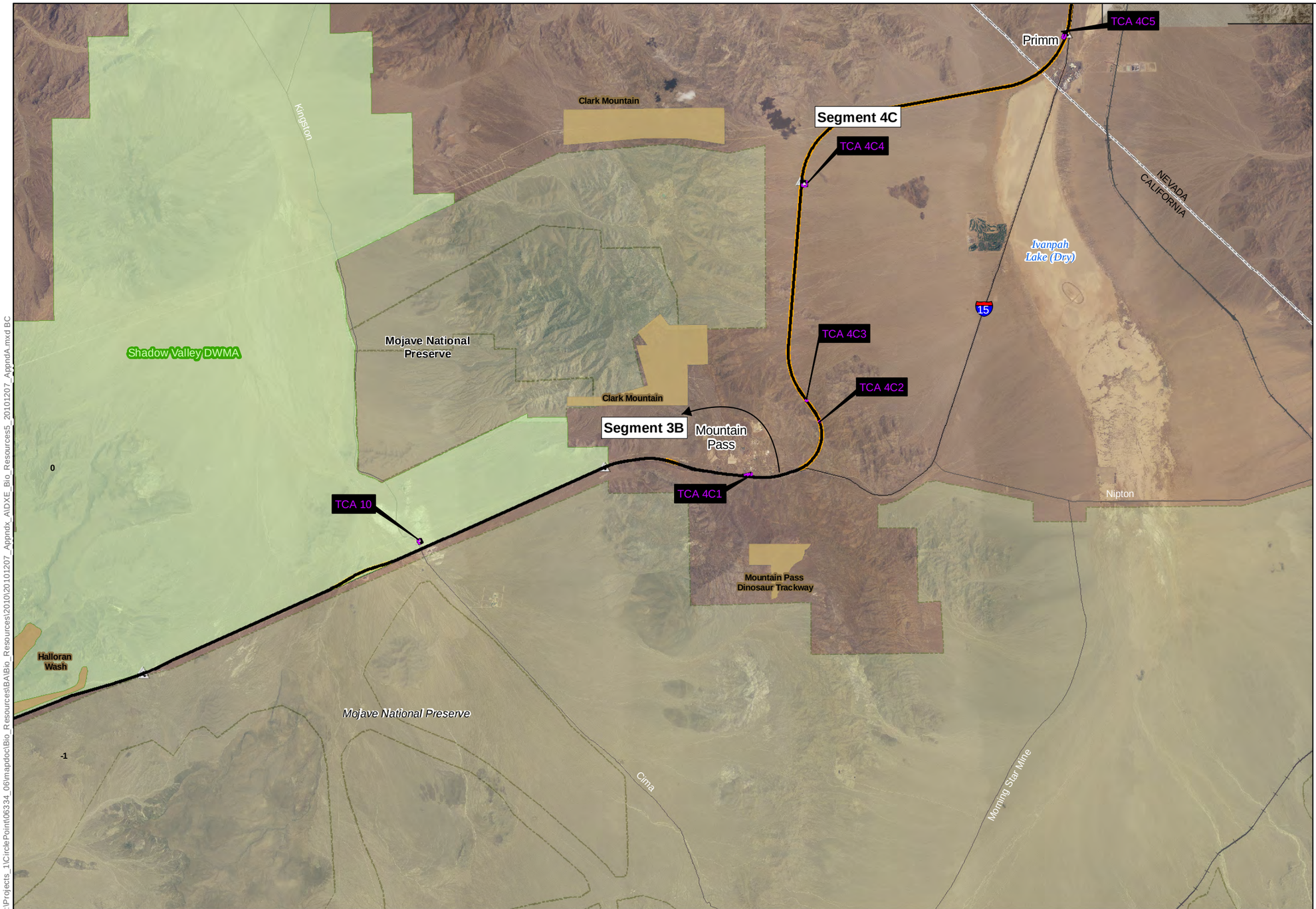


U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

Sheet 4



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0 2 4

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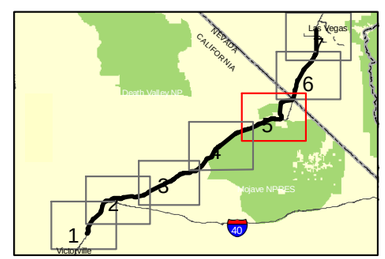

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U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

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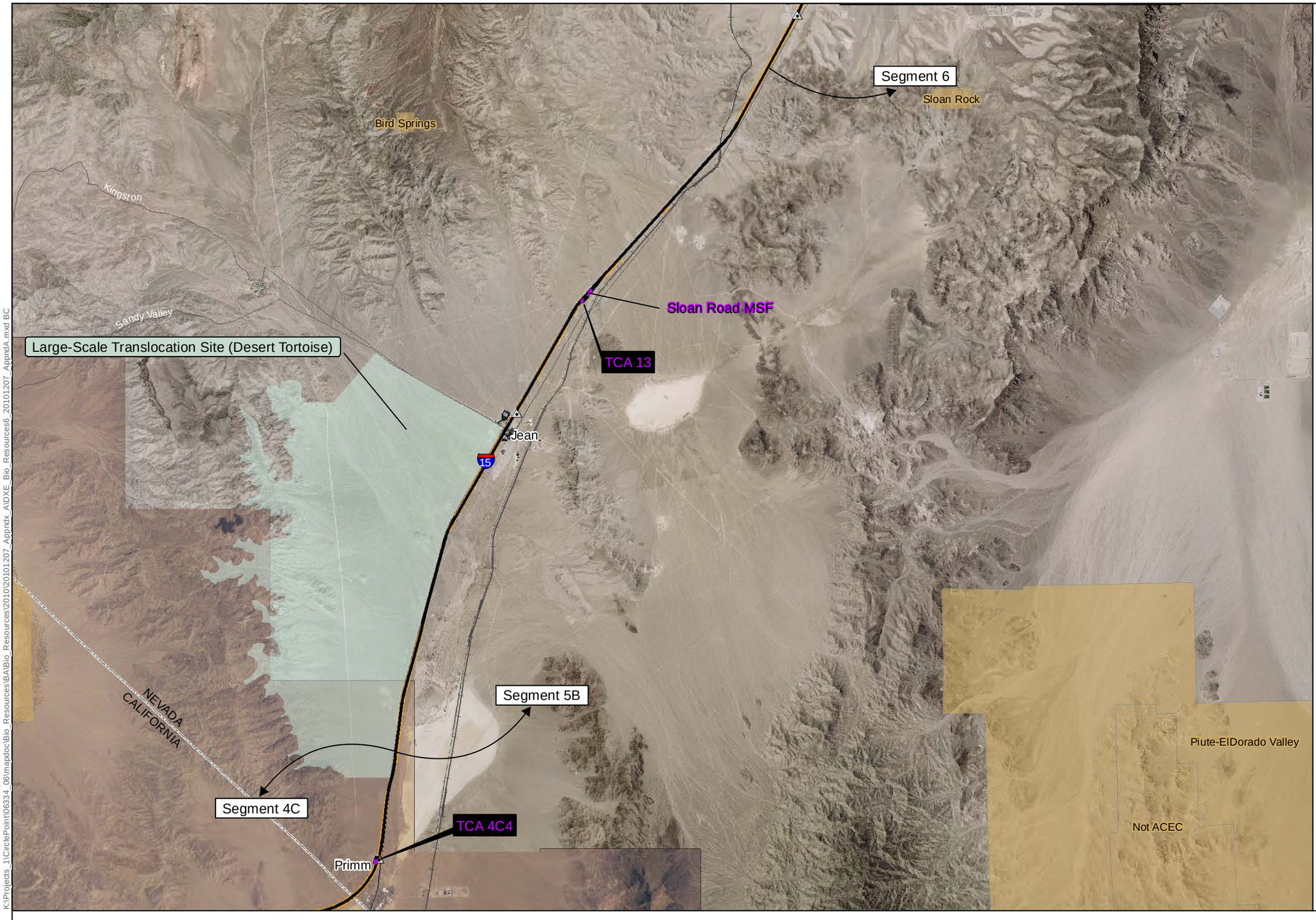


Appendix A

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- DesertXpress Alignment
- Project Outside of Transportation Right-of-Way

Ancillary Facility Sites

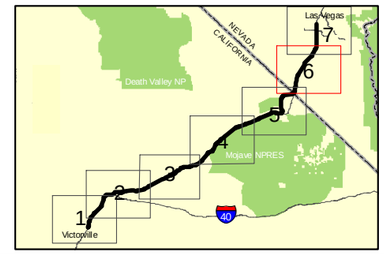
- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 2 4

Miles
0 2 4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007



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U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

Biological Resources

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Appendix A

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- DesertXpress Alignment
- Project Outside of Transportation Right-of-Way

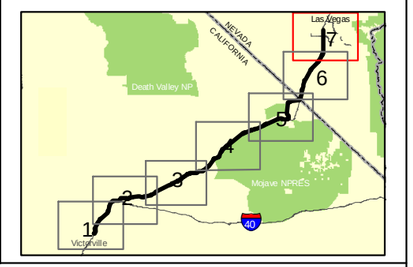
Ancillary Facility Sites

- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 2 4
Miles
0 2 4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007



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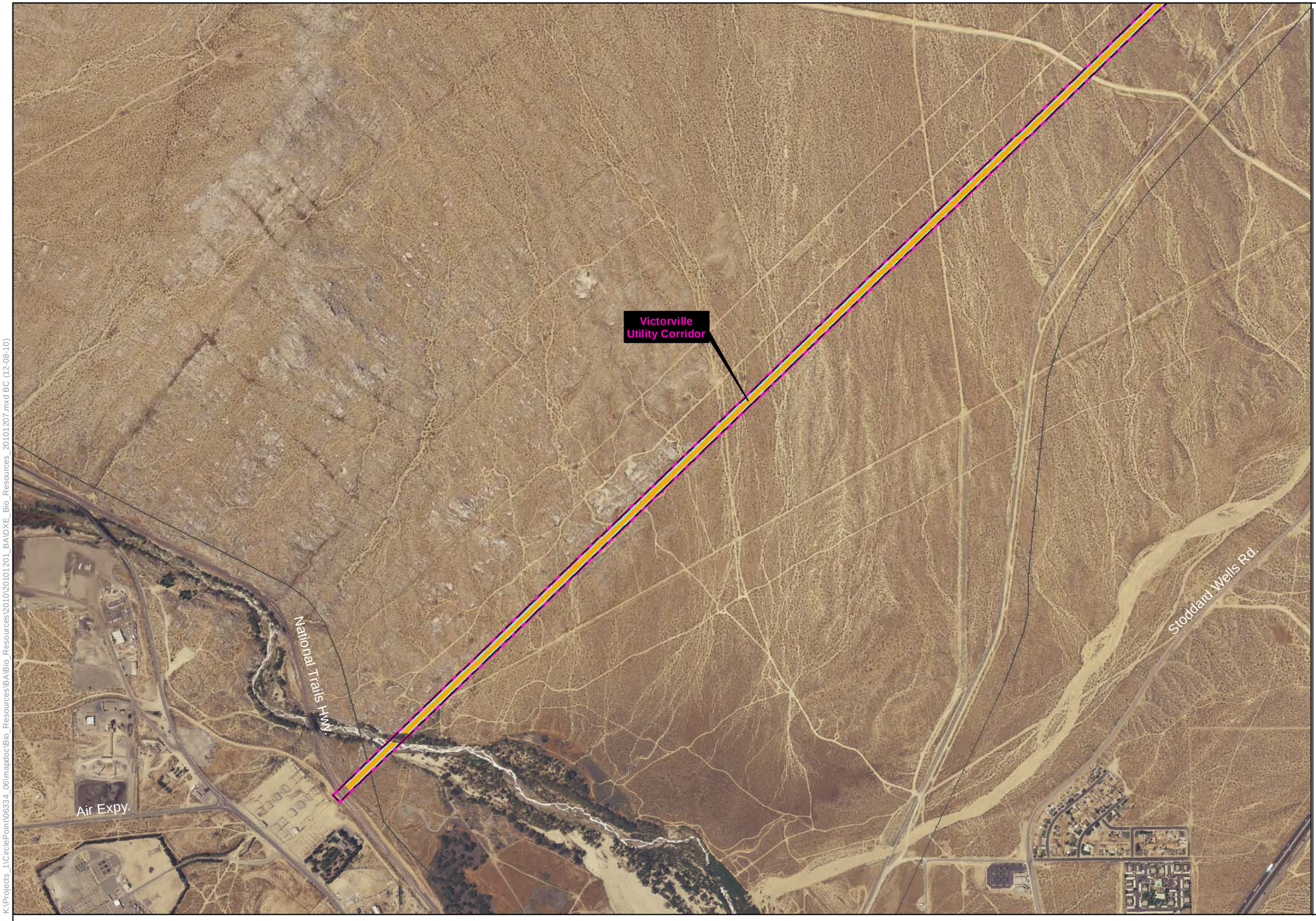
Appendix B

Detailed Project Alignment Impact Maps



Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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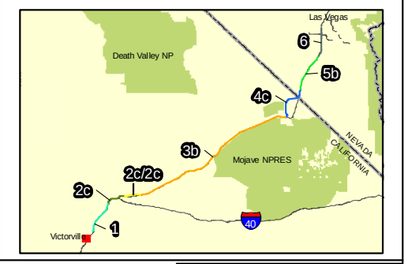
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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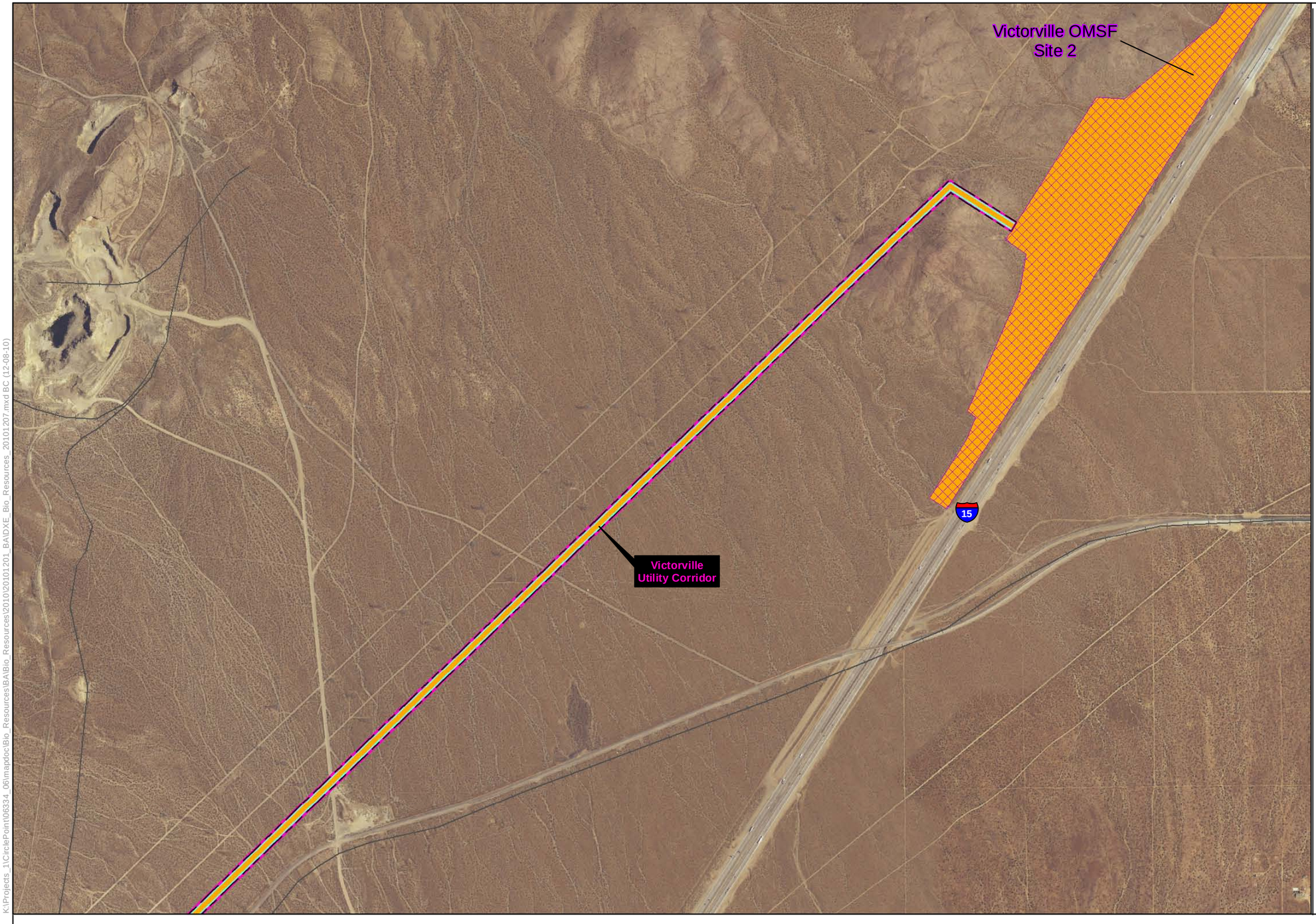

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Federal Railroad Administration

Desert Express - Biological Assesment

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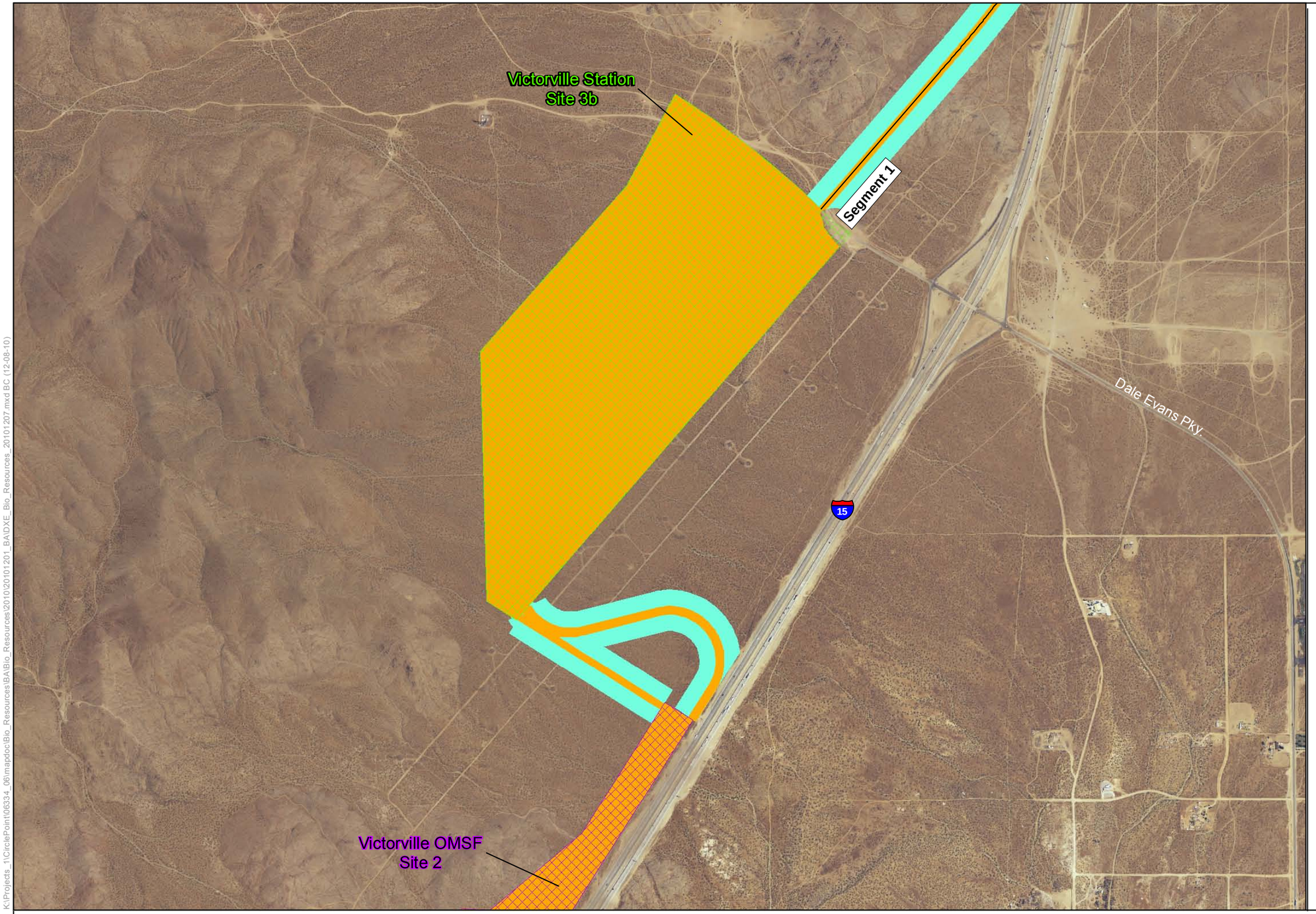

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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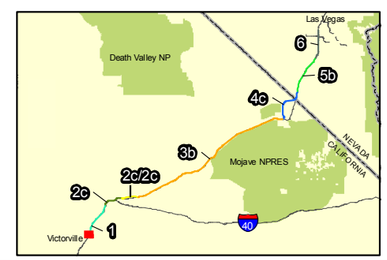
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers: 0 0.2 0.4

Miles: 0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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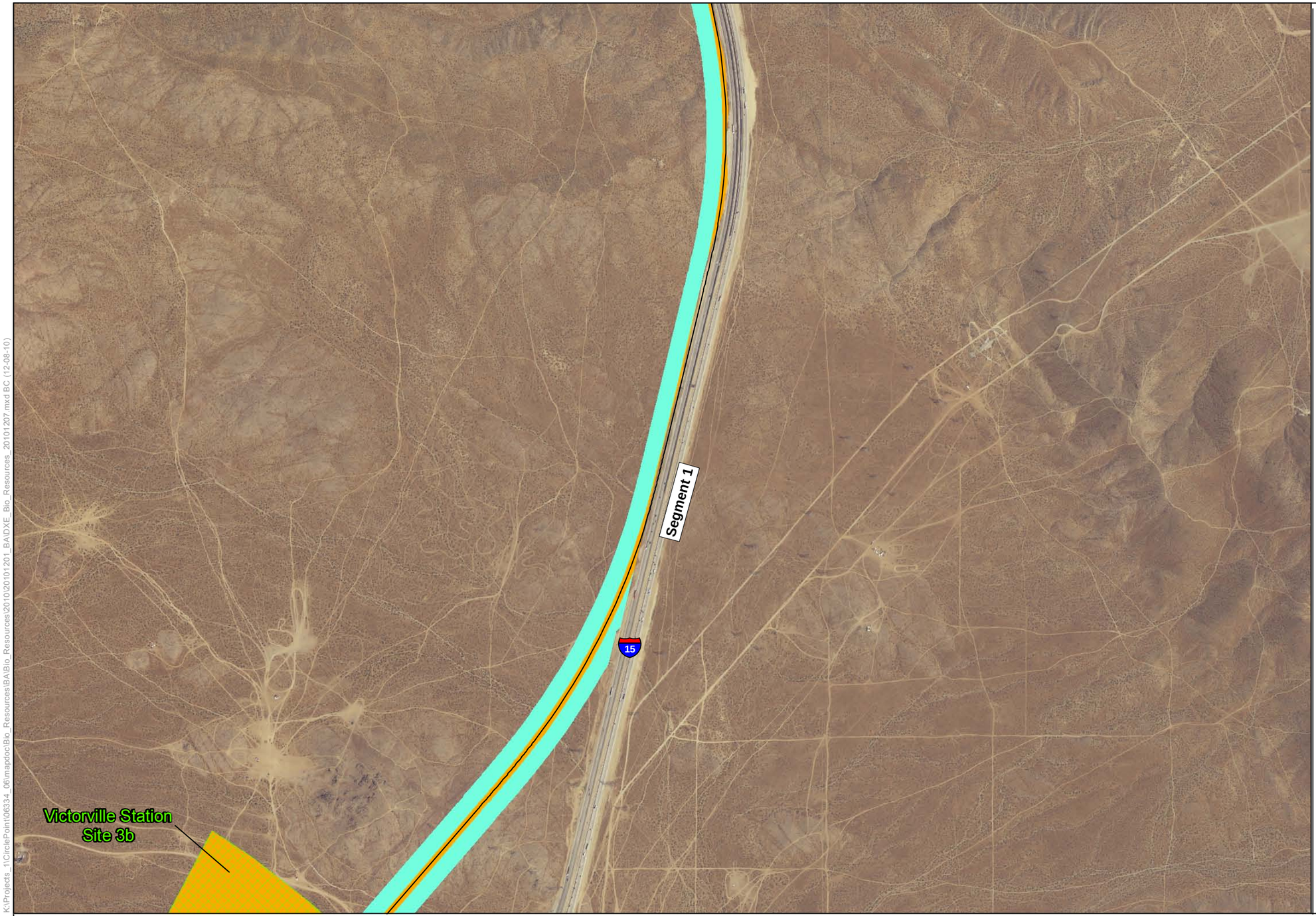

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
- DesertXpress Alignment

Ancillary Facility Sites

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- Maintenance Facility
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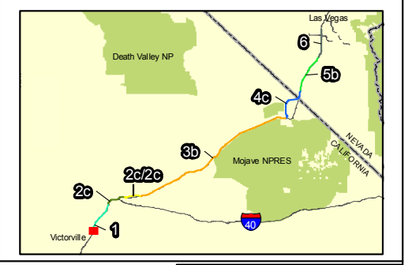
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
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Ancillary Facility Sites

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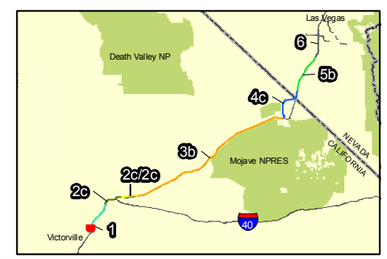
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
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- Desert Tortoise Critical Habitat
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Ancillary Facility Sites

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- Maintenance Facility
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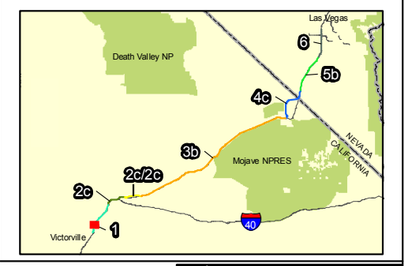
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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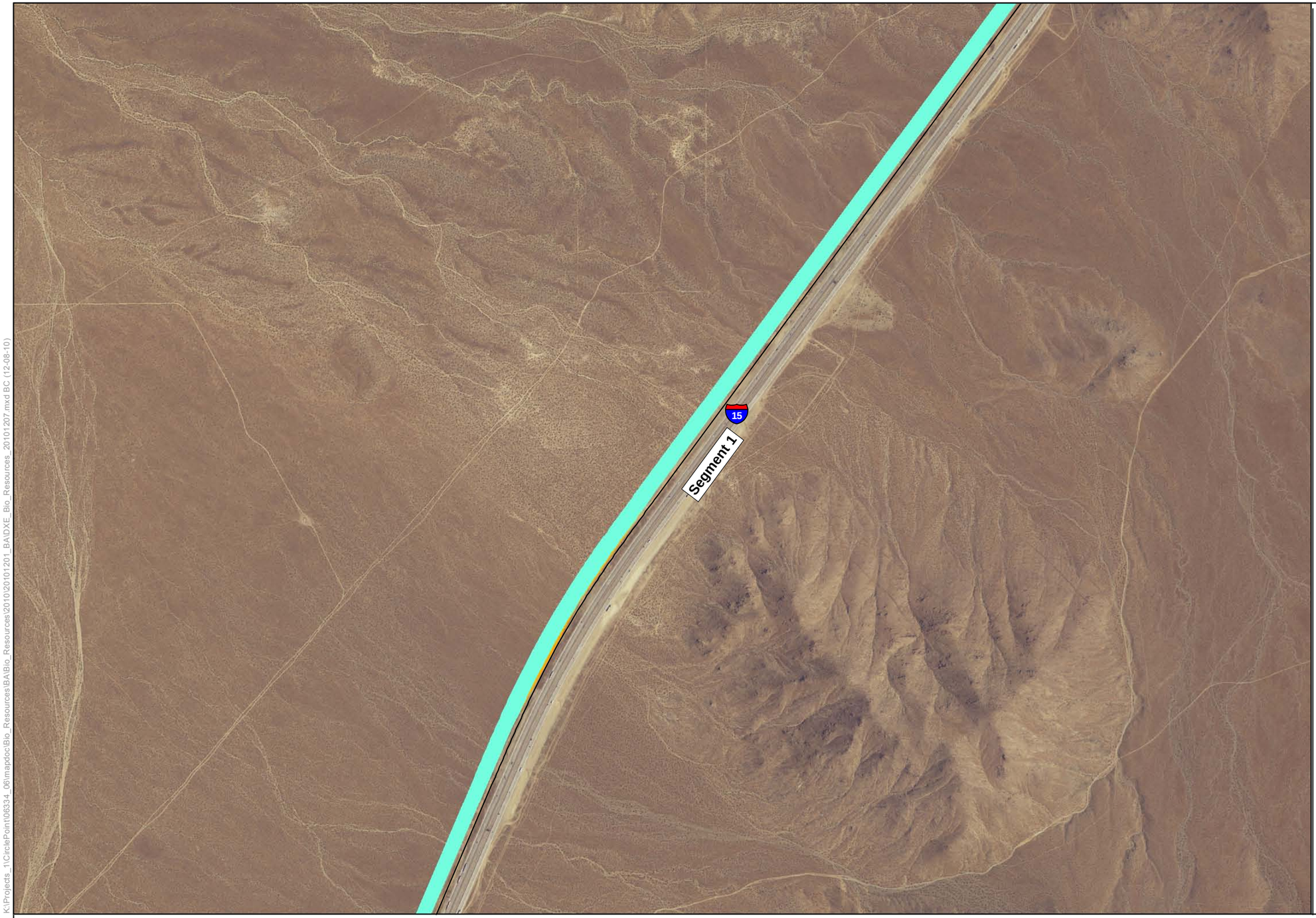

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
- DesertXpress Alignment

Ancillary Facility Sites

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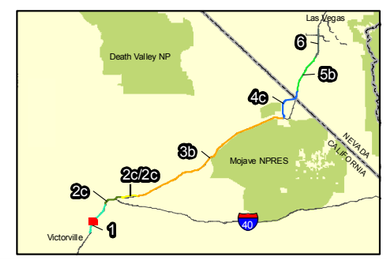
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
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Ancillary Facility Sites

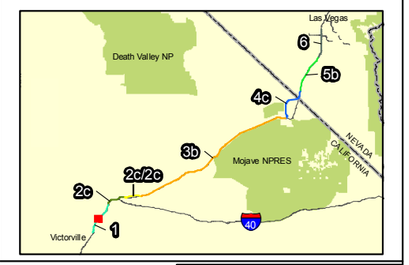
- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
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Ancillary Facility Sites

- Station/Substation Site
- Maintenance Facility
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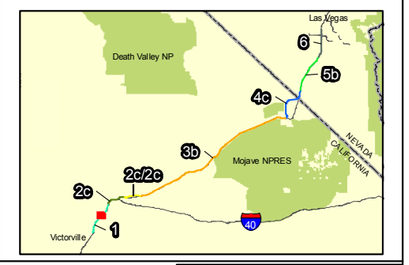
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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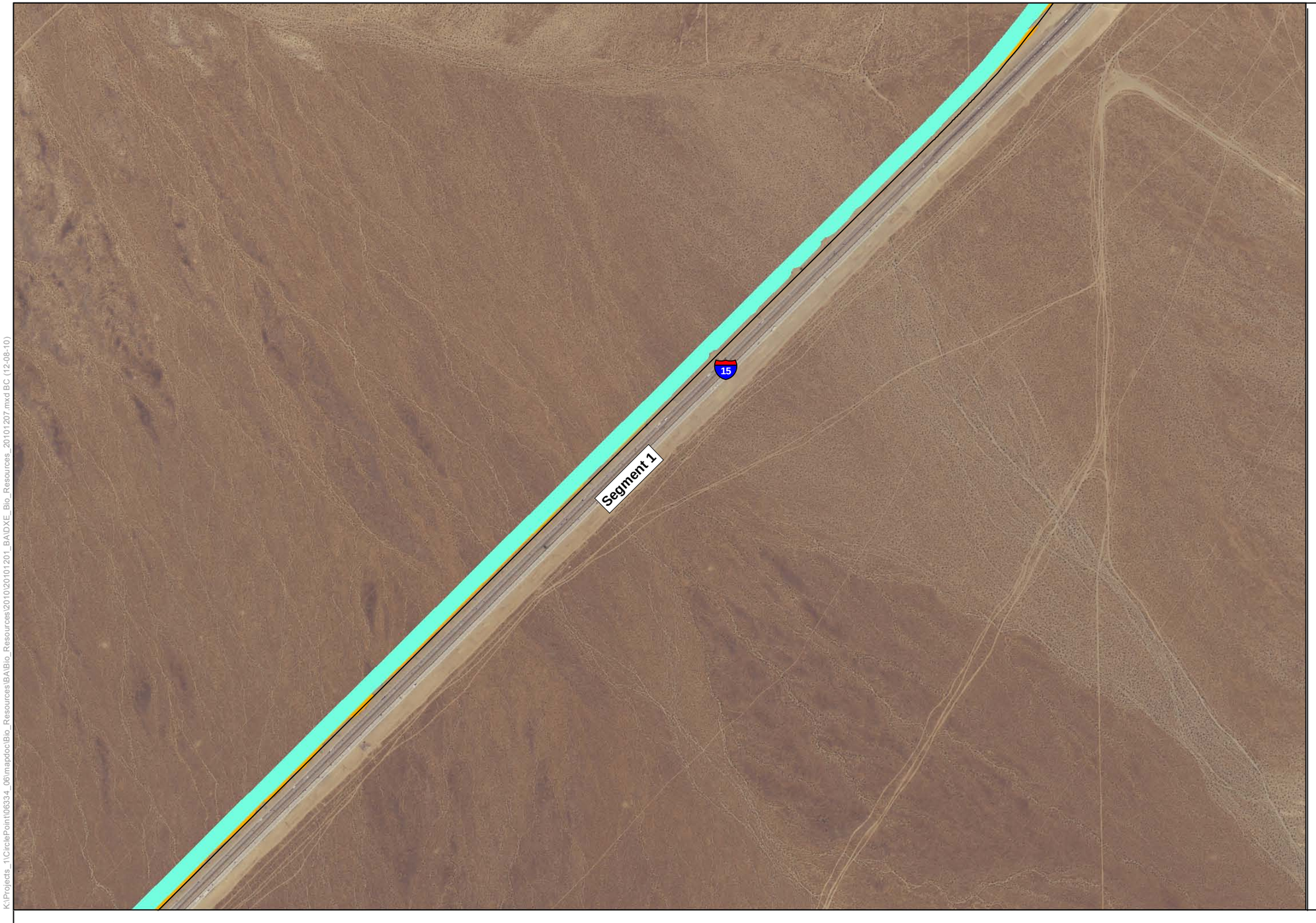

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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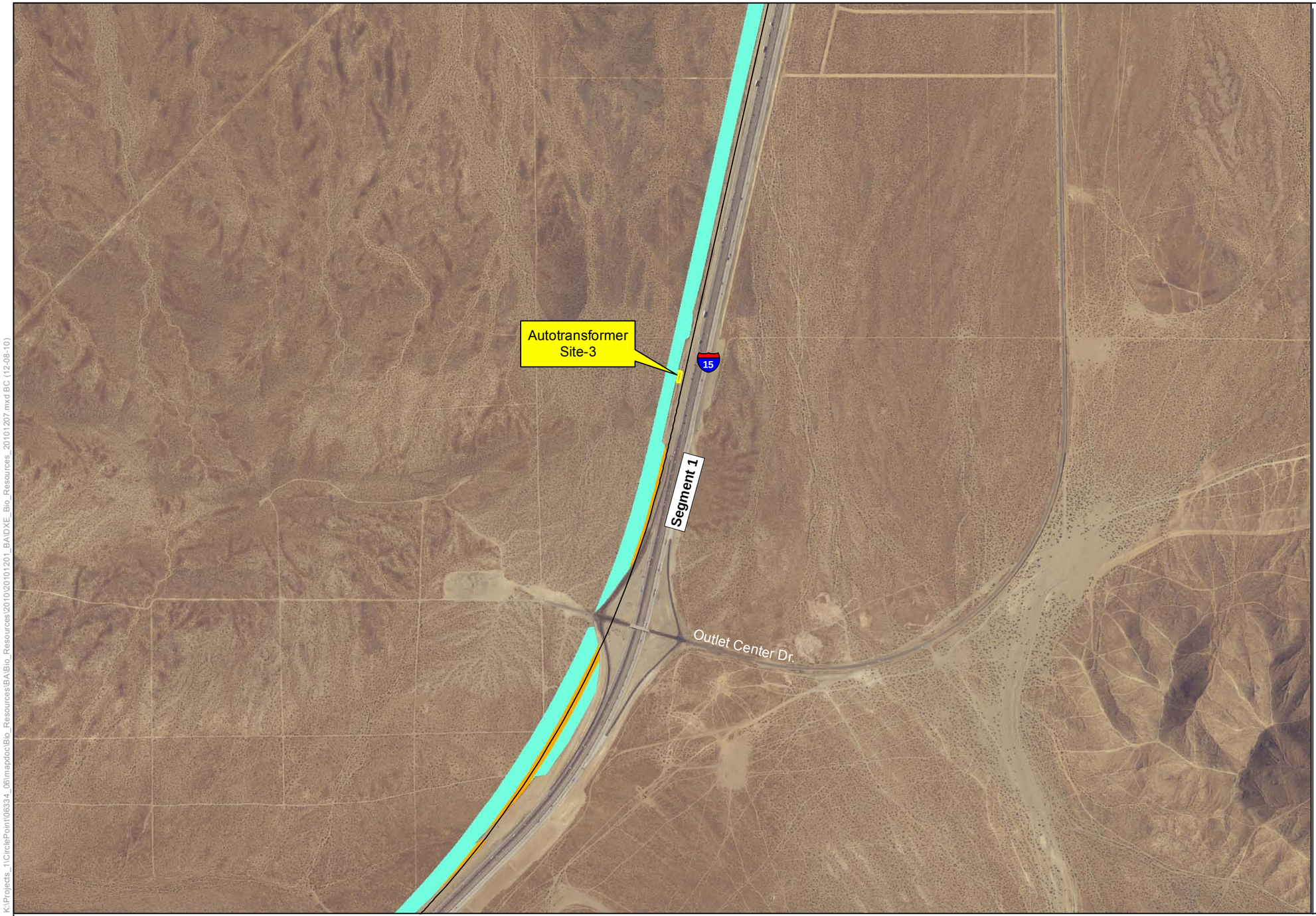

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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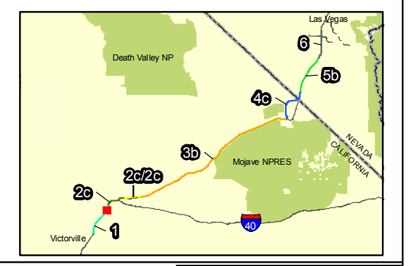
Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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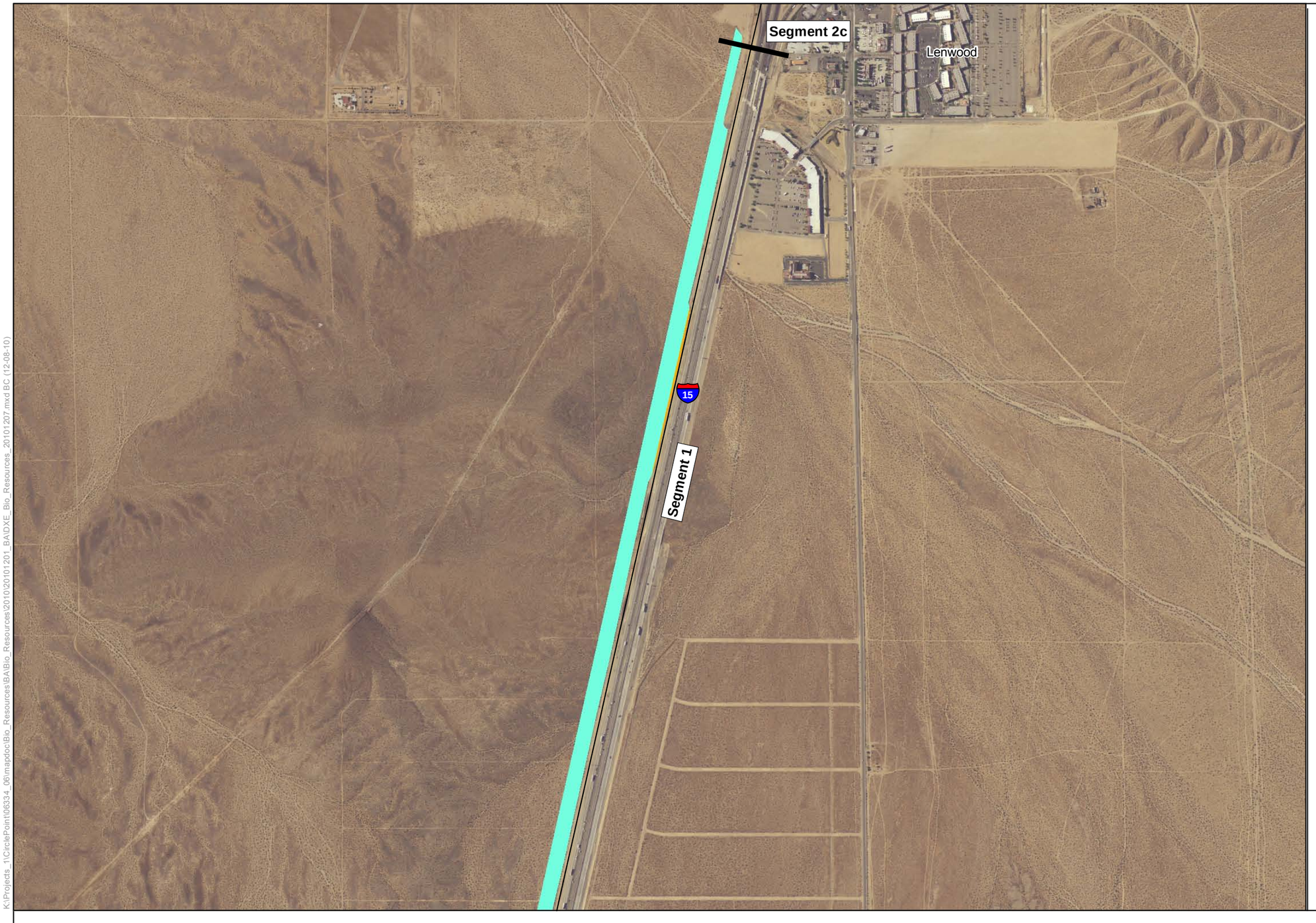
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 12



Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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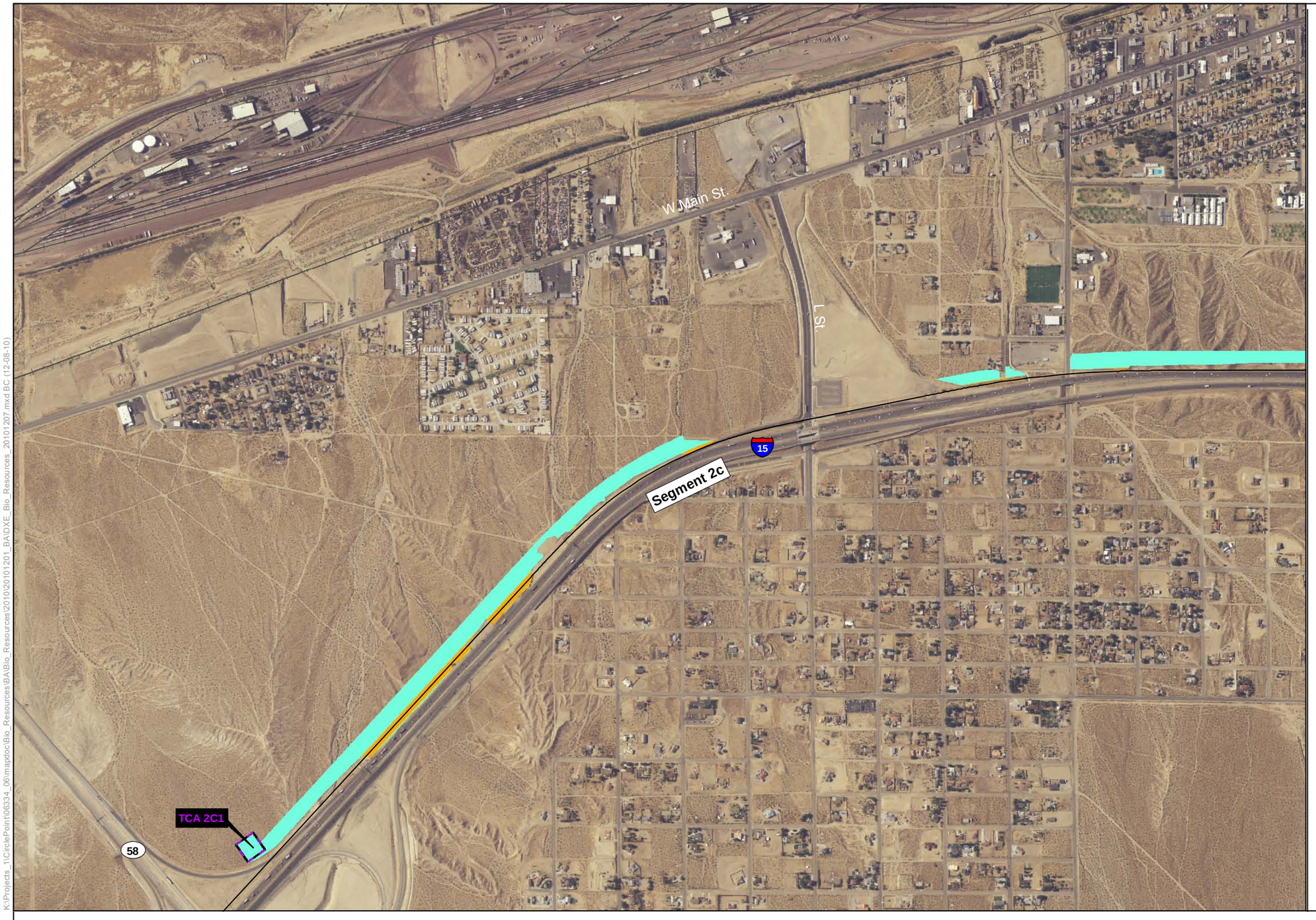
Desert Express - Biological Assesment

SHEET 14



Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
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Ancillary Facility Sites

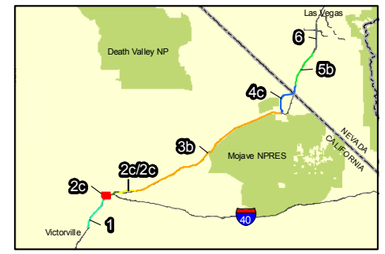
- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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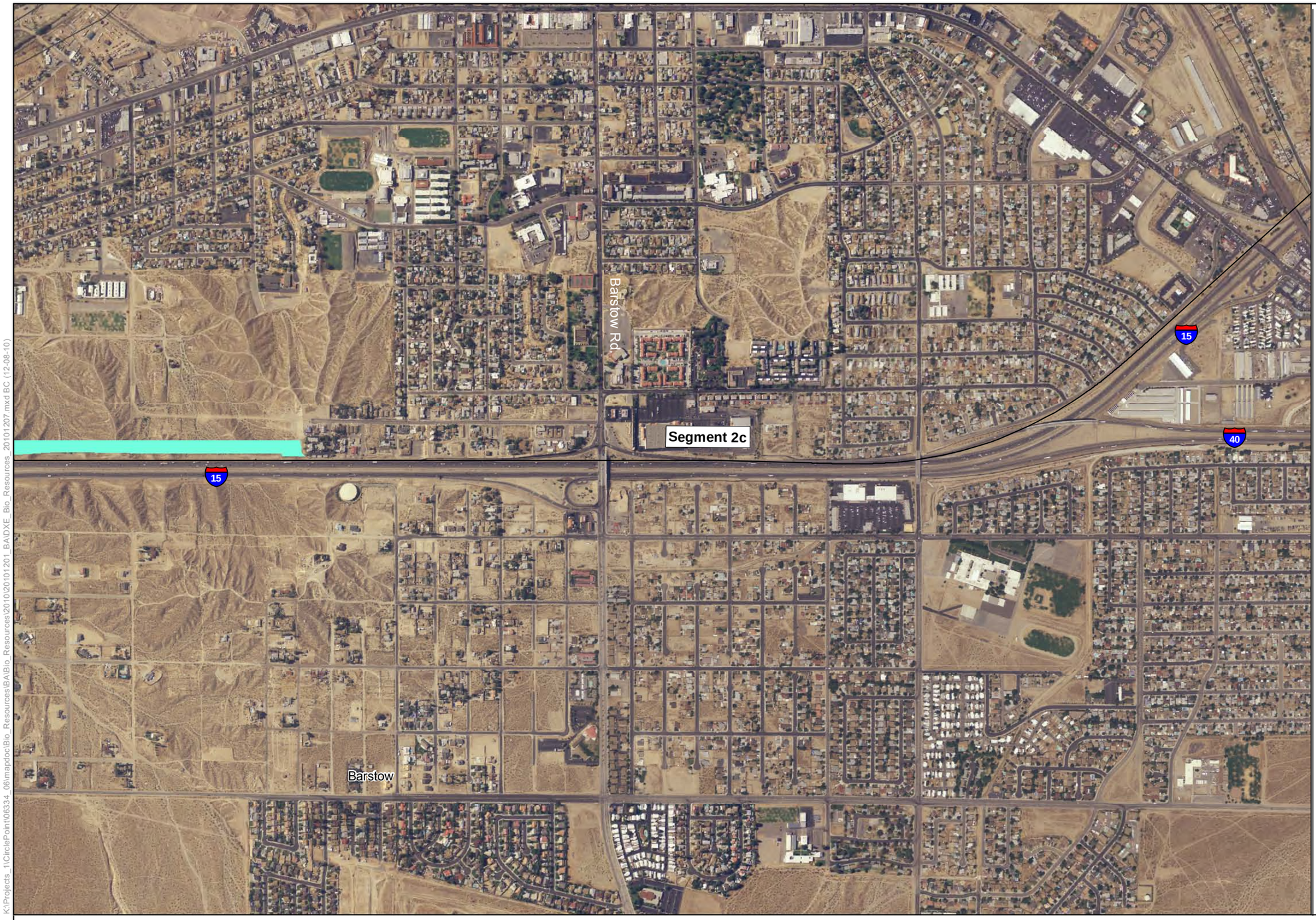
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 15



Appendix B

Biological Resources

Desert Tortoise Habitat

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- Electric Utility Corridor (EMU Option Only)

Kilometers: 0 0.2 0.4

Miles: 0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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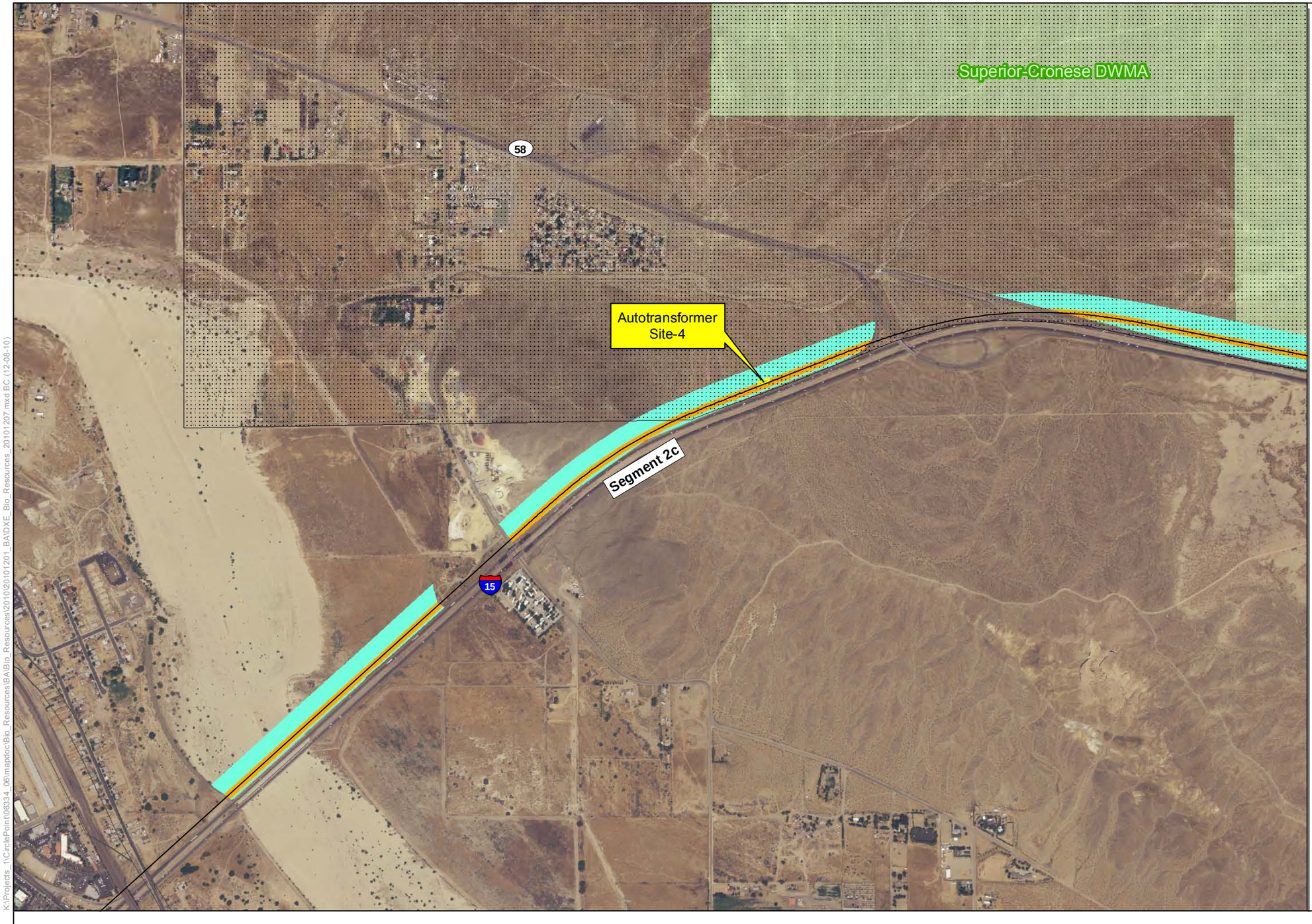
SHEET 16



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Appendix B

Biological Resources

Desert Tortoise Habitat

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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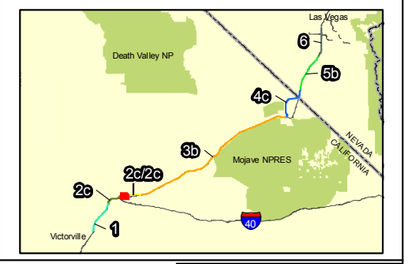
US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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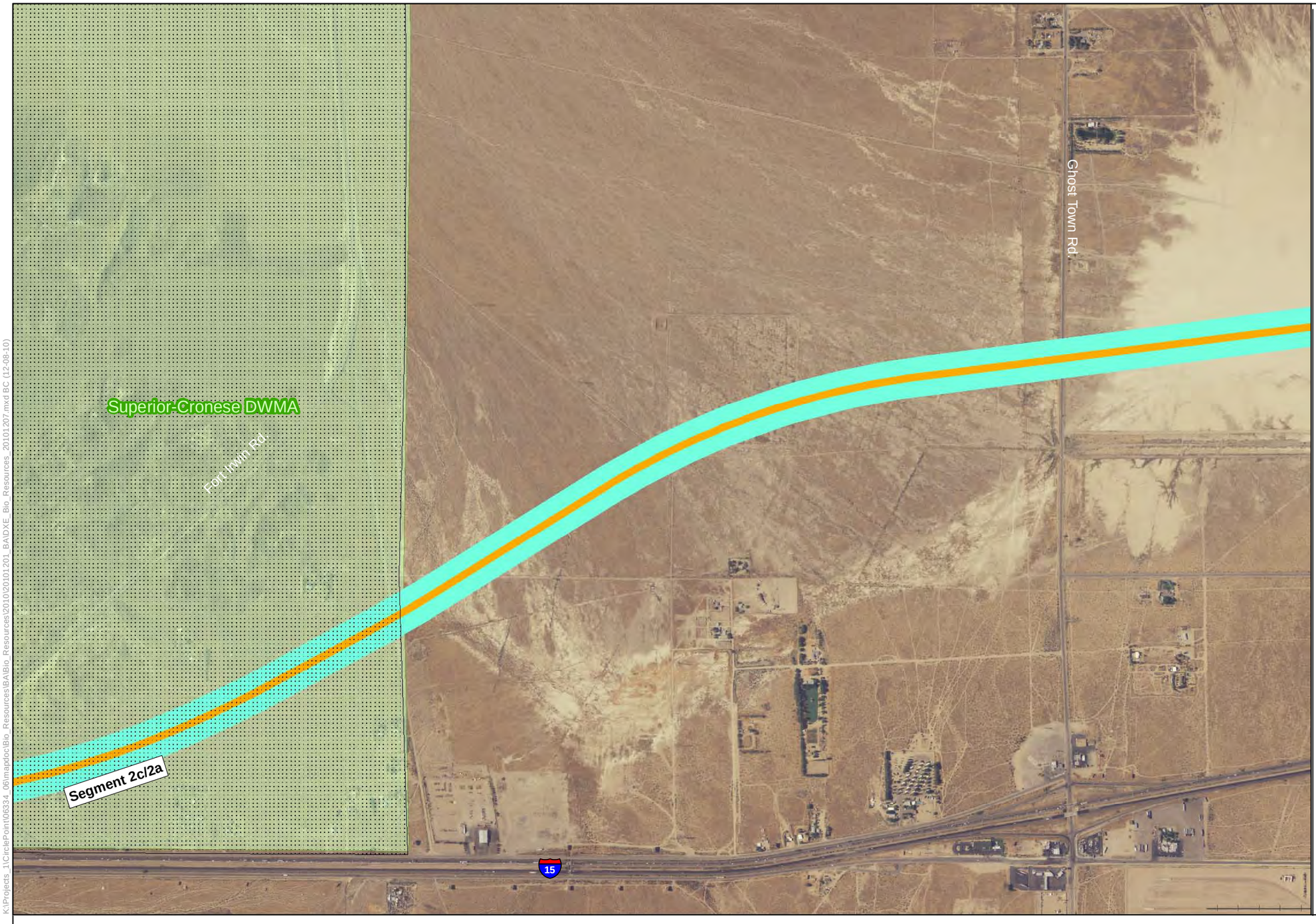

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Miles
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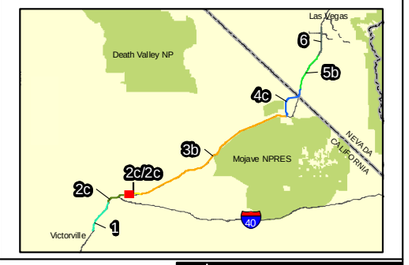

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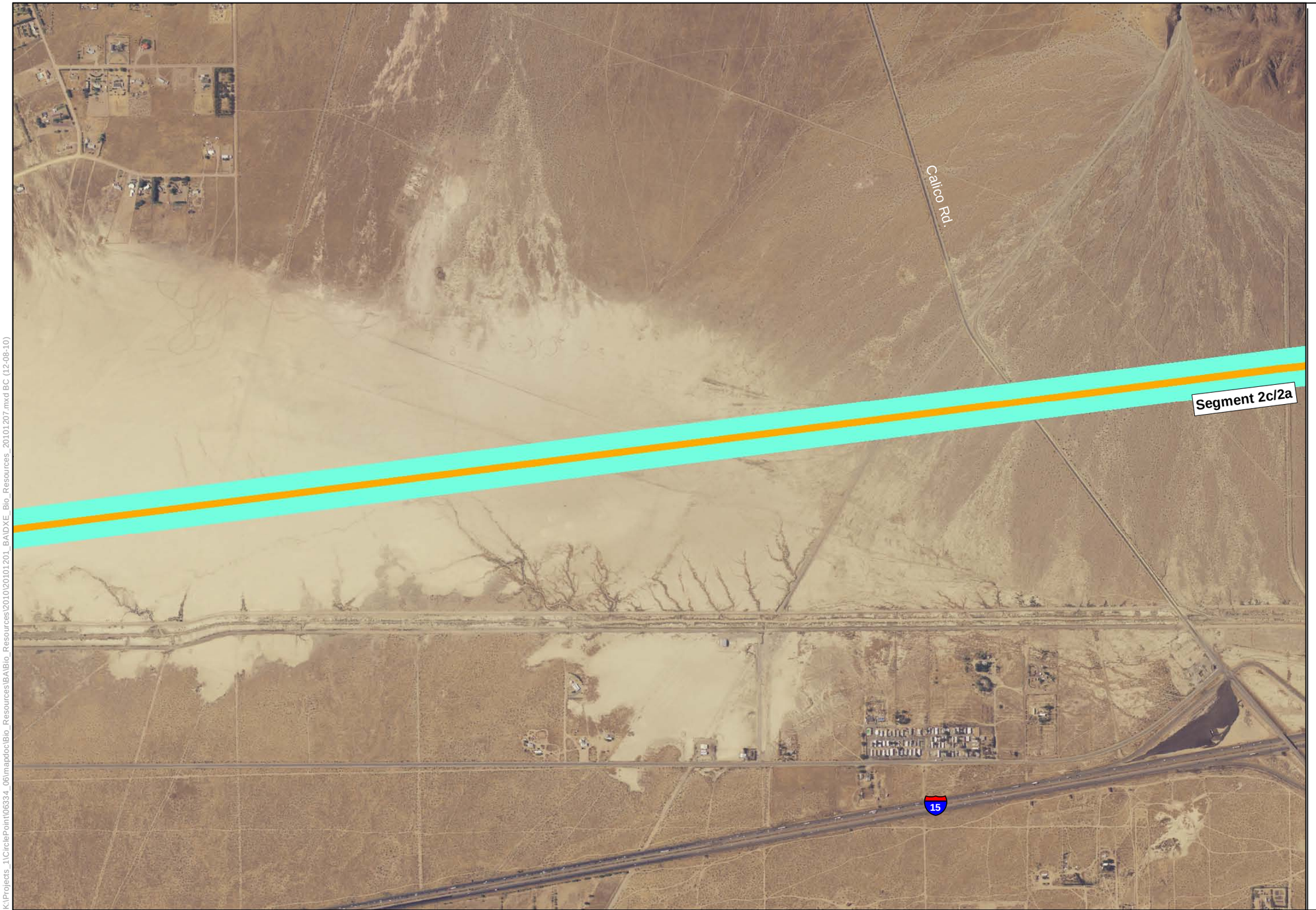

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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Kilometers
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Miles
0 0.2 0.4

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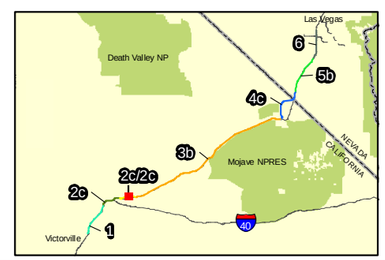

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Federal Railroad Administration

Desert Express - Biological Assesment

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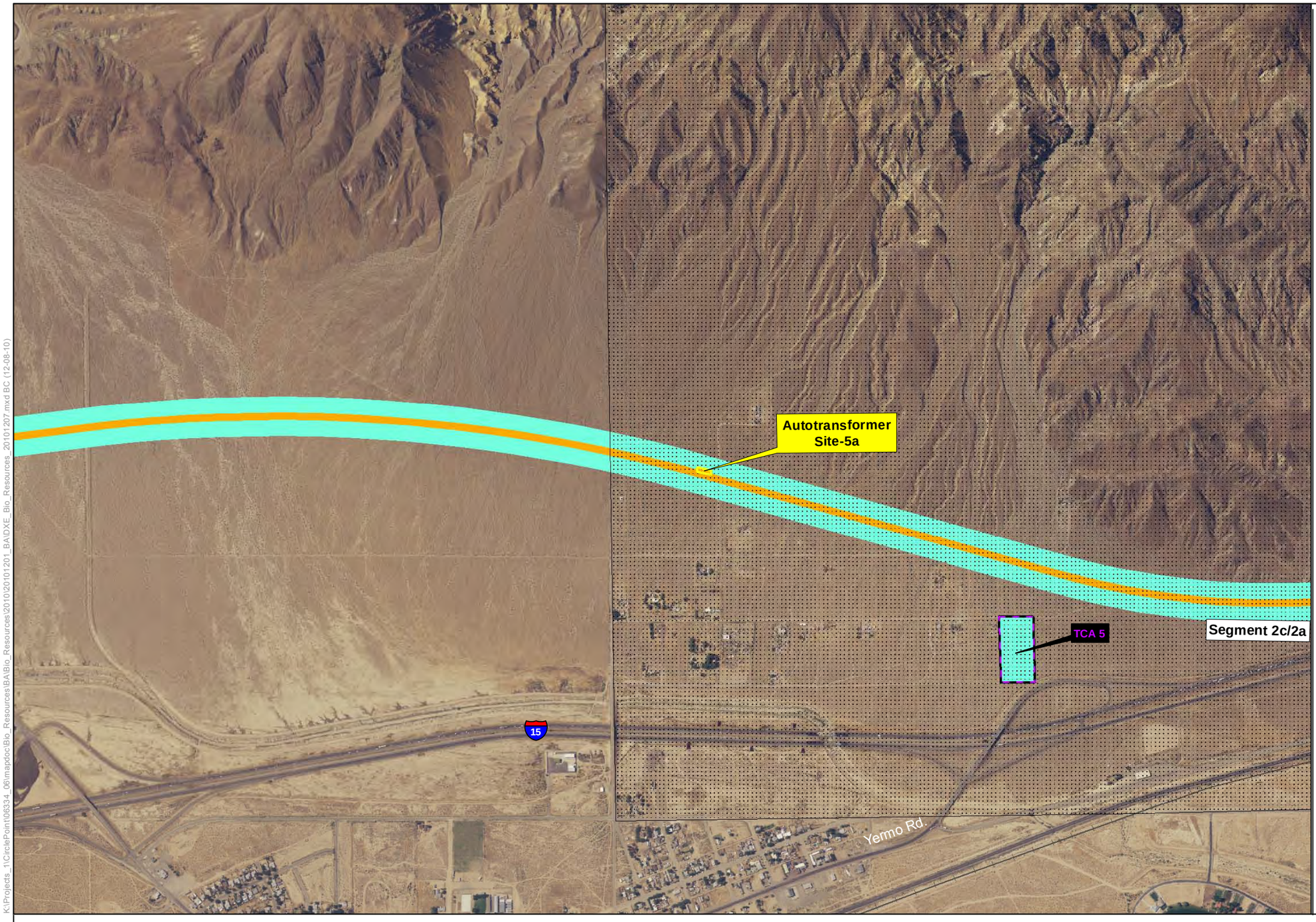

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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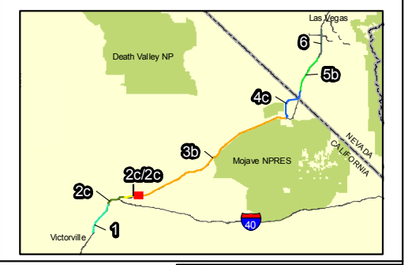

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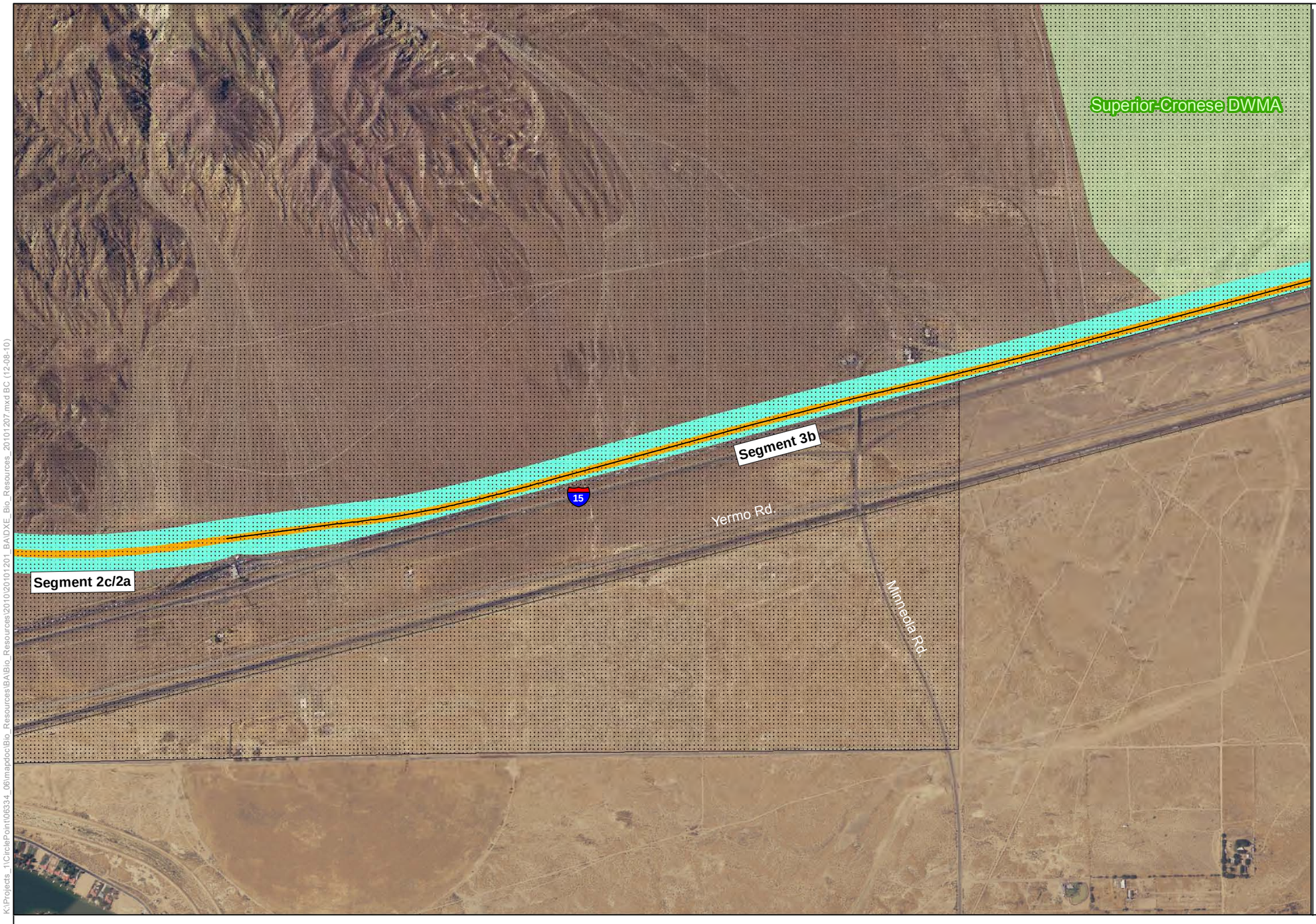
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 21



Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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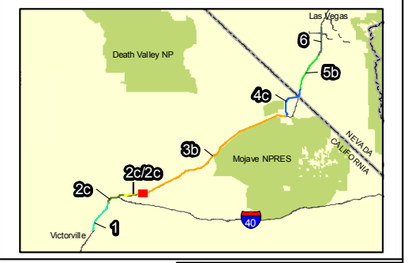
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
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Ancillary Facility Sites

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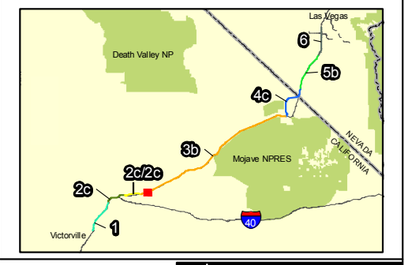
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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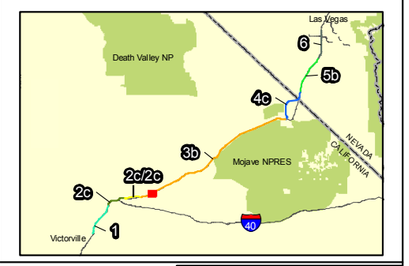
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Appendix B

Biological Resources

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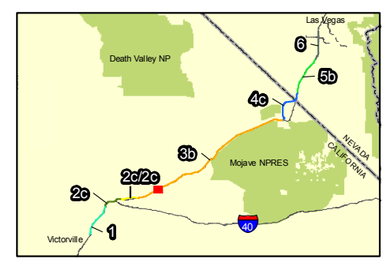

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Appendix B

Biological Resources

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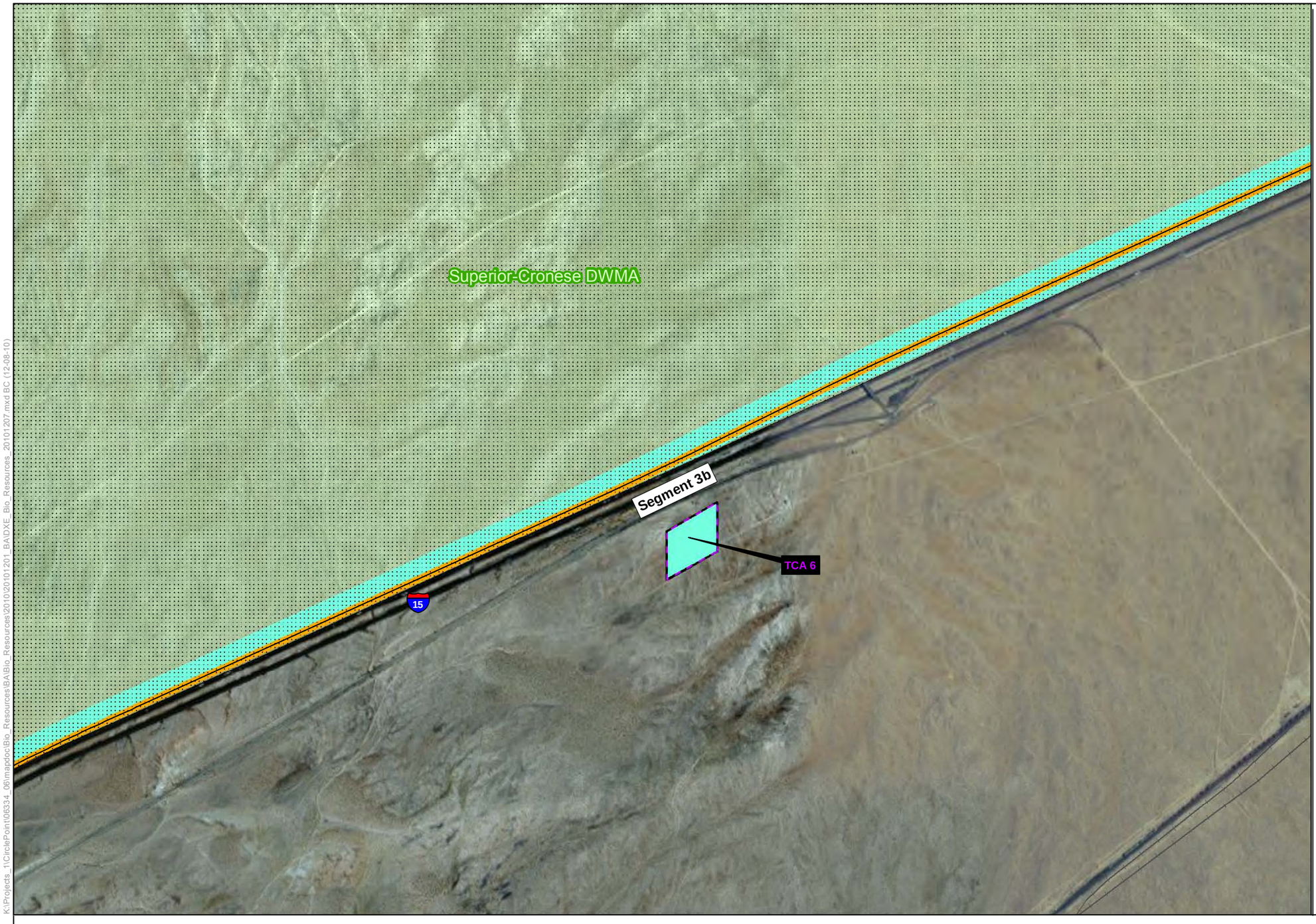

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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Kilometers
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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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Appendix B

Biological Resources

Desert Tortoise Habitat

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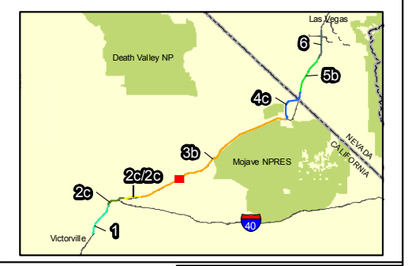

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Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

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- DesertXpress Alignment

Ancillary Facility Sites

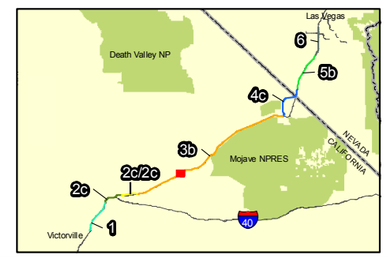
- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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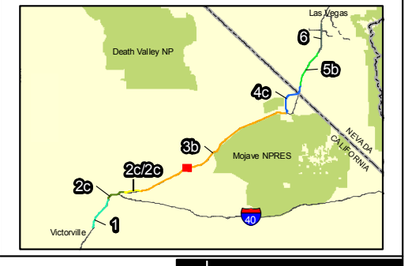

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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Miles
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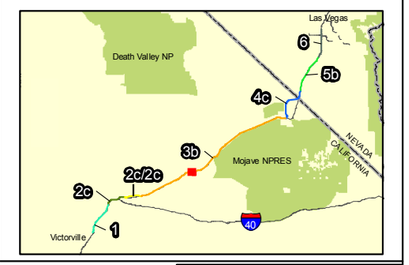

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Appendix B

Biological Resources

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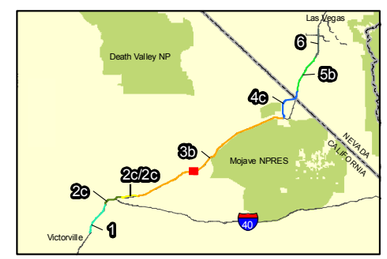

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Federal Railroad Administration

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Kilometers
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Miles
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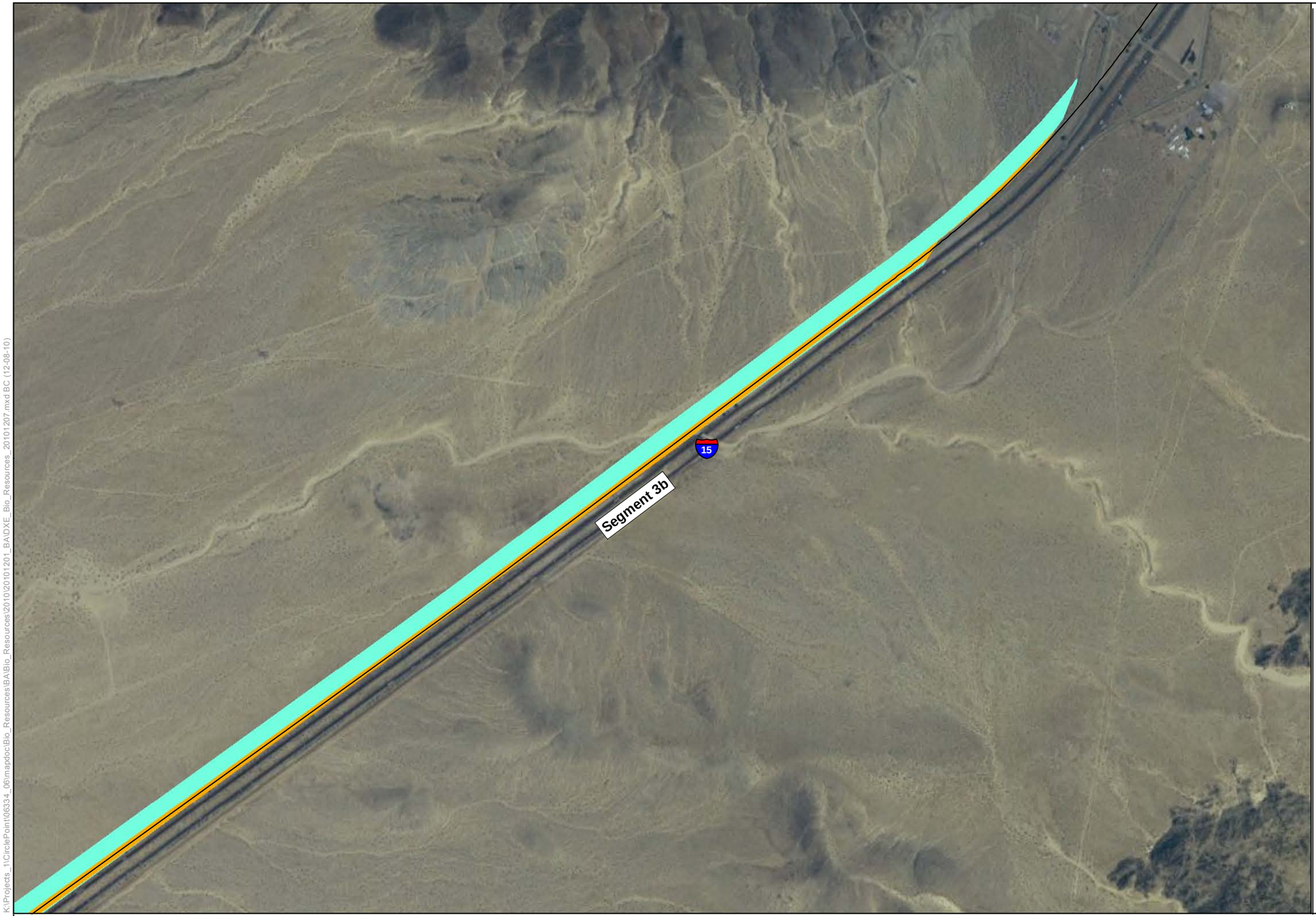

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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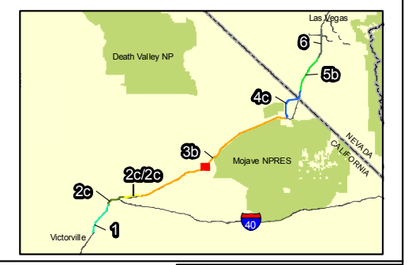

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Appendix B

Biological Resources

Desert Tortoise Habitat

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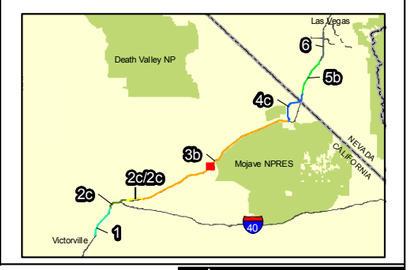

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Federal Railroad Administration

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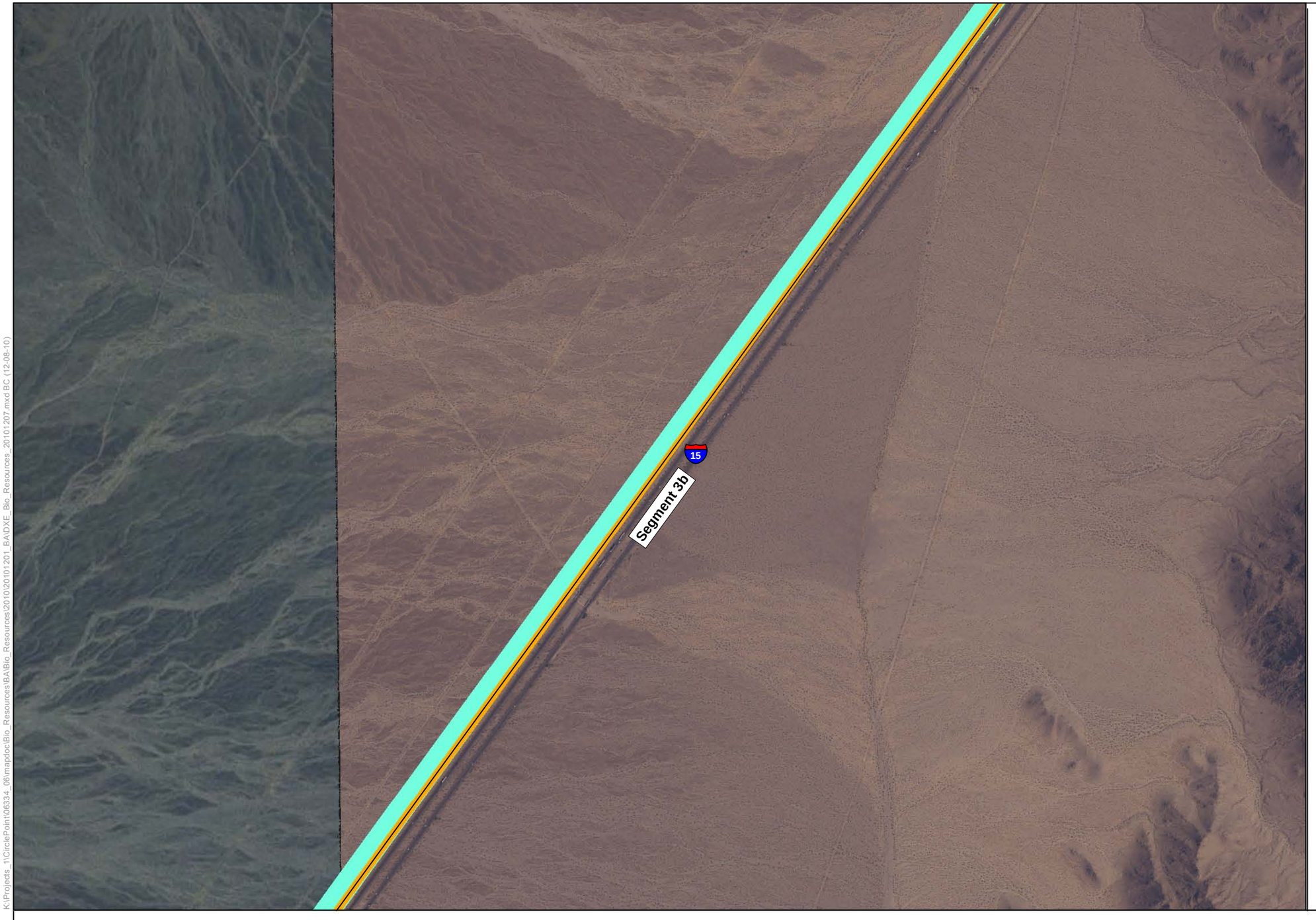

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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Kilometers
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Miles
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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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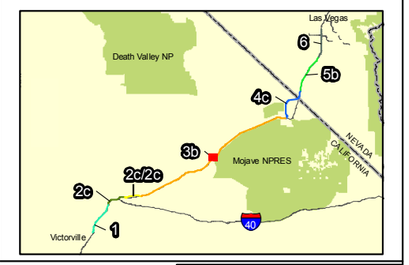

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Federal Railroad Administration

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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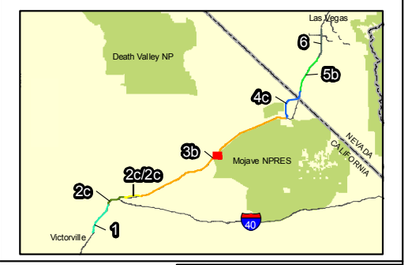

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U.S. Department of Transportation
Federal Railroad Administration

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Appendix B

Biological Resources

Desert Tortoise Habitat

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Kilometers
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Miles
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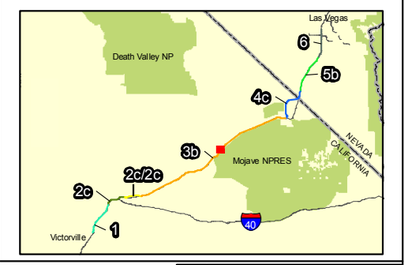

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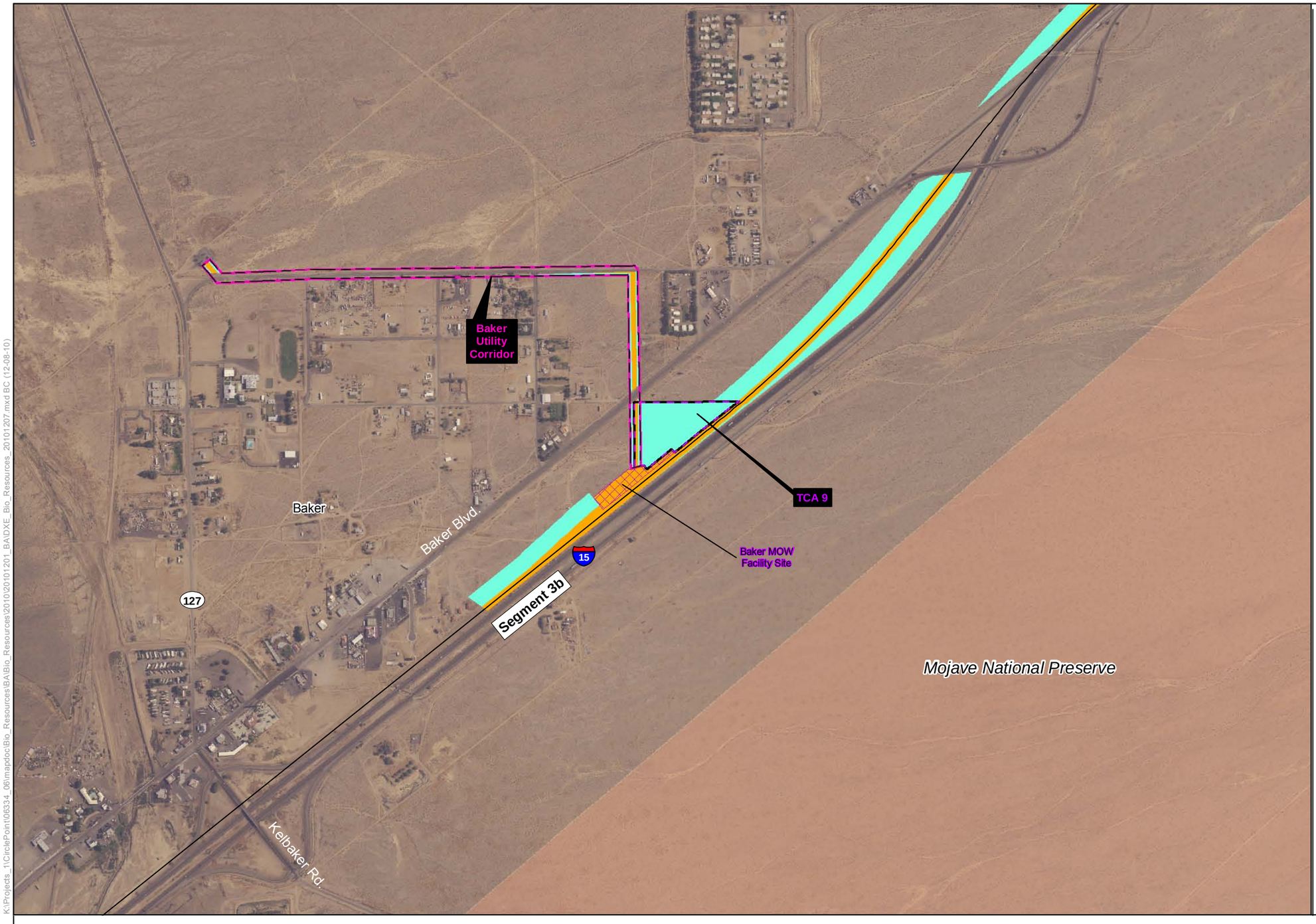

Appendix B

Biological Resources

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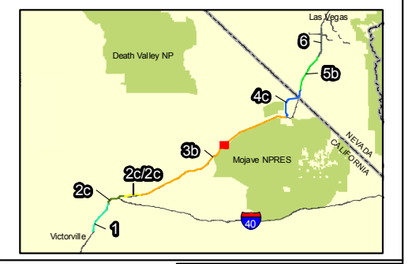

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Appendix B

Biological Resources

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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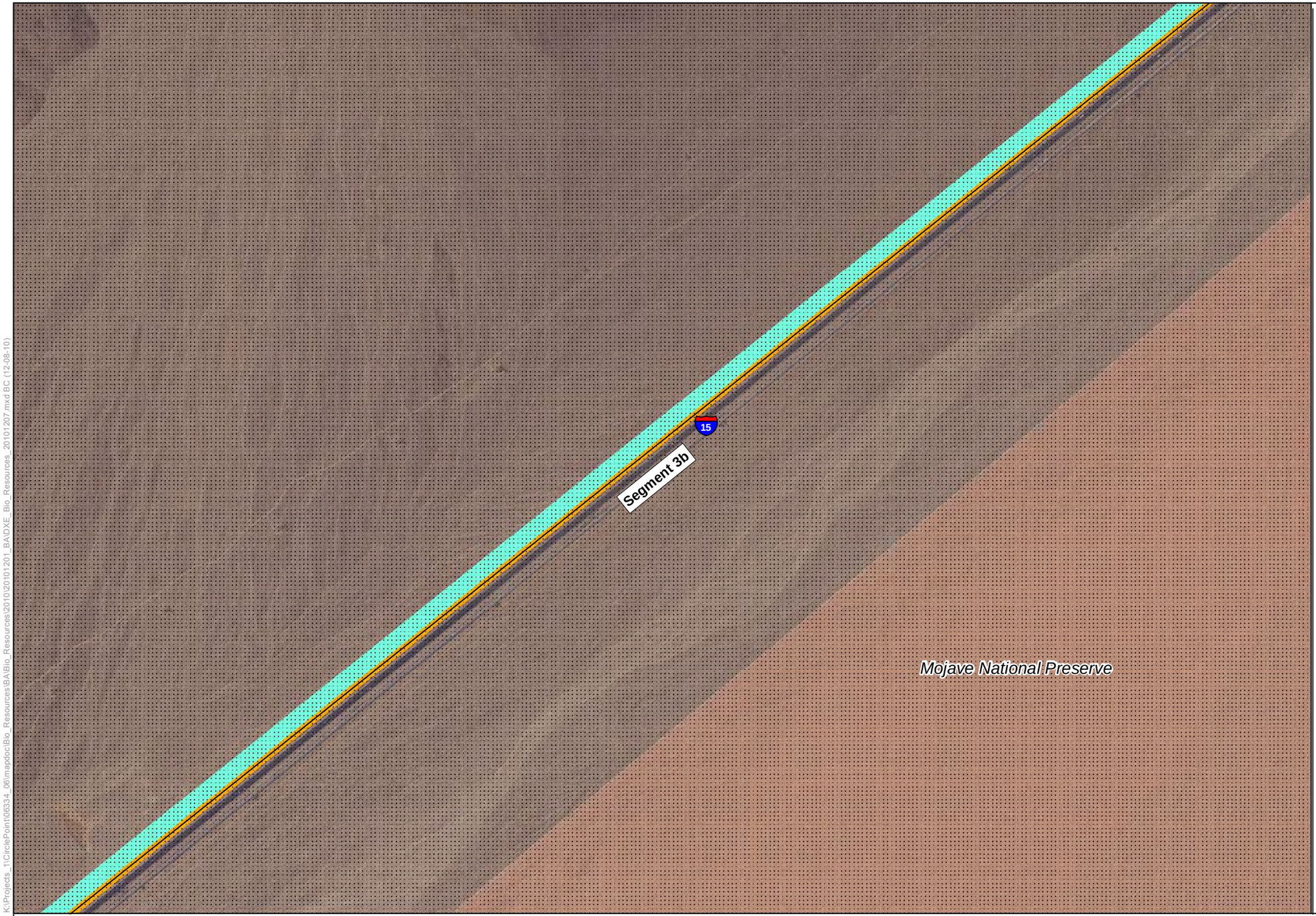

Appendix B

Biological Resources

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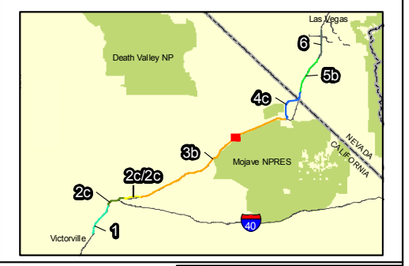

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Appendix B

Biological Resources

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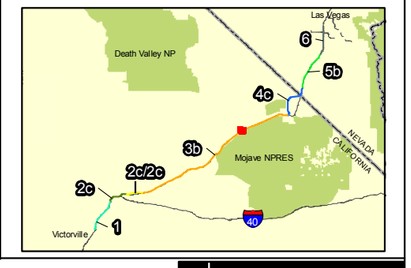

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U.S. Department of Transportation Federal Railroad Administration

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Desert Express - Biological Assesment

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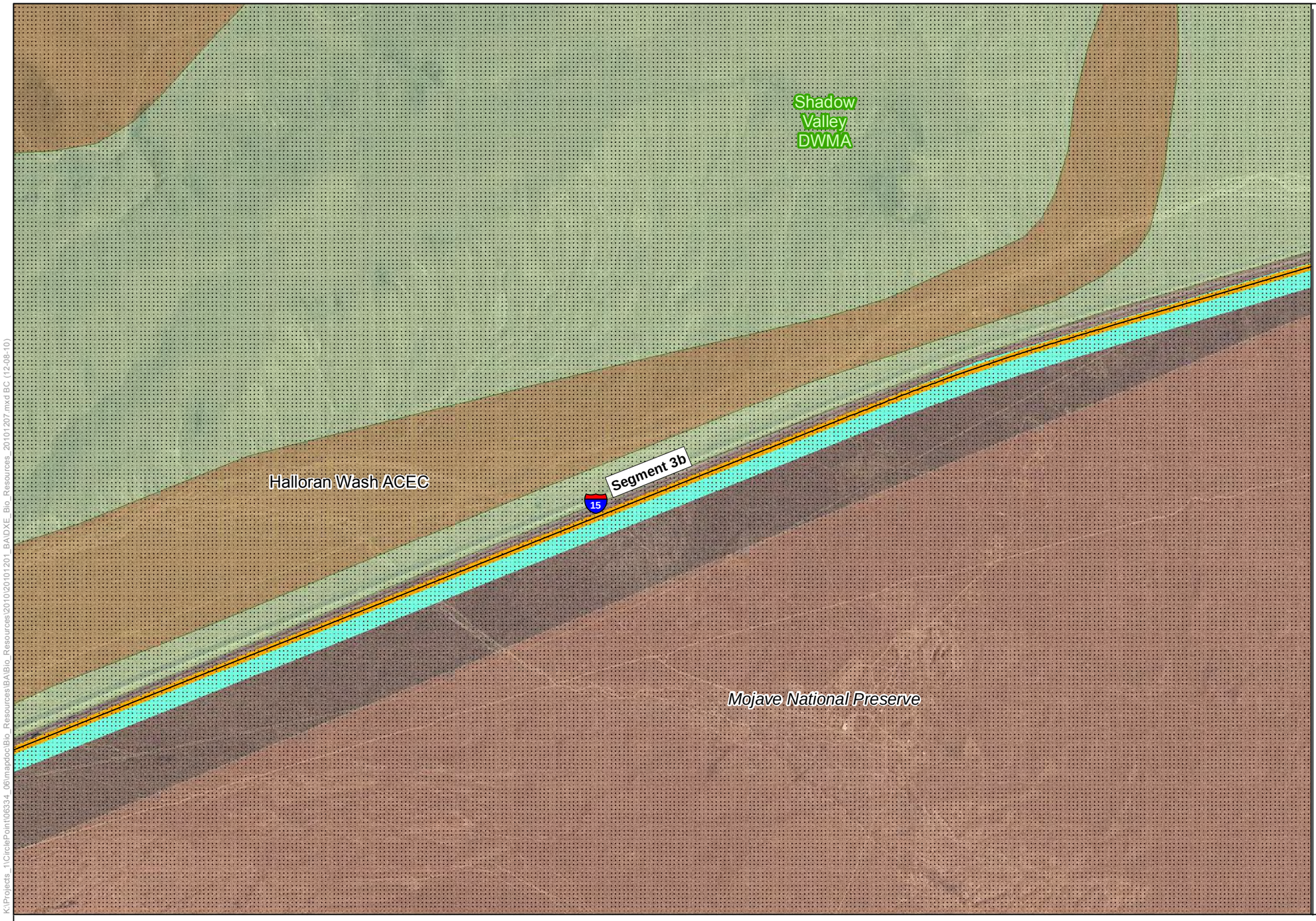

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
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Ancillary Facility Sites

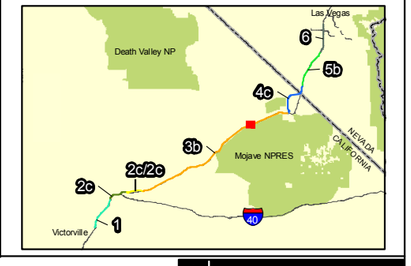
- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

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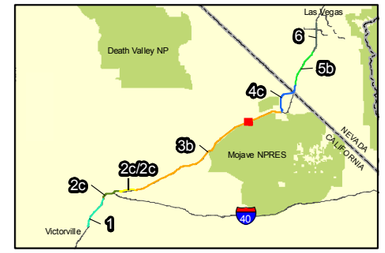

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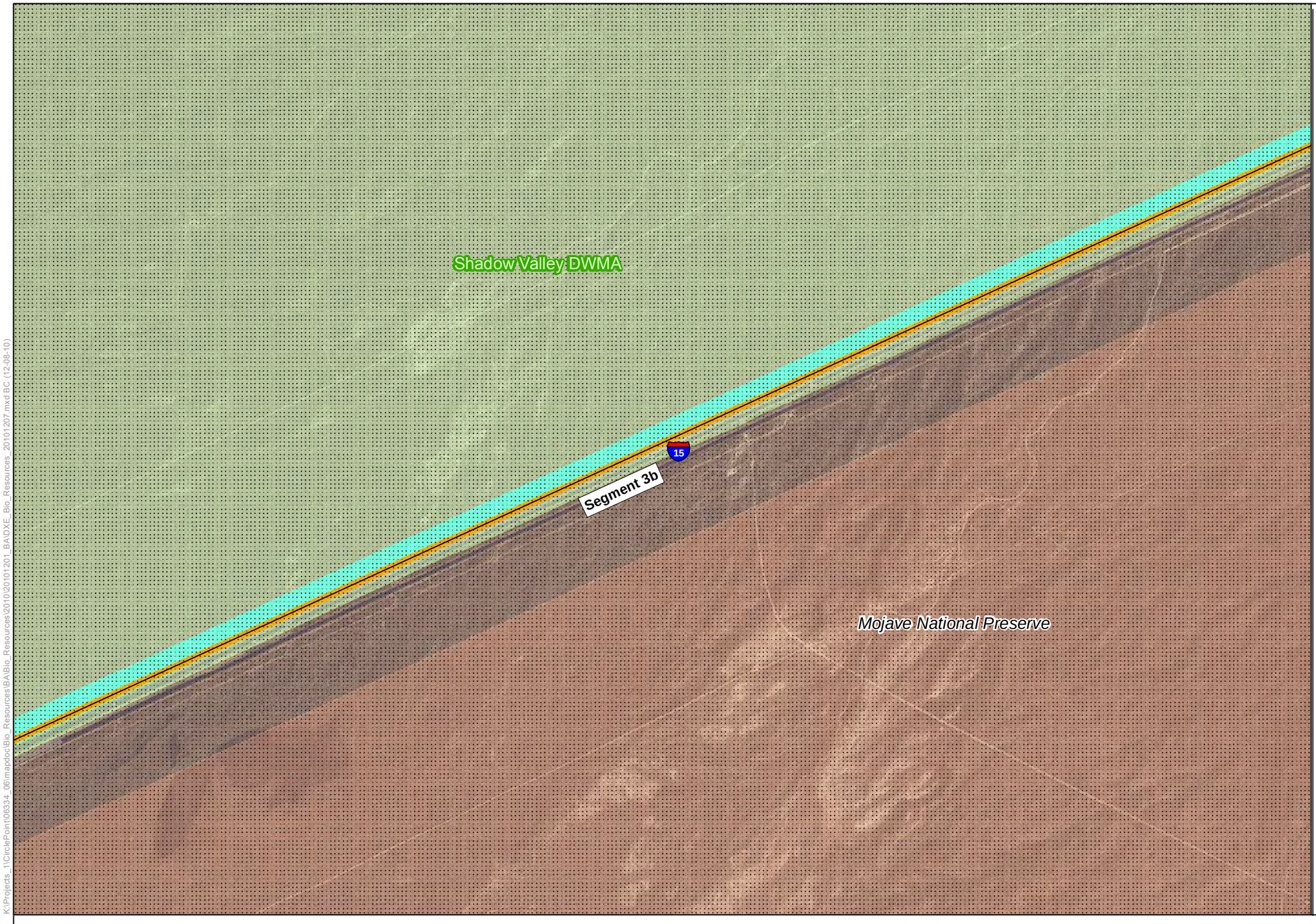

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Appendix B

Biological Resources

Desert Tortoise Habitat

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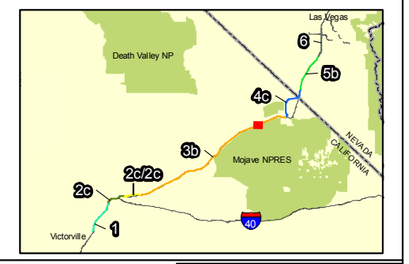

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Desert Express - Biological Assesment

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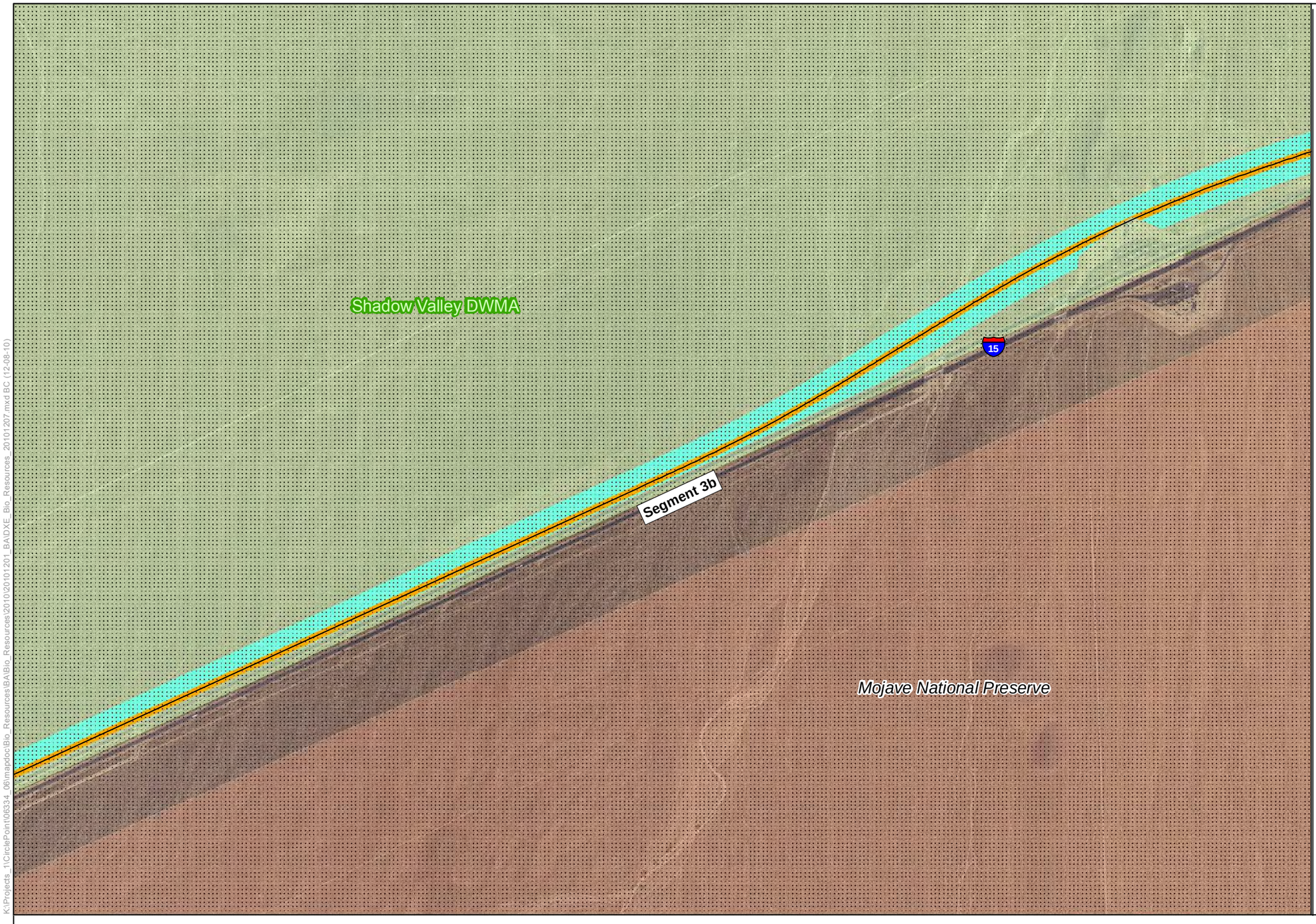

Appendix B

Biological Resources

Desert Tortoise Habitat

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Appendix B

Biological Resources

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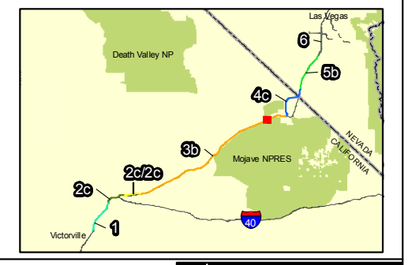

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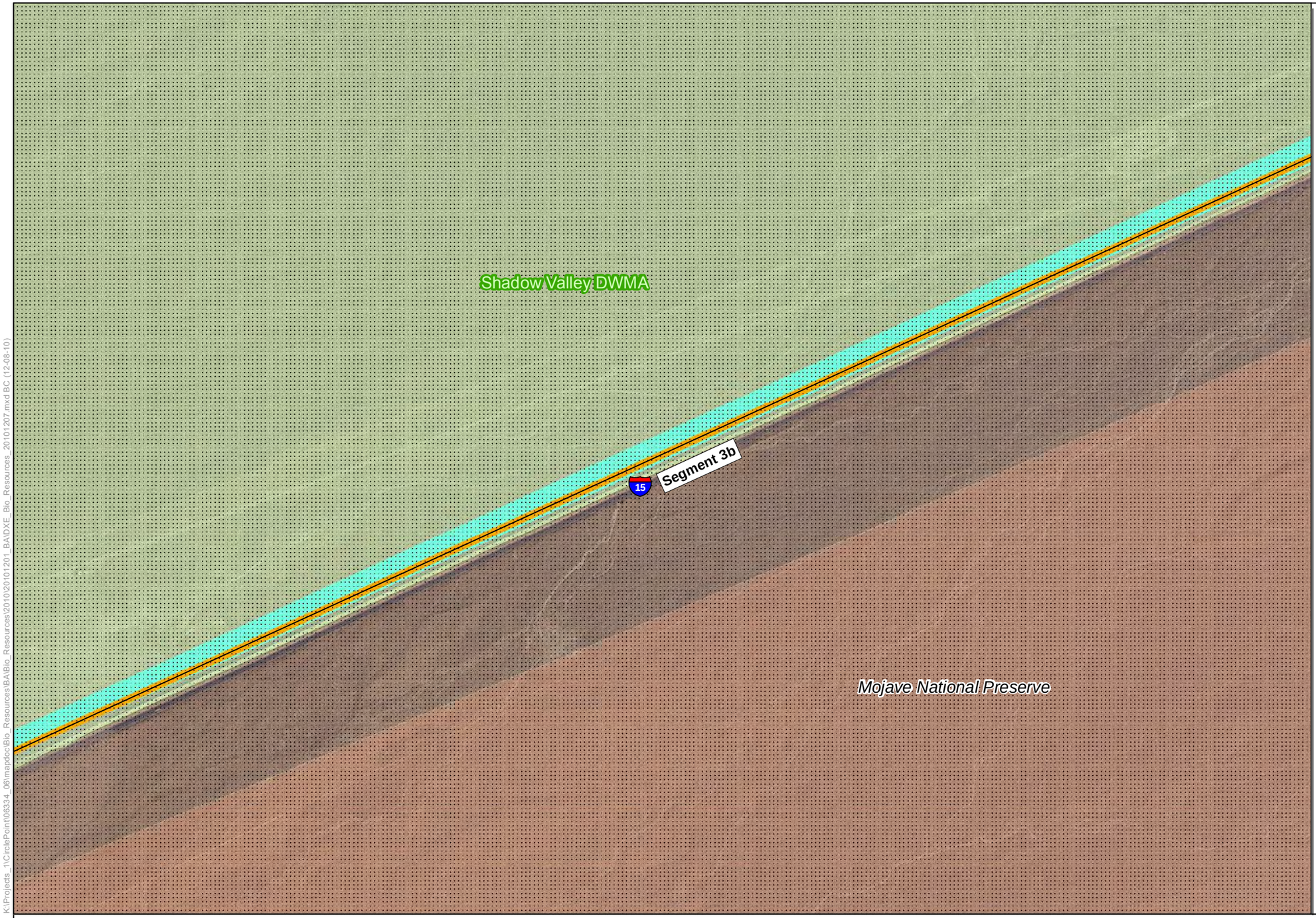

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

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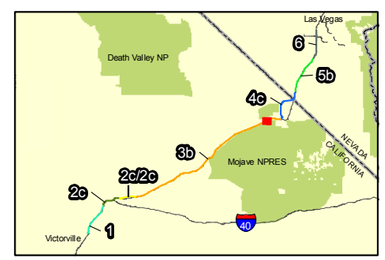

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Federal Railroad Administration

Desert Express - Biological Assesment

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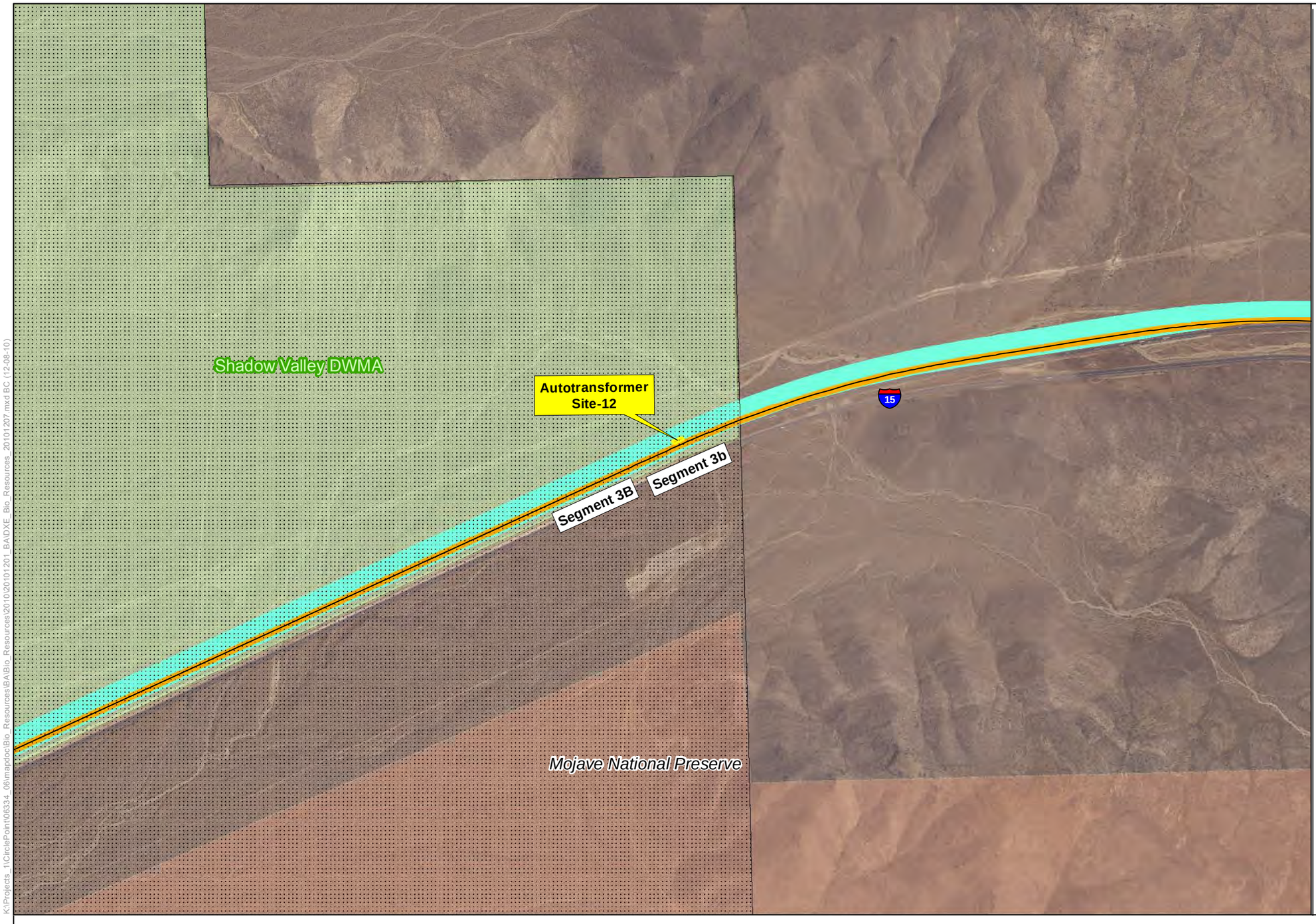

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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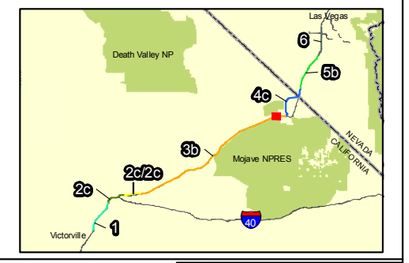

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Appendix B

Biological Resources

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- Permanent Habitat
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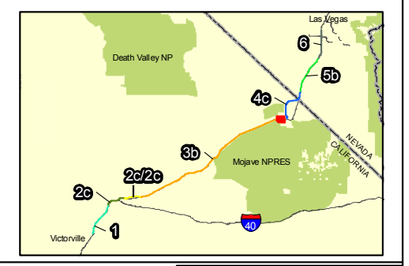
Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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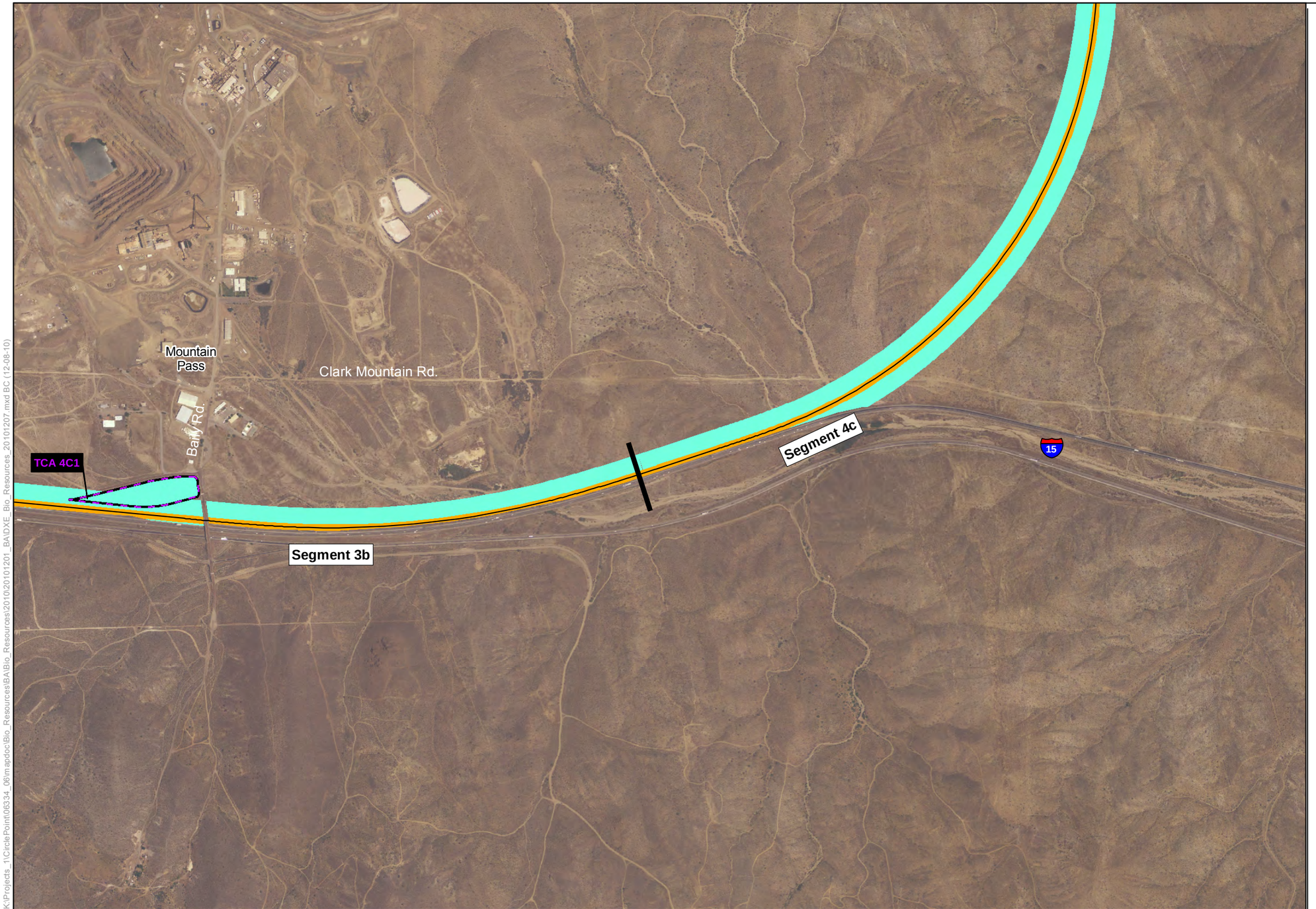

Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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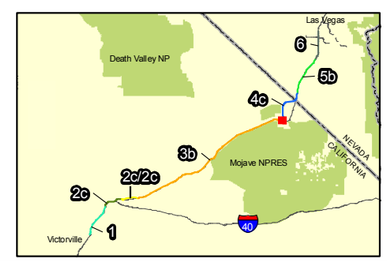

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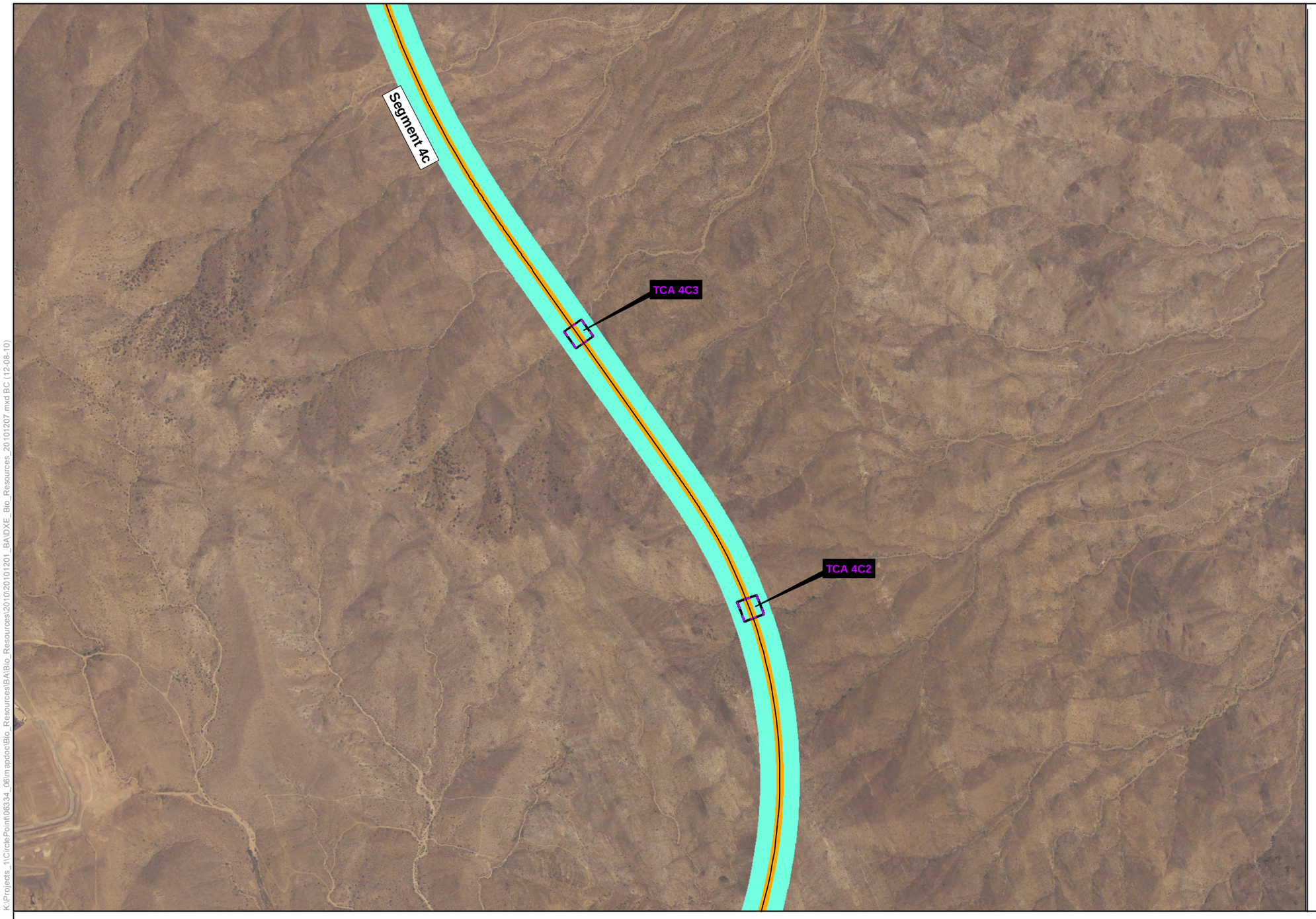

Appendix B

Biological Resources

Desert Tortoise Habitat

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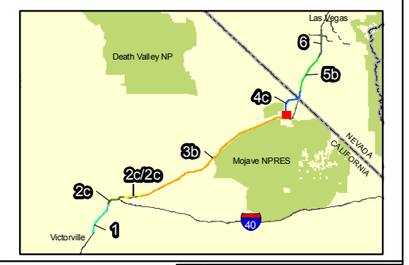

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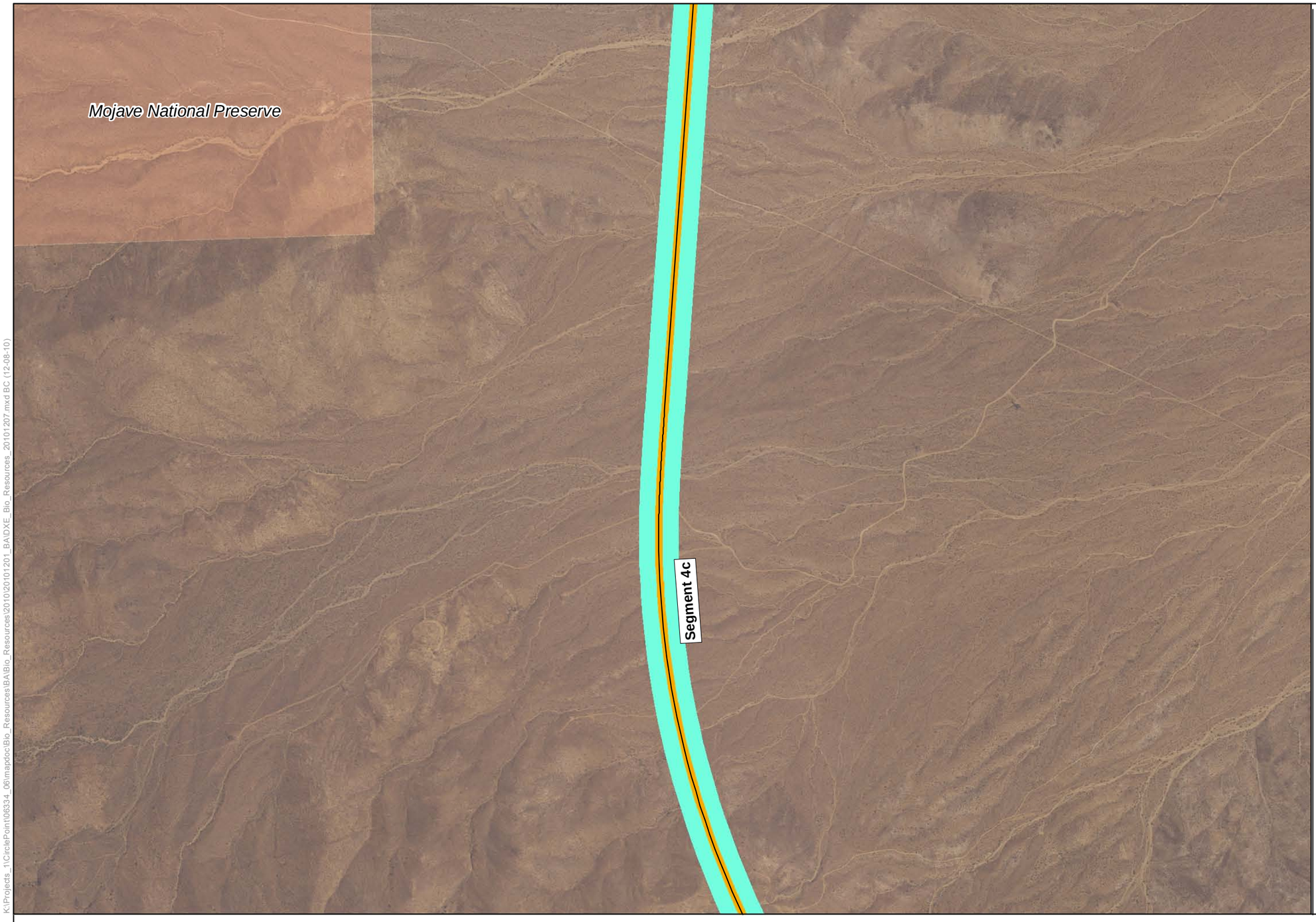

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Biological Resources

Desert Tortoise Habitat

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Appendix B

Biological Resources

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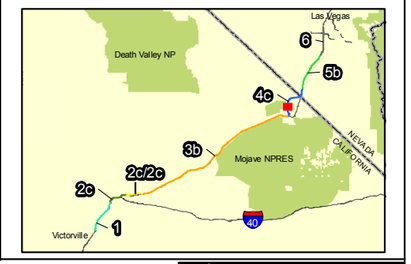

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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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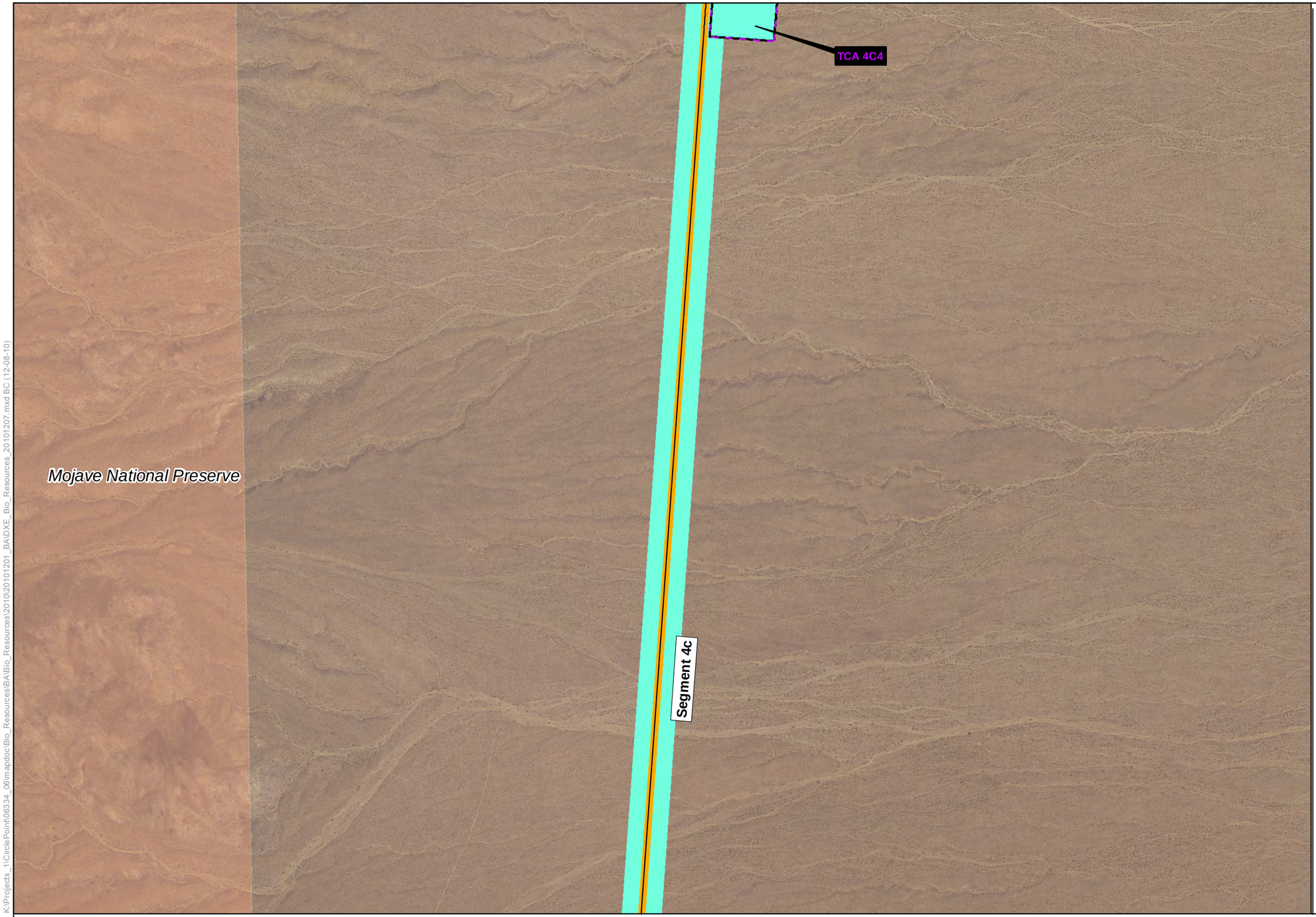

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Appendix B

Biological Resources

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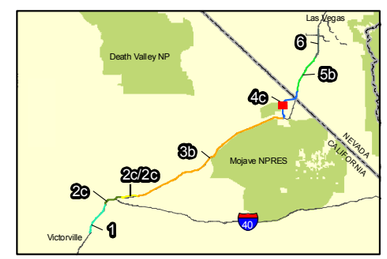

U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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Appendix B

Biological Resources

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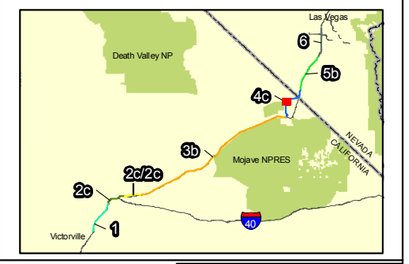

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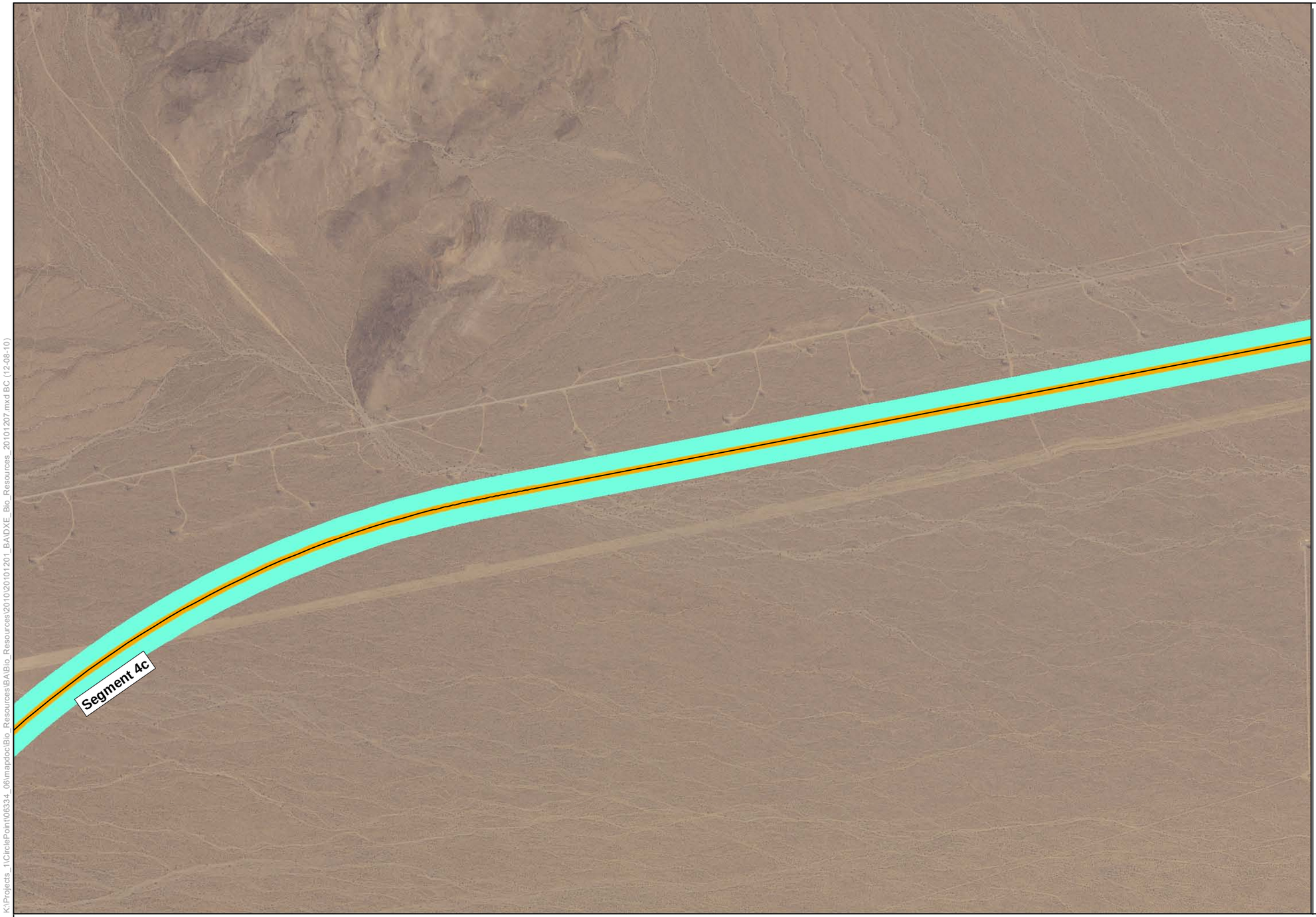

Appendix B

Biological Resources

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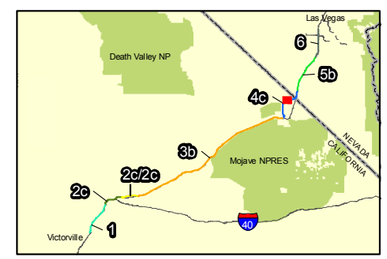

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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

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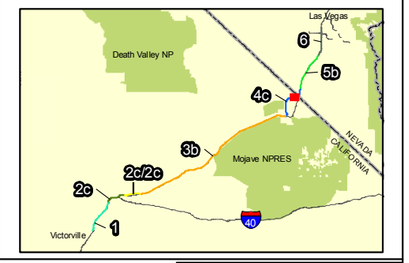

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
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Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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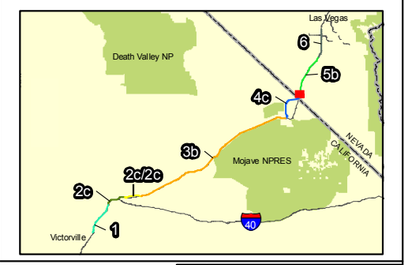

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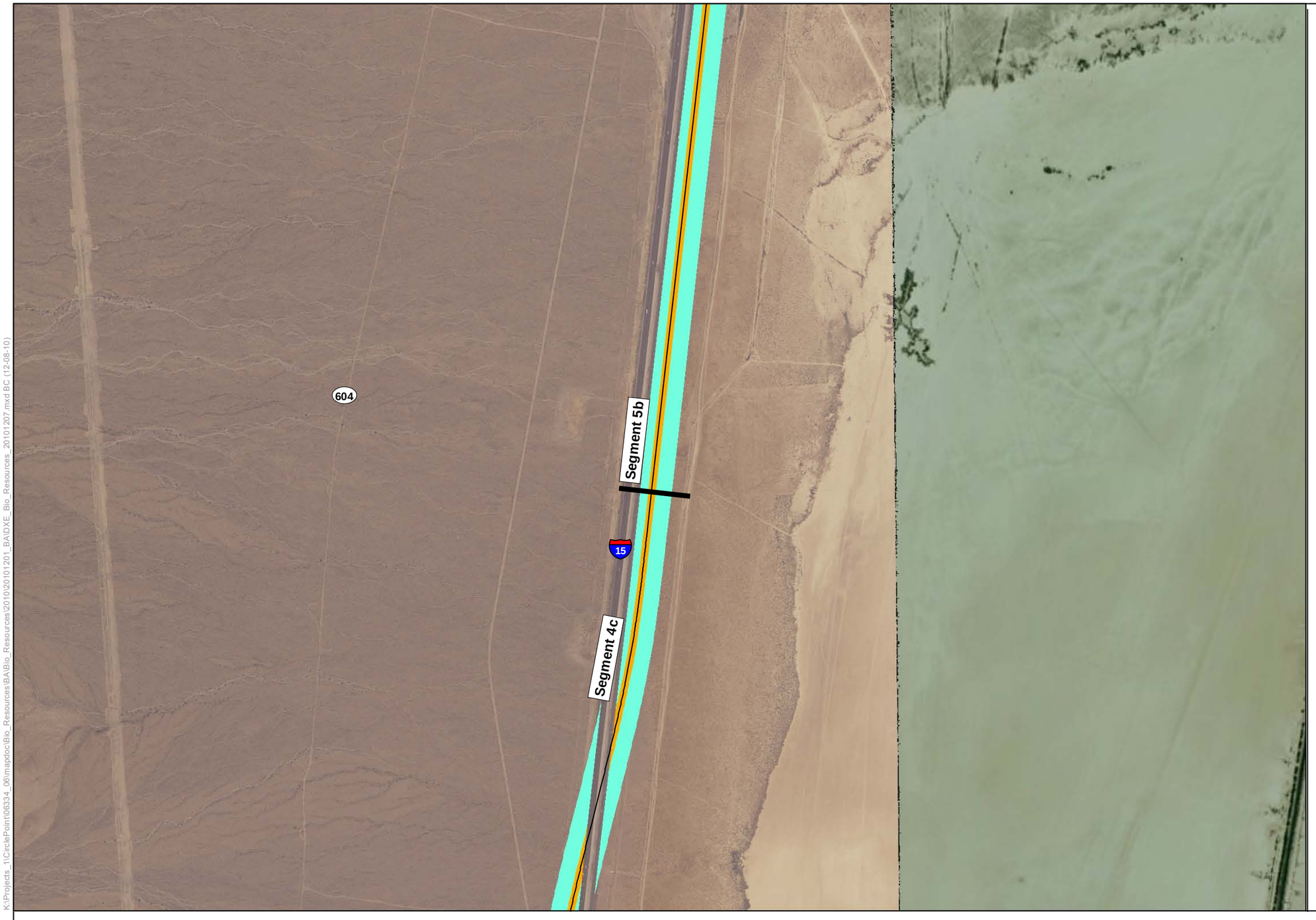

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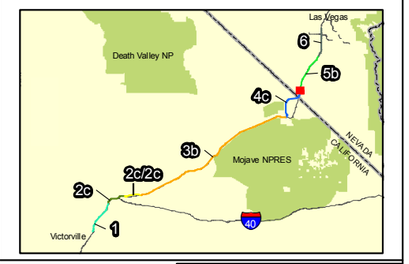

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Appendix B

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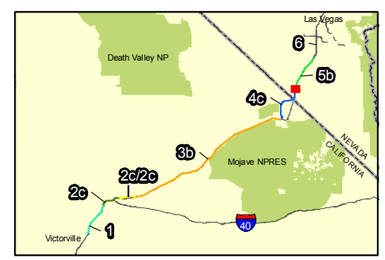

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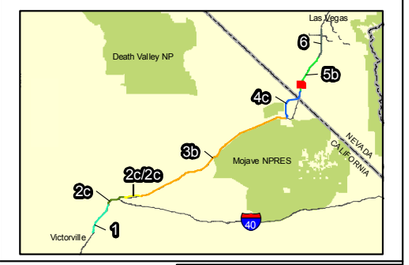

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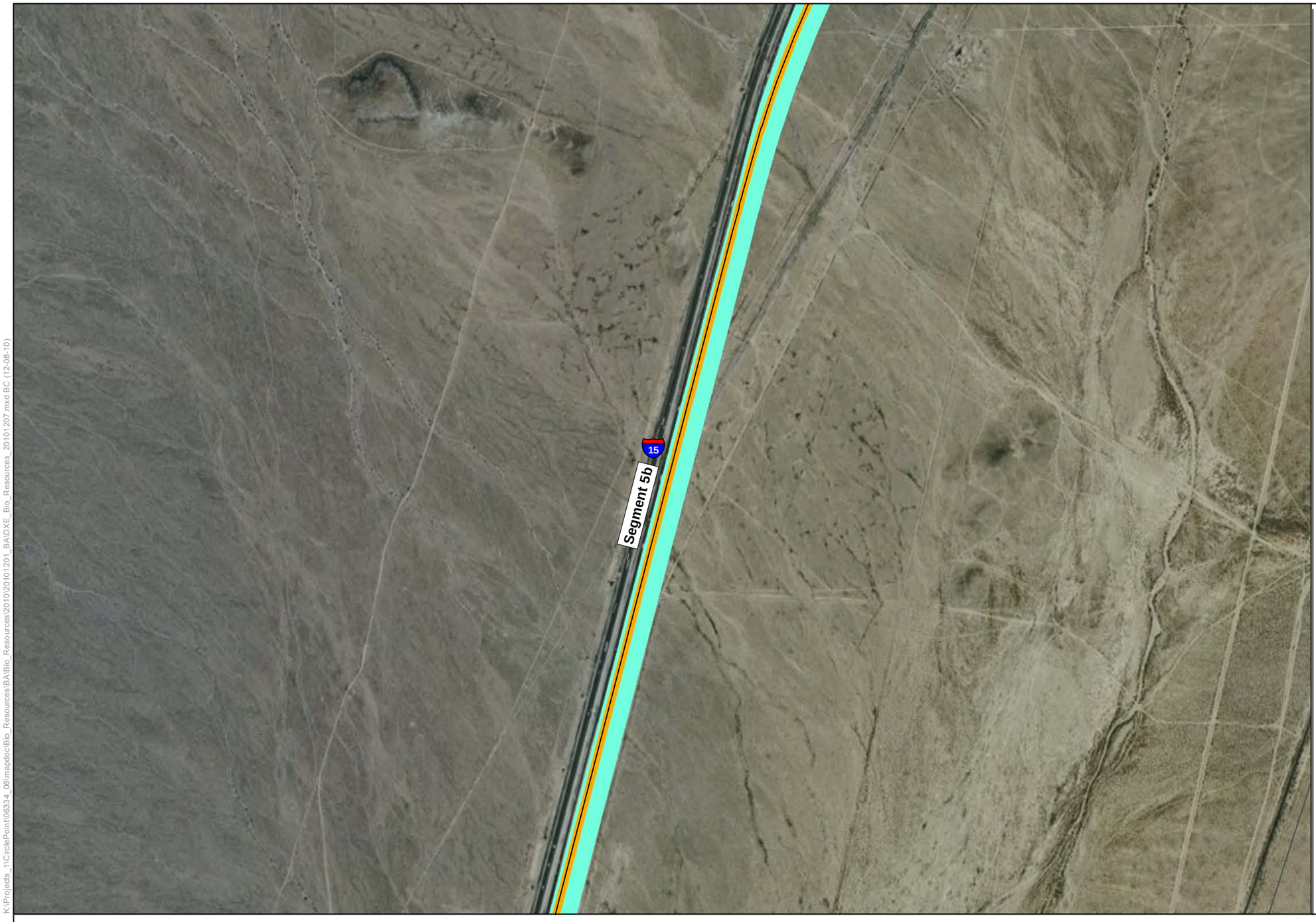

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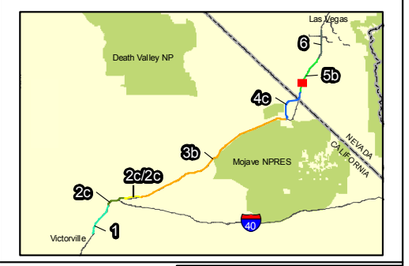

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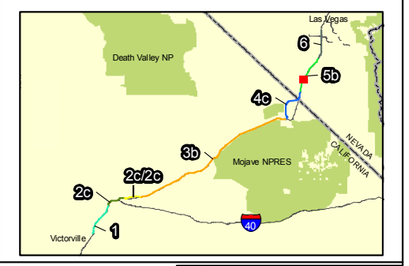

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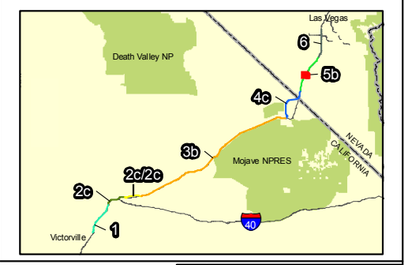

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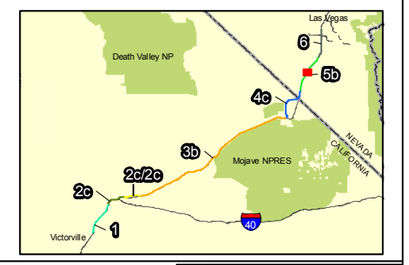

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Federal Railroad Administration

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Appendix B

Biological Resources

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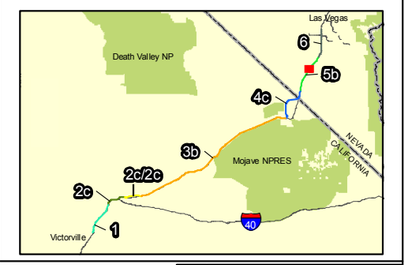

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Federal Railroad Administration

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Appendix B

Biological Resources

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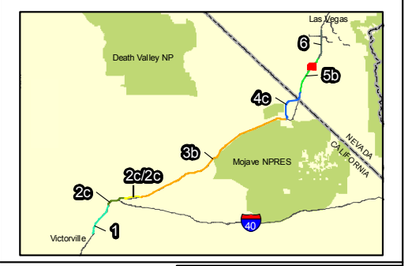

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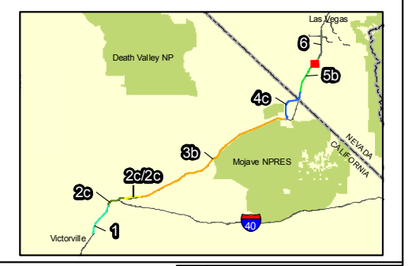

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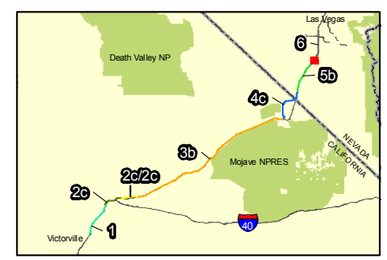

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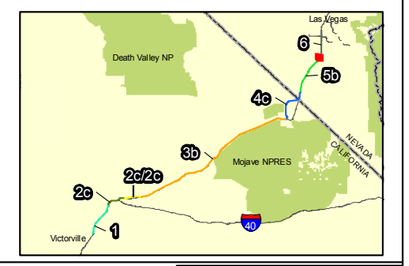

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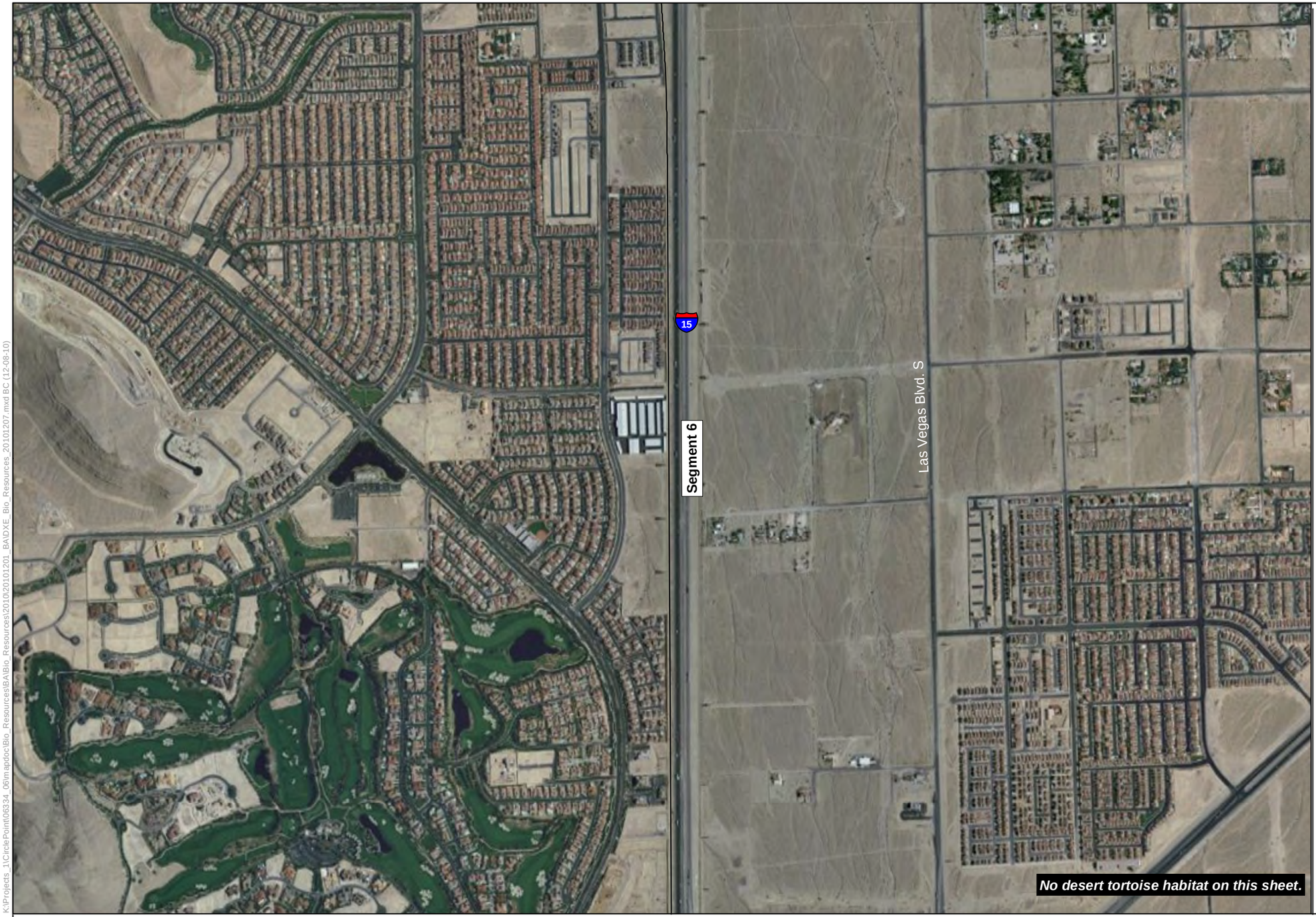

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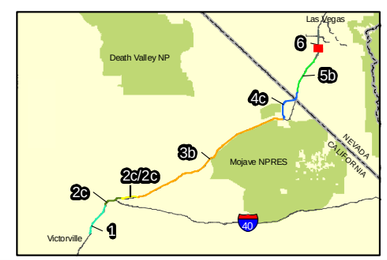

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US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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Appendix B

Biological Resources

Desert Tortoise Habitat

- Permanent Habitat
- Temporary Habitat

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- Area of Critical Environmental Concern
- Desert Wildlife Management Area (DWMA)
- Desert Tortoise Critical Habitat
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Ancillary Facility Sites

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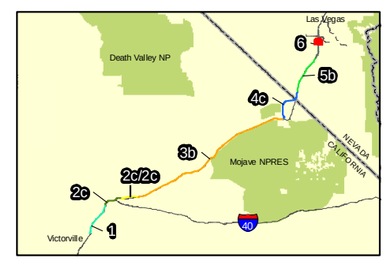
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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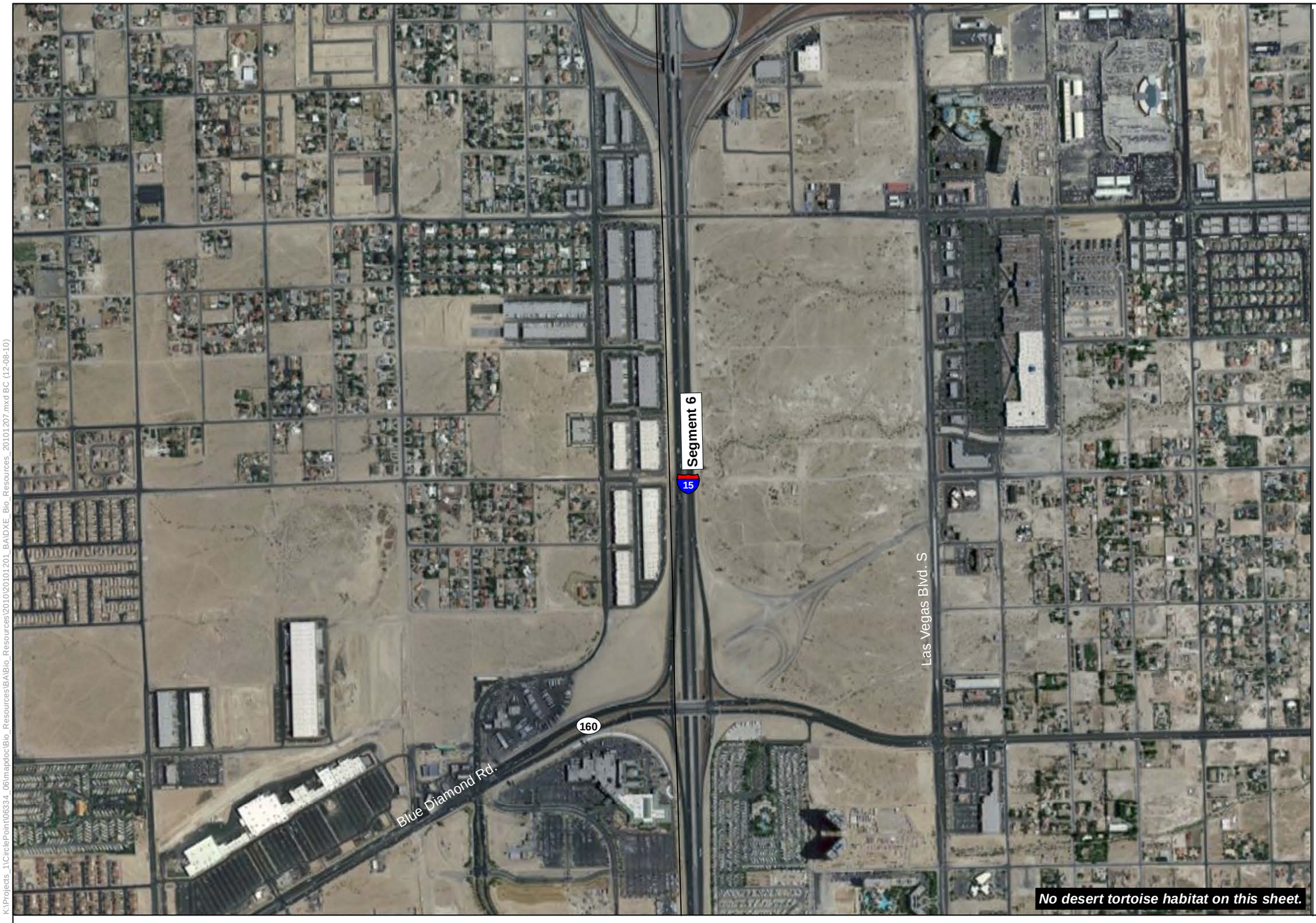

Appendix B

Biological Resources

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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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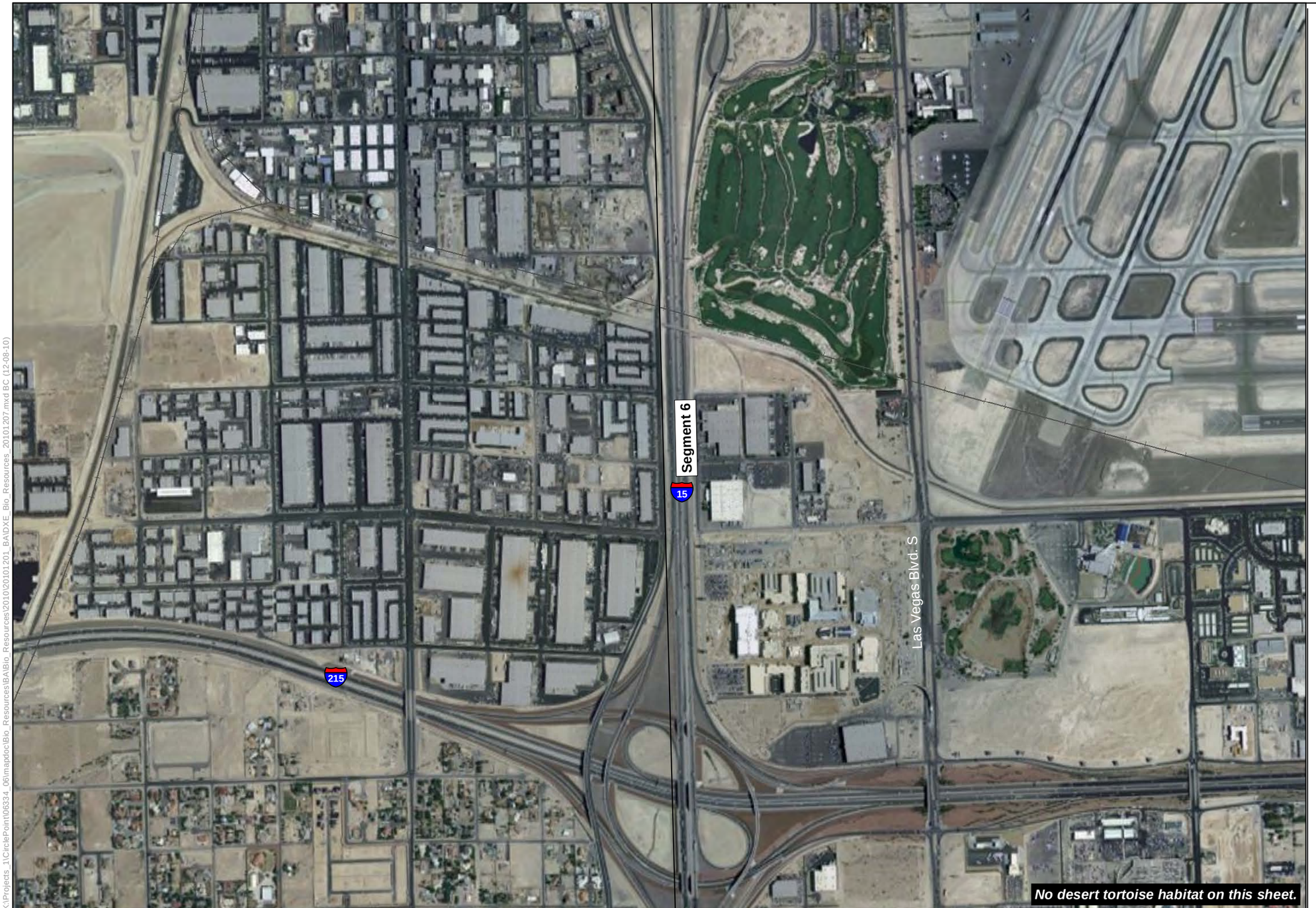

Appendix B

Biological Resources

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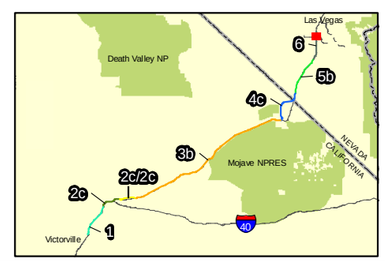
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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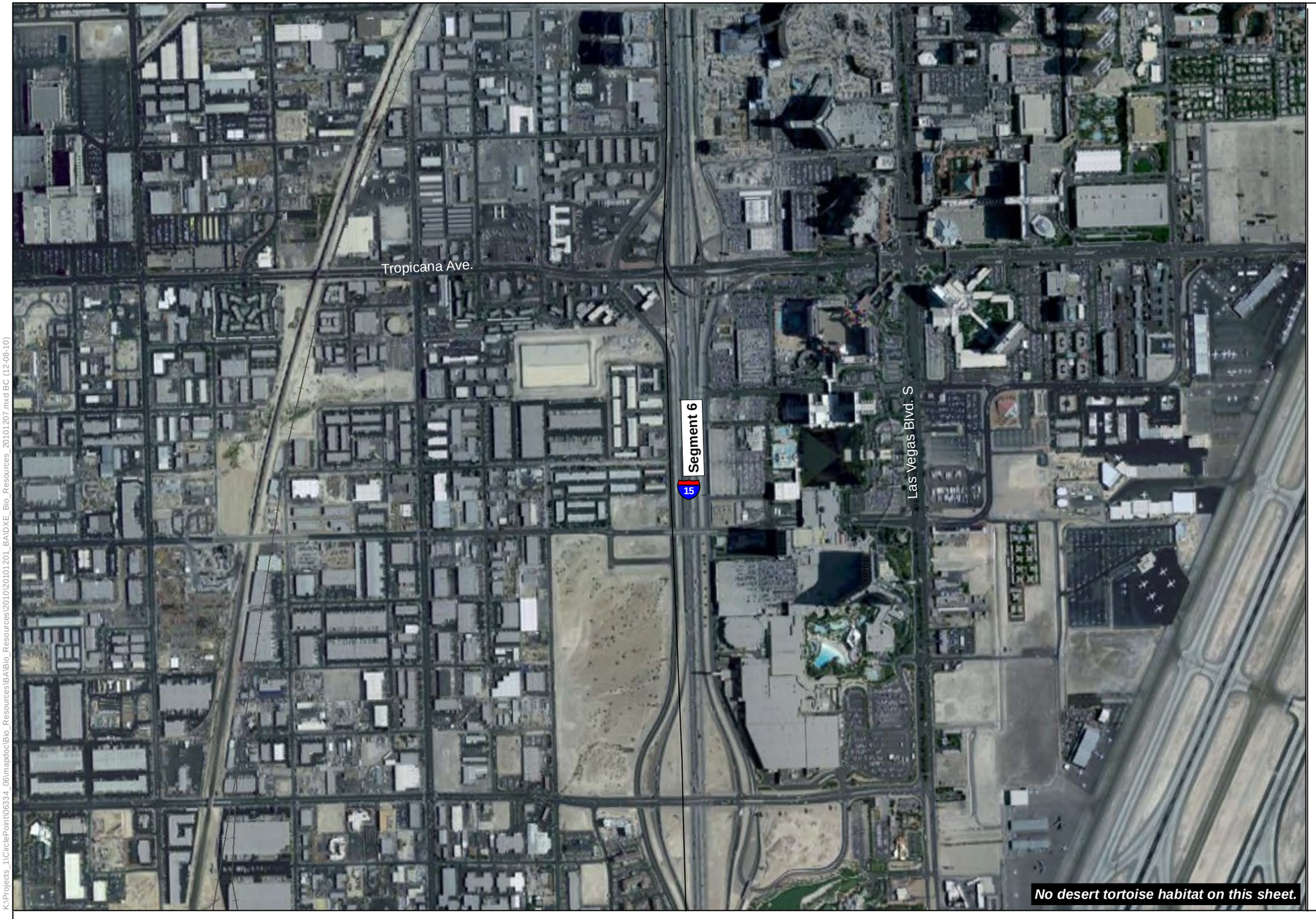

Appendix B

Biological Resources

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Miles
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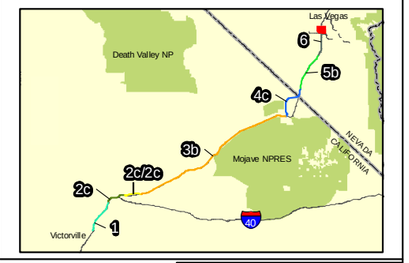
NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).



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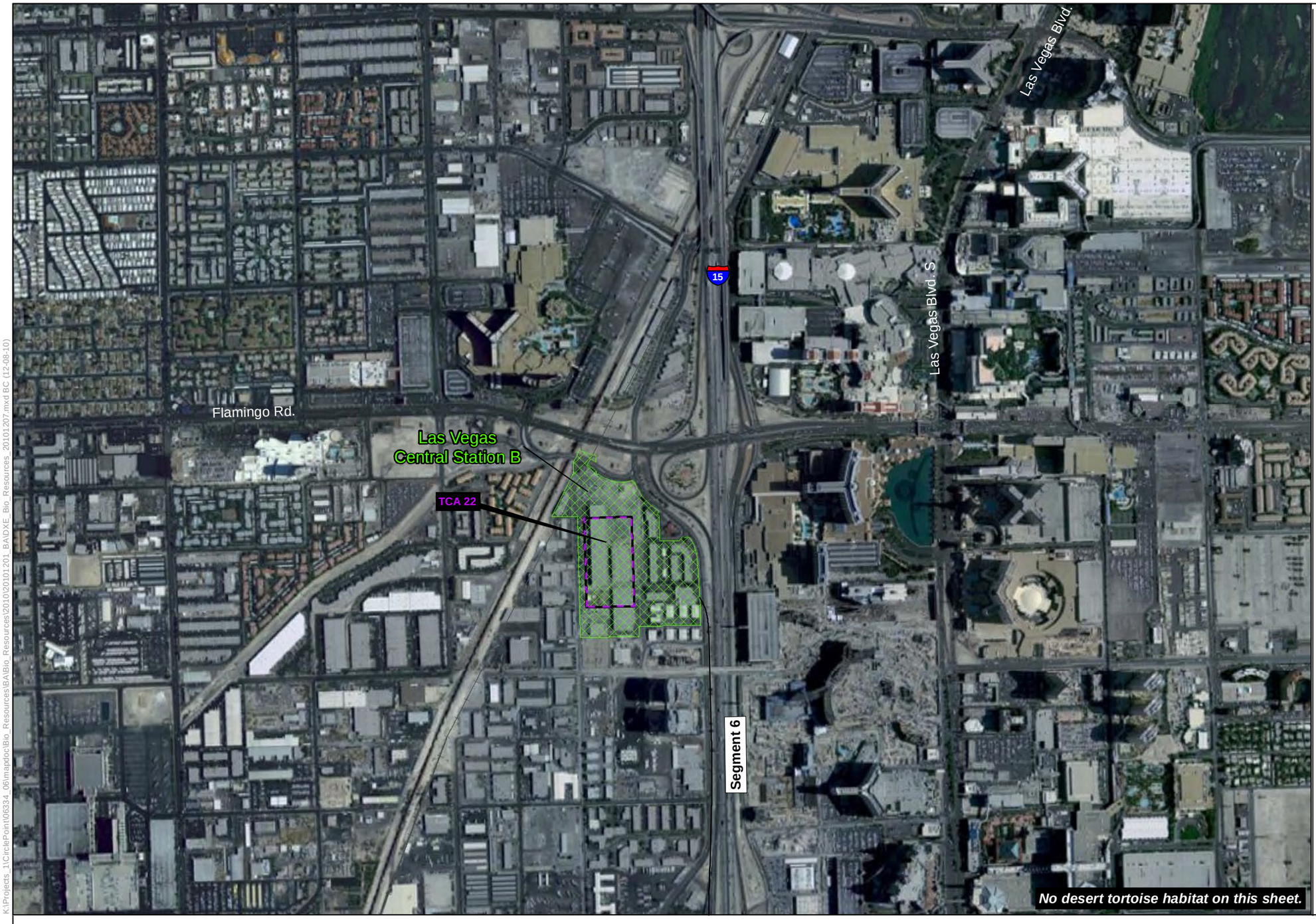

Appendix B

Biological Resources

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Habitat (ICF International 2010).

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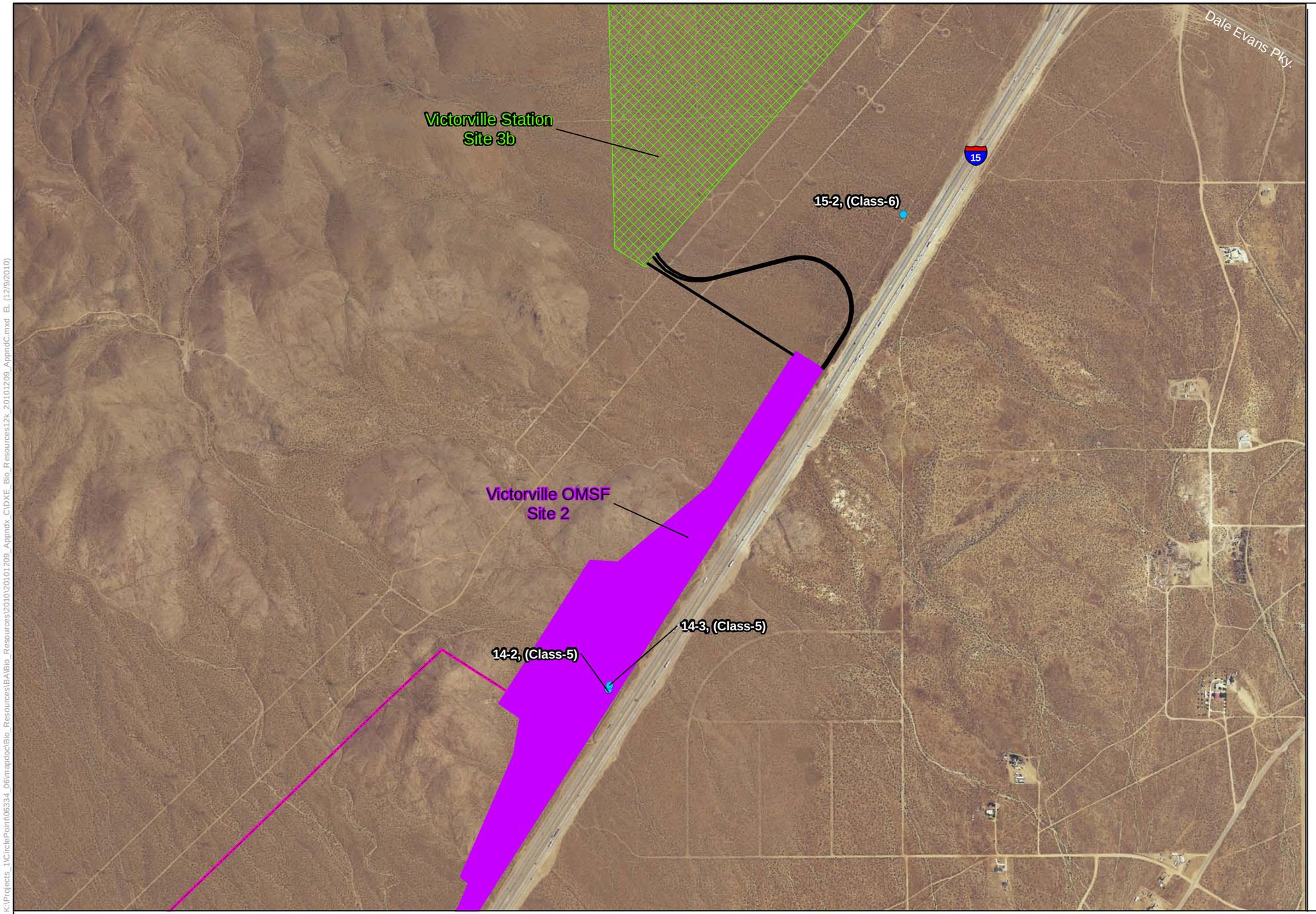
Appendix C

Location of Desert Tortoise Sign from Limited Survey Along the Proposed Action



Appendix C

Desert Tortoise Survey Results (2007)

Survey Record

- Desert Tortoise Burrow
- Desert Tortoise Carcass
- Desert Tortoise Pallet

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- DesertXpress Alignment

Ancillary Facility Sites

- Station/Substation Site
- Maintenance Facility
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- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).

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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 01

Appendix C

Desert Tortoise Survey Results (2007)

Survey Record

- Desert Tortoise Burrow
- Desert Tortoise Carcass
- Desert Tortoise Pallet

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- DesertXpress Alignment

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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).

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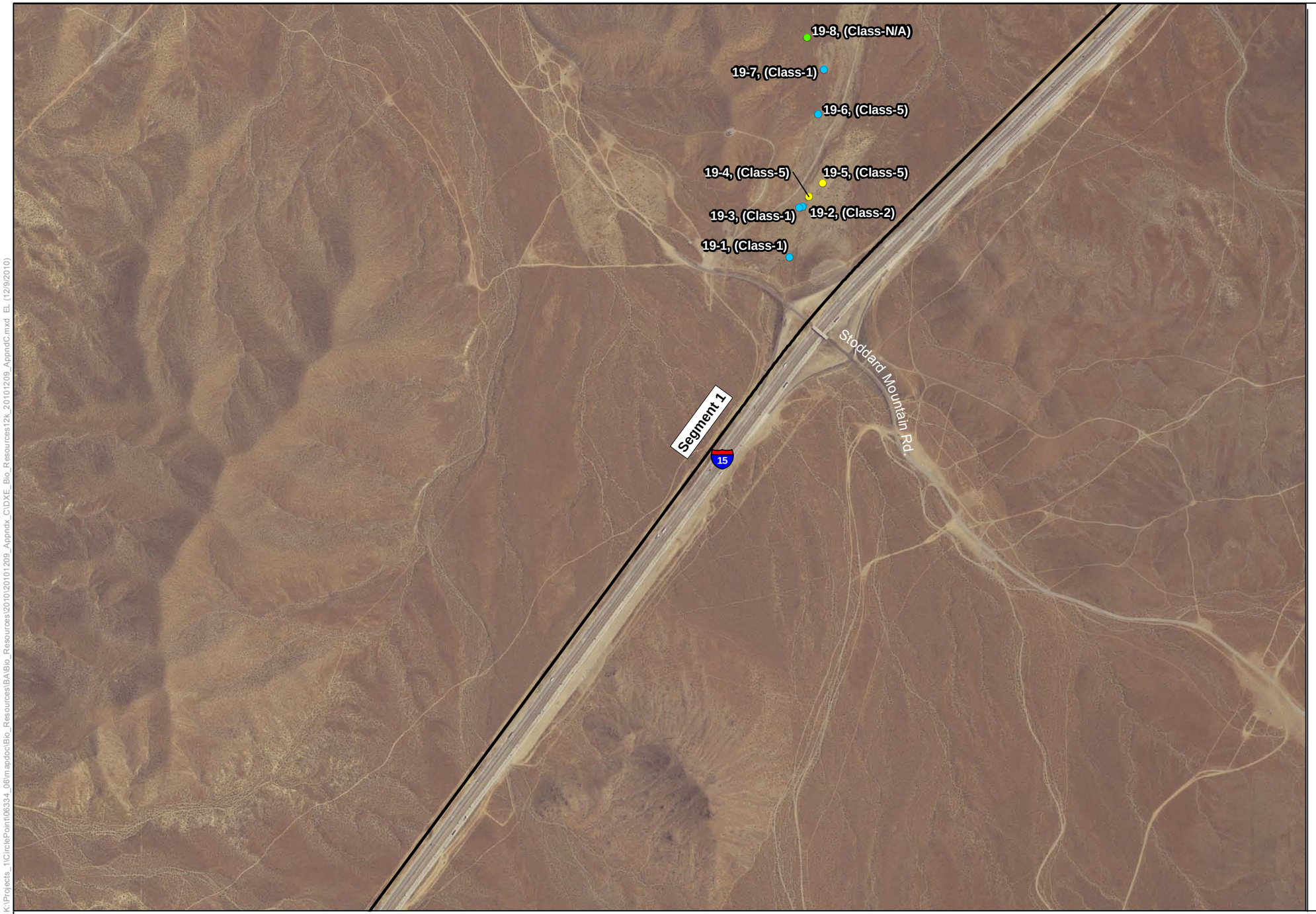
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 02



Appendix C

Desert Tortoise Survey Results (2007)

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- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).

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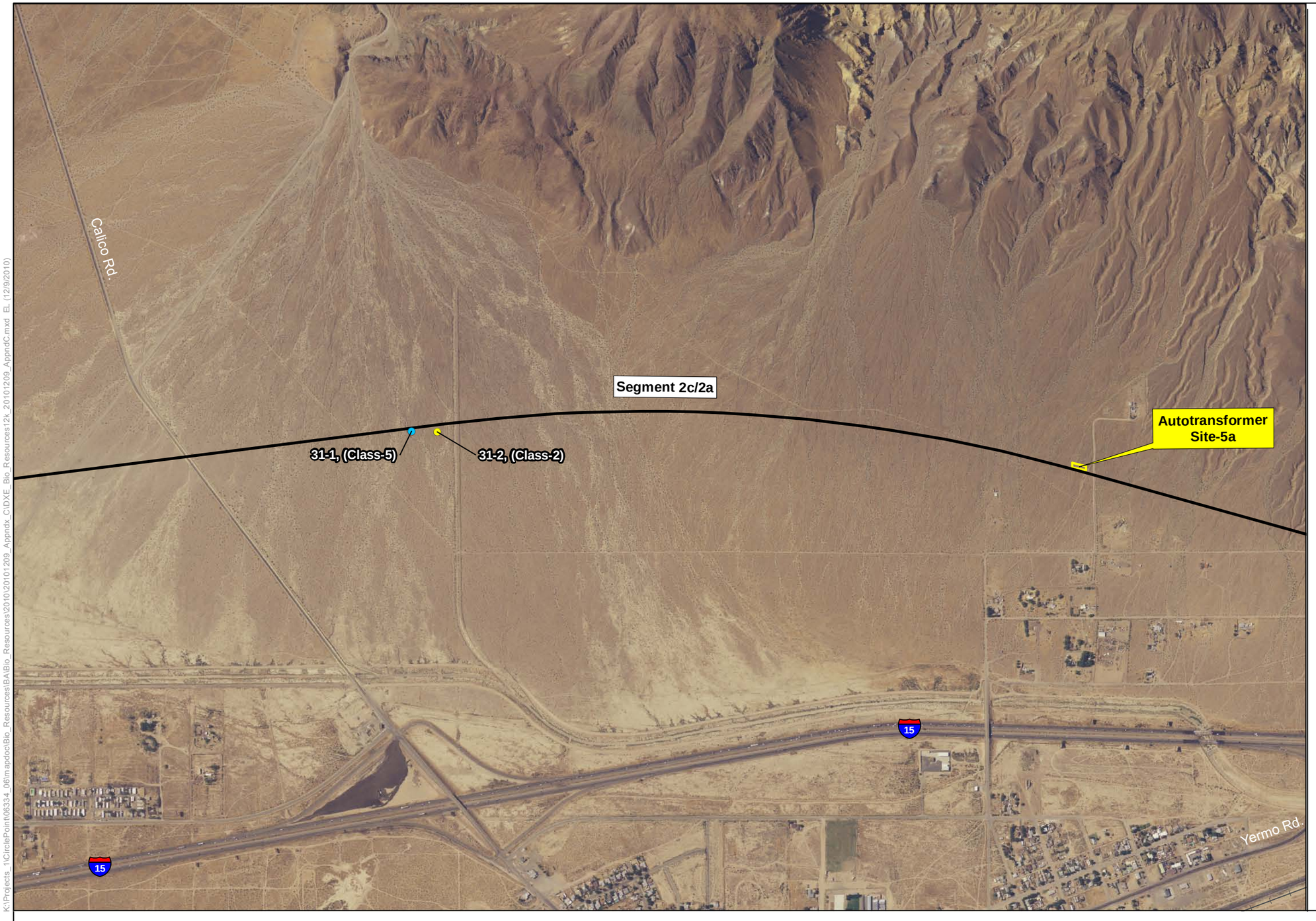
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 03



Appendix C

Desert Tortoise Survey Results (2007)

Survey Record

- Desert Tortoise Burrow
- Desert Tortoise Carcass
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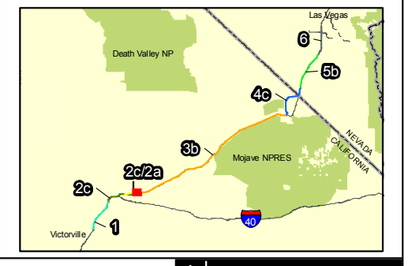
Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).



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U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 04

Appendix C

Desert Tortoise Survey Results (2007)

Survey Record

- Desert Tortoise Burrow
- Desert Tortoise Carcass
- Desert Tortoise Pallet

Note: Undeveloped areas below 5000 feet in elevation are potential Desert Tortoise habitat.

- DesertXpress Alignment

Ancillary Facility Sites

- Station/Substation Site
- Maintenance Facility
- Temporary Construction Area (TCAs) Site
- Autotransformer Site Options (EMU Option Only)
- Electric Utility Corridor (EMU Option Only)

Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).

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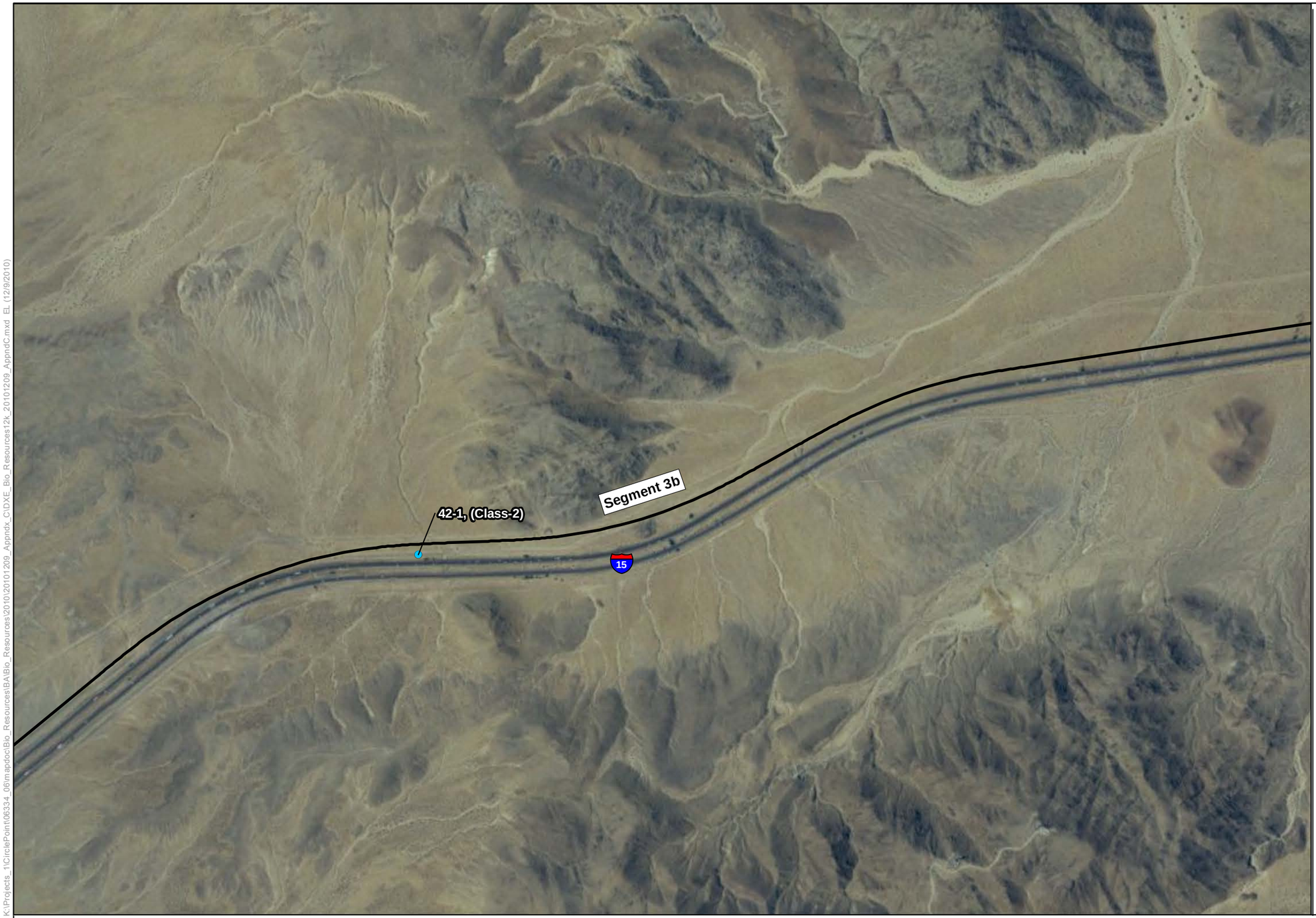
U.S. Department of Transportation Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 05



Appendix C

Desert Tortoise Survey Results (2007)

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Kilometers
0 0.2 0.4

Miles
0 0.2 0.4

NORTH

US DOI Bureau of Land Management, Reno Nevada April 2008, DesertXpress 2010, National Atlas of the United States and the United States Geological Survey, ESRI 2006. Tele Atlas and ESRI StreetMap USA 2006, National Agriculture Imagery Program (NAIP) 2005 & 2006, Air Photo USA April 2007, Desert Tortoise Survey Data (ICF International 2007).

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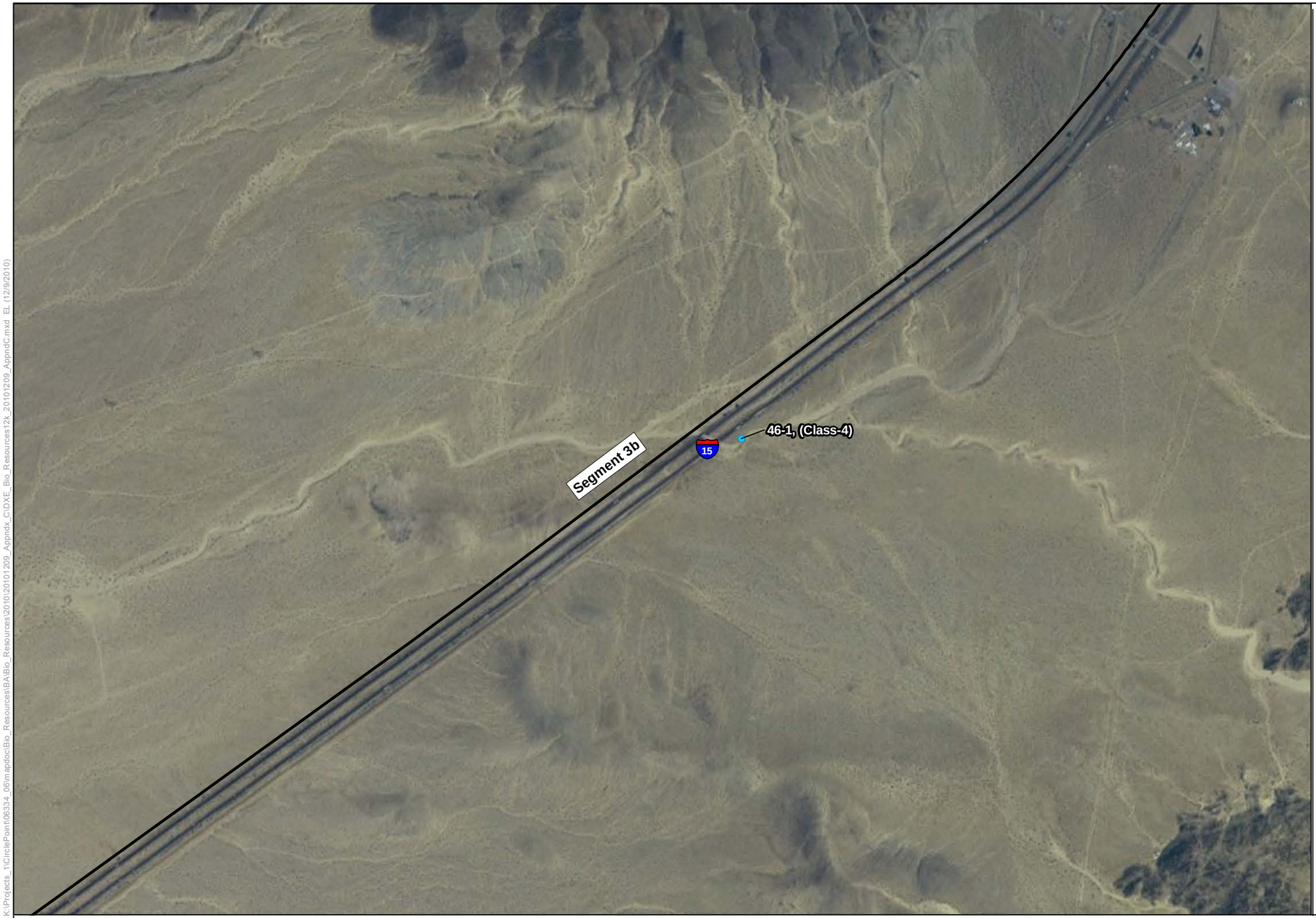
U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

SHEET 06



Appendix C

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Kilometers
0 0.2 0.4

Miles
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U.S. Department of Transportation
Federal Railroad Administration

Desert Express - Biological Assesment

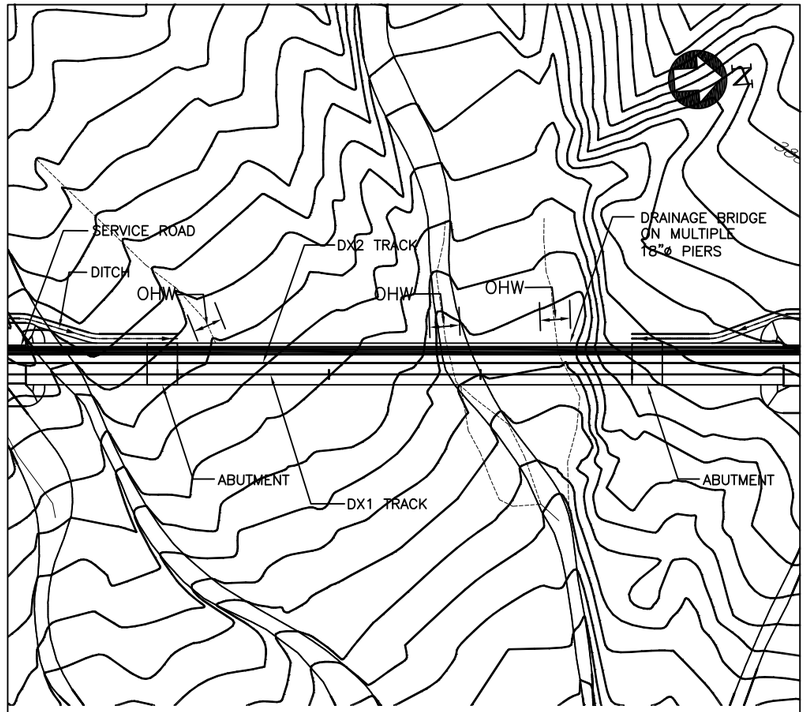
SHEET 07

Appendix D

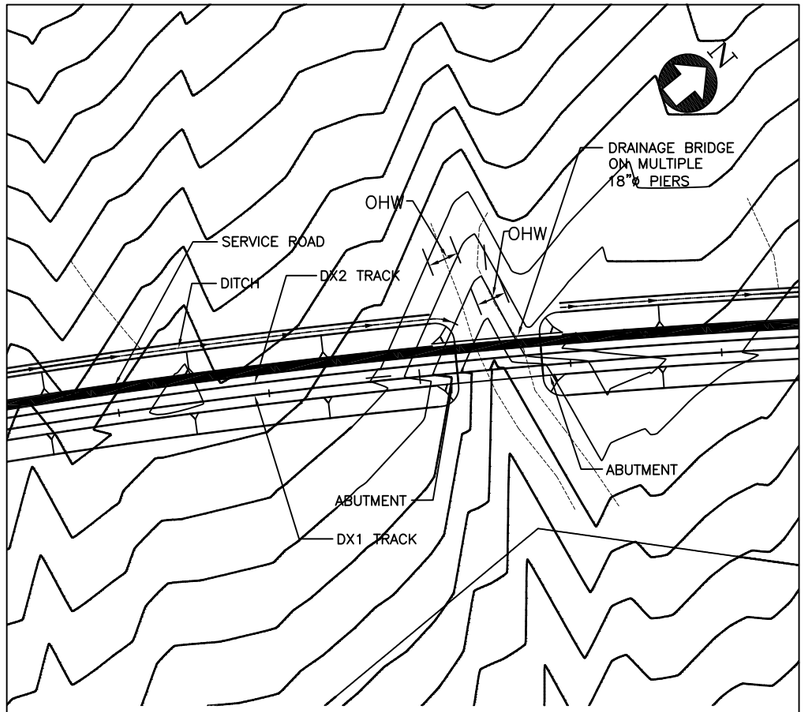
Segment 4C Preliminary Locations for Tunnels, Aerial, and At-Grade Crossings

Figure 1. Location of Ephemeral Drainages Greater than or Equal to Four Feet Wide Within the California Portion of Alternative 4C, DesertXpress Project

Figure 2. Preliminary Location of Aerial and At-Grade Crossings Within the California Portion of Alternative 4C, DesertXpress Project

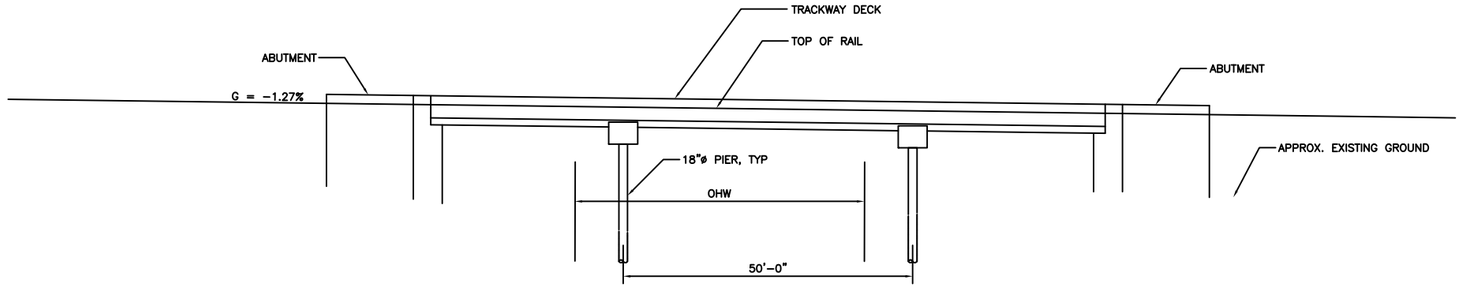


TYPICAL PLAN VIEWS: AT–GRADE DRAINAGE OVER CROSSINGS, DWG#1 (Preliminary)



TYPICAL PLAN VIEWS: AT–GRADE DRAINAGE OVER CROSSINGS, DWG#2 (Preliminary)

NOTE: WHERE PRACTICABLE PIERS TO BE LOCATED OUTSIDE OF WATERS OF THE U.S. SUBJECT TO CORPS CWA JURISDICTION



TYPICAL SECTION VIEW: AT–GRADE DRAINAGE OVER CROSSINGS, DWG#3 (Preliminary)

100' 0' 100' 200'

GRAPHIC SCALE

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE 04NOV10

EARTH TECH | AECOM
2101 Webster St., Suite 1000
Oakland, CA 94612
Phone: (510) 419-6000
Fax: (510) 419-5355

F-M-134

FIGURE 3. TYPICAL AT–GRADE EPHEMERAL DRAINAGE OVER CROSSING STRUCTURES, SHEET 1

DESERTXPRESS
VICTORVILLE TO LAS VEGAS

Preliminary

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FIGURE 3A SHEET 1 PREL

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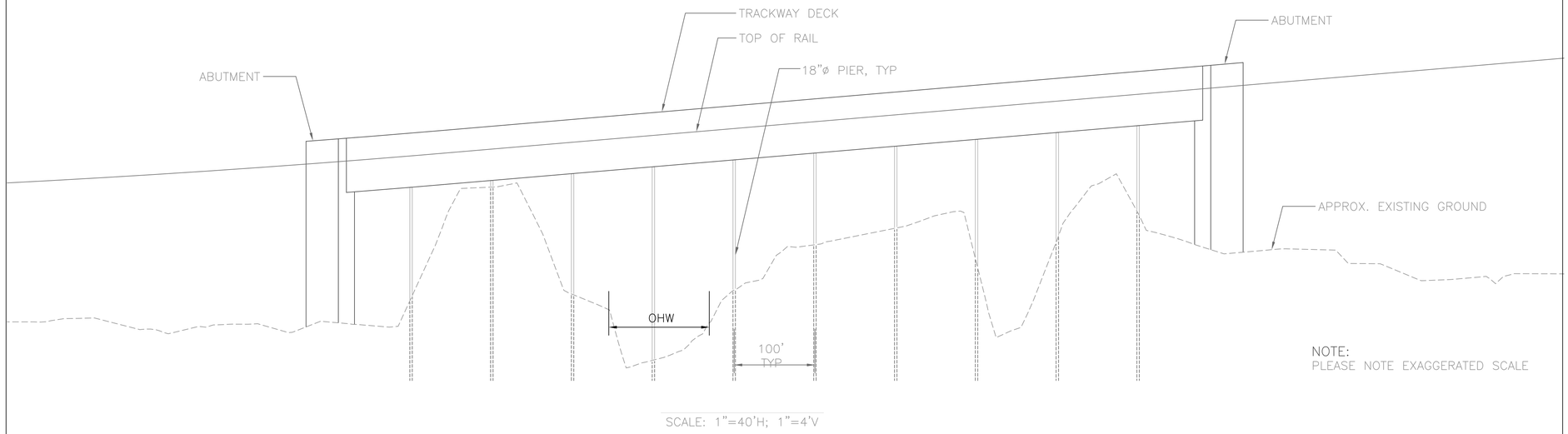
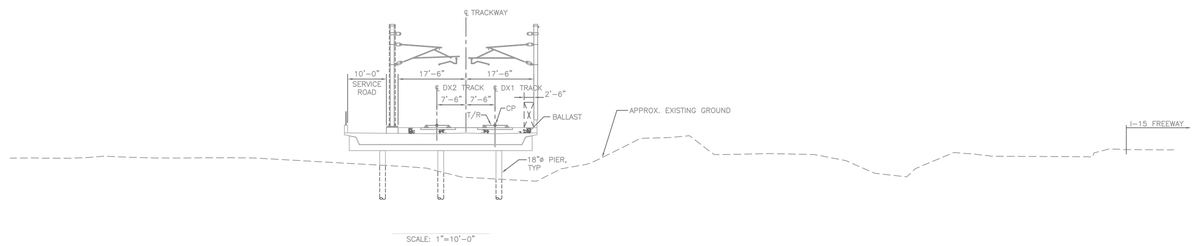
NOTE: WHERE PRACTICABLE PIERS TO BE LOCATED OUTSIDE OF WATERS OF THE U.S. SUBJECT TO CORPS CWA JURISDICTION



TYPICAL SECTION VIEW: PIER SUPPORTED AERIAL OVER CROSSING, DWG 1A (Preliminary)

NOTE: WHERE PRACTICABLE PIERS TO BE LOCATED OUTSIDE OF WATERS OF THE U.S. SUBJECT TO CORPS CWA JURISDICTION



TYPICAL SECTION VIEW: PIER SUPPORTED AERIAL OVER CROSSING, DWG 1B (Preliminary)

REV	DATE	BY	SUB	APP	DESCRIPTION
A	04NOV10				

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE 04NOV10

EARTH TECH | AECOM
2101 Webster St., Suite 1000
Oakland, CA 94612
Phone: (510) 419-6000
Fax: (510) 419-5355

F-M-135

FIGURE 3. TYPICAL AERIAL EPHEMERAL DRAINAGE OVER CROSSING STRUCTURES, SHEET 2

DESERTXPRESS
VICTORVILLE TO LAS VEGAS

Preliminary

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FIG 3 SHEET 2 PRELIMINARY

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