

APPENDIX A

Biological Technical Report for Verizon's Fiber Optic Cable Project at Fort Irwin

Biological Technical Report for Verizon's Fiber Optic Cable Project San Bernardino County, California

Submitted to:



Verizon
16071 Mojave Drive
Building A
Victorville, CA 92395

and



U.S. Army Garrison Fort Irwin
Directorate of Public Works
P.O. Box 105085
Fort Irwin, CA 92310

Submitted by:



215 North Fifth Street
Redlands, CA 92374

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Executive Summary

Current broadband capacity is insufficient to meet the needs of users in the Verizon Fort Irwin service area and additional capacity is required to meet current and future broadband demand. The proposed Verizon Fiber Optic Project comprises three elements: placing approximately eight miles of new conduit and fiber optic cable by a combination of trenching and directional bore method of construction from the Fort Irwin welcome sign on Fort Irwin Road to the intersection of Barstow Road and Outer Loop Road; aerial placement of the fiber optic cable on existing utility poles from utility riser pole 4659666E to the Verizon Fort Irwin Central Office located in Building 12, north of Inner Loop Road and west of Barstow Road; and the use of a 210-foot by 70-foot area for construction staging in the cantonment area south of Langford Lake Road and west of H Avenue. The Proposed Action Area and Alternatives include combinations of two different routes for the underground component and two different routes for the aerial component of the project. The staging area would be in the same location for all project alternatives. The estimated construction time for the Proposed Action or Alternatives is approximately 16 to 21 weeks. The objective of the Proposed Action is to provide sufficient data bandwidth for voice, video and data to Fort Irwin and install a new fiber optic cable through the most cost-efficient and least environmentally damaging construction methods.

This report describes biological studies conducted by ECORP Consulting, Inc. (ECORP), under contract with Verizon, in support of National Environmental Policy Act (NEPA) documentation and permitting for the Proposed Action Area and Alternatives. Biological studies undertaken by ECORP included a literature search of previously recorded biological resources at Fort Irwin, vegetation mapping, a habitat assessment for special-status species, a delineation of potential jurisdictional waters, focused protocol survey for desert tortoise (*Gopherus agassizii*), rare plants, Mohave ground squirrel (*Xerospermophilus mohavensis*; MGS) remote camera surveys, and focused protocol MGS trapping surveys. Special-status species include all federally and state-listed or proposed endangered and threatened species, species listed by the California Native Plant Society's (CNPS) California Rare Plant Ranking System (CRPR), federal species of concern (FSOC), and California species of special concern (SSC). Each proposed project element and its location(s) on Fort Irwin are described, along with the methods, results, and summary of the studies performed by ECORP specialists, and any recommendations for each biological resource studied.

Underground Route A (Proposed Action) is approximately 7.8 miles in length and would have 41 hand holes installed. Underground Route A would begin at the existing Verizon manhole pickup located on the west side of Fort Irwin Road, approximately 0.25 mile south of the Fort Irwin welcome sign and static helicopter and tank display. From here, a 14-inch-wide, 36-inch-deep underground trench would be excavated along an existing tank trail approximately 165 feet west of Fort Irwin Road until the trail ends at Outer Loop Road. The fiber optic line would cross underneath Outer Loop Road by way of directional boring, where it will transition to an aerial route at existing riser utility pole 4659666E approximately 725 feet north of the intersection of Barstow Road and Outer Loop Road.

Underground Route B (Alternative) is approximately 8.1 miles in length and would have 43 hand holes installed. Underground Route B would begin at the same existing Verizon manhole pickup as Underground Route A. The route would continue north/northeast on the west side of Fort Irwin Road, approximately 72 inches from the edge of pavement, to the intersection of Fort Irwin Road and Outer Loop Road, proceed west on the south side of Outer Loop Road and north on the west side of Barstow Road. Approximately 725 feet north of the intersection of Barstow Road and Outer Loop Road, the fiber optic line would transition to an aerial route at existing riser utility pole 4659666E.

Both underground alternative routes end with the placement of the fiber optic line on the existing riser utility pole 46566E. Both aerial placement routes are approximately one mile in length, begin at existing utility riser pole 4659666E and end at Building 12. All cable would be placed on existing utility poles in compliance with California General Order 95 Rules for Overhead Line Construction from equipment located on existing paved and dirt roads. Routine maintenance of the fiber optic line would not occur. Specific repairs would be made as-needed. With Aerial Placement Route A (Proposed Action), the line would cross Barstow Road continue north on existing poles on the east side of Barstow Road, cross

Barstow Road and Bastogne Street, continue north on the west side of Bastogne Street, travel briefly east on the north side of Salerno Drive to poles on the west side of Barstow Road, then travel north to Building 12. With Aerial Placement Route B (Alternative), the line would remain on the west side of Barstow Road until its terminus at Building 12.

Biological surveys were conducted in the area that could be affected by implementation of the Proposed Action or Alternatives (Project area). Both underground routes were found to be largely unvegetated (disturbed or developed) with a small amount of four native desert vegetation communities (Mojave creosote bush scrub, Mojave Desert wash scrub, saltbush scrub, and Mojave mixed woody scrub). The focused protocol desert tortoise survey resulted in finding eight pieces of desert tortoise sign (scat and burrows), but no live desert tortoises. The southern two miles of both underground routes are located within the Superior-Cronese designated desert tortoise Critical Habitat Unit. The focused sensitive plant surveys for federally-endangered and CRPR 1B.1 Lane Mountain milkvetch (*Astragalus jaegerianus*), FSOC and CRPR 1B.2 alkali mariposa lily (*Calochortus striatus*) and Barstow woolly sunflower (*Eriophyllum mohavense*), Bureau of Land Management (BLM) sensitive and CRPR 1B desert cymopterus (*Cymopterus deserticola*), Clokey's cryptantha (*Cryptantha clokeyi*), and Parish's phacelia (*Phacelia parishii*), CRPR 2B.2 jackass-clover (*Wislizenia refracta* ssp. *refracta*) and hot springs fimbristylis (*Fimbristylis thermalis*), and CRPR 2B.3 Booth's evening primrose (*Eremothera boothii* ssp. *boothii*) were not observed in the project area. Multiple Mojave indigo bush (*Psorothamnus arborescens* var. *arborescens*), a CRPR 4.3 species, were observed in both underground routes. Habitat for the federally and state-listed threatened desert tortoise, state-listed threatened MGS, and eleven other sensitive species were identified in the project area. A remote camera study and live trapping effort were conducted to detect presence of MGS in the Project area. Round-tailed ground squirrels (*Xerospermophilus tereticaudus*), which are known to hybridize with MGS in the vicinity of the project area, were detected by remote cameras at four locations. Focused trapping was conducted at each of these detection locations where five individuals were captured and tissue samples were collected for genetic testing to determine whether the captured individuals contain MGS genes. The jurisdictional delineation found the project area to contain many ephemeral streams, which are drainages that contain flows only during and immediately following a storm event. None of the drainages occurring within the project area are considered jurisdictional Waters of the U.S., subject to Section 404 of the Clean Water Act. The drainages, because they support surface water run-off, may be subject to Regional Water Quality Control Board (RWQCB) jurisdiction.

This biological technical report summarizes the results of the surveys and the literature search and analyzes the results with reference to the Project area to aid in future planning, permitting, and determining the need for additional survey efforts.

1.0 Introduction

The United States Army Garrison (USAG) at Fort Irwin is located approximately 37 miles northeast of Barstow, California, in the north-central part of the High Mojave Desert as shown on Figure 1 (Fort Irwin 2010). Fort Irwin encompasses approximately 1,190 square miles. Approximately half of Fort Irwin's land area is used for desert battlefield training. A cantonment area occupies approximately three square miles and provides temporary and permanent living quarters for soldiers and their families along with the support facilities of the base. The cantonment area consists of residential areas, support facilities, retail centers, restaurants, and health care facilities.

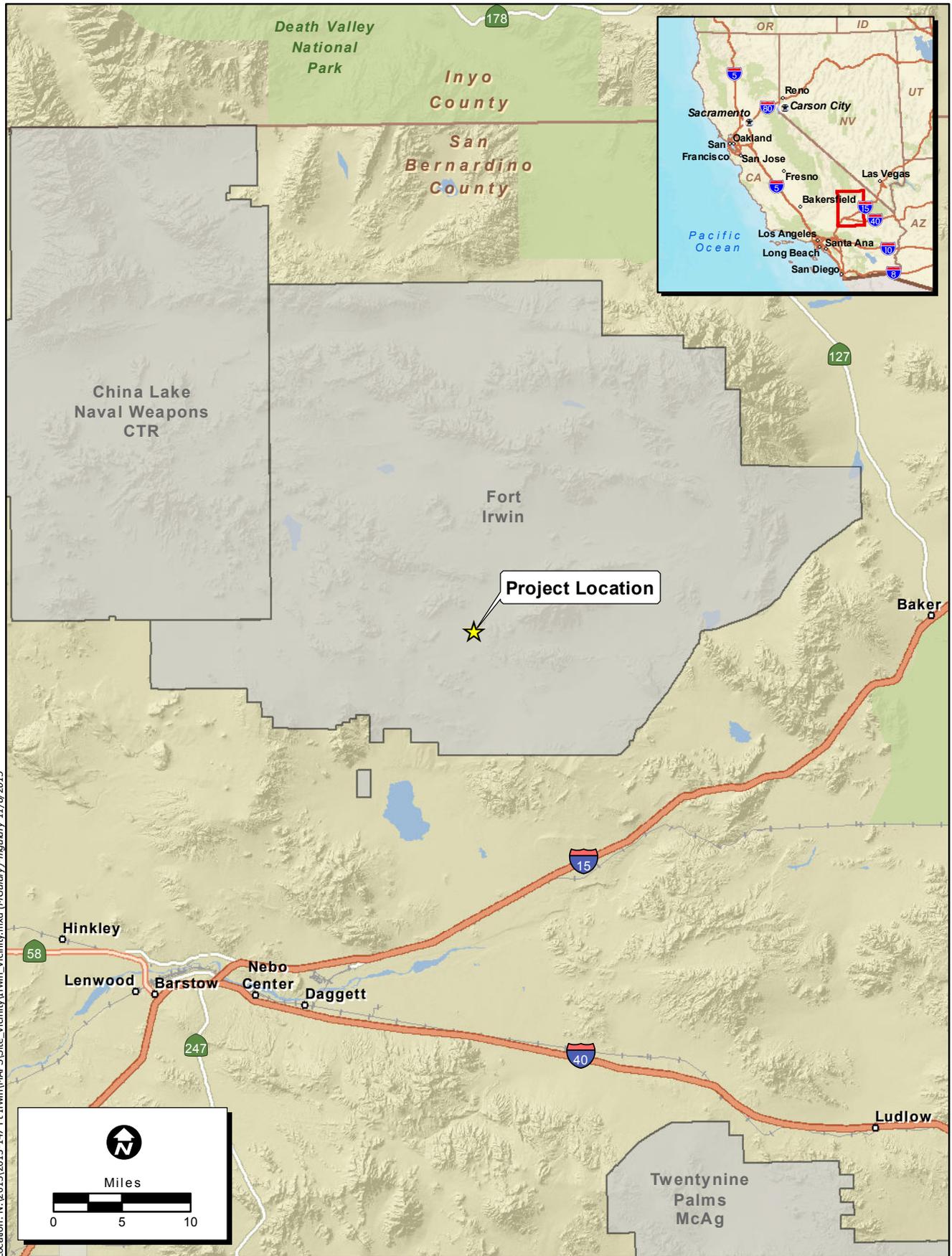
Fort Irwin's population includes approximately 5,000 assigned military members, 5,637 civilian workforce, and 6,934 family members. In addition, approximately 6,300 soldiers visit Fort Irwin during training rotations, which occur ten times per year.

The purpose of the Verizon Fiber Optic Project (Proposed Action) is to respond to increasing broadband demand in the Fort Irwin service area to support the installation's current and future broadband requirements for residential customers, government/education facilities, military, and businesses. Current broadband capacity is insufficient to meet the needs of users in the Verizon Fort Irwin service area and additional capacity is required to meet current and future broadband demand. The objective of the Proposed Action is to provide sufficient data bandwidth for voice, video and data to Fort Irwin and install a new fiber optic cable through the most cost-efficient and least environmentally damaging construction methods.

This report describes biological studies conducted by ECORP Consulting, Inc. (ECORP) in support of National Environmental Policy Act (NEPA) documentation and permitting for the Proposed Action and Alternatives. Studies undertaken by ECORP included a literature search of previously recorded biological resources at Fort Irwin, vegetation mapping, a habitat assessment for special-status species, a delineation of potential jurisdictional waters, focused protocol survey for desert tortoise (*Gopherus agassizii*), rare plants, Mohave ground squirrel (*Xerospermophilus mohavensis*; MGS) remote camera surveys and focused protocol MGS trapping surveys. Special-status species include all federally and state-listed or proposed endangered and threatened species, species listed by the California Native Plant Society's (CNPS) California Rare Plant Ranking System (CRPR), federal species of concern (FSOC), and California species of special concern (SSC).

The area that would be affected by the Proposed Action and Alternatives (Project area) is located on the U.S. Geological Survey (USGS) 7.5-minute Fort Irwin, Paradise Range, and Langford Well, California topographic quadrangle maps (1984 and 1986). Within the Fort Irwin quadrangle, the Project area is within Sections 5 and 6 of Township 13 North, Range 03 East and Section 32 of Township 14 North, Range 03 East of the San Bernardino Base and Meridian. Within the Langford Well quadrangle, the Project area is within Sections 12, 13, 14, 22, and 23 of Township 13 North, Range 02 East and Sections 6 and 7 of Township 13 North, Range 03 East of the San Bernardino Base and Meridian. Within the Paradise Range quadrangle, the Project area is within Sections 3, 4, and 9 of Township 12 North, Range 02 East and in Sections 22, 27, and 34 of Township 13 North, Range 02 East of the San Bernardino Base and Meridian.

All portions of the Proposed Action or Alternatives are addressed in this report, including a description of the location(s) on Fort Irwin; the methods, results, and summary of the studies performed by ECORP specialists; and any recommendations for each biological resource studied.



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Map Date: 11/8/2013
 Service Layer Credits: Sources: USGS, ESRI, TANA, AND

Figure 1 Vicinity Map

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1.1 Biological Resources

Biological resources include plants (flora) and animals (fauna or wildlife) and the habitats in which they occur. This report presents a characterization of the existing biological resources within and immediately adjacent to the Project area locations, which will be used as a basis for determining potential project effects to the resources. Accordingly, this report presents a characterization of the major vegetation communities on and adjacent to the Project area locations, with special attention placed on special-status species (i.e., those afforded some level of federal, state, or local protection such as the Lane Mountain milkvetch [*Astragalus jaegerianus*], desert tortoise, and MGS); general wildlife species expected to occur on and adjacent to the Project area, again with emphasis placed on special-status species; and the results of specialized studies and surveys of sensitive biological resources that ECORP conducted in support of the Proposed Action and Alternatives.

1.2 Regulatory Considerations

A number of state and federal regulations pertain to the consideration of sensitive biological resources within and adjacent to proposed actions and projects. These are discussed below.

Endangered Species Act (ESA). The ESA (16 U.S.C. Sections 1531 et. seq.) was established to protect and allow for recovery of species in danger of extinction and their associated habitat. Species are listed in the ESA as endangered or threatened. Endangered species includes those in danger of extinction throughout all or a large amount of its range. Threatened includes species likely to become endangered within the foreseeable future. The ESA also protects habitat considered critical to the existence and recovery of listed species. Federal projects with potential to affect a listed species or critical habitat are required to consult with the U.S. Fish and Wildlife Service (USFWS 1973).

California Endangered Species Act (CESA). The purpose of CESA is to ensure that all native species of flora and fauna, including associated habitat, threatened by extinction and/or significantly declining populations that could lead to a threatened or endangered designation, are protected. The CESA delegates the responsibility of maintaining a list of state threatened and endangered species to the California Department of Fish and Wildlife (CDFW). CESA encourages consultation with CDFW if a proposed action may affect a state-listed species.

Federal Clean Water Act. The federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency (EPA) also has authority over wetland determinations and consults together with the USACE for Section 404 review and enforcement.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

Migratory Bird Treaty Act (MBTA). The purpose of the MBTA (16 U.S.C. Section 703 et. seq.) is to protect migratory birds. The MBTA states that it is unlawful to pursue, hunt, take, capture, or kill a migratory bird by any means, including any part, egg, or nest. The list of bird species protected by the MBTA is included in 50 CFR Section 10.13.

Bald and Golden Eagle Protection Act of 1940. Under the Bald and Golden Eagle Protection Act, 54 Stat. 251, as amended (16 U.S.C. Sections 668 through 668d), it is illegal to possess, sell, transport, or trade American bald or golden eagles, dead or alive, their nests, or their eggs. The Secretary of the Interior can issue a permit for taking or transporting eagles for scientific, exhibition, and religious purposes or for transporting nests if the eagles interfere with resource development. Searches, seizures, and arrests are authorized by this act. Infrastructure must be built, installed, or expanded in such a

manner as to avoid disturbing bald and golden eagles. If a nest is discovered in the affected area, a permit must be obtained to transport the nest to another site.

Sikes Act and Sikes Act Improvement Amendments. The Sikes Act, Pub. L. 86-797, as amended (16 U.S.C. Sections 670 through 670f), requires the Secretary of Defense to provide for conserving and rehabilitating natural resources on military installations; for sustaining multipurpose use of the resources (including hunting, fishing, trapping, and non-consumptive uses); and for public access to military installations, subject to safety requirements and military security. To facilitate the program, the Secretary of the Army is required to prepare and implement an Integrated Natural Resource Management Plan (INRMP). Fort Irwin has prepared an INRMP (USACE 2006), which describes existing conditions and acts as a resource management guide for the installation.

Environmental Protection and Enhancement. Environmental Protection and Enhancement, Army Regulation (AR) 200-1, prescribes current Army policies, procedures, and standards for conserving, managing, and restoring land and the renewable natural resources consistent with and in support of military mission and national policies.

Recovery Plans. Recovery plans are developed as required under the ESA. The plans are documents that detail the specific management practices and tasks needed to enable the recovery of species listed under the ESA. Recovery plans offer guidelines for private, federal, and state cooperation in conserving threatened and endangered species and areas where such species are or historically have been distributed. Current management direction requires that any action conform to any United States Fish and Wildlife Service (USFWS) recovery plan for federally listed species. A recovery plan must include the following components: a description of site-specific management actions necessary to achieve the goals of the plan; objective measurable criteria, which, when met, would result in a determination that the species no longer needs the protection of the ESA and can be removed from the list; and estimates of the time and costs required to carry out the plan and to achieve intermediate steps toward the goal.

Within the vicinity of the Proposed Action and Alternatives, there is an existing recovery plan for one species – the desert tortoise. The original desert tortoise recovery plan was issued by the USFWS in 1994 (USFWS 1994); the USFWS issued a revised recovery plan for desert tortoise in 2011 (USFWS 2011).

2.0 Description of Proposed Action and Alternatives

This section describes the Proposed Action and Alternatives for implementation of the Verizon Fiber Optic Project. Alternatives were evaluated using an interdisciplinary approach. Potential alternatives were evaluated against the following criteria:

- Meets project purpose and need (see Section 1.0);
- Potential for land use and mission conflicts;
- Cost of construction, operation, and maintenance; and
- Technological feasibility.

From this process, five alternatives (the Proposed Action, Alternatives 1 through 3, and the No Action Alternative) were selected for detailed analysis.

2.1 Project Components

All alternatives are composed of three elements:

- Placing new conduit and fiber optic cable underground from an existing interconnection located on the west side of Fort Irwin Road approximately 0.25 mile southwest of the Fort Irwin welcome sign and static helicopter and tank display to the existing riser utility pole 4659666E located in the Fort Irwin cantonment area west of Barstow Road approximately 725 feet north of the intersection of Barstow Road and Outer Loop Road.
- Aerial placement of the fiber optic cable on existing utility poles from utility riser pole 4659666E to the Verizon Fort Irwin Central Office located in Building 12, north of Inner Loop Road and west of Barstow Road.

- Use of a 210-foot by 70-foot area for construction staging in the cantonment area south of Langford Lake Road and west of H Avenue.

The project alternatives include combinations of different routes for the underground and aerial components of the project. The staging area would be in the same location for all project alternatives. No routine maintenance would be required for the Proposed Action or Alternatives. All Alternatives are anticipated to begin construction in Spring 2016.

2.1.1 Underground Placement

Two routes are evaluated for the underground portion of the project.

2.1.1.1 Underground Route A

Underground Route A would be approximately 7.8 miles in length. Underground Route A would begin at the existing Verizon manhole pickup located on the west side of Fort Irwin Road, approximately 0.25 mile south of the Fort Irwin welcome sign and static helicopter and tank display (Grid NV 272 900). From here, the route would follow an existing tank trail approximately 165 feet west of Fort Irwin Road until the trail ends at Outer Loop Road (Grid NU 212 890). The route would cross Outer Loop Road and the fiber optic line would transition to an aerial route at existing riser utility pole 4659666E, approximately 725 feet north of the intersection of Barstow Road and Outer Loop Road (Figure 2).

Verizon would use the trenching construction method to construct the majority of Underground Route A. With this method, a 14-inch-wide, 36-inch-deep trench would be excavated the majority of the length of the route, from the existing Verizon manhole pickup described above to Outer Loop Road, using back hoes. Where large rocks are encountered, a rock saw would be used. A four-inch sand cushion will be placed under the fiber optic cable, and the cable will be covered with 32-inches of native soil. The total work area that would be temporarily disturbed during construction would be approximately 30 feet wide (15 feet on center of the trench). A maximum of 1,000 feet of trench would be open each day. Any open trenches would be covered at the end of the day, and temporary fencing would be placed to secure each location for the duration the trenches remain open. This alternative would require approximately 4,000 gallons of water per day, or less than 1 acre-foot of water, for dust control and trench compaction. Directional boring would be used to tunnel under Outer Loop Road to existing riser utility pole 4659666E to avoid cutting into the road surface. The directional bore portion of Underground Route A would be approximately 670 feet in length. Please see Section 2.1.1.2, below, for a more detailed description of the directional boring process. Detailed traffic control methods for construction in the cantonment area would be provided in a Traffic Control Plan (TCP) to be approved by Fort Irwin. Measures may include signs informing motorists to reduce speed, "Worker Ahead" signs, traffic cones, light boards, and flag control personnel as needed.

Hand holes (small access boxes) of dimensions 2-feet wide by 3-feet long by 30-inches deep would be placed along the route every 1,000 feet. Approximately 41 hand holes would be required. The hand holes will be buried a minimum of 10 inches below grade, and a geographic positioning system (GPS) locator device would be placed inside the hand hole to aid in locating the hand hole for future maintenance, if required. A 50-foot coil of fiber optic cable would be placed inside every third hand hole (every 3,000 feet). In the event of accidental damage to the fiber optic cable, these 50-foot coils would be used to repair the damaged cable.



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Map Date: 9/24/2015
Photo Source: NAIP 2014

Figure 2. Underground Route A

2015-035 Ft. Irwin Verizon

2.1.1.2 Underground Route B

Underground Route B is approximately 8.1 miles in length. Underground Route B would begin at the same existing Verizon manhole pickup as Underground Route A (Grid NV 272 900). The pickup is located on the west side of Fort Irwin Road, approximately 0.25 mile south of the Fort Irwin welcome sign and static helicopter and tank display. The route would continue north/northeast on the west side of Fort Irwin Road, approximately 72 inches from the edge of pavement, to the intersection of Fort Irwin Road and Outer Loop Road, proceed west on the south side of Outer Loop Road and north on the west side of Barstow Road (Grid NU 210 890). Approximately 725 feet north of the intersection of Barstow Road and Outer Loop Road, the fiber optic line would transition to an aerial route at existing riser utility pole 4659666E (Figure 3).

Verizon would use a directional bore method of construction for Underground Route B. Directional boring, also called horizontal directional drilling, is a trenchless method of installing underground pipes, conduits, and cables in a shallow arc along a prescribed bore path using a surface-launched drilling rig. Directional boring is used when trenching or excavating is not practical, such as for crossing waterways or drainages, roadways, urban areas with traffic or other constraints, and environmentally sensitive areas. The process starts with the excavation of receiving hole and entrance pits. For the project at Fort Irwin, directional boring would be accomplished by placing 4-foot wide by 4-foot long by 40-inch deep bore and receiving pits 72 inches west of the edge of the pavement of Fort Irwin Road at approximately 1,000-foot intervals. Approximately 43 bore pits would be required for the 8.1-mile bore route. The total area that would be disturbed by boring is approximately 30 feet by 75 feet around the bore and receiving pits.

The first stage drills a pilot hole on the designed path, and the second stage (reaming) enlarges the hole by passing a larger cutting tool known as the back reamer. The third stage places the conduit in the enlarged hole by way of the drill stem; it is pulled behind the reamer to allow centering of the pipe in the newly reamed path.

For this project, two-inch schedule 40 polyvinyl chloride (PVC) conduit would be glued together the length of the bore and pulled from bore pit to receive pit. Upon completion of each section, duct plugs would be installed to prevent wildlife from entering the vacant conduit. These plugs would be removed during the cable placement phase. Approximately 43 hand holes, as described in Section 2.1.1.1, above, would be placed in the bore/receive pit locations. Fiber optic cable would be placed inside the 2-inch conduit, and a 50-foot coil of fiber optic cable would be placed inside each hand hole. In the event of accidental damage to the fiber optic cable, these 50-foot coils would be used to repair the damaged cable.

Horizontal directional drilling is done with the help of a viscous fluid known as drilling fluid. It is a mixture of water and bentonite or polymer continuously pumped to the cutting head or drill bit to facilitate the removal of cuttings, stabilize the bore hole, cool the cutting head, and lubricate the passage of the product pipe. Water for the drilling fluid would be obtained from Fort Irwin or brought from off-installation. The drilling fluid would be sent into a machine called a reclaimer, which removes the drill cuttings and maintains the proper viscosity of the fluid. Drilling fluids hold the cuttings in suspension to prevent them from clogging the bore. A clogged bore creates back pressure on the cutting head, slowing production. Drilling fluid would be collected with a vacuum in the bore pits and taken off-installation to the contractor's yard to dry out. Once dried, the spoils, which are not considered a hazardous waste and can be disposed in a municipal landfill.

If the directional bore is blocked by unforeseen geologic substructure, a 1-foot wide by 36-inch deep trench may be required to bypass the blockage. Directional boring would continue after the blockage is passed. With Underground Route B, trenching is expected to be limited because large boulders and other obstructions are likely to have been removed during the construction of Fort Irwin Road.

Open bore and receive pits would be barricaded and temporary fencing would be placed to secure each location for the duration the pits remain open. Detailed traffic control methods for construction along Fort Irwin Road and in the cantonment area would be provided in a TCP to be approved by Fort Irwin.



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\CEOA\FIV_DBB_20150922.mxd (MAG./DS)_Svager 9/24/2015

Map Date: 9/24/2015
Photo Source: NAIP 2014

Figure 3. Underground Route B

2015-035 Ft. Irwin Verizon

Routine maintenance of the fiber optic line would not occur. If specific repairs are required, the fiber optic line would be accessed using the hand holes and would be repaired using the 50-foot coils of fiber optic line that were left in the hand hole during construction.

2.1.2 Aerial Placement

2.1.2.1 Aerial Placement Route A

Both underground routes end with the placement of the fiber optic line on existing riser utility pole 4659666E. Aerial Placement Route A is approximately one mile in length. With Aerial Placement Route A, the line would cross Barstow Road continue north on existing poles on the east side of Barstow Road, cross Barstow Road and Bastogne Street, continue north on the west side of Bastogne Street, travel briefly east on the north side of Salerno Drive to poles on the west side of Barstow Road, then travel north to terminate at the existing Verizon Fort Irwin Central Office located in Building 12 (Figure 4). All cable would be placed on existing utility poles in compliance with California General Order 95 Rules for Overhead Line Construction. Detailed traffic control methods for construction in the cantonment area would be provided in a TCP to be approved by Fort Irwin.

Routine maintenance of the fiber optic line would not occur. Specific repairs would be made as-needed.

2.1.2.2 Aerial Placement Route B

Aerial Placement Route B would also begin at existing utility riser pole 4659666E and end at Building 12, and would also be approximately one mile in length. The line would remain on the west side of Barstow Road until its terminus at Building 12 (Figure 5). Existing utility poles would be used, and all cable would be placed in compliance with California General Order 95 Rules for Overhead Line Construction from equipment located on existing paved and dirt roads. Detailed traffic control methods for construction in the cantonment area would be provided in a TCP to be approved by Fort Irwin.

Routine maintenance of the fiber optic line would not occur. Specific repairs would be made as-needed.

2.1.3 Staging Area

A staging area has been identified by Fort Irwin for temporary use by the project. The staging area would be located within the cantonment in the area known as Green Acres, northwest of the intersection of South Loop Road and Langford Lake Road (Figure 6). Green Acres is regularly used by contractors working at Fort Irwin to stage material, equipment, and for trailer space. The staging area would be an approximately 210-foot-long by 70-foot-wide area with a concrete pad and gravel. An existing fueling station is located southeast of the staging area.

2.2 Proposed Action

The Proposed Action would include the following project components:

- Underground Route A;
- Aerial Placement Route A; and
- Staging Area.

The Proposed Action is anticipated to begin construction in Spring 2016 and would take approximately 13 to 18 weeks to complete the underground portion of the project, which includes 11 to 16 weeks for trenching and two weeks for placement of the fiber optic line. Aerial placement would take approximately one week. Underground and aerial splicing and final testing would take approximately 3 weeks. The total construction time is estimated to be 16 to 21 weeks.

2.3 Alternative 1

Alternative 1 would include the following project components:

- Underground Route B;
- Aerial Placement Route A; and
- Staging Area.



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\CEOA\FIV_AerialA.mxd (MAG) dwagmon 8/11/2015

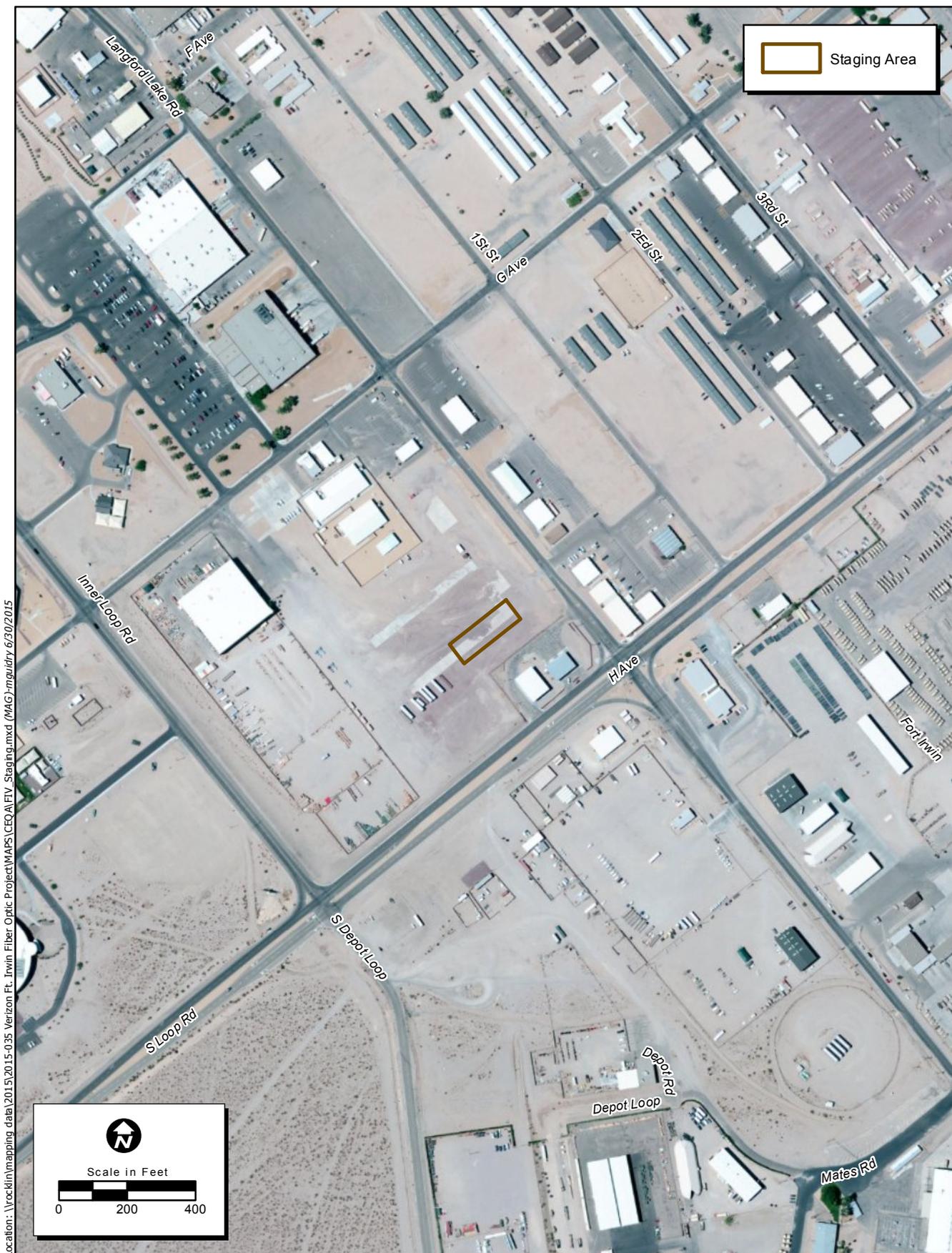
Map Date: 8/11/2015
 Photo Source: NAIP 2012

Figure 4. Aerial Placement Route A



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\CEOA\FIV_AerialB.mxd (MAG) dwagman 8/11/2015

Figure 5. Aerial Placement Route B



Location: \\rockin\mapping_data\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\CEOA\FIV_Staging.mxd (MAG) mawidny 6/30/2015

Map Date: 6/5/2015
 Photo Source: NAIP 2012

Figure 6. Staging Area
 2015-035 Ft. Irwin Verizon

This alternative is anticipated to begin construction in Spring 2016. The directional bore portion of the project would take approximately eight weeks to complete, including six weeks for substructure installation and two weeks for placement of the fiber optic line. Aerial placement would take approximately one week. Underground and aerial splicing and final testing would take approximately 3 weeks. The total construction time is estimated to be 12 weeks.

2.4 Alternative 2

Alternative 2 would include the following project components:

- Underground Route A;
- Aerial Placement Route B; and
- Staging Area.

This alternative is anticipated to begin construction in Spring 2016 and take 16 to 21 weeks to complete, similar to the Proposed Action.

2.5 Alternative 3

Alternative 3 would include the following project components:

- Underground Route B;
- Aerial Placement Route B; and
- Staging Area.

This alternative is also anticipated to begin construction in Spring 2016 and take 12 weeks to complete, similar to Alternative 1.

2.6 No Action Alternative

With the No Action Alternative, the fiber optic line would not be installed at Fort Irwin. The environmental consequences associated with the project would not occur within the installation and Fort Irwin would continue to have insufficient data bandwidth for voice, video and data.

3.0 Methodology

To characterize the baseline biological conditions within the area that could be affected by implementation of the Proposed Action or Alternatives (Project area), ECORP conducted a background review, vegetation mapping, assessment of special-status species potential for occurrence, focused desert tortoise surveys, focused rare plant surveys, MGS camera study, MGS trapping surveys, and jurisdictional delineation. The methods for these studies are presented below.

3.1 Background Review

ECORP conducted a review of CDFW's California Natural Diversity Database (CNDDDB) (CDFW 2015a) and the Electronic Inventory of California Native Plant Society (CNPS 2015) to determine whether special-status plant and wildlife species have been previously reported in or adjacent to the Project area. The search was conducted on the USGS 7.5-minute topographic quadrangles that encompass the Proposed Action (Fort Irwin) and the surrounding quadrangles (Coyote Lake, Alvord Mountain West, Langford Well, Paradise Range, East of Goldstone, and Fort Irwin). ECORP compiled additional information from Fort Irwin's internal sensitive species database through communication with Clarence Everly and Nicole Aldrete (Fort Irwin Directorate of Public Works [DPW] 2015).

3.2 Vegetation Community Mapping and Biological Resources Survey

ECORP mapped vegetation communities and evaluated the general biological resources within the Project area concurrently with the focused desert tortoise and rare plant surveys. The boundaries of the vegetation communities were drawn on field maps by hand and then digitized into a Geographic Information System (GIS) to create the vegetation map. Vegetation community type descriptions followed a combination of descriptions from the Fort Irwin INRMP (USACE 2006) and Sawyer, et al. (2009). The habitats within the Project area were evaluated for their potential to support plants and wildlife.

Photographs were taken during the survey to provide visual representation of the various vegetation communities and biological conditions within the Project area. The coordinates of each photo-point location were recorded using a Global Positioning System (GPS) unit (Trimble Juno) in Universal Transverse Mercator (UTM) coordinates, North American Datum 1983 (NAD 83), Zone 11 S North. All plant and wildlife species, including any special-status species that were observed during the survey were recorded on field data sheets.

Taxonomy of plant and wildlife species identified during the survey was based on the following sources:

- The American Ornithologists' Union (AOU) Checklist of North American Birds, 7th edition with 55th Supplement (AOU 1998, 2014);
- The Jepson Manual, vascular plants of California, second edition (Baldwin, Goldman, *et al.* 2012);
- A Manual of California Vegetation, 2nd Addition (Sawyer *et al.* 2009);
- Consortium of California Herbaria (CCH 2015);
- Western Reptiles and Amphibians (Stebbins 2003); and
- Mammal Species of the World (Wilson and Reeder 2005).

In instances where a sensitive species was observed, the date, species, notes on location and habitat, and GPS coordinates were recorded. Locations of incidentally observed sensitive species were recorded using a handheld GPS in NAD 83, UTM coordinates, Zone 11 North.

3.3 Assessment of Potential for Species Occurrence

Following the background review and vegetation/habitat mapping, ECORP evaluated the potential for special-status species to occur on or adjacent to the Project area. The potential for species' occurrence was determined through consideration of their known geographical distributions in relation to the project area, the proximity and timing of previous observations of individuals or populations of each species in relation to the project area, and general habitat requirements of the species in relation to the habitat(s) observed in the project area. ECORP evaluated and ranked each special-status species according to their "potential for use" of the project area based on the following criteria:

- **Low potential for use.** No recent or historical records exist of the species occurring in the project area or its immediate vicinity (within approximately two miles) and the habitat requirements of the species are not found in the project area.
- **Moderate potential for use.** Either a historical record exists of the species in the project area or its immediate vicinity (within approximately two miles) or the habitat requirements of the species are found in the project area.
- **High potential for use.** Both a historical record exists of the species in the project area or its immediate vicinity (within approximately two miles) and the habitat requirements of the species are found in the project area.
- **Present.** Species has been observed recently (in the last two years) in the project area.

Note: Location information for some special-status species listed in the CNDDDB may be of questionable accuracy or may be unavailable. Therefore, for the purposes of this evaluation, the environmental factors associated with species occurrence requirements may be considered sufficient reason to give a species a positive potential for occurrence. In addition, just because a record of a species does not exist in the databases does not mean it does not occur in the project vicinity. In many cases, records may not be present in the databases because an area has not been surveyed for that particular species.

3.4 Jurisdictional Delineation

3.4.1 Pre-Survey Investigations

Prior to conducting the field delineations, the following resources were reviewed to identify potentially jurisdictional areas: aerial imagery (ESRI 2015), 7.5-minute USGS quadrangles (Paradise Range, Langford Well, and Fort Irwin), the National Wetlands Database, the on-line web soil survey (NRCS 2015a), and hydric soils list for the area. The aerial imagery from 2010 for San Bernardino County was 0.9-foot resolution and used at a scale from 1:500 to 1:800 to digitize potential jurisdictional features scale using ArcGIS™. The imagery was analyzed during a preliminary desktop delineation effort to identify

differences in vegetative cover, the presence of breaks in a slope, and other areas of potential water disturbance. The aerial imagery, combined with these other resources, was used to create a field map with potentially jurisdictional features.

3.4.2 Field Survey

The boundaries of potential waters of the U.S. were delineated through field assessment, made in conjunction with research of hydrological connectivity, soils data, and aerial photograph interpretation. The unified federal method, as defined by the USACE, using methodology outlined in the Corps of Engineers Wetlands Delineation Manual [Environmental Laboratory 1987] and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Region Supplement Version 2.0) (USACE 2008b) was used to delineate the jurisdictional areas. The boundaries of potential Waters of the U.S. were delineated through a field determination, made in conjunction with aerial photograph interpretation.

For this delineation, ECORP biologists used the presence of the ordinary high water mark (OHWM) and/or the three-parameter wetland methodology utilized by the USACE for identification of streambeds and wetlands (excluding Rapanos and other case considerations). The limits of waters of the state were considered to be the estimated limits of a greater than 10-year flood event.

The area was also delineated according to RWQCB criteria, which includes any "surface water or groundwater, including saline waters, within the boundaries of the state." The RWQCB jurisdiction encompasses all waters of the U.S., including wetlands. RWQCB publishes no methodology for determining their jurisdictional boundaries.

The entire Project area was visually surveyed and walked to determine the location and extent of potential waters of the U.S. Where jurisdictional features were present, the extent of potential waters of the U.S. within the site were determined in accordance with agency requirements and guidelines, including:

- A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008a);
- Arid West Delineation Manual (USACE 2008b); and
- The Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2010).

The perimeter and/or stream center of the majority of features was mapped using a post-processing capable GPS unit with sub-meter accuracy (i.e., Trimble™ GeoXT). Streambed widths were based on evidence of OHWM as observed during the field survey. In addition, each of the drainages were evaluated for the presence or absence of sediment deposits, litter/debris, water stains, soil shelving, and/or exposed roots indicating active hydrology within the channel. Feature characteristics and measurements were recorded directly into the data dictionary in the GPS unit. Characteristics of the majority of drainage features were also documented in photographs.

Post-Processing of Field Data

The data collected in the field were transferred from the GPS to a personal computer, and differential correction post-processing was performed. The data were then viewed and analyzed for verification, edited, and converted to a GIS format at the time of download. GIS software (i.e., ArcGIS™) was used to develop the geodatabase and the shapefiles depicted on the attached maps.

3.5 Focused Biological Surveys

3.5.1 Rare Plant Survey

A focused sensitive plant survey was conducted by qualified biologists with extensive experience conducting botanical surveys and knowledge regarding plant taxonomy, plant species in the region, and special-status plant species. The purpose of the survey was to determine the presence or absence of sensitive plant species within the Project area. The area surveyed was determined to be a 33-foot buffer off both sides of Underground Route A and a 164-foot buffer off both sides of Underground Route B,

which overlap with each other (Figure 7). Sensitive plant species are those federally or state listed as threatened or endangered or those considered rare by CNPS.

The survey team included ECORP biologists Josh Corona-Bennett, Wendy Turner, and Kristen (Mobraaten) Wasz. Mr. Corona-Bennett was the lead surveyor. Survey methods were devised with consideration of the following resources: 1) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 1996), 2) CNPS Botanical Survey Guidelines (CNPS 2001), and 3) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). The survey was scheduled to coincide with the target species bloom periods and during a period when target species were readily identifiable which was, in part, based on the results of assessments of reference plant populations.

To complete focused rare plant surveys within the Project area, ECORP biologists walked straight-line pedestrian survey transects at 33-foot spacing to achieve 100 percent coverage. Common plant species were identified and recorded in order to develop a compendium of plant species that occur in the study area. In some cases, biologists took samples from the site so that a dissecting microscope could be used for plant identification. Taxonomy of plant species identified within the study area is based on the following sources:

- *The Jepson Manual* (Hickman 1993);
- *The Jepson Desert Manual* (Baldwin et al. 2002); and
- *The Jepson Manual*, 2nd Ed. (Baldwin et al. 2012).

The GPS data collected in the field were transferred from the GPS to a computer and differential correction post-processing was performed. The data were then viewed and analyzed for verification, edited, and converted to a GIS format at the time of download. In addition, field map notes were completed concurrently with GPS data collection and in some cases field data forms were also completed when appropriate.

Concurrent with surveys, ECORP visited three reference population locations for which rare plant records exist. Two representative target species reference populations were visited, one for desert cymopterus and two for Lane Mountain milkvetch. The primary reason for visiting reference populations was to observe the stage of development of those species to compare with what may be observed within the survey area.

3.5.2 Desert Tortoise

ECORP biologists with extensive experience in identifying tortoises, scat, shelter sites/burrows, carcasses, and other tortoise sign conducted a focused presence/absence survey for desert tortoise. Surveys were conducted in accordance with the most recent protocol guidelines published in the USFWS document titled "Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise (USFWS 2010)" to ensure compliance with NEPA. Surveyors walked pedestrian transects spaced at 33 feet throughout the entire action area to provide 100 percent coverage as well to determine potential presence of tortoises in the area that may be affected by the proposed project activities. Under the USFWS desert tortoise survey protocol (2010), the action area is defined as "all areas to be affected directly and indirectly and not merely the immediate area involved in the action" (USFWS 2010). One of the objectives of the pre-project focused survey protocol is to determine the presence of desert tortoises within the action area (USFWS 2010). The action area for the Proposed Action and Alternatives was determined through coordination with the DPW Natural Resources Program Manager (Clarence Everly). Two separate tortoise surveys were conducted during the 2015 field season. The first action area survey included a 164-foot buffer from Underground Route B, (personal communication Don Mitchell with Clarence Everly, April 2, 2015). Following the first survey effort, Underground Route A was proposed by Fort Irwin and accepted by Verizon, and a second survey effort was required because Underground Route A was about 33 feet west of the original action area boundary. Based on communication with Mr. Everly, it was determined that an additional 33-foot buffer from Underground Route A was necessary to include in the action area to complete the survey (Clarence Everly, personal communication, May 18, 2015). Figure 7 provides a map of the desert tortoise action area.



Figure 7. Desert Tortoise Action Area and Rare Plant Study Area

According to the USFWS guidelines, if neither tortoise nor sign are observed during the 100 percent coverage survey of the action area, it is recommended that three additional 33-foot belt transects at 656-foot intervals parallel to or encircling the project area perimeter (656, 1,312, and 1,968 feet) from the perimeter of the project site be surveyed (USFWS 2010). If desert tortoise sign is found within the action area then no additional belt transects would be required.

ECORP did not survey areas that were developed, inaccessible, or off-limits. The ECORP biologists recorded all desert tortoise sign identified during the surveys using a GPS unit in NAD 83, UTM coordinates, Zone 11 North. Weather data (temperature, cloud cover, and wind speed) were recorded at the start and end of each survey day and all tortoise sign encountered during the survey was photographed and recorded on survey data sheets. Sign was ranked on a scale of 1 through 5 based on the USFWS class ranking system (USFWS 1992)

3.5.3 Mohave Ground Squirrel Remote Camera Surveys

In order to survey for the presence of MGS, remote camera stations were established at various locations throughout the Project area. A total of 91 proposed camera station locations were identified during a desktop analysis and given numerical station names. Stations were placed 492 feet apart on opposite sides of Fort Irwin Road, along the length of the Project area. During the initial field assessment 44 of the proposed stations were removed from the study due to the lack of suitable habitat or proximity to human disturbances, resulting in 47 remaining proposed camera locations. During camera set up, camera stations were modified based on site conditions, habitat presence, and level of human activity at each of the proposed sites. Cameras were placed within suitable habitat for MGS and in areas with enough vegetation to provide camouflage for the cameras. Camera station placement was limited to areas not heavily used by humans and away from vehicular traffic. Biologists coordinated with Fort Irwin Range Operations each day. Biologists took photographs, documented the habitat types and topography surrounding each camera station, and recorded the exact location of the remote camera stations using a GPS unit. Data were recorded on data sheets and in an electronic database on the GPS unit.

Each camera station consisted of a single, individually labeled movement-detection camera (Browning® Dark Ops, Model BTC-6) mounted on a plywood base positioned for optimal capture of squirrel movement. Individually labeled data cards were inserted into each camera and the identification numbers of both the camera and data card were recorded onto data sheets at the time of camera set up to link the photograph data to the camera station name. Bait consisted of a mix of sunflower-free birdseed, oats, and peanut butter and/or chicken scratch and was mixed in with the existing soil in front of the camera. One wooden dowel dipped in peanut butter was inserted into the ground in the middle of the bait/dirt mix to lure squirrels to the camera location. The bait system was placed approximately 3 to 4 feet from the camera to optimize likelihood of the motion sensors being triggered by squirrels while still capturing clear photos. Each camera was programmed to take four photos each time the sensor was triggered with a pause interval of 10 seconds before the camera could be triggered again. Photo resolution was set to 10 megapixels for the surveys.

Burlap (jute netting) was wrapped around most cameras and the associated plywood bases to further camouflage the remote camera setup. The burlap was taped down to the front of the camera and weighted on the base to prevent it from interfering with the camera trigger or lens.

The survey consisted of six consecutive full study days, with one full day of the study beginning at sunrise and ending at sunset. Cameras were set up the day prior to the start (Day 1) of each survey period. On the last day of the survey (Day 6), cameras were removed approximately two hours before sunset, at the earliest, to ensure all cameras would be removed from the study area by sunset. Biologists checked the cameras daily during the survey to monitor battery usage, resupply bait, and to ensure the camera was functioning properly. When necessary, batteries were replaced and adjustments were made to the camera view to better capture the surrounding areas. Data cards were collected daily and new cards were inserted. The new card number, number of photos, and any actions taken were recorded for each camera on the data sheets.

All photos were downloaded from every data card at the end of each study day for both survey sessions to an external hard drive. At the end of the study all photos of squirrels (*Ammospermophilus* sp. and

Xerospermophilus spp.) were transferred to a server. Copies of all photos of squirrels were saved in specific folders for each camera location. Squirrels captured in photos were identified to species and each photo was individually labeled with the date, a four-letter species code, and camera station name. Data taken from the photographs were entered into a separate remote camera photograph data spreadsheet. Data on camera location, camera function, sampling dates, number of photographs taken, and number of operational days for each camera during the survey were documented in a camera station data spreadsheet. Permitted MGS biologists were consulted on all photos that captured images of *Xerospermophilus* squirrels to aid in proper identification.

3.5.4 Mohave Ground Squirrel Focused Trapping Surveys

Trapping locations were determined based on remote camera locations where *Xerospermophilus* squirrels were captured on photograph(s). The study area was located in a region where MGS and round-tailed ground squirrel (*Xerospermophilus tereticaudus*; RTGS) ranges overlap and, because they are two very closely related species, there has been evidence of the two species hybridizing with one another. Trapping was necessary to identify squirrels to a species level and to obtain tissue samples for genetic testing to positively identify the species present in the study area. Coordinates for the selected trapping locations were recorded using a GPS unit on standardized data sheets in UTM Zone 11 S, NAD 83.

Trapping was conducted under a Memorandum of Understanding (MOU) with CDFW issued to ECORP (Donald Mitchell as Principal Investigator). Trapping for the project was conducted by Field Investigators Kristen (Mobraaten) Wasz and Phillip Wasz. Field Assistant Amy Trost assisted the Field Investigators in establishing trapping web locations within the survey area, setting up and taking down webs, opening and baiting the traps, processing animals captured, closing the traps, and recording data during the inventory.

Trapping locations were established in a web-shaped design. The center of the web was set at the camera station coordinates and marked with flagging. Minor adjustments to the location of the web were made to avoid placing the web in the center of a bush or traps in areas lacking suitable habitat (e.g., in roads or other disturbed areas). A GPS reading at the center of the web was recorded.

The standard web design is shown in Figure 8. Once the center of the web was established, the field team marked the location of each radius by pacing along a fixed bearing as specified in Table 1. The web consisted of 8 radii, with up to 5 traps along each radius. Traps were spaced at 33-foot intervals, with the diameter of each web being up to 328 feet from end to end. Radii were labeled alphabetically in a clockwise direction. Traps were labeled alphanumerically starting at the innermost ring. The location of traps were individually labeled and identified by flagging. One trap was placed at the center of the web, and was designated trap "00". The placement and number of traps was based on the availability of suitable habitat.

Figure 8. Layout of a Trapping Web

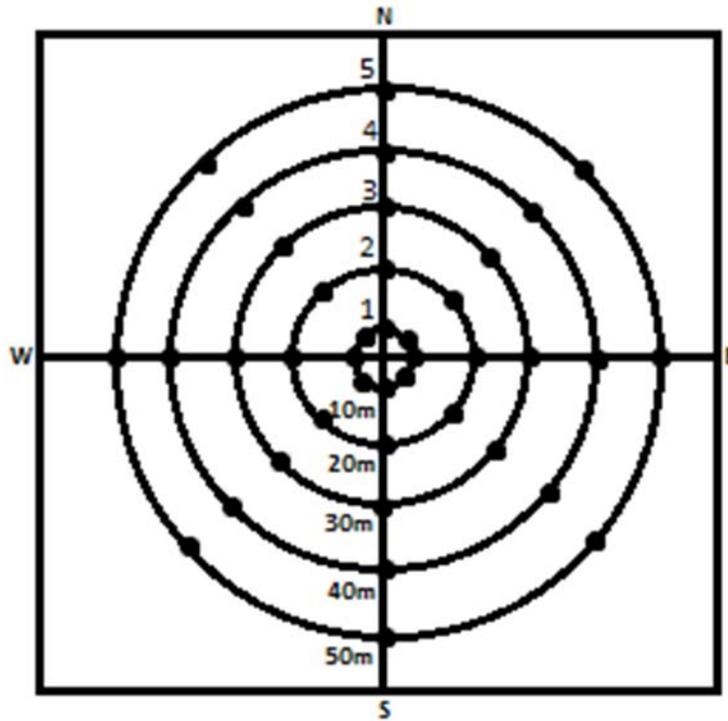


Table 1. Definition of Trapping Radii

Radius Label	Bearing (degrees)	Compass Direction
A	0	N
B	45	NE
C	90	E
D	135	SE
E	180	S
F	225	SW
G	270	W
H	315	NW

Trapping was conducted up to five consecutive days on each web. A trapping web was shut down after two *Xerospermophilus* were trapped and a tissue sample was obtained from each individual for that web. Traps used were standard Sherman™ 12-inch aluminum folding traps. Each trap was shaded with a cardboard box frame oriented north-south to keep temperatures moderate inside the shade and trap. Traps were opened within one hour of sunrise and checked at least every four hours, as specified by CDFW in the MGS trapping protocol (CDFW 2010). Traps were closed when the air temperature at 6 inches above ground were at or exceeded 90 degrees Fahrenheit (°F). Trapping was conducted during appropriate weather conditions and periods of extremely high winds, precipitation and/or snowfall, and low temperatures (less than 40°F) were avoided. Air temperature, cloud cover, and wind speed data were recorded before and after each trap check and when the traps were closed due to weather conditions. Traps were baited with bait consisting of a mix of sunflower-free birdseed, oats, and peanut butter and/or chicken scratch. Dominant plant species, a description of the soils, any land forms, and disturbances were recorded for each web. Photographs were taken from the north end of the A line facing south and the south end of the E line facing north.

A remote camera was placed at the center of each trapping web to amplify data collected during the trapping effort. Some squirrel species are more difficult to capture in traps because they are hesitant to enter new environments, even with the prospect of a food source (bait). Placing a camera in the center

of the web allowed biologists to determine whether *Xerospermophilus* squirrels were active on the web during trapping activities even if *Xerospermophilus* squirrels were not captured in traps at that particular web. The camera stations at the web center were established using the same methods described in Section 3.5.3.

Location was recorded for all captured *Xerospermophilus* squirrels, using a combination of the GPS coordinates, web location, and trap label. Captured *Xerospermophilus* squirrels were uniquely identified using a felt-tipped marker to allow subsequent individual identification of recaptured squirrels. Non-*Xerospermophilus* squirrels were marked with non-unique marks. Squirrels were identified to species, sexed, and age class (juvenile, sub-adult, adult), reproductive status determined, and notes on overall health appearance were made (e.g., presence of external parasites or injuries). *Xerospermophilus* squirrels were also weighed and morphological measurements were taken (ear, hind foot, tail, and head-body). Squirrels were kept in shade during all data collection procedures and were released at the point of capture immediately after processing. Data on all squirrel captures and the date and time of each capture were recorded on data sheets.

Tissue Sampling

Due to the possible hybridization of *Xerospermophilus* squirrels, tissue samples were collected in order to definitively identify the species of squirrels occupying the study area. A tissue sample was taken from the ear tissue of all *Xerospermophilus* squirrels captured during the study. Biologists collected tissue samples using 0.08-inch ear punches designed for small mammal tissue sampling. After the sample was taken from the squirrel, the affected area was treated with antibiotic ointment to help prevent subsequent infections. Samples were placed in airtight and leak-proof vials filled with a solution of 90 percent ethyl alcohol for preservation. Samples were kept in the shade in the field and then stored in a climate controlled environment after biologists finished trapping for the day. All tools were sanitized before and after use.

4.0 Results

The results of the biological studies conducted for the Project area are presented below.

4.1 General Habitat Types and Wildlife at Fort Irwin

Wildlife present at Fort Irwin consists of a variety of species adapted to desert scrub habitats that provide little cover and xeric conditions. Some isolated seeps and springs provide perennial sources of water and vegetative cover that contribute to increased wildlife diversity in these areas. Rocky terrain provides additional cover and habitat for various reptile, rodent, bat, and bird species. Playas could support seasonal wetlands or pools with brine shrimp, which in turn support migratory water birds. Lack of specialized aquatic habitat contributes to the absence of native amphibian and fish populations on the installation. Game species at Fort Irwin include Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), chukar partridge (introduced) (*Alectoris chukar*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*). Following are descriptions of common wildlife species that may occur near the Project area.

Reptiles and Amphibians. The habitat types in the Project area could support a diverse assemblage of reptiles, including common lizards such as zebra-tailed lizards (*Callisaurus draconoides*), side-blotched lizards (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), and western whiptails (*Aspidoscelis tigris*). Less common lizards might include the desert horned lizard (*Phrynosoma platyrhinos*), long-nosed leopard lizard (*Gambelia wislizenii*), and desert iguana (*Dipsosaurus dorsalis*). Habitat specialists might include the common (desert) night lizard (*Xantusia vigilis*). Common snake species include the coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis melanoleucus*), western patch-nosed snake (*Salvadora hexalepis*), western shovel-nosed snake (*Chionactis occipitalis*), and sidewinder (*Crotalus cerastes*). Less common species include the blind snake (*Leptotyphlops humilis*) and ground snake (*Sonora semiannulata*). The desert tortoise occurs in varying densities throughout Fort Irwin and the surrounding area.

Birds. Common bird species potentially occurring year-round in the Project area include the black-throated sparrow (*Amphispiza bilineata*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila*

alpestris), common raven (*Corvus corax*), and greater roadrunner (*Geococcyx californianus*). Additional species could occur as migrants or could winter on the Project area. Some common species include the yellow-rumped warbler (*Dendroica coronata*), Hutton's vireo (*Vireo huttoni*), cliff swallow (*Hirundo pyrrhonata*), ruby-crowned kinglet (*Regulus calendula*), and white-crowned sparrow (*Zonotrichia leucophrys*). Some raptors which may forage in the Project area include red-tailed hawks (*Buteo jamaicensis*), northern harriers (*Circus cyaneus*), golden eagles (*Aquila chrysaetos*), and prairie falcons (*Falco mexicanus*). Owls that may occur in the Project area include the western burrowing owl (*Athene cunicularia*), great-horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), and barn owl (*Tyto alba*).

Most bird species at Fort Irwin are protected under the MBTA.

Mammals. Small mammals potentially occurring in the Project area include black-tailed jackrabbit, desert cottontail, and white-tailed antelope ground squirrel (*Ammospermophilus leucurus*; AGS). Small rodent species could include kangaroo rats (*Dipodomys* spp.), pocket mice (*Chaetodipus* sp., *Perognathus* sp.), and field mice (*Peromyscus* sp.). Desert woodrat (*Neotoma lepida*) and Botta's pocket gopher (*Thomomys bottae*) are also common. Larger mammals could include badger (*Taxidea taxus*), desert kit fox (*Vulpes macrotis*), grey fox (*Urocyon cinereoargenteus*), coyote, bobcat (*Lynx rufus*), and mountain lion (*Puma concolor*). The kit fox and coyote are expected to occur throughout the area, whereas the others are localized and fairly rare. Abandoned mines, natural caves, trees, and manmade structures throughout the installation provide potential roosting habitat for bats. Bats also use the many cliff faces and rocky ledges of mountain ranges as sites for roosting and have the potential to use Joshua trees (*Yucca brevifolia*) as night roosts. The western pipistrelle (*Pipistrellus hesperus*) and California myotis (*Myotis californicus*) are the two species most commonly observed.

Pest Species. Common ravens are native birds in the Mojave Desert; however, their numbers have increased substantially over the past several decades as a result of expanding human use of the desert. Raven populations have grown beyond the natural carrying capacity of the desert environment because of resources provided by humans. In certain areas of the Western Mojave, raven populations have increased 1,500 percent from 1968 to 1992 (USACE 2006). Because ravens are known to prey on juvenile desert tortoises, increased populations of ravens could have negative impacts on the desert tortoise populations at Fort Irwin.

European starlings (*Sturnus vulgaris*) are another pest species at Fort Irwin. Starlings originally came from Europe and have become widespread in the United States since their introduction. They have a detrimental effect on the nesting habits of several other bird species due to their tendencies to aggressively protect their territories. Starling nests are not protected by the MBTA. Other non-native pest species recorded at Fort Irwin include the house sparrow (*Passer domesticus*).

4.2 Vegetation Community Mapping

Nine vegetation communities and two land cover types were mapped within the Project area and the immediately surrounding areas (within 450 feet), which are listed in Table 2 below. Dominant vegetation communities within the Project area included creosote bush scrub, desert wash scrub, and disturbed saltbush scrub. Each vegetation community that was mapped during the survey effort is discussed separately below. Figure 9 shows the vegetation communities mapped within the Project area. Table 3 shows the impacts each Project Component would have on the vegetation communities. A compendium of all plant species observed is found in Appendix A.

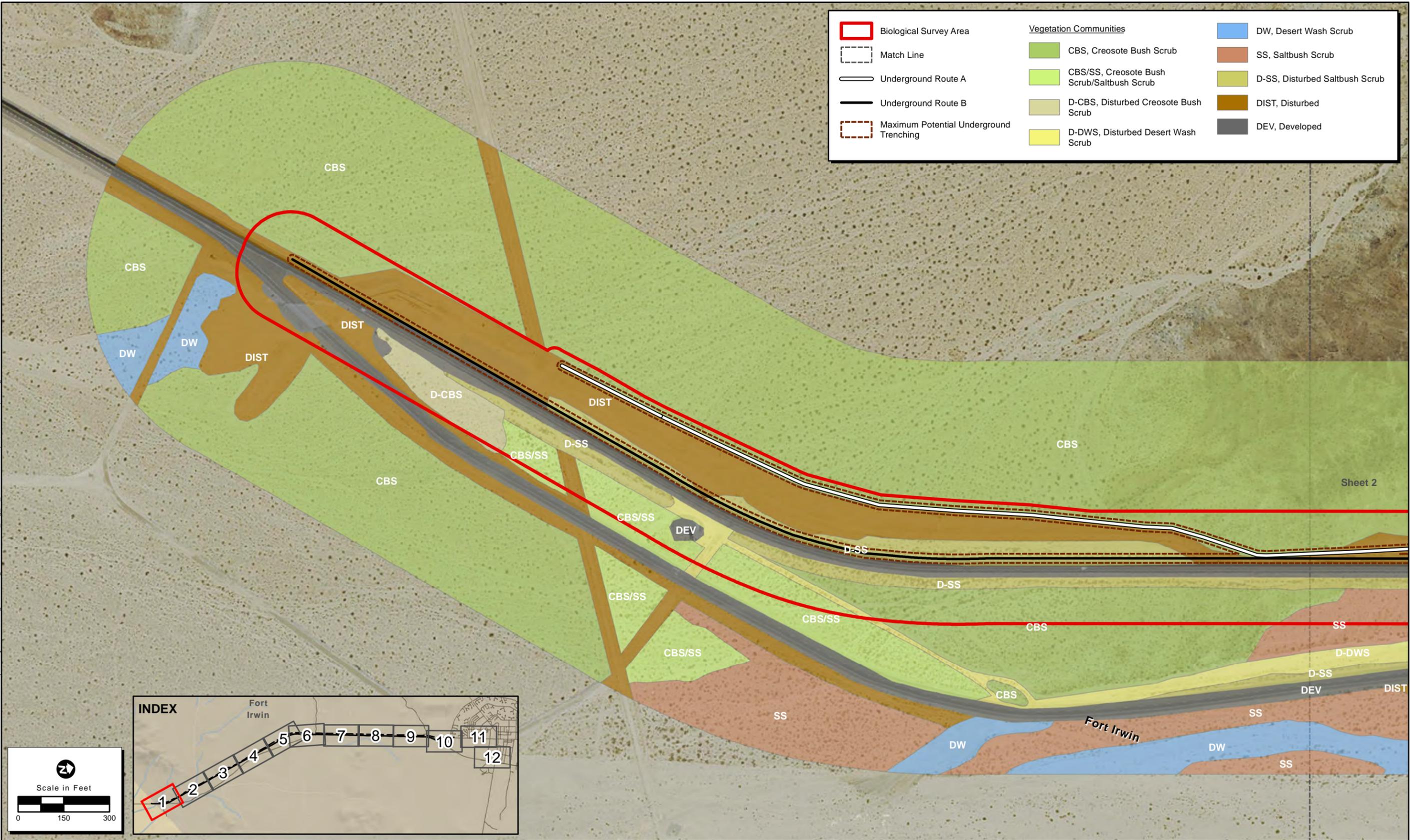
Table 2. Vegetation Communities Present Within and Adjacent to the Project Area

Vegetation Community/Land Cover Type	Within Project Area	Outside Project Area (within 450 feet)
undisturbed creosote bush scrub	X	X
disturbed creosote bush scrub	X	X
undisturbed desert wash scrub	X	X
disturbed desert wash scrub		X
desert wash scrub/creosote bush scrub	X	X
undisturbed saltbush scrub		X
disturbed saltbush scrub	X	X
Mojave mixed woody scrub	X	X
creosote bush scrub/saltbush scrub		X
disturbed	X	X
Developed	X	X

Table 3. Vegetation Impacts per Project Component

Vegetation Community/Land Use	Acres				
	Underground Route A	Underground Route B	Aerial Route A	Aerial Route B	Staging Area
undisturbed creosote bush scrub	2.82	0.06	0	0	0
disturbed creosote bush scrub	0.27	0.49	0	0	0
undisturbed desert wash scrub	0.82	0.28	0	0	0
desert wash scrub/creosote bush scrub	0.47	0	0	0	0
disturbed saltbush scrub	0	1.48	0	0	0
Mojave mixed woody scrub	0	0.04	0	0	0
<i>Vegetation Community Subtotal</i>	<i>4.38</i>	<i>2.35</i>	<i>0</i>	<i>0</i>	<i>0</i>
Disturbed	23.66	26.49	0	0	0
Developed	0.15	0.58	0	0	0.34
Total	28.19	29.42	0	0	0.34

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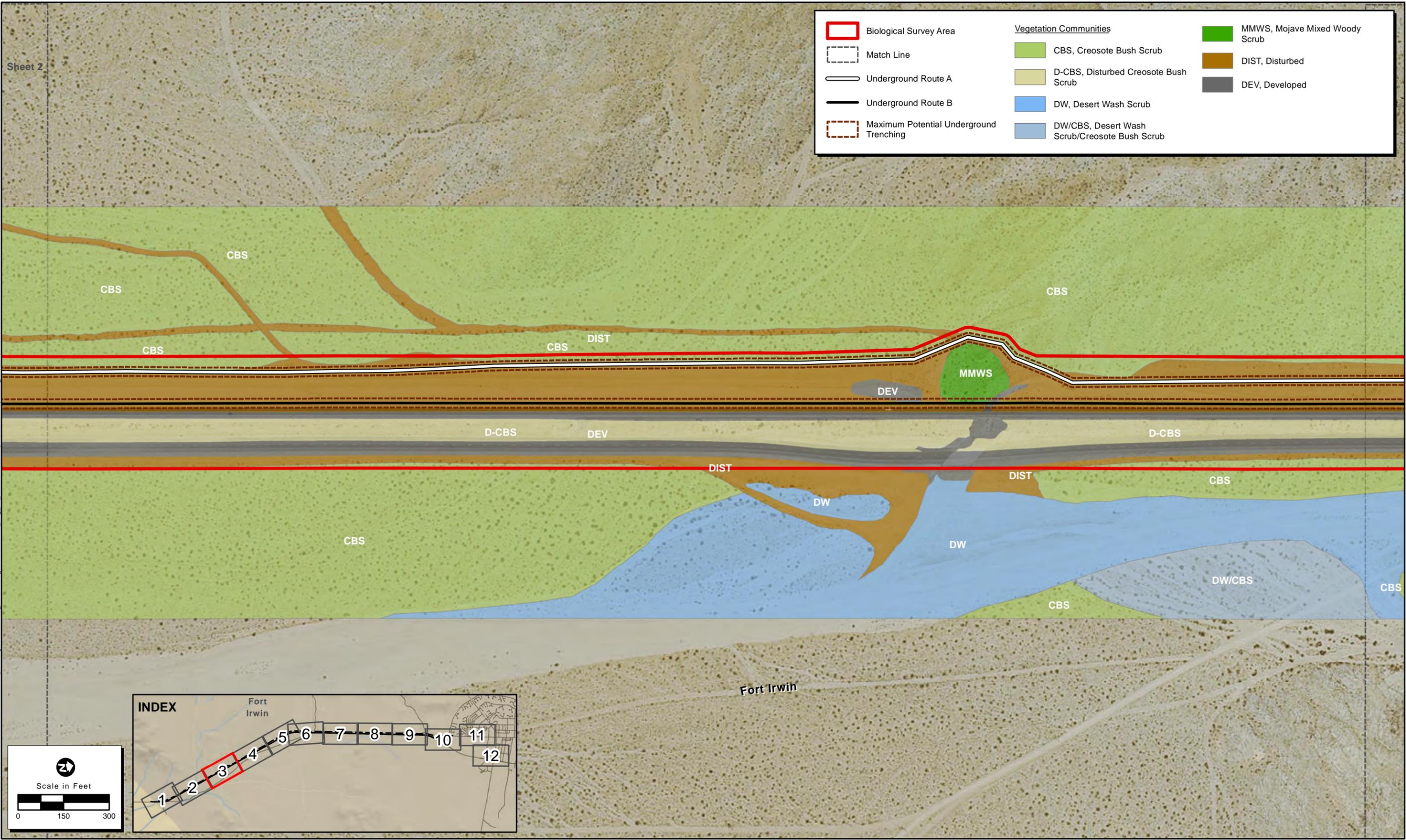


Map Date: 9/28/2015
Photo Source: ArcGIS USA Imagery - Accessed 9/28/2015

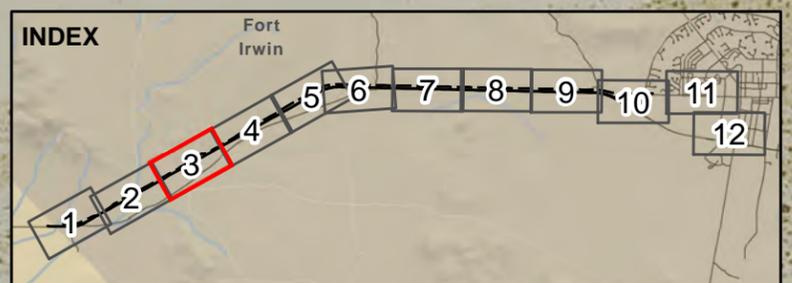
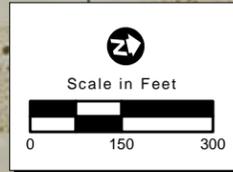
Figure 9. Vegetation Map: Sheet 1 of 12

Sheet 2

	Biological Survey Area	Vegetation Communities		MMWS, Mojave Mixed Woody Scrub	
	Match Line		CBS, Creosote Bush Scrub		DIST, Disturbed
	Underground Route A		D-CBS, Disturbed Creosote Bush Scrub		DEV, Developed
	Underground Route B		DW, Desert Wash Scrub		
	Maximum Potential Underground Trenching		DW/CBS, Desert Wash Scrub/Creosote Bush Scrub		



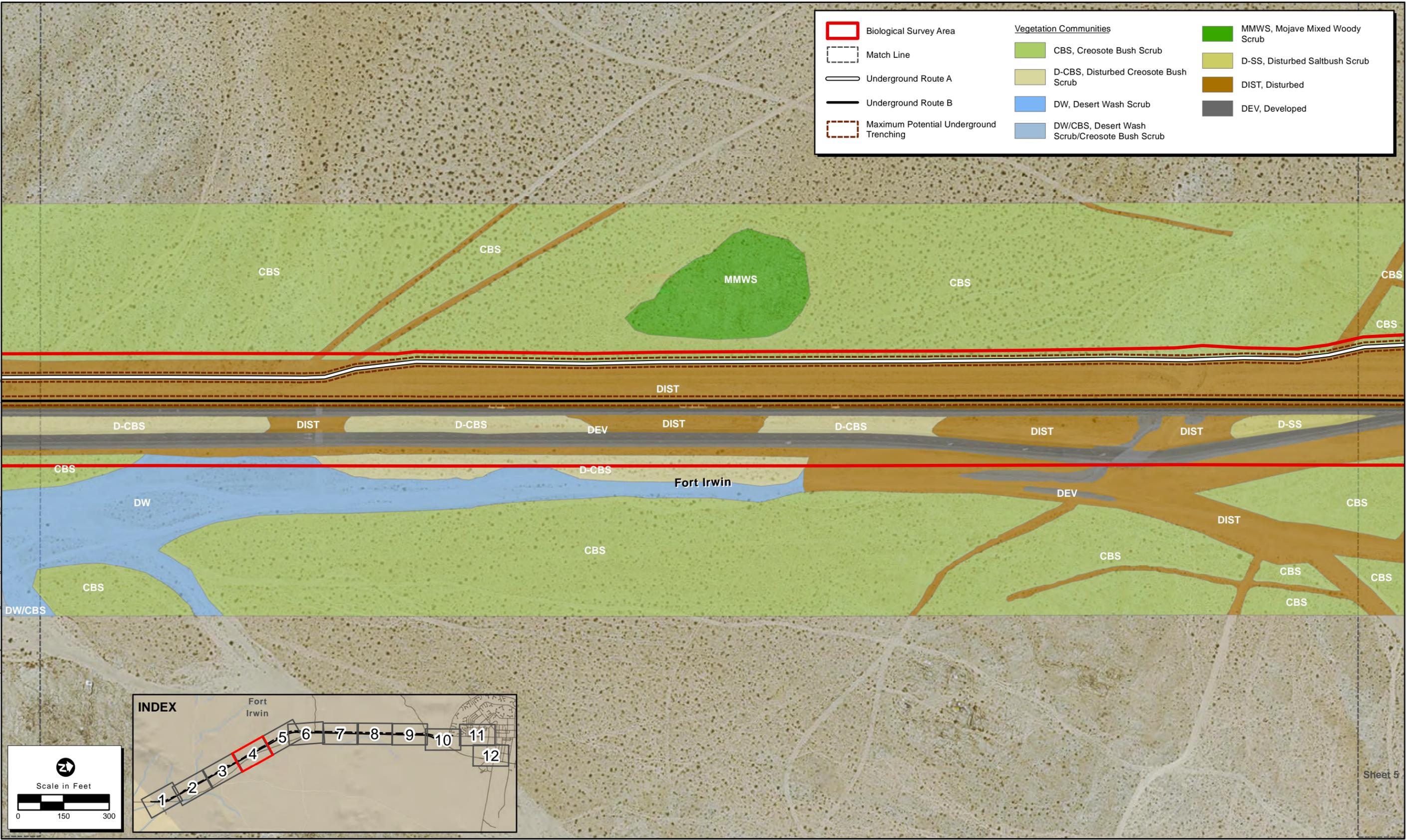
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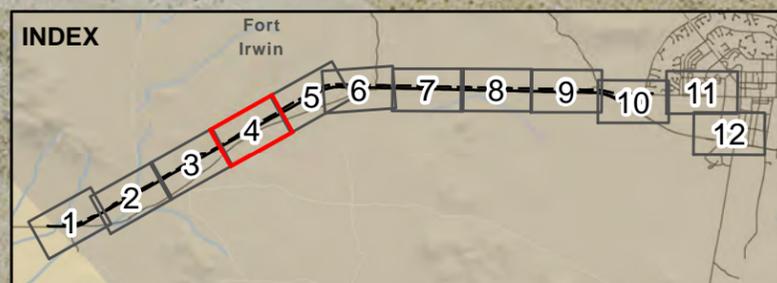
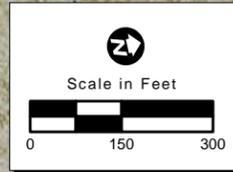
Map Date: 9/28/2015
Photo Source: ArcGIS USA Imagery - Accessed 9/28/2015

Figure 9. Vegetation Map: Sheet 3 of 12

	Biological Survey Area	Vegetation Communities		MMWS, Mojave Mixed Woody Scrub	
	Match Line		CBS, Creosote Bush Scrub		D-SS, Disturbed Saltbush Scrub
	Underground Route A		D-CBS, Disturbed Creosote Bush Scrub		DIST, Disturbed
	Underground Route B		DW, Desert Wash Scrub		DEV, Developed
	Maximum Potential Underground Trenching		DW/CBS, Desert Wash Scrub/Creosote Bush Scrub		



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Map Date: 9/28/2015
 Photo Source: ArcGIS USA Imagery - Accessed 9/28/2015

Figure 9. Vegetation Map: Sheet 4 of 12

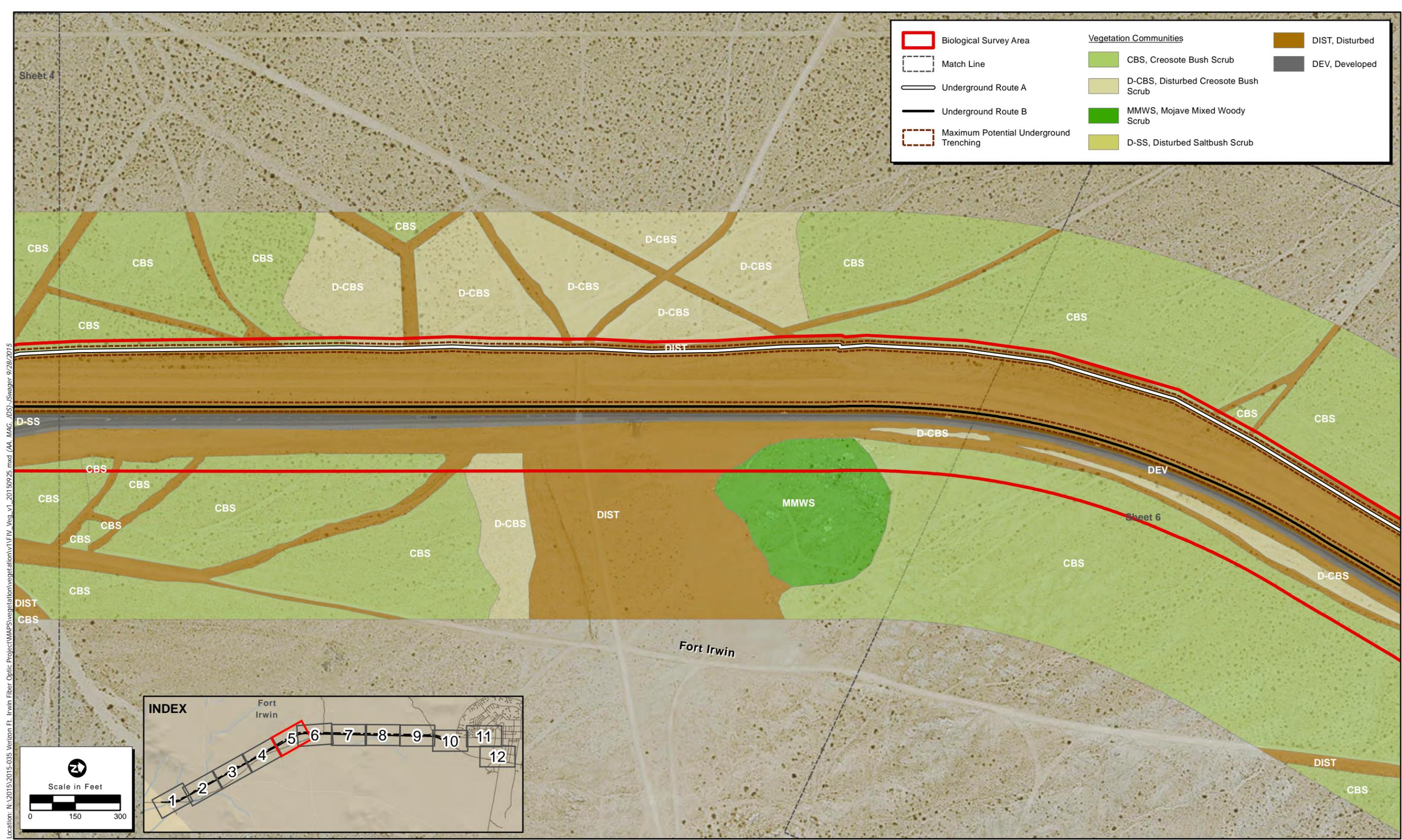


Figure 9. Vegetation Map: Sheet 5 of 12

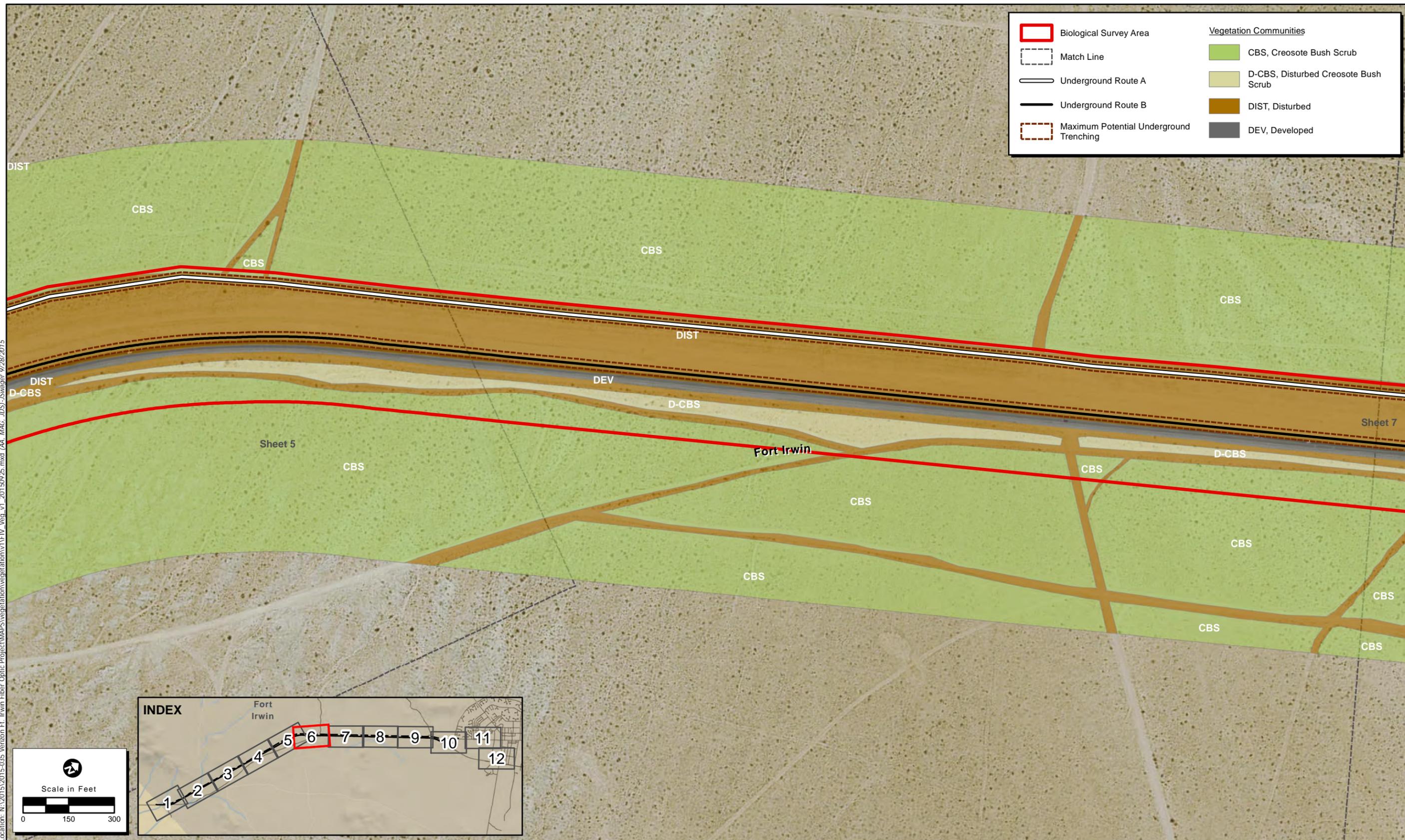
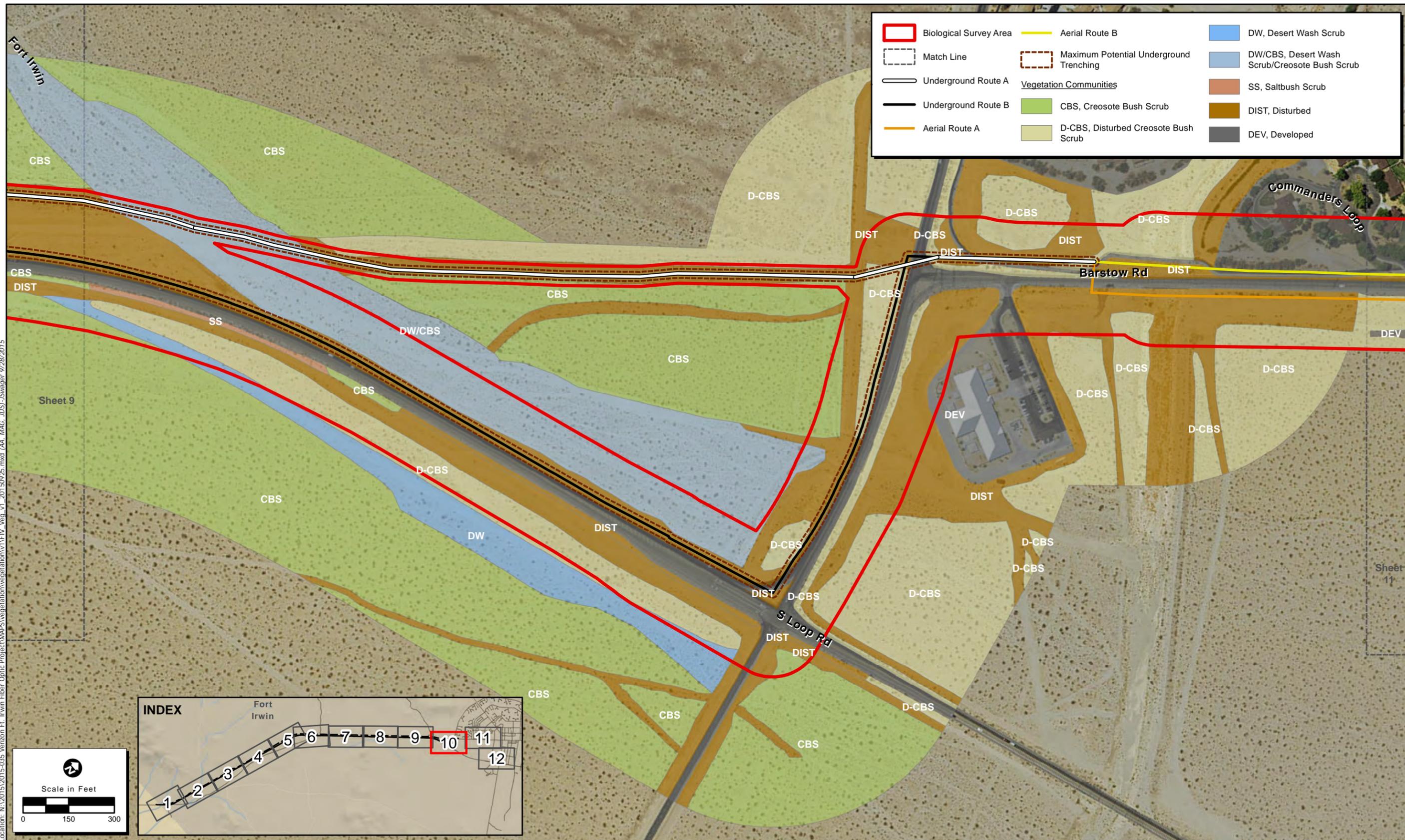


Figure 9. Vegetation Map: Sheet 6 of 12

2015-035 Ft. Irwin Verizon



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Map Date: 9/28/2015
 Photo Source: ArcGIS USA Imagery - Accessed 9/28/2015

Figure 9. Vegetation Map: Sheet 10 of 12

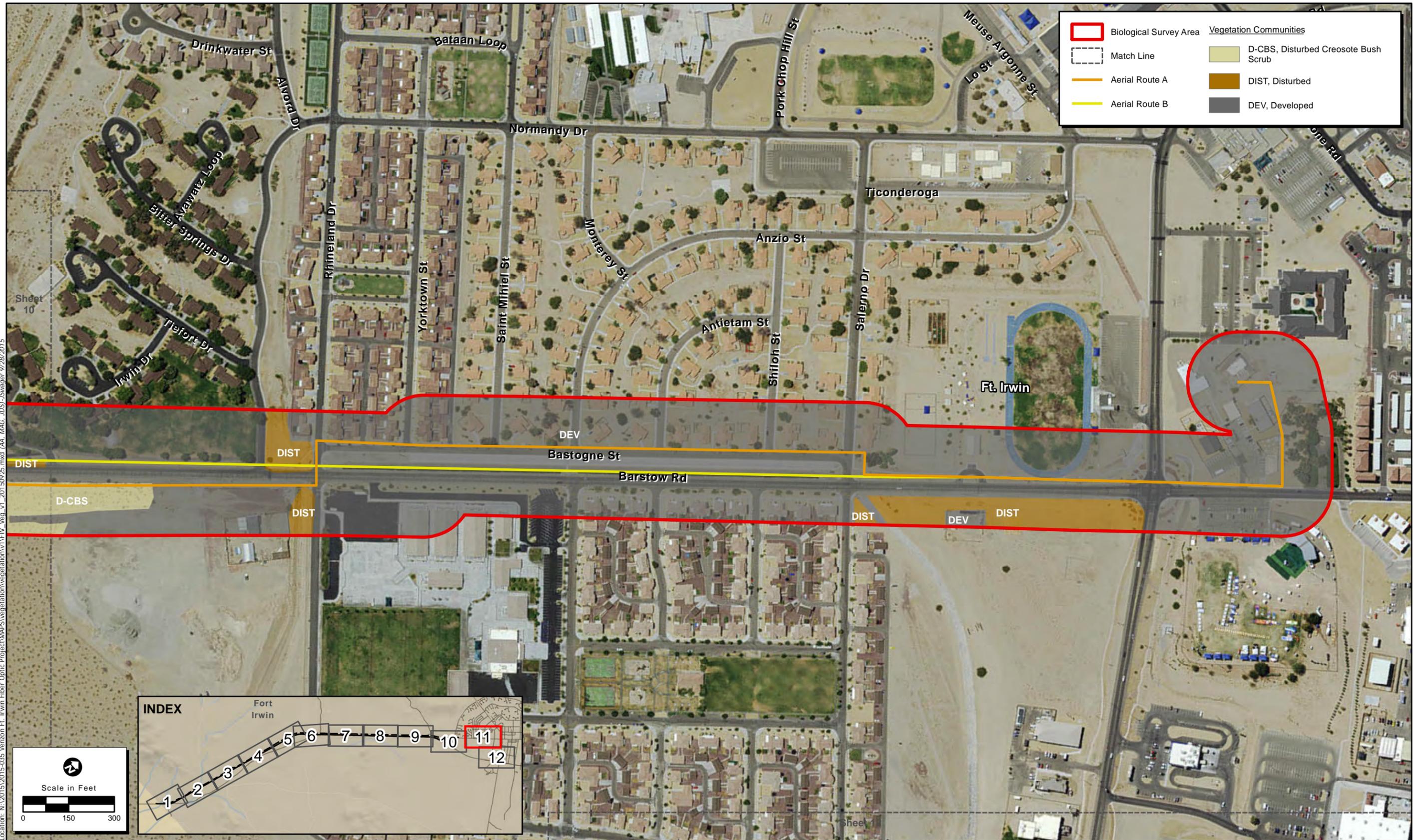


Figure 9. Vegetation Map: Sheet 11 of 12



Figure 9. Vegetation Map: Sheet 12 of 12

Creosote Bush Scrub (Disturbed and Undisturbed). Creosote bush scrub, an association dominated by the large shrub creosote bush (*Larrea tridentata*), is the most widespread community at Fort Irwin, occurring throughout the range below 3,610 feet on alluvial slopes, valley floors, and mountain slopes. Many subdominant shrubs typically occur in creosote bush scrub, including range rhatany (*Krameria erecta*), desert straw (*Stephanomeria pauciflora*), wishbone bush (*Mirabilis bigelovii*), and cheesebush (*Ambrosia salsola*) (USACE 2006). Subdominant shrubs that were observed growing within creosote bush scrub included white bur-sage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), California jointfir (*Ephedra californica*), Mojave Desert California buckwheat (*Eriogonum fasciculatum* var. *polifolium*), and water jacket (*Lycium andersonii*). Although there were areas where creosote bush scrub was intact, the majority of this vegetation community within the Project area has been disturbed by vehicular travel. Within the alignment for Underground Route A, approximately 2.82 acres of this community were undisturbed while approximately 0.27 acre was disturbed. Within the alignment for Underground Route B, approximately 0.06 acre of this community was undisturbed, while approximately 0.49 acre was disturbed. The alignment for Aerial Placement Route A had a portion of disturbed creosote bush scrub adjacent to the alignment. This community is considered suitable habitat for the desert tortoise, rare plants, MGS, and other special-status plant and wildlife species (see Section 4.4).

Desert Wash Scrub (Disturbed and Undisturbed). Desert wash scrub is a low, shrubby, diverse community occurring in open washes, arroyos, and canyons throughout the desert. Within the Project area, dominant shrubs of this vegetation community that were observed included cheesebush (*Ambrosia salsola*), desert alyssum (*Lepidium fremontii*), indigo bush (*Psoralea arborescens* var. *minutiflora* and *P. a.* var. *arborescens*), sandpaper plant (*Petalonyx thurberi*), and desert senna (*Senna armata*). In many cases, it was observed that desert wash scrub vegetation communities were disturbed by vehicular travel or diverted by human-made structures, such as rip-rap piles associated with bridge construction. Within the alignment for Underground Route A, approximately 0.82 acre was undisturbed and within the alignment for Underground Route B, approximately 0.28 acre of this community was undisturbed. Disturbed Desert wash was mapped in the surrounding areas but was not mapped within the Project area.

Desert Wash Scrub/Creosote Bush Scrub (Undisturbed). The alignment for Underground Route A contained approximately 0.47 acre of a community intergrade between desert wash scrub and creosote bush scrub, but this community was not present in the alignment for Underground Route B. This community is considered suitable habitat for the desert tortoise, rare plants, MGS, and other special-status plant and wildlife species (see Section 4.4).

Saltbush Scrub (Disturbed and Undisturbed). Saltbush scrub is characterized by the dominance of one or more species of saltbush (*Atriplex* spp.). Saltbush scrub is associated with moderately alkaline soils toxic enough to inhibit most desert shrubs that occur in the creosote bush scrub. It commonly occurs on lower bajada slopes and plains and around playas throughout most of the desert (Holland 1986). Good examples of saltbush scrub can be found on playas along margins of dry lakes on Fort Irwin. Underground Route A was not found to contain this vegetation community. Within the alignment for Underground Route B, approximately 1.48 acres of this community were found to have a level of disturbance associated (disturbed). Undisturbed saltbush scrub was only found in the areas surrounding the Project area. The dominant shrubs of this vegetation community that were observed included allscale (*Atriplex polycarpa*). A subdominant species that was observed on occasion included spiny hopsage (*Grayia spinosa*). Saltbush scrub was mainly observed growing in close proximity to Fort Irwin Road. This community is in the process of recovering and is therefore considered suitable habitat for the desert tortoise, rare plants, MGS, and other special-status plant and wildlife species (see Section 4.4).

Creosote Bush Scrub/Saltbush Scrub (Undisturbed). An intergrade of creosote bush scrub and saltbush scrub was observed in the southern portion of the Project area in the median between the northbound and southbound traffic lanes on Fort Irwin Road. This community did not occur within the Project area but was mapped within the surrounding areas. This community is considered suitable habitat for the desert tortoise, rare plants, MGS, and other special-status plant and wildlife species (see Section 4.4).

Mojave Mixed Woody Scrub (Undisturbed). Mojave mixed woody scrub was not observed to be a dominant vegetation community within the Project area; however, it was observed in a few locations interspersed within rock/boulder outcrops. Plant species observed within the Mojave mixed woody scrub vegetation community included desert brickellia (*Brickellia desertorum*), Cooper's goldenbush (*Ericameria cooperi*), Mojave woodyaster (*Xylorhiza tortifolia* var. *tortifolia*), clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), pima rhatany (*Krameria erecta*), and Mohave sage (*Salvia mohavensis*). The alignment for Underground Route A was not found to contain this vegetation community. Within the alignment for Underground Route B, approximately 0.04 acre of this community was present. This community is considered suitable habitat for the desert tortoise, rare plants, MGS, and other special-status plant and wildlife species (see Section 4.4).

Disturbed/Unvegetated. In addition to the vegetation communities discussed above, there were portions of the Project area that exhibited habitat that was degraded and disturbed beyond what would happen in a natural setting. Those areas mapped as disturbed have been affected by military operations, road construction, water conveyance features, and other associated human activities. Disturbed areas were usually much more sparsely vegetated than adjacent habitat and in some cases were dominated by non-native plant species. Within the alignment for Underground Route A, approximately 23.66 acres of this land cover type were present, while the alignment for Underground Route B was found to contain approximately 26.49 acres. The unvegetated areas do not provide habitat for special-status species except for burrowing owl.

Developed. Developed is not considered a community, rather a land cover type. This land type includes industrial areas, paved roads, and building pads. This land type primarily occurred in the cantonment area and along Fort Irwin Road. Approximately 0.15 acre occurred in the alignment for Underground Route A, while approximately 0.58 acre of this land type occurred within the alignment for Underground Route B. The entire staging area (0.34 acre) consisted of this land cover type. The developed areas do not contain habitat for special-status species except for nesting bird species protected under the MBTA.

4.3 Biological Resources Survey

All wildlife species detected or observed during the 2015 surveys conducted within the respective survey areas were recorded. Wildlife species that were documented are typical of those found in desert scrub habitats in proximity to urbanized areas within the Mojave Desert. A compendium of all wildlife species observed or detected is found in Appendix B.

Reptiles and Amphibians. No desert tortoises were observed during the focused surveys; however, desert tortoise burrows and scat were observed, indicating presence in the Project area (discussed further in Section 4.7.2). Nine additional reptile species were observed during surveys in the Project area, such as zebra-tailed lizard, side-blotch lizard, and sidewinder rattlesnake.

Birds. Birds were the most abundantly observed taxa, with a total of 13 species detected. Some bird species that were observed in the survey areas included horned lark, common raven, sage sparrow (*Artemisiospiza belli*), turkey vulture (*Cathartes aura*), and red-tailed hawk. Nesting habitat for these birds is present throughout the Project area in the native vegetation and the man-made structures. Burrowing owls were not observed during the surveys and potential burrowing owl burrows were also not observed. The Project area provides suitable raptor foraging habitat; however, nesting habitat is fairly limited within the Project area due to the lack of tall, supportive nesting substrates (e.g., transmission towers, cliffs, Joshua trees, etc.).

Mammals. Ten mammal species were observed or detected in the Project area, including coyote, feral burro (*Equus asinus*), desert woodrat, and black-tailed jackrabbit. Suitable roosting habitat for bats is present in the rocky outcrops towards the southern end of the Project area. Although not observed, bobcat is also likely to occupy the Project area.

4.4 Background Review and Assessment of Potential for Species Occurrence

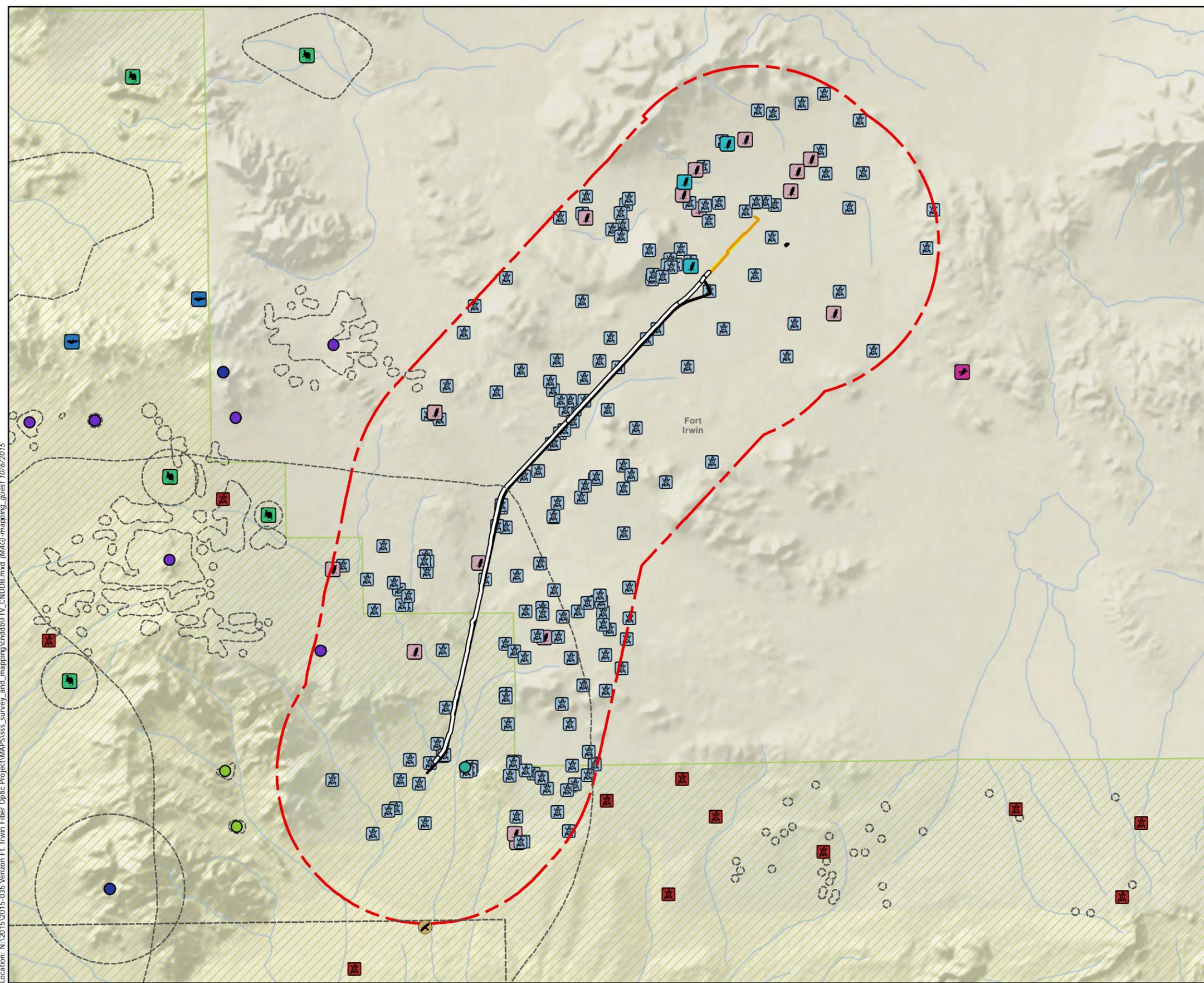
4.4.1 Flora

The flora of Fort Irwin is described in the installation INRMP, which is the partial source of material presented here (USACE 2006). Special-status flora species considered here include the following species of interest: (1) those species that are listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS under the ESA; (2) those species designated as sensitive by the Bureau of Land Management (BLM), indicating species requiring special management consideration; (3) those species designated by the federal government as Species of Concern, representing species formerly designated as candidates for listing as endangered or threatened, but for which information is insufficient to make that determination; (4) those species listed by the CDFW as threatened or endangered under the CESA; and (5) those species designated by the CNPS as CRPR 1B, meaning rare, threatened, or endangered in California and elsewhere; CRPR 2A, meaning it is presumed extinct in California but extant elsewhere; or CRPR 2B, meaning rare, threatened, or endangered in California, but more common elsewhere.

Figure 10 shows the results of the background review in relation to the Project area. Table 4 lists the special-status plant species evaluated during the background review. A brief natural history and discussion of the potential for occurrence in the Project area for each of the special-status plant species is discussed below. The habitat associated with each species was evaluated and used to determine their specific potential for occurrence within the habitat types in the Project area. A rare plant survey was conducted specifically for Lane Mountain milkvetch; however, the survey timing also correlated with the appropriate time of year to detect any of the other special-status species listed below.

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Figure 10. CNDDDB Occurrences and Fort Irwin Records of Special Status Species



Distance From Project
 2 Miles

Project Components¹

- Underground Route A
- Underground Route B
- Aerial Route A
- Aerial Route B
- Staging Area

CNDDDB Occurrences²

- CNDDDB Polygon Extent

Plants

- Hot Springs Fimbristylis
- Lane Mountain Milk-vetch
- Clokey's Cryptantha
- Alkali Mariposa-lily

Amphibians/Reptiles

- Desert Tortoise

Birds

- Burrowing Owl
- Loggerhead Shrike
- Prairie Falcon

Mammals

- Mohave Ground Squirrel
- Townsend's Big-eared Bat

Ft. Irwin Records³

- Burrowing Owl
- Desert Tortoise
- Swainson's Hawk

Critical Habitat⁴

- Desert Tortoise

This map may include multiple species' occurrences at each location, some of which may not be visible on this graphic. The CNDDDB occurrences shown may not reflect the actual location of the occurrence.

¹ Project Boundary: MountainTop Communication Solutions
² CDFW California Natural Diversity Database (CNDDDB), June 2015 (GIS Shapefile)
³ Received from Ft. Irwin
⁴ Insert Critical Habitat Source: USFWS
 CNDDDB Occurrences Located on USGS 7.5' Quadrangles: East of Goldstone, CA (1984), Fort Irwin, CA (1984), Paradise Range, CA (1984), Langford Well, CA (1986), East of Langford Well, CA (1986), Coyote Lake, CA (1986)



Table 4. Plant Potential for Occurrence

Scientific Name Common Name	Status	Flowering Period Elevation (meters)	Potential for Occurrence; Habitat
<i>Astragalus jaegerianus</i> Lane Mountain milk-vetch	Fed: END Ca: none CRPR: 1B.1 BLM: none	April-June 900-1200	High; Joshua tree woodland, Mojavean desert scrub. Dry, stony hillsides and mesas, in granite, sand and gravel.
<i>Calochortus striatus</i> alkali mariposa lily	Fed: none Ca: none CRPR: 1B.2 BLM: sens	April-June 90-1595	Moderate; Chaparral, chenopod scrub, Mojavean desert scrub, meadows, alkaline meadows and ephemeral washes.
<i>Cryptantha clokeyi</i> Clokey's cryptantha	Fed: none Ca: none CRPR: 1B.1 BLM: sens	April 800-1280	Moderate; Mojavean desert scrub. Sandy or gravelly soils.
<i>Cymopterus deserticola</i> desert cymopterus	Fed: none Ca: none CRPR: 1B BLM: sens	March-May 630-1500	Moderate; Deep loose, well drained sandy soil that occurs in alluvial fans and basins, stabilized low sand dune and sandy slopes
<i>Eremothera boothii</i> ssp. <i>boothii</i> Booth's evening-primrose	Fed: none Ca: none CRPR: 2B.3 BLM: none	June- August 815- 2400	Low; Joshua Tree woodland, pinyon and juniper woodland
<i>Eriophyllum mohavense</i> Barstow woolly sunflower	Fed: SOC Ca: none CRPR: 1B.2 BLM: sens	March- May 500-960	Low; Chenopod scrub, Mojave desert scrub, and playas
<i>Fimbristylis thermalis</i> hot springs fimbristylis	Fed: none Ca: none CRPR: 2B.2 BLM: none	July- Septmeber 120-1340	Moderate; freshwater-marsh, springs, meadows
<i>Phacelia parishii</i> Parish's phacelia	Fed: none Ca: none CRPR: 1B.1 BLM: sens	April-July 535-1200	Low; Clay or alkaline soils, on lake margins.
<i>Wislizenia refracta</i> ssp. <i>refracta</i> jackass-clover	Fed: none Ca: none CRPR: 2B.2 BLM: none	April-November 600-800	Moderate; Playas, desert dunes, Mojavean desert scrub, Sonoran desert scrub. Sandy washes, roadsides, alkaline flats.
Federal Designations (FESA, USFWS)			
END: Federally listed, endangered			
SOC: Species of Concern			
California Native Plant Society (CNPS) Ranking System-California Rare Plant Ranks (CRPR; formerly known as CNPS Lists): (Note: All of the plants constituting California Rare Plant Rank 1B and 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing.			
1A: Plants presumed extinct in California.			
1B: Plants rare and endangered in California and elsewhere			
2: Plants rare, threatened or endangered in California, but more common elsewhere			
List 1B and 2 extension meanings:			
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat).			
.2 Fairly endangered in California (20-80% occurrences threatened/moderate degree and immediacy of threat).			
.3 Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known).			
Source: California Natural Diversity Database (CDFW 2015a), California Native Plant Society Electronic Inventory (CNPS 2015)			

Lane Mountain milkvetch (*Astragalus jaegerianus*). One federally listed endangered plant species occurs on the installation, the Lane Mountain milkvetch, which was listed by the USFWS as endangered on October 6, 1998; the species also is designated as CRPR 1B. The closest record of this species is approximately two miles west of the southern end of the Project area. Lane Mountain milkvetch occurs in Joshua tree woodland, mixed Mojave scrub, and creosote bush scrub in poorly developed sandy or granitic gravelly soils. During 2001, a survey covering over 21,000 acres mapped four major geographic populations of Lane Mountain milkvetch. A new population of Lane Mountain milkvetch was discovered immediately south of the Goldstone facility that belongs to the National Aeronautics and Space Administration (NASA). Also, three previously known populations (Coolgardie Mesa, Paradise Valley, and Brinkman Wash) were found to be significantly larger than previously reported. The majority of these populations are located between three and five miles west of the Project area. Populations of Lane Mountain milkvetch were encountered at elevations from 3,100 to 4,200 feet above mean sea level (msl), generally in areas of small ridges, shallow bedrock, and granitic soils. The populations occur in Mojave creosote bush scrub and Mojave mixed woody scrub communities with diverse shrub assemblages. The most common host shrubs for the Lane Mountain milkvetch were turpentine broom (*Thamnosma montana*), bursage, eastern Mojave buckwheat (*Eriogonum fasciculatum*), Cooper's goldenbush (*Ericameria cooperi*), and Nevada jointfir (*Ephedra nevadensis*) (USACE 2006). Based on the distribution of the Lane Mountain milkvetch, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered high.

Alkali mariposa lily (*Calochortus striatus*). The alkali mariposa lily is a federal Species of Concern and is designated as a CRPR 1B species. The alkali mariposa lily is in the lily family (Liliaceae) and occurs in creosote brush scrub communities in the Mojave Desert and has been reported in the California Mojave Desert in small scattered populations in Kern, Los Angeles, and San Bernardino Counties. Alkali mariposa lily grows in alkaline meadows and moist creosote bush scrub plant communities where it flowers in the spring between April and June. The alkali mariposa lily has been observed at Two Springs and at Paradise Springs (USACE 2006). The Paradise Springs population is approximately three miles southwest of the southern end of the Project area and another small population is located approximately 0.7 mile north of Paradise Springs (CNDDDB 2015). Based on the distribution of the alkali mariposa lily, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered moderate.

Clokey's cryptantha (*Cryptantha clokeyi*). Populations of Clokey's cryptantha are uncommon but have been observed in rocky areas surrounding Superior Valley and Paradise Valley. This species is designated as a CRPR 1B species and is a small annual in the waterleaf family (Boraginaceae). Plants typically occur in gravelly areas of coarse colluvium substrate and are most frequently found on upper slopes in Mojavean desert scrub. The closest record to the Project area is approximately four miles southwest (CCH 2015; Fort Irwin DPW 2015). Based on the distribution of Clokey's cryptantha, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered moderate.

Desert cymopterus (*Cymopterus deserticola*). Desert cymopterus is designated as sensitive by the BLM and is designated as a CRPR 1B species. This herbaceous perennial in the carrot family (Apiaceae) is found on deep, loose, well-drained sandy soil that occurs on alluvial fans and basins. Desert cymopterus also occurs on stabilized low sand dune areas and occasionally on sandy slopes. One of the known populations of desert cymopterus is located in the Superior Valley area, which is located just south of the Naval Air Weapons Station (NAWS) China Lake boundary. Several additional populations, potentially containing several thousand plants, were observed during a survey of the Superior Valley (USACE 2006). Other extant populations of this species are located near Harper Dry Lake in Lockhart, California, and in the vicinity of the border of Kern and San Bernardino Counties, near Boron, California. Based on the distribution of desert cymopterus, the known occurrences of this species in the vicinity of the Project

area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered moderate.

Booth's Evening Primrose (*Eremothera boothii* ssp. *boothii*). Booth's evening primrose is designated as a CRPR 2B species. This annual herb is in the evening-primrose family (Onagraceae) and typically grows in sandy flats and steep loose slopes within Joshua tree and pinon/juniper woodland, and sometimes within sandy openings in riparian forest/scrub. One of the known populations of this species nearest to the Project area is located approximately 18 miles to the north-northwest of the Fort Irwin cantonment area. Specifically this population is located 3.3 miles northeast of the McLean Junction, off of Pioneer Cut Road and southwest of the Granite Mountains range. Other extant populations of this species within the Mojave Desert are mainly limited to the eastern Mojave Desert mountain ranges and in the vicinity of Victorville and Hesperia, California. Based on the known distribution of Booth's evening primrose, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered low.

Hot Springs fimbristylis (*Fimbristylis thermalis*). Hot springs fimbristylis is designated as a CRPR 2B species. This perennial rhizomatous herb is in the sedge family (Cyperaceae) and typically grows in mineralized soils near hot springs and meadows near seeps. One of the known populations of this species is located approximately 0.2 mile to the east of the southern end of the Project area. Specifically this population is located within Jack Spring, which is just east of the intersection of Rocking K Ranch Road and Fort Irwin Road. Other extant populations of this species are located in Death Valley National Park in Inyo County, and in southwestern San Bernardino County. Although this species is present immediately adjacent to the Project area, the existence of suitable habitat within the Project area was not observed therefore the potential for occurrence by this species is considered moderate.

Barstow woolly sunflower (*Eriophyllum mohavense*). Barstow woolly sunflower is a FSOC, a BLM sensitive species, and is designated as a CRPR 1B species. Barstow woolly sunflower is a small annual in the sunflower family (Asteraceae) and typically occurs in creosote bush scrub that is adjacent to or within an overstory of Joshua trees and saltbush scrub. Barstow woolly sunflower is found in open, flat, barren sites, most commonly on the sandy margins of alkali depressions distributed among the more common creosote bush plant community. The range of Barstow woolly sunflower extends within the west-central Mojave Desert. All known locations of Barstow woolly sunflower are south, southwest, and west of Fort Irwin, with the closest known population located on Coolgardie Mesa, about 5 miles outside Fort Irwin (USACE 2006). Based on the distribution of Barstow woolly sunflower, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered low.

Parish's phacelia (*Phacella parishii*). Parish's phacelia is designated as a CRPR 1B.1 species and BLM sensitive species. An annual plant, Parish's phacelia is a member of the waterleaf family (Boraginaceae) found in Mojave Desert scrub, playas, and lake margins on alkaline or clay soils. The closest known location of Parish's phacelia is south of Fort Irwin on the southeast margin of Coyote Lake, over 10 miles south of the Project area (CCH 2015). Based on the distribution of Parish's phacelia, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered low.

Jackass clover (*Wislizenia refracta* ssp. *refracta*). The jackass clover is designated as a CRPR 2B.2 species. An annual plant, the jackass clover is a member of the spiderflower family (Cleomaceae) found in creosote bush scrub, primarily in sandy washes, along roadsides, and in alkaline flats. All known locations of jackass clover are south of Fort Irwin on the south side of Coyote Lake, over 10 miles south of the Project area (CCH 2015). Based on the distribution of the jackass clover, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for occurrence by this species is considered moderate.

4.4.2 Fauna

Special-status faunal species considered here include the following species of interest: (1) those species that are listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS under the ESA; (2) those species designated as sensitive by the BLM, indicating species requiring special management consideration; (3) those species designated by the federal government as Species of Concern; in some cases this represents species formerly designated as candidates for listing as endangered or threatened, but for which information is insufficient to make that determination; (4) those species listed by the CDFW as threatened or endangered under the CESA; and (5), those species designated by CDFW as SSC.

Figure 10 shows the results of the background review for wildlife in relation to the Project area. Table 5 lists the special-status wildlife species evaluated during the background review. The habitat types in the study area were evaluated and used to determine the potential for occurrence for each species (Table 5). Focused surveys were conducted for the desert tortoise and MGS.

The following species have potential to occur at Fort Irwin and are listed by the USFWS as threatened or endangered under the ESA, or by CDFW as threatened or endangered under the CESA.

Peregrine falcon (*Falco peregrinus anatum*). This subspecies of peregrine falcon was federally delisted from its endangered status in August 1999 and state delisted from its endangered status in 2009. This subspecies is found primarily in the western United States. During winter, they can be found throughout most of California. Summer range is more restricted to northern California, along the coast from Santa Barbara northward, and in the Sierra Nevada Mountains. Peregrines typically nest on high cliffs, or less commonly, on buildings and structures in urban areas. They forage over wetlands or other habitats with large concentrations of birds, their primary food source. Peregrines are uncommon winter migrants to the West Mojave. A peregrine falcon was observed at Bitter Springs in 1997. This subspecies would not be expected except as an occasional transient at the Project area. This species was not observed during field surveys. Based on the distribution of the peregrine falcon, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered low.

Southwestern willow flycatcher (*Empidonax traillii extimus*). This species was federally listed as endangered in 1995 and is also state-listed as endangered. Southwestern willow flycatcher breeds in riparian woodland habitats with willows (*Salix* sp.), cottonwoods (*Populus* sp.), and/or alders (*Alnus* sp.). Scattered records exist of this species occurring at various locations throughout Fort Irwin. However, in all cases the observations represented transient birds detected during spring and fall migration periods. While the southwestern willow flycatcher is a summer resident in the region, the species is not expected to occur regularly at Fort Irwin in the breeding season because of a lack of appropriate habitat; however, the species might occur during brief periods of migration at springs and riparian areas. Suitable habitat is not present in the Project area. Based on the distribution of the southwestern willow flycatcher, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered low.

Table 5. Wildlife Potential for Occurrence

<p><i>Scientific Name</i> Common Name</p>	<p>Status</p>		<p>Potential to Occur</p>	<p>Habitat</p>
<p><i>Accipiter cooperii</i> Cooper's hawk</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Inhabits a variety of habitats, including grasslands, woodlands, urban areas, and arid areas.</p>
<p><i>Accipiter striatus</i> Sharp-shinned hawk</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Typically occurs in woodlands and forested habitats but will forage in open areas.</p>
<p><i>Agelaius tricolor</i> tri-colored blackbird</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>A highly colonial species. Occurs in wetlands with reeds for nesting.</p>
<p><i>Antrozous pallidus</i> pallid bat</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC SEN</p>	<p>Moderate</p>	<p>Occurs in a variety of habitats throughout California. Roosts in dry, open areas with rocky outcrops.</p>
<p><i>Aquila chrysaetos</i> golden eagle</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC/FP SEN</p>	<p>Moderate</p>	<p>Occurs in rolling foothill mountain areas; nests in large trees in open areas or cliff-walled canyons.</p>
<p><i>Asio otus</i> Long-eared owl</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Moderate</p>	<p>Found in grassland habitats and open areas.</p>
<p><i>Athene cunicularia</i> burrowing owl (burrow sites)</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC SEN</p>	<p>High</p>	<p>Associated with low-lying vegetation, open scrub, grassland, and agricultural habitats.</p>
<p><i>Buteo regalis</i> Ferruginous hawk</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Found in prairie, grassland, forest and desert habitats; nests along streams or on steep slopes.</p>
<p><i>Buteo swainsoni</i> Swainson's hawk</p>	<p>Fed: Ca: BLM:</p>	<p>none THR none</p>	<p>High</p>	<p>Nests in stands with few trees in juniper-sage flats, riparian areas and in oak savanna. Forages in grassland, or cultivated field areas supporting rodent populations.</p>
<p><i>Chaetura vauxi</i> Vaux's swift</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Moderate</p>	<p>Occupies open desert, roosts and nests in cliffs and rocky outcrops.</p>
<p><i>Charadrius montanus</i> mountain plover</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Found in desert, grassland and cropland habitats.</p>
<p><i>Chlidonias niger</i> Black tern</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Found in riparian and wetland habitats.</p>
<p><i>Circus cyaneus</i> Northern harrier</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Occupies a variety of habitats with low-growing vegetation, including riparian, montane, and agricultural areas.</p>

Table 5. Wildlife Potential for Occurrence

<p><i>Scientific Name</i> Common Name</p>	<p>Status</p>		<p>Potential to Occur</p>	<p>Habitat</p>
<p><i>Corynorhinus townsendii</i> Townsend's big-eared bat</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC SEN</p>	<p>Low</p>	<p>Occurs in a variety of habitats throughout California. Roosts in open areas.</p>
<p><i>Dendroica petechia brewsteri</i> Yellow warbler</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Occurs in riparian woodlands and forests.</p>
<p><i>Empidonax traillii extimus</i> Southwestern willow flycatcher</p>	<p>Fed: Ca: BLM:</p>	<p>END END none</p>	<p>Low</p>	<p>Occupies riparian woodland habitat with willows.</p>
<p><i>Falco columbarius</i> merlin (wintering)</p>	<p>Fed: Ca: BLM:</p>	<p>none WL none</p>	<p>Low</p>	<p>Inhabits marshes, deserts, open woodlands, fields and coastal lakes and lagoons.</p>
<p><i>Falco mexicanus</i> prairie falcon</p>	<p>Fed: Ca: BLM:</p>	<p>none WL none</p>	<p>High</p>	<p>Nests in open, dry habitats on cliffs. Often found far away from permanent water sources.</p>
<p><i>Falco peregrinus anatum</i> Peregrine falcon</p>	<p>Fed: Ca: BLM:</p>	<p>none END none</p>	<p>Low</p>	<p>Typically nests on high cliffs along the western coast and forages in wetlands.</p>
<p><i>Gopherus agassizii</i> desert tortoise</p>	<p>Fed: Ca: BLM:</p>	<p>THR THR none</p>	<p>Present</p>	<p>Inhabits almost any desert habitats with friable soils for burrow and nest construction.</p>
<p><i>Icteria virens</i> Yellow-breasted chat</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Occurs in riparian woodlands and forests.</p>
<p><i>Lanius ludovicianus</i> loggerhead shrike</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Moderate</p>	<p>Inhabits large, open areas conducive to hunting. Nests in dense brush and shrubs.</p>
<p><i>Larus californicus</i> California gull</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Found in areas with perennial access to water, usually associated with ocean, lake, or ponded habitats.</p>
<p><i>Laterallus jamaicensis coturniculus</i> California black rail</p>	<p>Fed: Ca: BLM:</p>	<p>none THR SEN</p>	<p>Low</p>	<p>Occurs in marshes, swamps and wet meadows.</p>
<p><i>Oreothlypis virginiae</i> Virginia's warbler</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Occurs in riparian woodlands and forests.</p>
<p><i>Plegadis chihi</i> white-faced ibis</p>	<p>Fed: Ca: BLM:</p>	<p>none SSC none</p>	<p>Low</p>	<p>Found in shallow freshwater marshes with dense tule thickets for nesting.</p>

Table 5. Wildlife Potential for Occurrence

Scientific Name Common Name	Status		Potential to Occur	Habitat
<i>Pyrocephalus rubinus</i> Vermillion flycatcher	Fed: Ca: BLM:	none SSC none	Low	Occurs in riparian woodlands and forests.
<i>Taxidea taxus</i> American badger	Fed: Ca: BLM:	none SSC none	Moderate	Associated with open stages of dry scrub, forest, and herbaceous habitats. Requires sufficient food, friable soils, and open uncultivated ground.
<i>Toxostoma bendirei</i> Bendire's thrasher	Fed: Ca: BLM:	none SSC SEN	Moderate	Found in desert habitats.
<i>Toxostoma crissale</i> Crissal thrasher	Fed: Ca: BLM:	none SSC none	Low	Inhabits desert riparian and desert wash habitats.
<i>Toxostoma lecontei</i> Conte's thrasher	Fed: Ca: BLM:	none SSC* none	Low	Inhabits arid and desert habitats in the southwest. *SSC designation refers only to <i>Toxostoma lecontei macmillanorum</i> , the subspecies found in the San Joaquin Valley (CDFW 2015c).
Uma Scoparia Mojave fringe-toed lizard	Fed: Ca: BLM:	none SSC SEN	Low	Found in areas with dry, loose, wind-blown sand in dunes, dry lakebeds, riverbanks, desert washes, alkali scrub, and desert scrub.
<i>Vireo bellii pusillus</i> Least Bell's vireo	Fed: Ca: BLM:	END END SEN	Low	Nests in low riparian habitat in the vicinity of water or dry river bottoms below 609 meters (2,000') amsl.
<i>Vireo vicinior</i> Gray vireo	Fed: Ca: BLM:	none SSC SEN	Low	Inhabits woodland and forested habitats.
<i>Vulpes macrotis arsipus</i> Desert kit fox	Fed: Ca: BLM:	none FBM none	Moderate	Occupies open desert, creosote bush flats, and sand dunes.
<i>Xerospermophilus mohavensis</i> Mohave ground squirrel	Fed: Ca: BLM:	none THR none	Moderate	Found in desert scrub, alkali scrub and Joshua tree woodland habitats with winterfat and spiny hopsage present.
Federal Designations (FESA, USFWS) END: Federally listed, endangered THR: Federally listed, threatened	BLM Designation SEN: Sensitive		State Designations (CESA, CDFW) END: State listed, endangered THR: State listed, threatened SSC: California Species of Special Concern FP: Fully Protected FBM: Fur-bearing mammal WL: Watch List	

* CDFW 2015c

Table 6. Vegetation Communities in Critical Habitat

Vegetation Community/Acres	Underground Route A	Underground Route B
undisturbed creosote Bush Scrub	1.56	0.06
undisturbed desert wash scrub	0.60	0.18
Developed	0	0.32
Disturbed	5.42	6.15
Disturbed Saltbush	0	1.48
Mojave Mixed Woody Scrub	0	0.04
Percent of Critical Habitat Unit* Affected	0.000282	0.000230
Subtotal (no disturbed or developed)	2.16	1.76
Total	7.58	8.23

*Total acreage in Superior-Cronese Critical Habitat Unit is 766,900 acres

Least Bell's vireo (*Vireo bellii pusillus*). This species was federally listed as endangered in 1986 and state listed as endangered in 1980. The least Bell's vireo is a summer resident in the region and breeds in riparian habitat, preferring areas of dense mulefat (*Baccharis salicifolia*) with an overstory of willows. In 1986 a least Bell's vireo was observed on Fort Irwin at Bitter Springs. This species is not expected to occur regularly at Fort Irwin because of the lack of suitable habitat; however, it might occur near springs for brief periods during migration. Suitable habitat is not present in the Project area. Based on the distribution of the least Bell's vireo, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered low.

Desert tortoise (*Gopherus agassizii*). This species was federally listed as threatened in 1990 and state-listed as threatened in 1989. Desert tortoise is a large, herbivorous reptile found throughout much of the Mojave and Sonoran Deserts; its range roughly approximates the distribution of creosote bush scrub. The desert tortoise is active in the spring, summer, and autumn when daytime temperatures are below 90°F. Most activity occurs during spring and early summer.

The USFWS determined that the Mojave population of the desert tortoise warranted listing in response to documented population declines over portions of its range, particularly in the western Mojave Desert. The declines are thought to be due to a number of reasons, including upper respiratory tract disease exacerbated by the stress of several drought seasons, loss of habitat, predation by ravens, livestock grazing, and direct disturbance by humans.

The desert tortoise is well studied at Fort Irwin. Numerous surveys have been conducted over the years to document the distribution and estimated size of tortoise populations throughout the installation. The desert tortoise is known to occur throughout Fort Irwin in low to moderate numbers, with the highest concentration along the southern boundary. Multiple records of desert tortoise occur within the Project area (Fort Irwin DPW 2015). Since 1998, there were approximately 17 observations of desert tortoise within or adjacent to the tortoise survey action area (Fort Irwin DPW 2015). These observations of tortoises were primarily reports to DPW from motorists travelling along Fort Irwin Road reporting either roadkill animals or animals trying to cross the road. Desert tortoise is present within the Project area.

The southern two miles of the Project area are within the USFWS Superior-Cronese Critical Habitat Unit (Figure 10). Approximately 7.58 acres of Underground Route A and 8.23 acres of Underground Route B of a 766,900-acre USFWS-designated Critical Habitat Unit for desert tortoise are within the Project area footprint and would be affected by Project activities (Table 5). However, most of this designated Critical Habitat (5.42 acres for Underground Route A and 6.47 acres for Underground Route B) within each of the alignments for the Underground Routes had previously been disturbed or developed and does not provide

suitable tortoise habitat. The amount of affected critical habitat that supports native or recovering (disturbed) native vegetation, therefore, is 2.16 acres for Underground Route A and 1.76 acres for Underground Route B, which totals approximately 0.000282 percent for Underground Route A and 0.000230 percent for Underground Route B of the overall Critical Habitat Unit.

Burrowing owl (*Athene cunicularia*). The burrowing owl is designated as a CDFW SSC. The SSC designation includes burrow sites in breeding locations throughout California and wintering sites in several counties in northern California (CDFW 2015b). The burrowing owl is not formally listed under the California Endangered Species Act or the federal Endangered Species Act. The primary reasons for burrowing owl population decline are habitat loss, degradation, and fragmentation due to agricultural and urban development. Predation by natural predators (hawks, larger owls, and mammals) and introduced predators (domestic cats and dogs) may also contribute to population declines. There are several records of this species occurring within two miles of the Project area (Fort Irwin DPW 2015). Based on the distribution of the burrowing owl, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered high.

California black rail (*Laterallus jamaicensis coturniculus*). This species was state-listed as threatened in 1971. The California black rail is an uncommon, local resident of marshes, swamps, and wet meadows. A black rail was observed at the wastewater evaporation and percolation ponds at Fort Irwin during fall 1994, but it has not been detected since. The occurrence of this species in the central Mojave Desert is extremely unusual, and it would not occur at the Project area due to lack of habitat. Based on the distribution of the California black rail, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered low.

Swainson's hawk (*Buteo swainsoni*). This species was state-listed as threatened in 1983. The Swainson's hawk was once a widespread breeder in the non-forested areas of northern California and the Central Valley. This species is migratory and is not expected to occur regularly at Fort Irwin or forage in the area for prolonged periods. Swainson's hawk has been observed at Bitter Springs and might occasionally use the area for transient forage habitat during migration. Two individuals were documented approximately one mile (3.2 km) east of the Project area in 2014. Based on the distribution of Swainson's hawk, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered high.

Desert kit fox (*Vulpes macrotis*). This species is not listed under the federal or state Endangered Species Acts; however, it is considered a protected species by the State of California because it is classified as a fur bearing mammal. In the California Code of Regulations (CCR), desert kit foxes are protected under Title 14, Chapter 5, Section 460, which prohibits take of this species at any time. The desert kit fox is found in various types of desert habitats that include creosote bush, shadscale, greasewood, and sagebrush. It feeds primarily on nocturnal rodents and rabbits but will opportunistically take birds, reptiles, and insects. Based on the distribution of the desert kit fox and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered moderate.

Mohave ground squirrel (*Xerospermophilus mohavensis*). This species was state-listed as threatened in 1971. Numerous petitions to federally list the species have been filed, but listing the species has not been warranted. The MGS generally occurs in habitat that consists of large alluvial-filled valleys with deep fine- to medium-textured soils vegetated with creosote scrub, shadscale scrub, or alkali sink scrub with the absence of desert pavement and shallow eroded soils. At Fort Irwin, MGS occurrences in the Western Expansion Area are well documented. Recent focused surveys conducted in spring 2015 for MGS on the eastern portions of the Goldstone area were negative and surveys conducted in the vicinity of the Gary Owen impact area for the last three years were negative as well (Clarence Everly, personal communication, July 31, 2015). These surveys were concentrated in the northern and eastern portions of the installation; other populations of MGS could occur in areas with suitable habitat yet to be

surveyed. Previous surveys conducted in the 1980s and 1990s indicated the presence of this species at 12 sites, including several in the vicinity of Goldstone Lake, the Echo site, Nelson Lake, Bicycle Lake, Drinkwater Lake, the north end of Lucky Fuse, and Lizard Gulch. Surveys over the last five years in these areas for this species were negative (Clarence Everly, personal communication, August 18, 2015). The closest record of this species to the Project area is over three miles west (Fort Irwin DPW 2015), but suitable habitat is present throughout the Project area. Based on the distribution of the MGS, the known occurrences of this species in the vicinity of the Project area, and the vegetation community and habitat characteristics within and adjacent to the Project area, the potential for use by this species is considered moderate.

Other special-status fauna. Other special-status faunal species are proposed for listing, candidates for listing, SSC, or designated as Sensitive by the BLM. This list is steadily growing for the Mojave Desert region and includes 27 additional animal species that were either observed at Fort Irwin previously or occur in the Mojave Desert ecosystem. No other special-status species were observed during field surveys.

Based on the presence of suitable habitat and records within two miles, prairie falcon was given a high potential to occur in the Project area. Based on the presence of suitable habitat and no records within two miles, the pallid bat (*Antrozous palludus*), long-eared owl (*Asio otus*), Vaux's swift (*Chaetura vauxi*), loggerhead shrike (*Lanius ludovicianus*), American badger, golden eagle, and Bendire's thrasher (*Toxostoma bendire*) were given a moderate potential to occur in the Project area. The remaining 19 species were given a low potential to occur in the Project area based on no recent or historical records of the species occurring within approximately two miles and/or the habitat requirements of the species are not present. Le Conte's thrasher (*Toxostoma lecontei*), a CDFW SSC, was classified as having a low potential to occur because the SSC designation refers only to the subspecies population occurring in the San Joaquin Valley, *T. l. macmillanorum*, and does not include the population found in the Mojave Desert (CDFW 2015c).

4.5 Jurisdictional Delineation

The following section provides a discussion of jurisdictional findings. ECORP regulatory specialist Alfredo Aguirre conducted the jurisdictional delineation on May 26 and 27, 2015.

4.5.1 Soils

Soils types were determined using the Natural Resources Conservation Service Web Soil Survey (NRCS 2015a). Soils within the Project area are shown in Figure 11. Hydric soils are those soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils support the growth and regeneration of hydrophytic vegetation. None of the soil types mapped within the Project area are considered to be potentially hydric (NRCS 2015b).

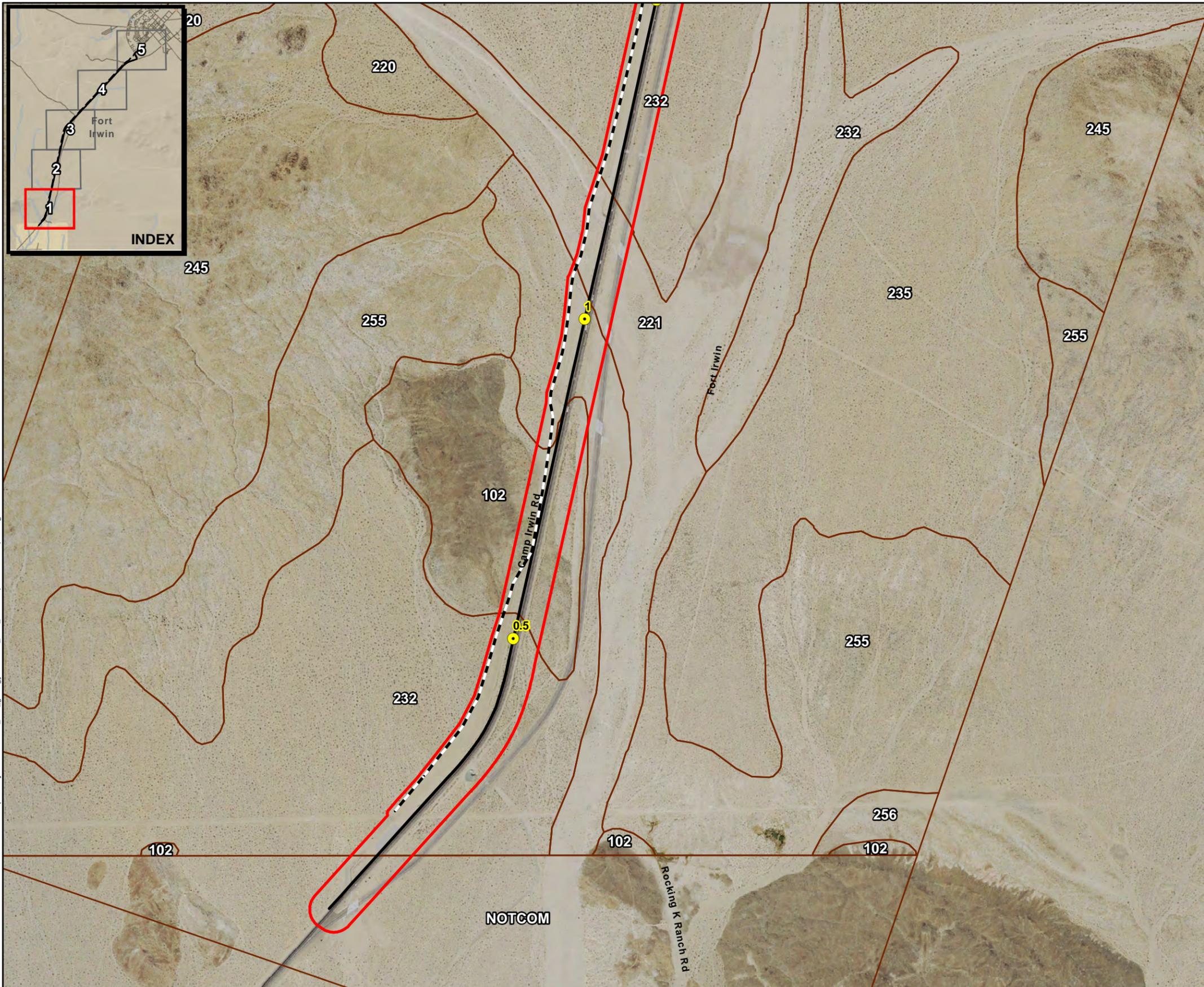
Figure 11.
NRCS Soil Types Sheet: 1

Map Features

- Biological Study Area
- Project Mile Marker
- Underground Route A
- Underground Route B

NRCS Soil Types

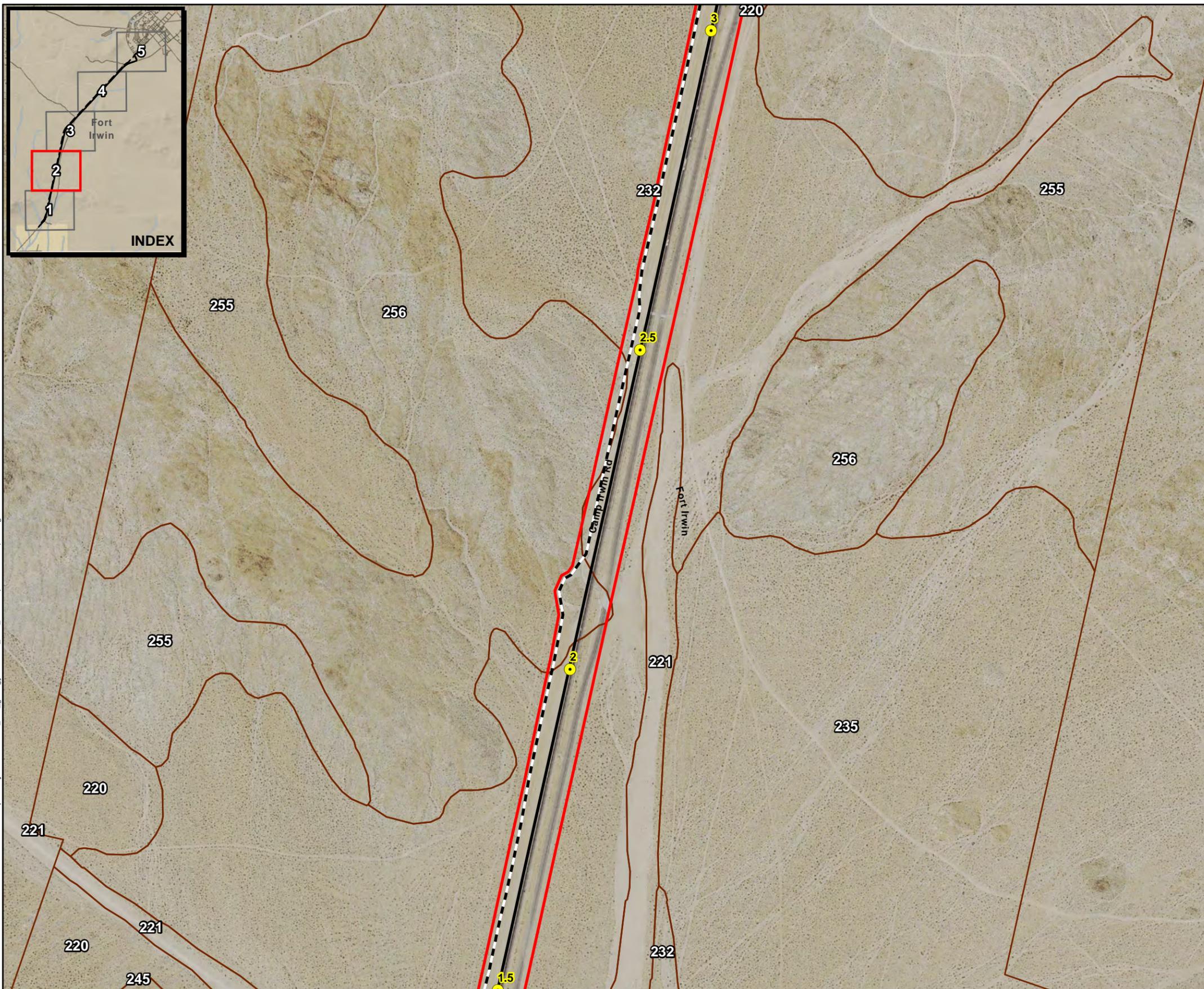
- 102 - MULESPRING-NEWERA-NOBLE PASS
- 220 - GARLOCK-AMBROSIA-ARIZO COMPLEX, 2 TO 8
- 221 - ARIZO COMPLEX, 2 TO 8 PERCENT
- 232 - ARIZO-CAJON COMPLEX, 2 TO 8 PERCENT
- 235 - OLYMPUS-CAJON COMPLEX, 2 TO 8 PERCENT
- 245 - DALVORD-ROCK OUTCROP-LANGWELL
- 255 - PAINTROCKS-ROCK OUTCROP COMPLEX, 4 TO 8
- 256 - ROCK OUTCROP-PAINTROCKS COMPLEX, 15
- NOTCOM - MAPPING NOT



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**Figure 11.
NRCS Soil Types Sheet: 2**



Map Features

- Biological Study Area
- Project Mile Marker
- Underground Route A
- Underground Route B

NRCS Soil Types

- 220 - GARLOCK-AMBROSIA-ARIZO COMPLEX, 2 TO 8
- 221 - ARIZO COMPLEX, 2 TO 8 PERCENT
- 232 - ARIZO-CAJON COMPLEX, 2 TO 8 PERCENT
- 235 - OLYMPUS-CAJON COMPLEX, 2 TO 8 PERCENT
- 245 - DALVORD-ROCK OUTCROP-LANGWELL
- 255 - PAINTROCKS-ROCK OUTCROP COMPLEX, 4 TO 8
- 256 - ROCK OUTCROP-PAINTROCKS COMPLEX, 15

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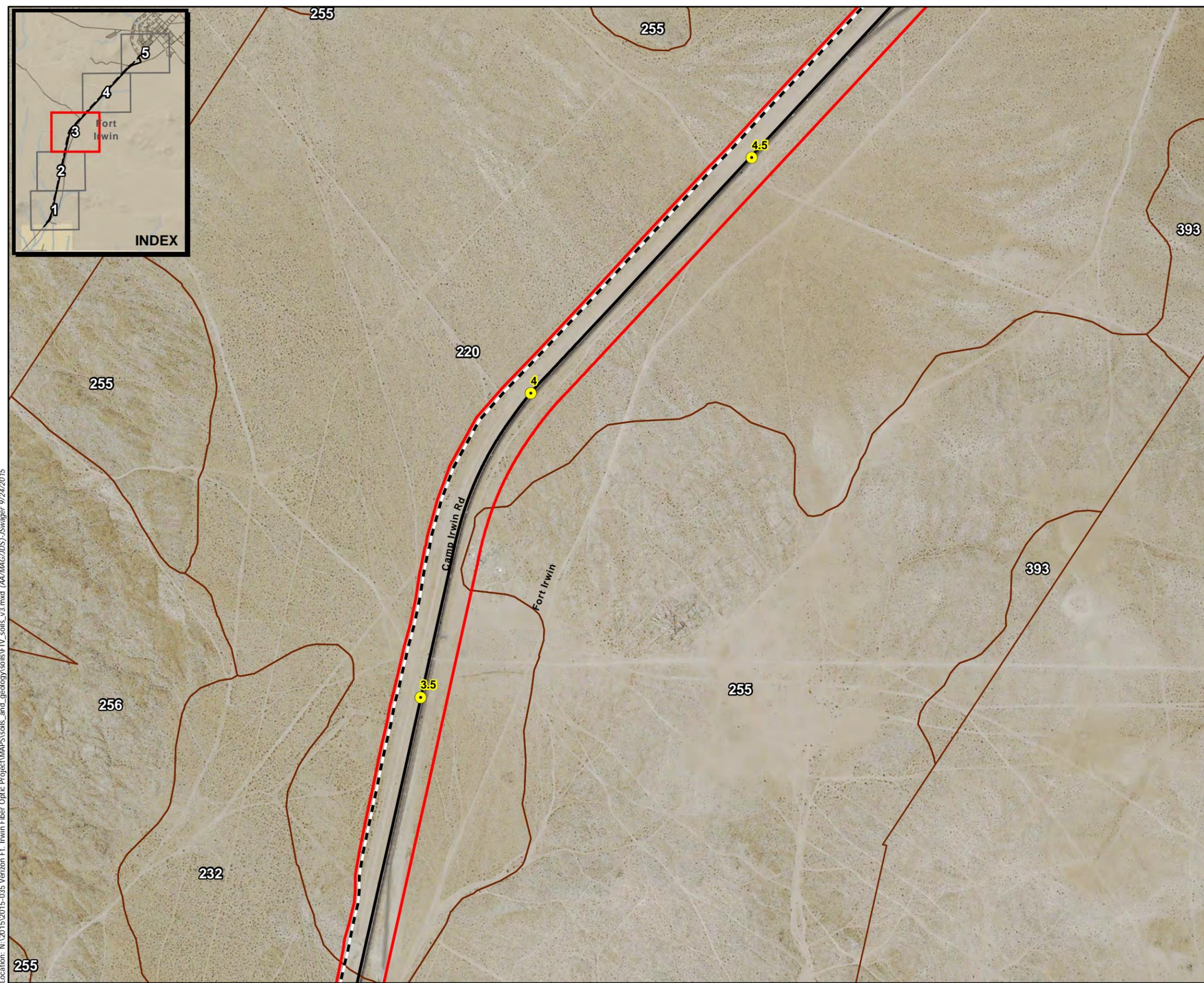
Figure 11.
NRCS Soil Types Sheet: 3

Map Features

-  Biological Study Area
-  Project Mile Marker
-  Underground Route A
-  Underground Route B

NRCS Soil Types

-  220 - GARLOCK-AMBROSIA-ARIZO COMPLEX, 2 TO 8
- 232 - ARIZO-CAJON COMPLEX, 2 TO 8 PERCENT
- 255 - PAINTROCKS-ROCK OUTCROP COMPLEX, 4 TO
- 256 - ROCK OUTCROP-PAINTROCKS COMPLEX, 15
- 393 - GRAVESUMIT-THERMOPYL COMPLEX, 2 TO 4



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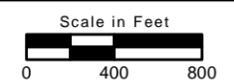


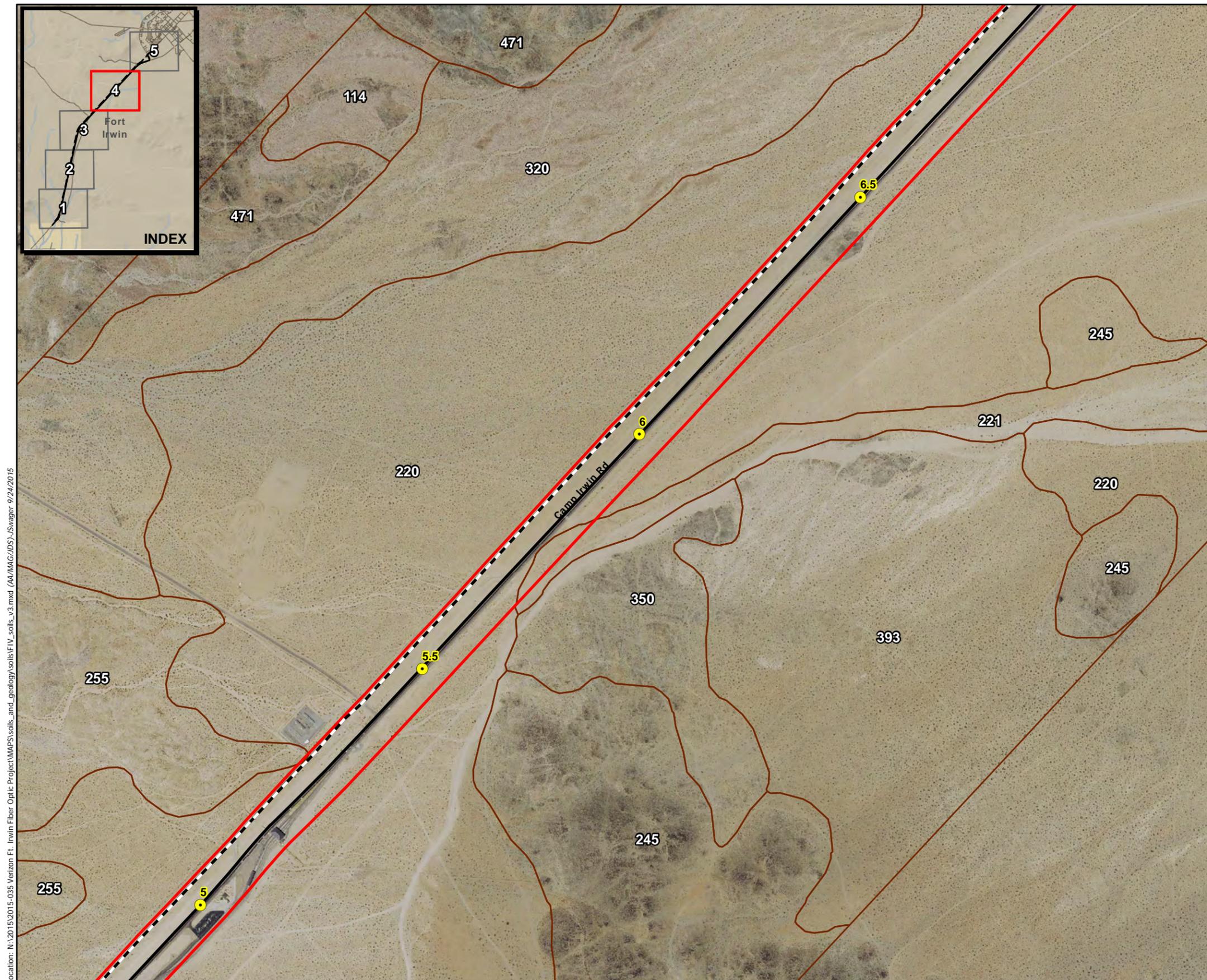
Figure 11.
NRCS Soil Types Sheet: 4

Map Features

- Biological Study Area
- Project Mile Marker
- Underground Route A
- Underground Route B

NRCS Soil Types

- 114 - CROSGRAIN COMPLEX, 2 TO 8 PERCENT
- 220 - GARLOCK-AMBROSIA-ARIZO COMPLEX, 2 TO 8
- 221 - ARIZO COMPLEX, 2 TO 8 PERCENT
- 245 - DALVORD-ROCK OUTCROP-LANGWELL
- 255 - PAINTROCKS-ROCK OUTCROP COMPLEX, 4 TO
- 320 - FORTIRWIN-GOLDDIVIDE-ARIZO ASSOCIATION, 2
- 350 - TWOBITTER-LANGWELL COMPLEX, 4 TO 15
- 393 - GRAVESUMIT-THERMOPYL COMPLEX, 2 TO 4
- 471 - NOBLE PASS COMPLEX, 8 TO 30 PERCENT



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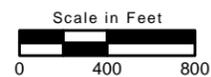
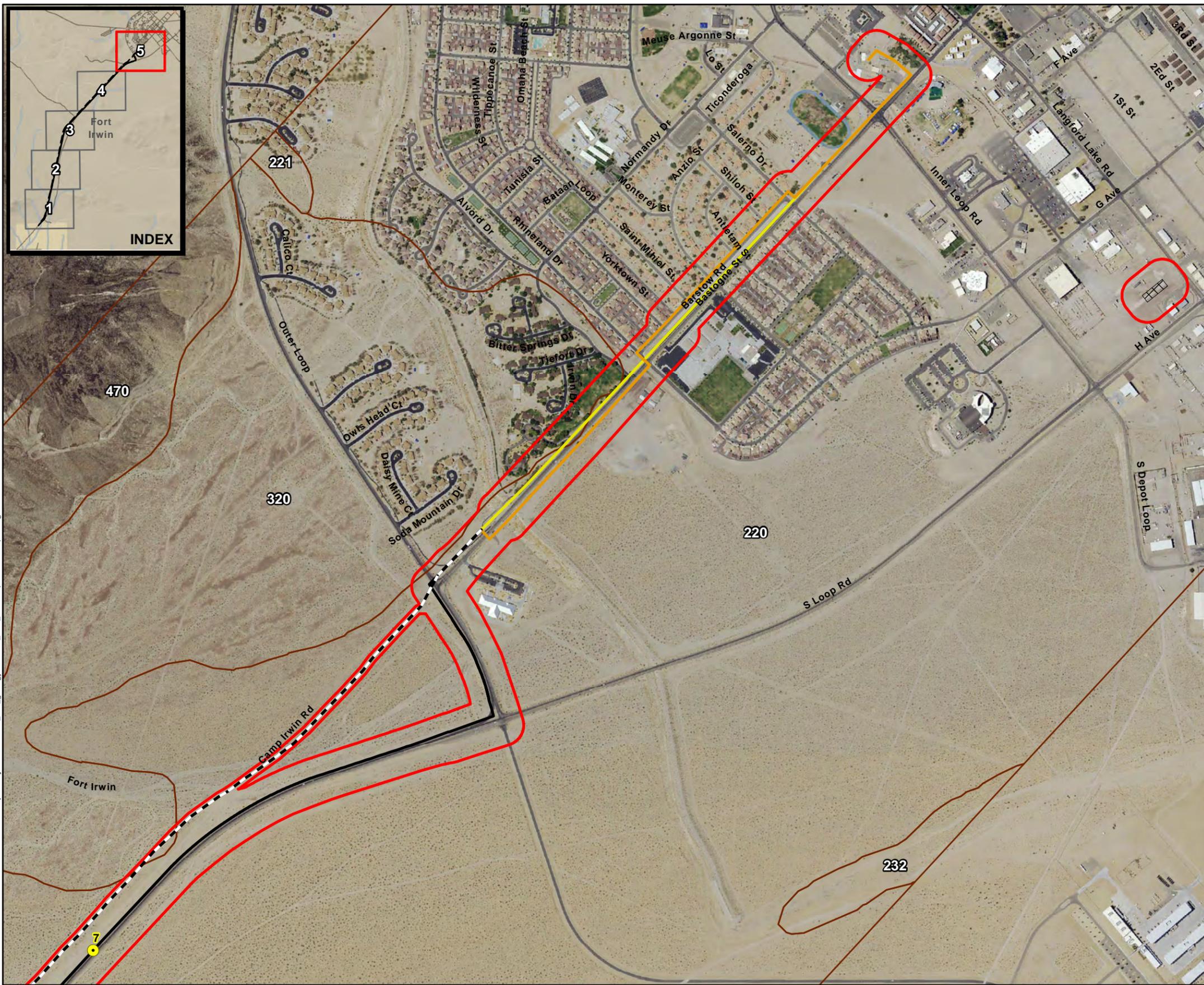


Figure 11.
NRCS Soil Types Sheet: 5



- Map Features**
- Biological Study Area
 - Project Mile Marker
 - Underground Route A
 - Underground Route B
 - Aerial Route A
 - Aerial Route B
 - Staging Area
- NRCS Soil Types**
- 220 - GARLOCK-AMBROSIA-ARIZO COMPLEX, 2 TO 8
 - 221 - ARIZO COMPLEX, 2 TO 8 PERCENT
 - 232 - ARIZO-CAJON COMPLEX, 2 TO 8 PERCENT
 - 320 - FORTIRWIN-GOLDDIVIDE-ARIZO ASSOCIATION, 2
 - 470 - NOBLE PASS-ROCK OUTCROP ASSOCIATION,

Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\WAPs\soils_and_geology\soils\FIV_soils_v3.mxd (44/MAG/IDS)-Swager 9/24/2015



4.5.2 Watersheds

The Project area is located within the Coyote-Cuddeback Lake (HUC 18090207) and the Mojave (HUC 18090208) Watersheds (Figure 12). Sub-watersheds include Paradise Springs-Coyote Lake (HUC 180902070307), Jack Spring (HUC 180902070306), and Garlic Spring (HUC 18090281501).

4.5.2.1 Coyote-Cuddeback Lakes watershed

The Coyote-Cuddeback Lakes watershed encompasses approximately 1,828 square miles and is located entirely within San Bernardino County. The primary geographic and hydrologic features of the watershed are Coyote and Cuddeback Lakes (dry). The Project area is located in the southeastern part of the watershed, which drains towards Coyote Lake. Coyote Lake measures approximately 6,457 acres in size and receives runoff flows from the surrounding Mountains (Alvord Mountain to the east, Paradise Range to the north, Lane Mountain to the west, and Calico Peak to the southwest). Coyote Lake is located approximately three miles south of the Project area.

4.5.2.2 Mojave Watershed

The Mojave Watershed encompasses approximately 4,500 square miles and is located entirely within San Bernardino County. The primary geographic and hydrologic feature of the watershed is the Mojave River. The headwaters of the Mojave River are in the San Bernardino Mountains, which annually receives greater than 40 inches of precipitation at its highest elevation. Much of the winter precipitation in the San Bernardino Mountains falls in the form of snow that provides spring recharge for the Mojave River system. The Mojave River channel, through both surface and subsurface flow, transects the watershed a linear distance of approximately 120 miles to its terminus at Silver Dry Lake near the Community of Baker. Aside from intense storm events, the Mojave River Channel is typically dry downstream of the Mojave Forks Dam except in select locations where ground water is forced to the surface by shallow subsurface geologic formations (CalEPA 2013). The Mojave River has typically been considered to be jurisdictional to the U.S. Army Corps of Engineers under the federal Clean Water Act Section 404.

4.6 Jurisdictional Findings

4.6.1 Potential USACE Jurisdiction

None of the drainages occurring within the Project area are considered jurisdictional Waters of the U.S., subject to Section 404 of the CWA (33 U.S.C. 1344) because of the lack of a downstream connection to a navigable waterway. In the decision of Solid Waste Agency of Northern Cook County v. Army Corps of Engineers (Solid Waste Agency of Northern Cook County [SWANCC]), 531 U.S. 159, the Supreme Court upheld a decision in 2001 that USACE could not regulate isolated, intrastate waters that do not bear a "significant nexus" to traditional navigable waters or interstate waters (at least in most cases).

The Project area contains many ephemeral streams, drainages that contain flows only during and immediately following a storm event. Within the jurisdictional study area (50-foot buffer from the proposed alignments) a total of 17.667 acres of ephemeral stream were mapped (Figure 13).

Runoff in the Project area, from approximately the security checkpoint to the south end of the project, primarily flows north to south towards Coyote Lake (dry lake). Runoff in the Project area, from approximately the security checkpoint to the north end of the project, primarily flows from west to east towards Langford Well Lake (dry lake). Both of these dry lakes are natural sinks with no outlets, and, therefore, "isolated." Drainages in the project area are isolated geologically from other groundwater basins, and the drainages are not considered "navigable" nor are they used for "interstate commerce." Because they drain to natural sinks with no outlet, the ephemeral streams in the Project area are considered "isolated" and not subject to jurisdiction under Section 404.

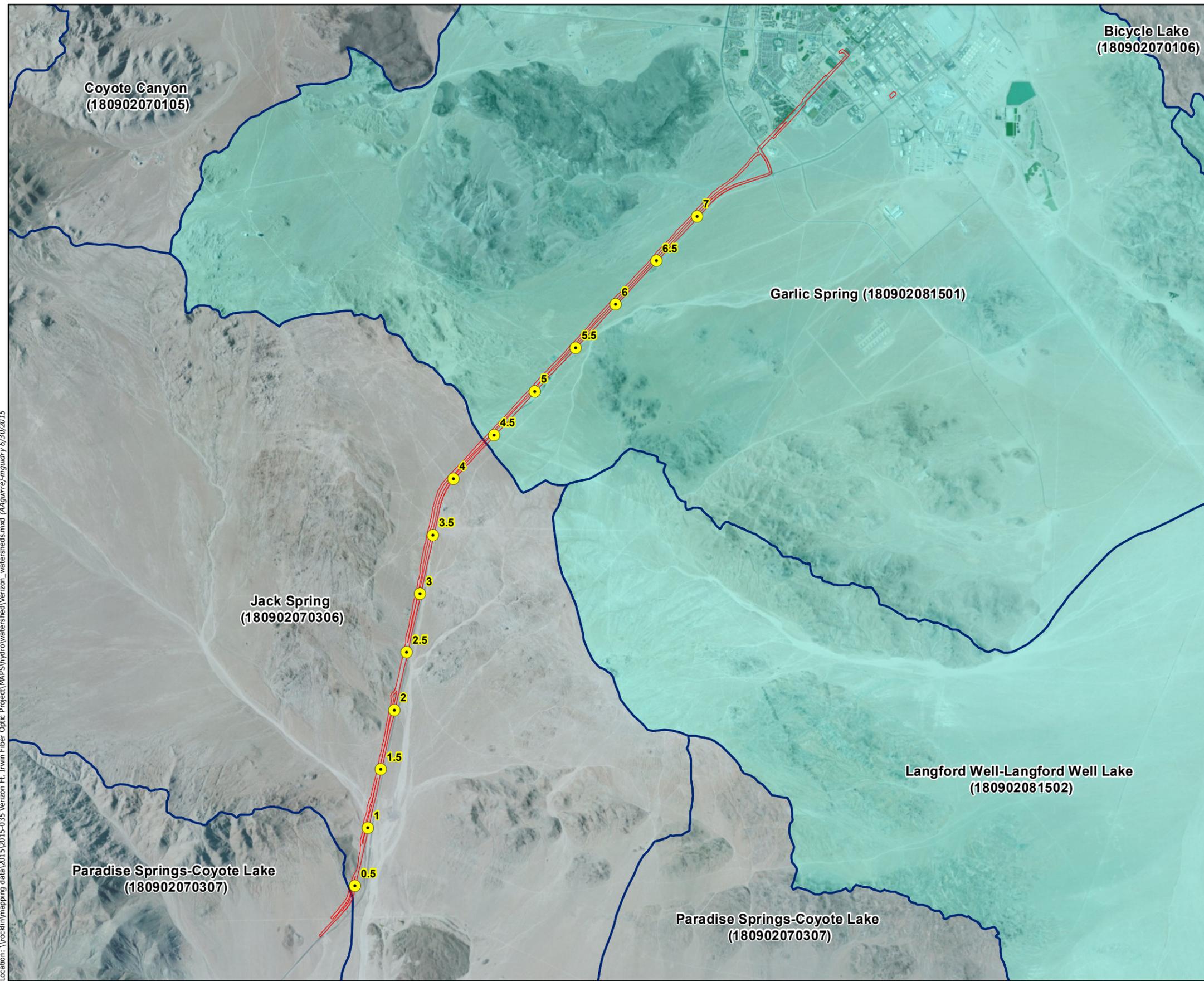
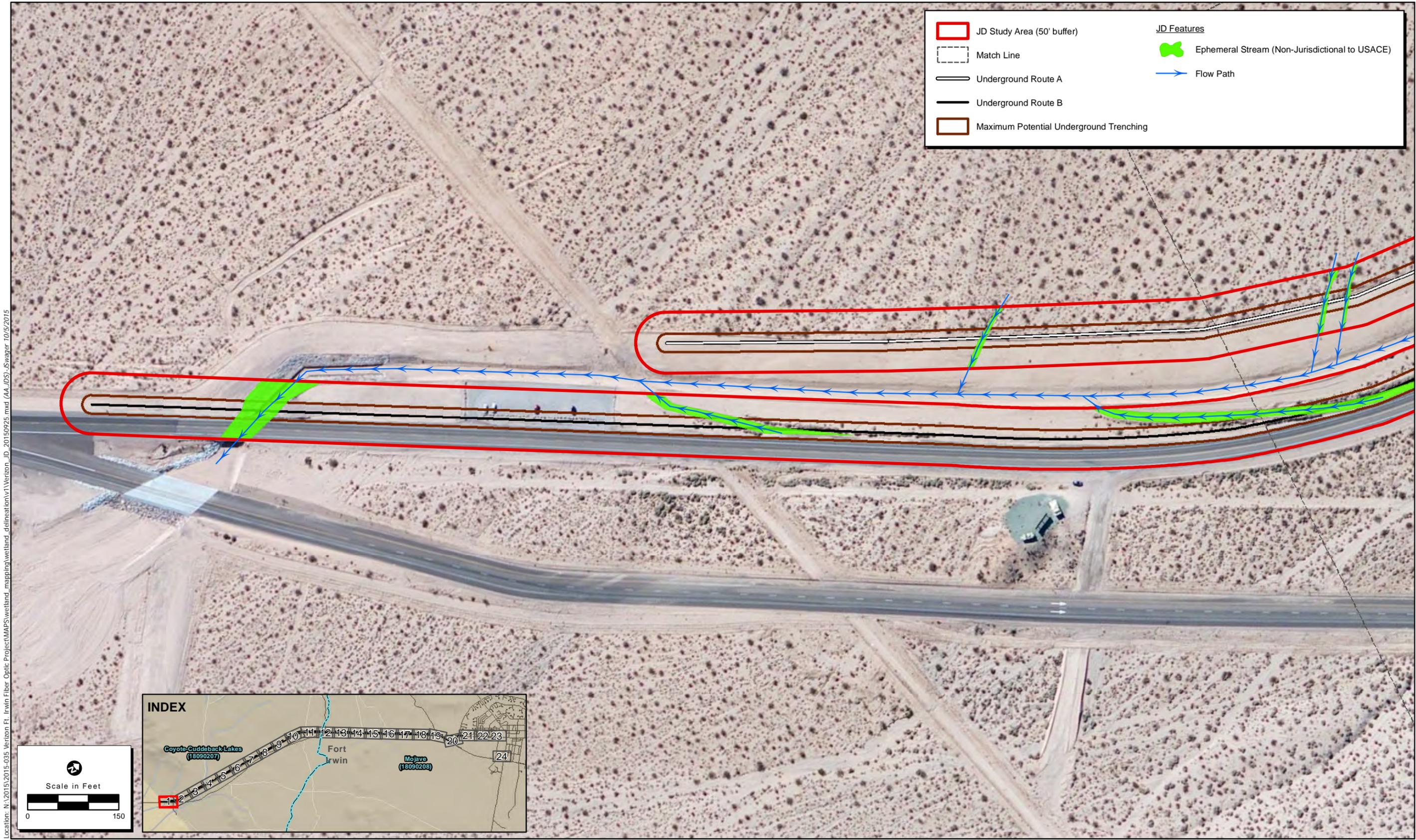


Figure 12. Watersheds

- Map Features**
-  Project Mile Marker
 -  JD Study Area (50' buffer)
 -  HUC 12 Watersheds
- Watersheds (8 Digit HUCs)**
-  Coyote-Cuddeback Lakes (18090207)
 -  Mojave (18090208)

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Map Date: 10/5/2015
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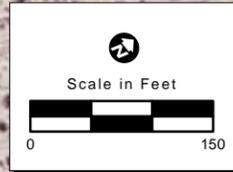
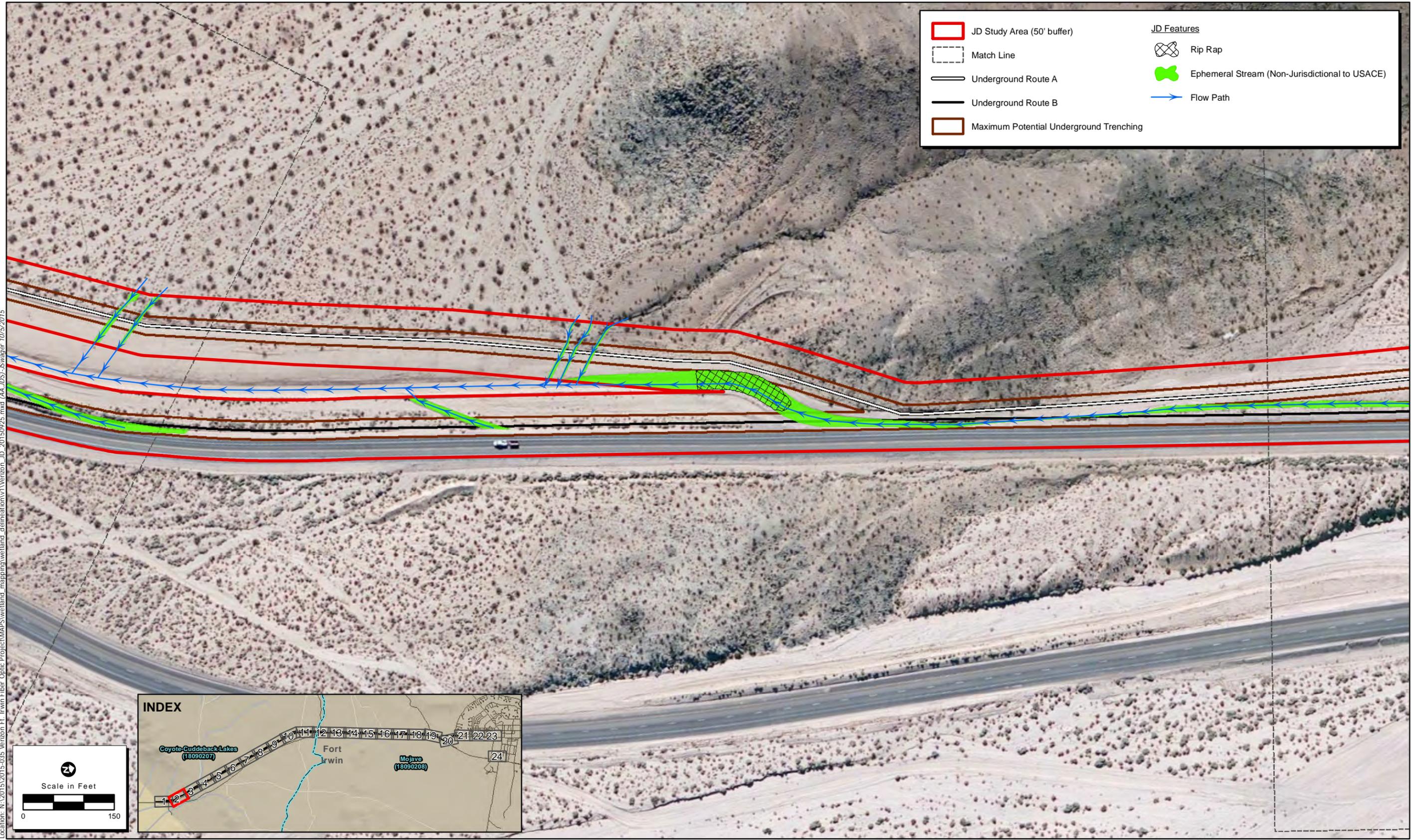


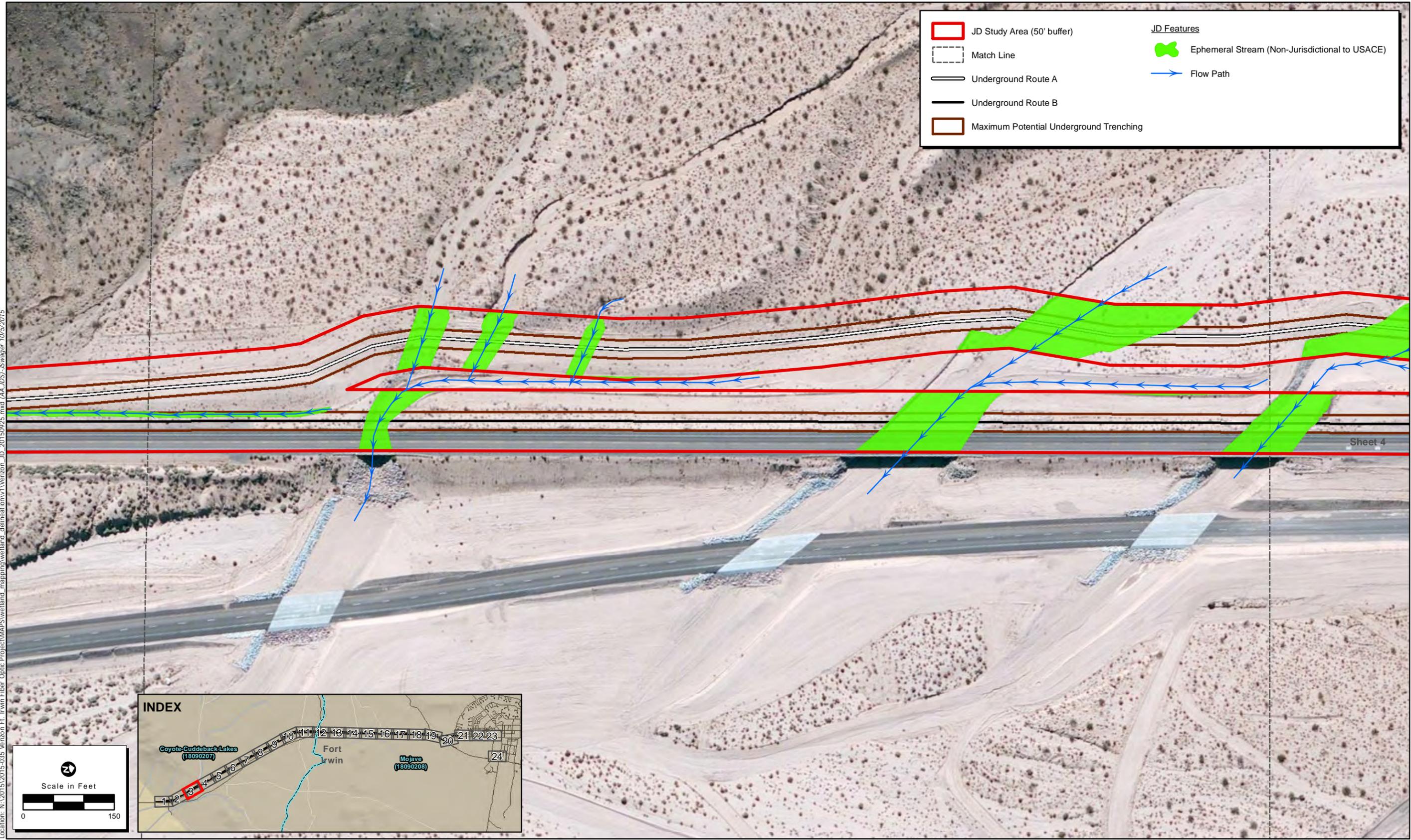
Figure 13. Jurisdictional Delineation: Sheet 1 of 24



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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 2 of 24



	JD Study Area (50' buffer)	JD Features	
	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\wetland_mapping\wetland_delineation\1\Verizon_ID_20150925.mxd (AA_IDS)_Svager 10/5/2015

Sheet 4

Scale in Feet



Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 3 of 24

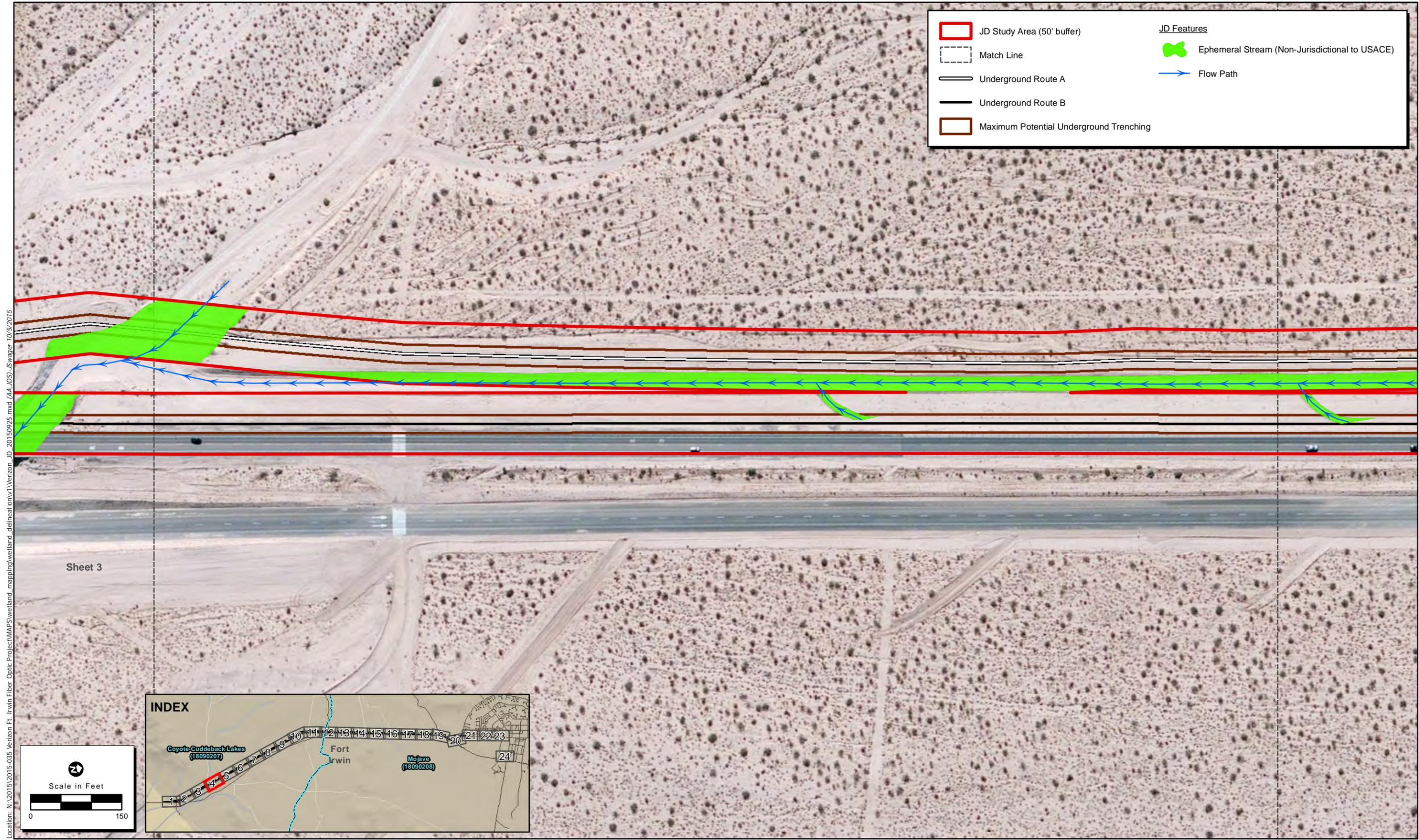
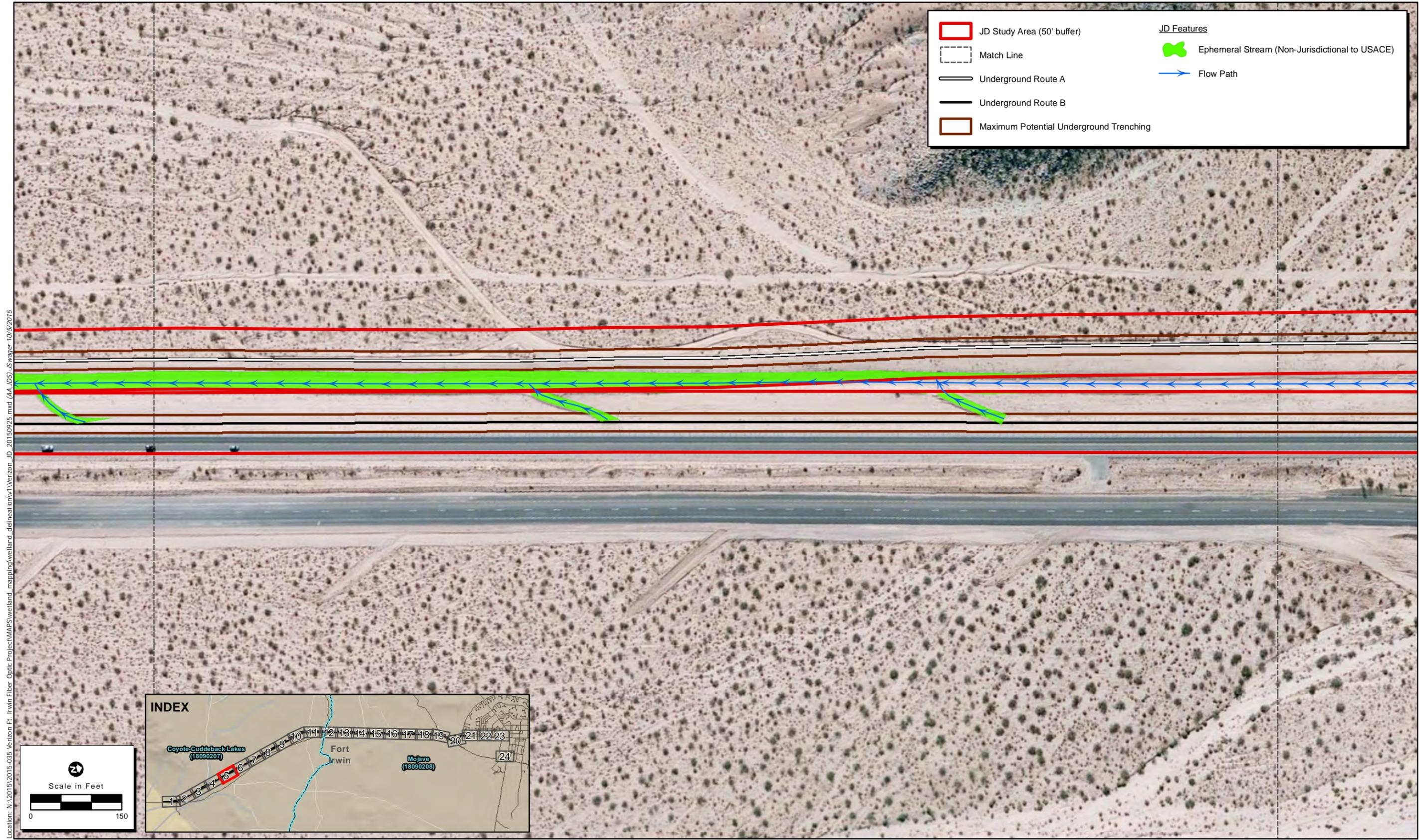


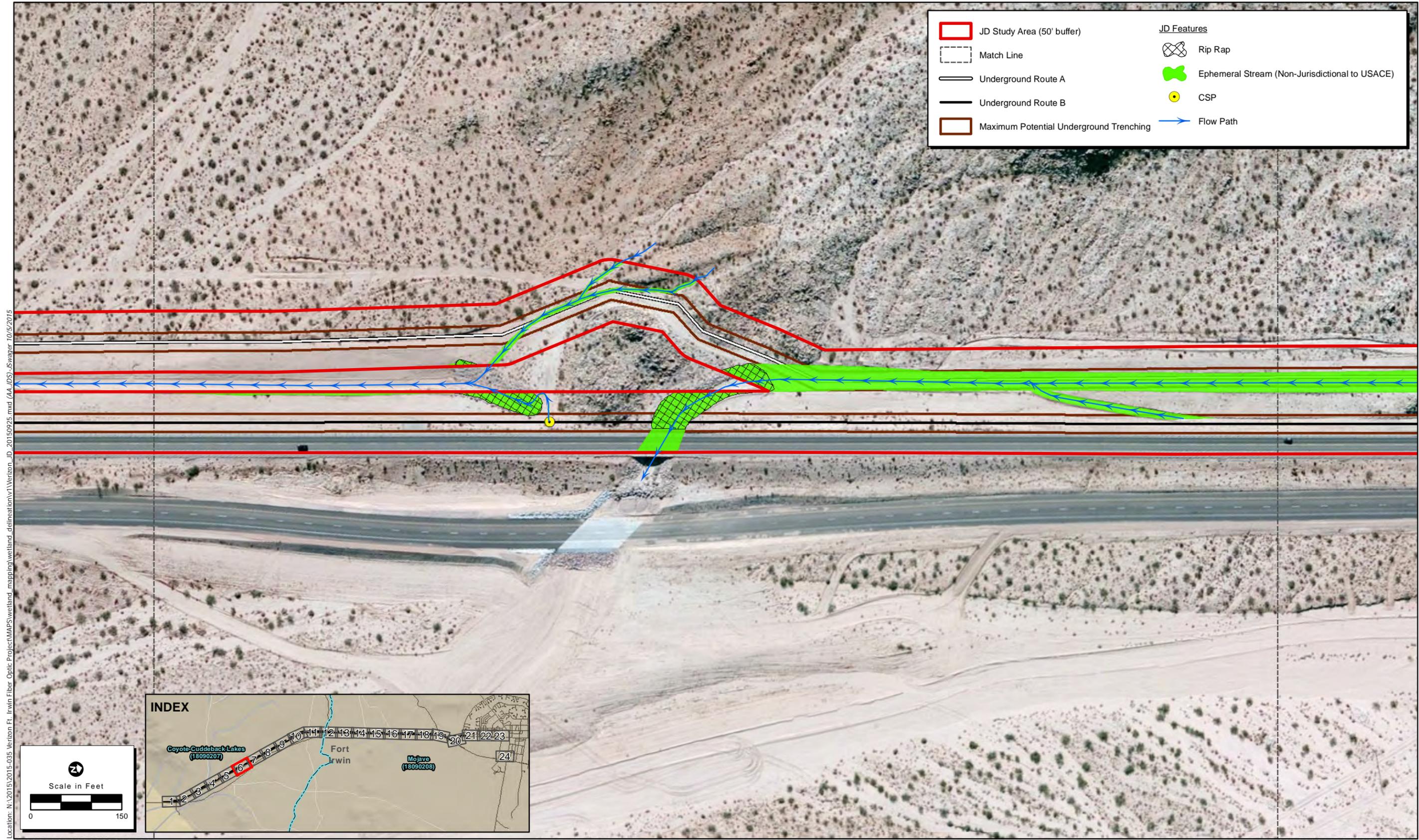
Figure 13. Jurisdictional Delineation: Sheet 4 of 24



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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 5 of 24

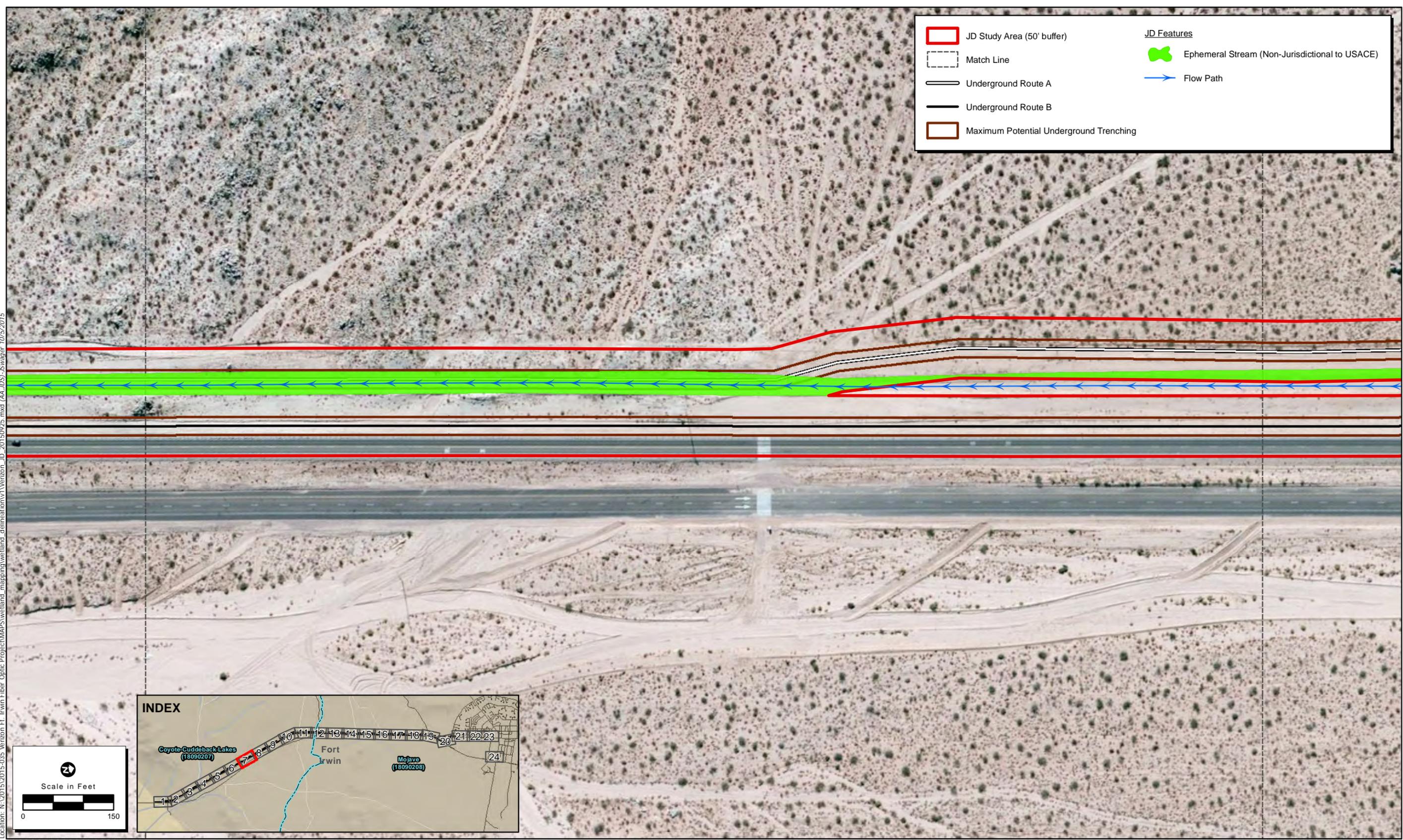


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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 6 of 24

Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\Wetland_delineation\Verizon_JD_20150925.mxd (AA_DS)_Svagner_10/5/2015



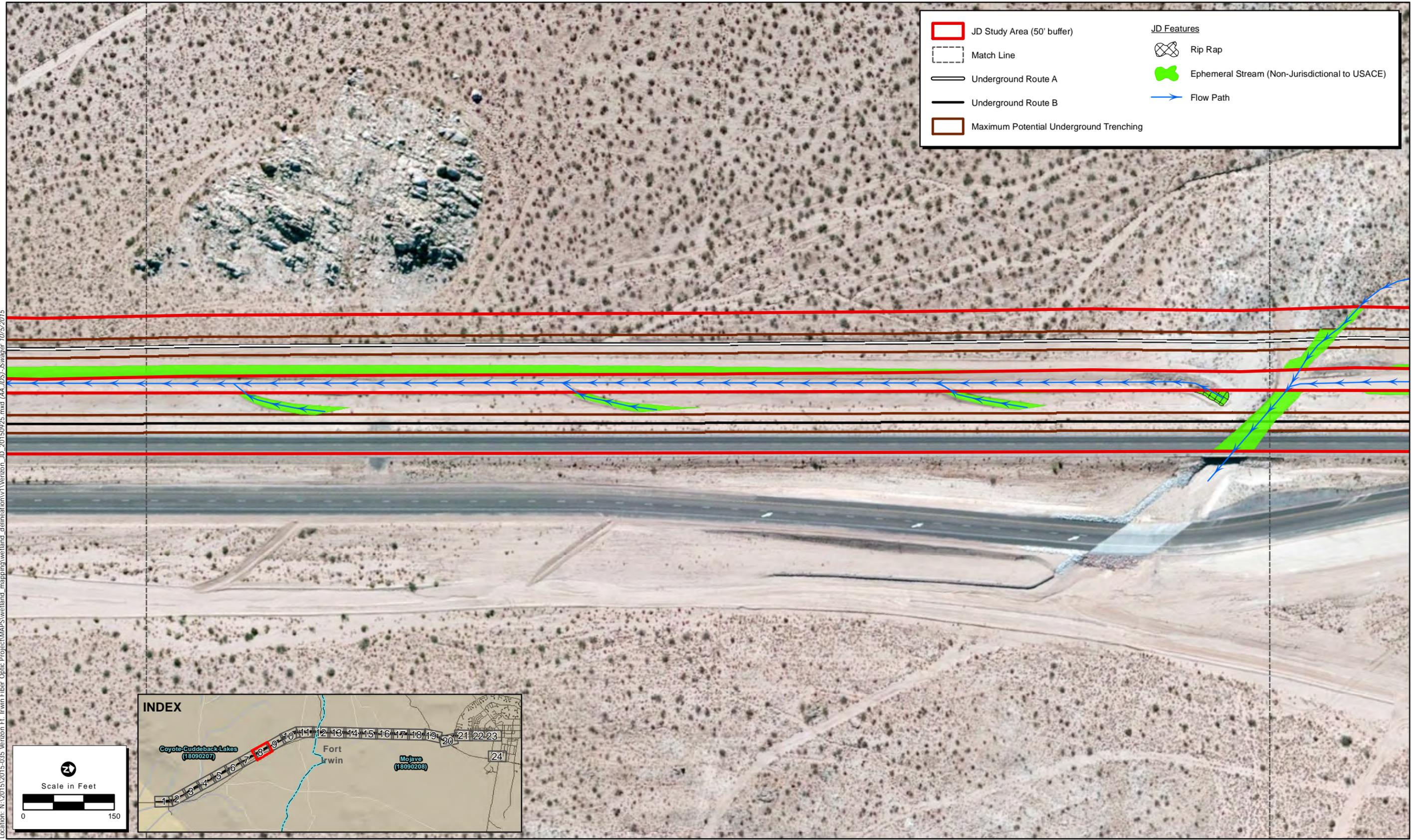
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	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

Scale in Feet



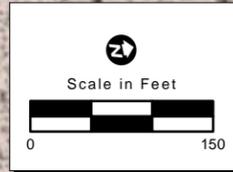
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Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 7 of 24



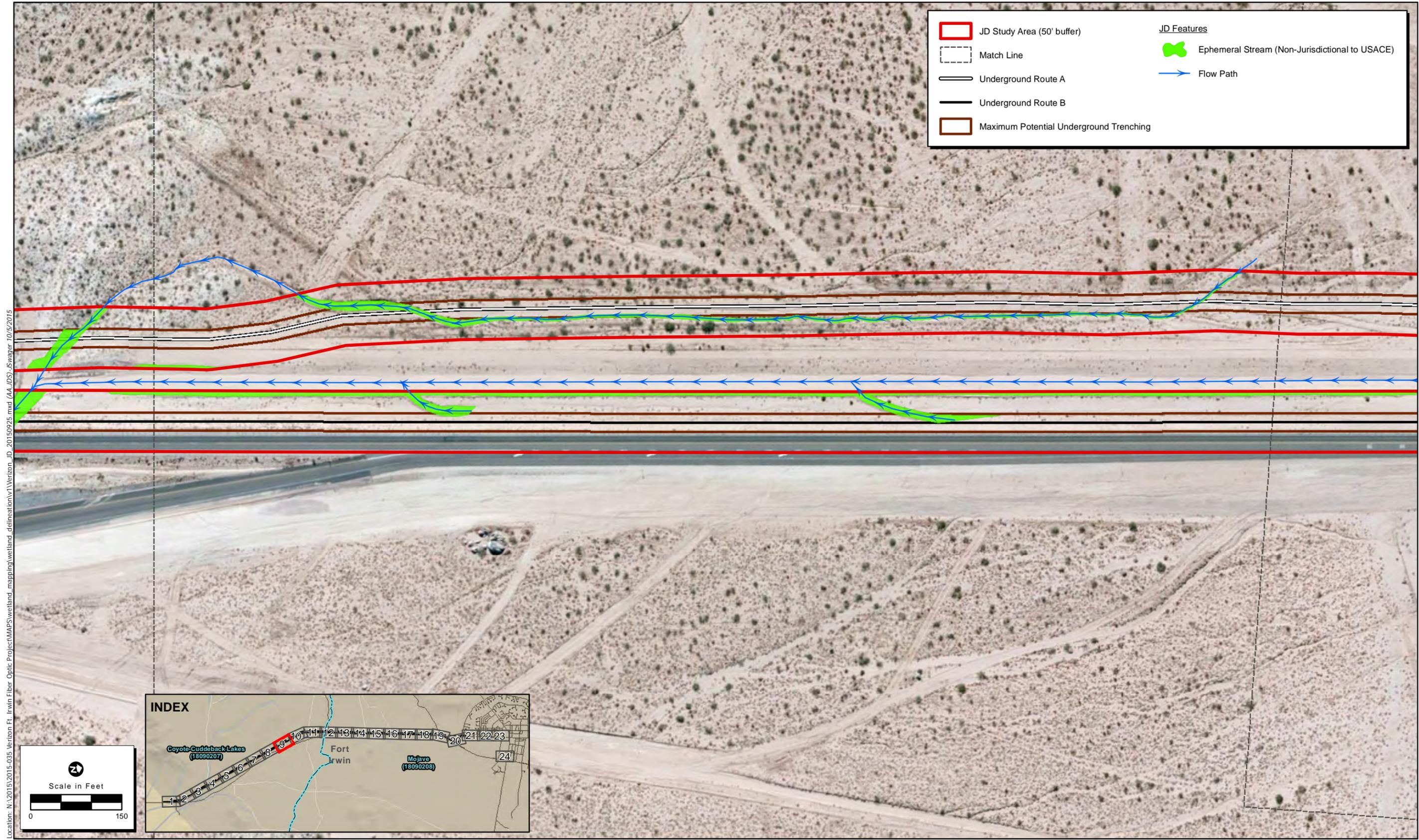
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	JD Study Area (50' buffer)	JD Features	
	Match Line		Rip Rap
	Underground Route A		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route B		Flow Path
	Maximum Potential Underground Trenching		



Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 8 of 24

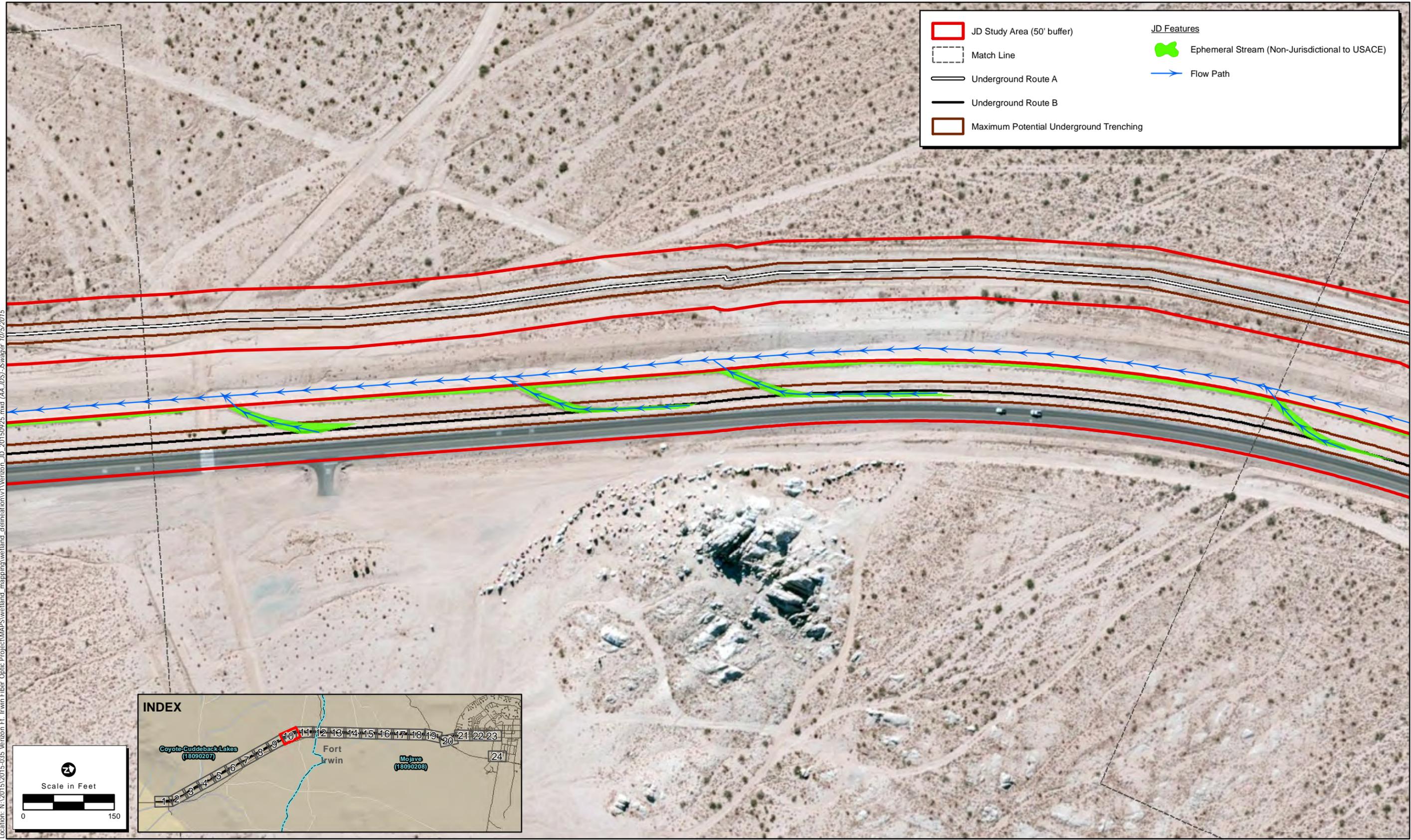


	JD Study Area (50' buffer)	JD Features	
	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\Wetland_delineation\Verizon_ID_20150925.mxd (AA_DS)_Svagner_10/5/2015

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 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 9 of 24



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\Wetland_delineation\1\Verizon_ID_20150925.mxd (AA_IDS)_Svager 10/5/2015

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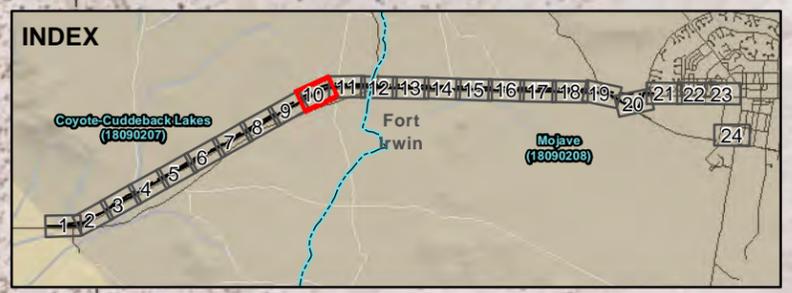
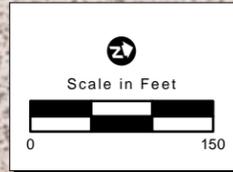
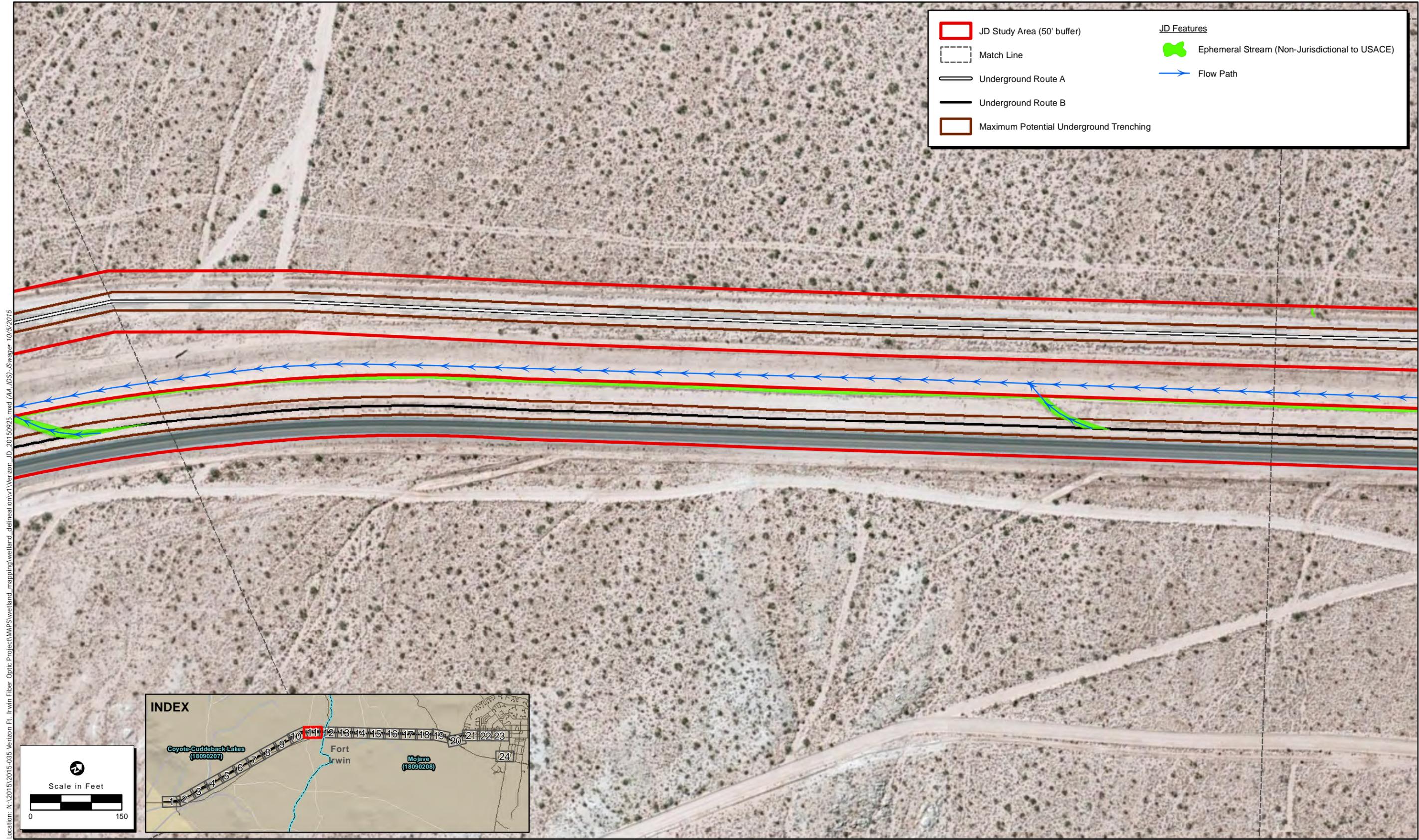


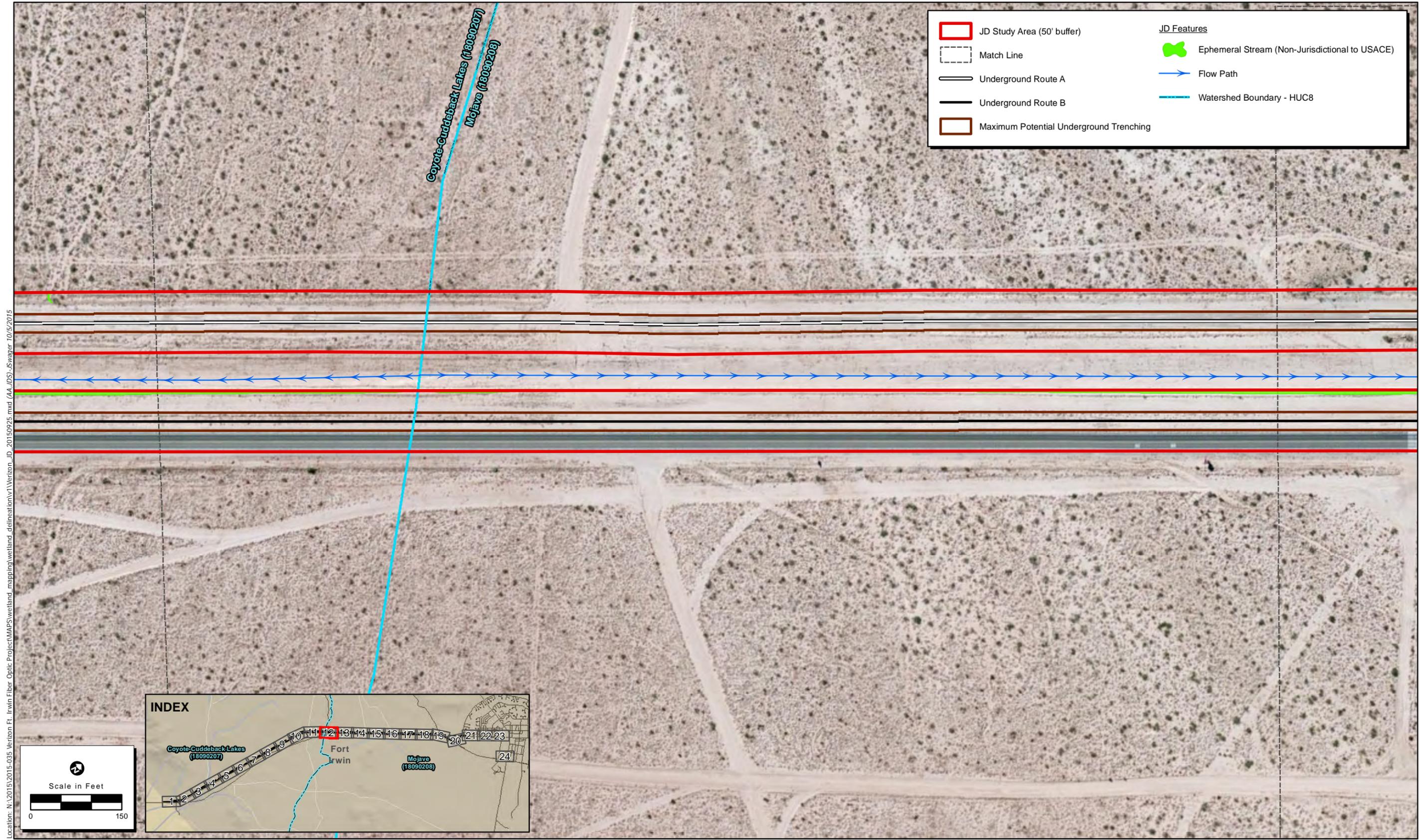
Figure 13. Jurisdictional Delineation: Sheet 10 of 24



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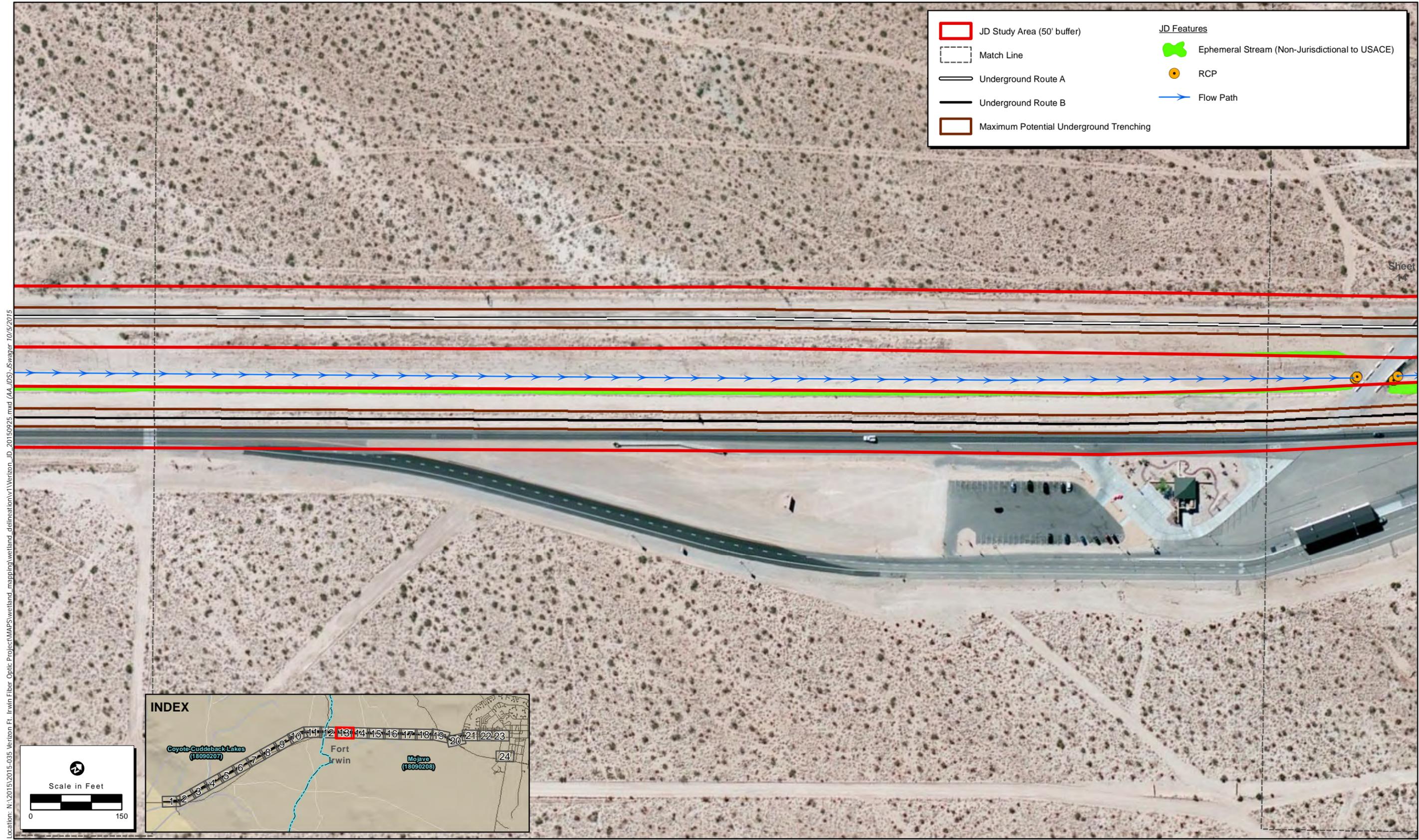
Figure 13. Jurisdictional Delineation: Sheet 11 of 24



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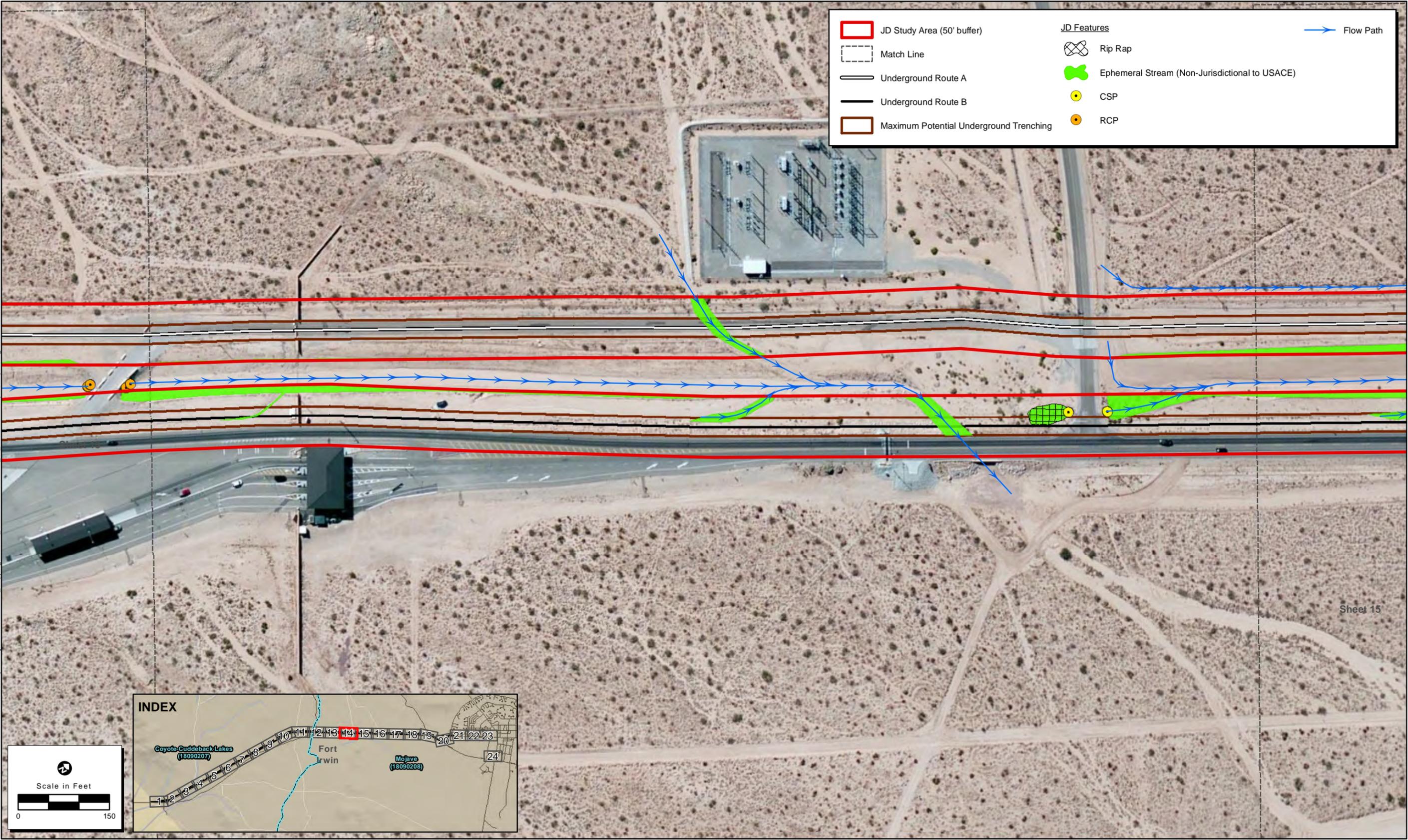
Figure 13. Jurisdictional Delineation: Sheet 12 of 24



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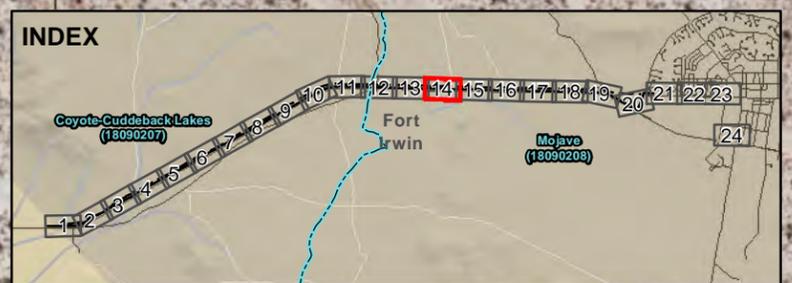
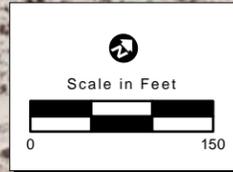
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Figure 13. Jurisdictional Delineation: Sheet 13 of 24



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Sheet 15



Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 14 of 24

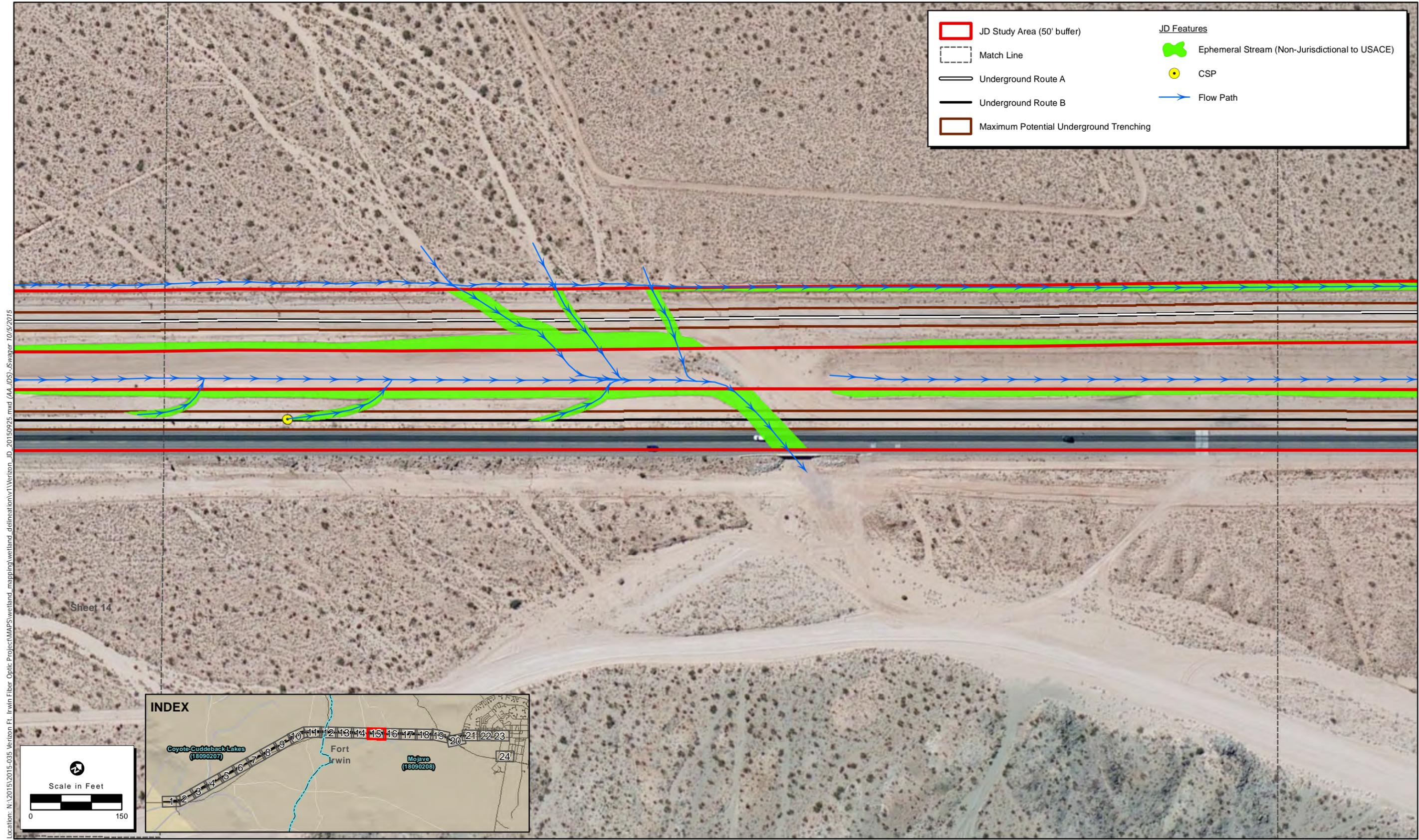
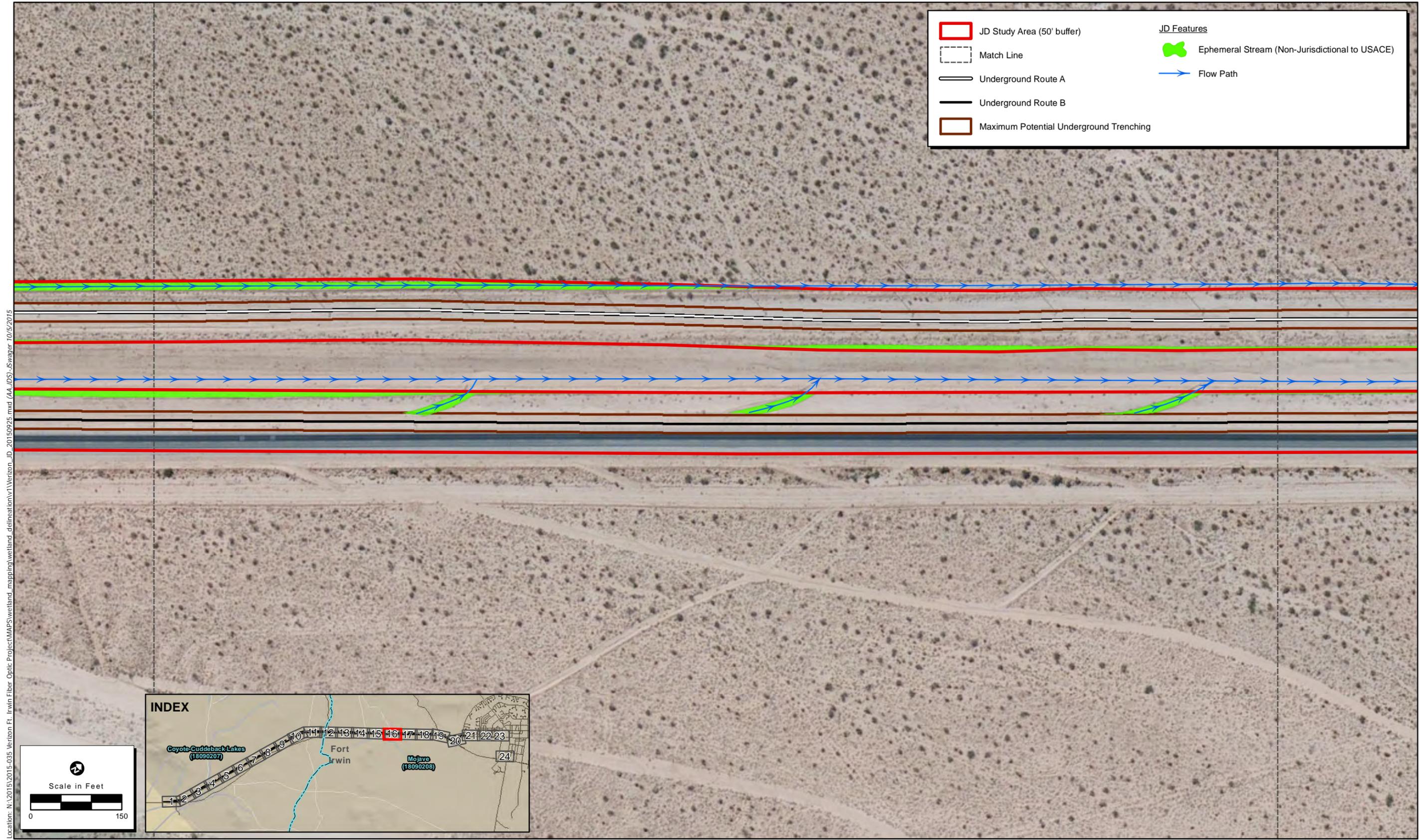


Figure 13. Jurisdictional Delineation: Sheet 15 of 24

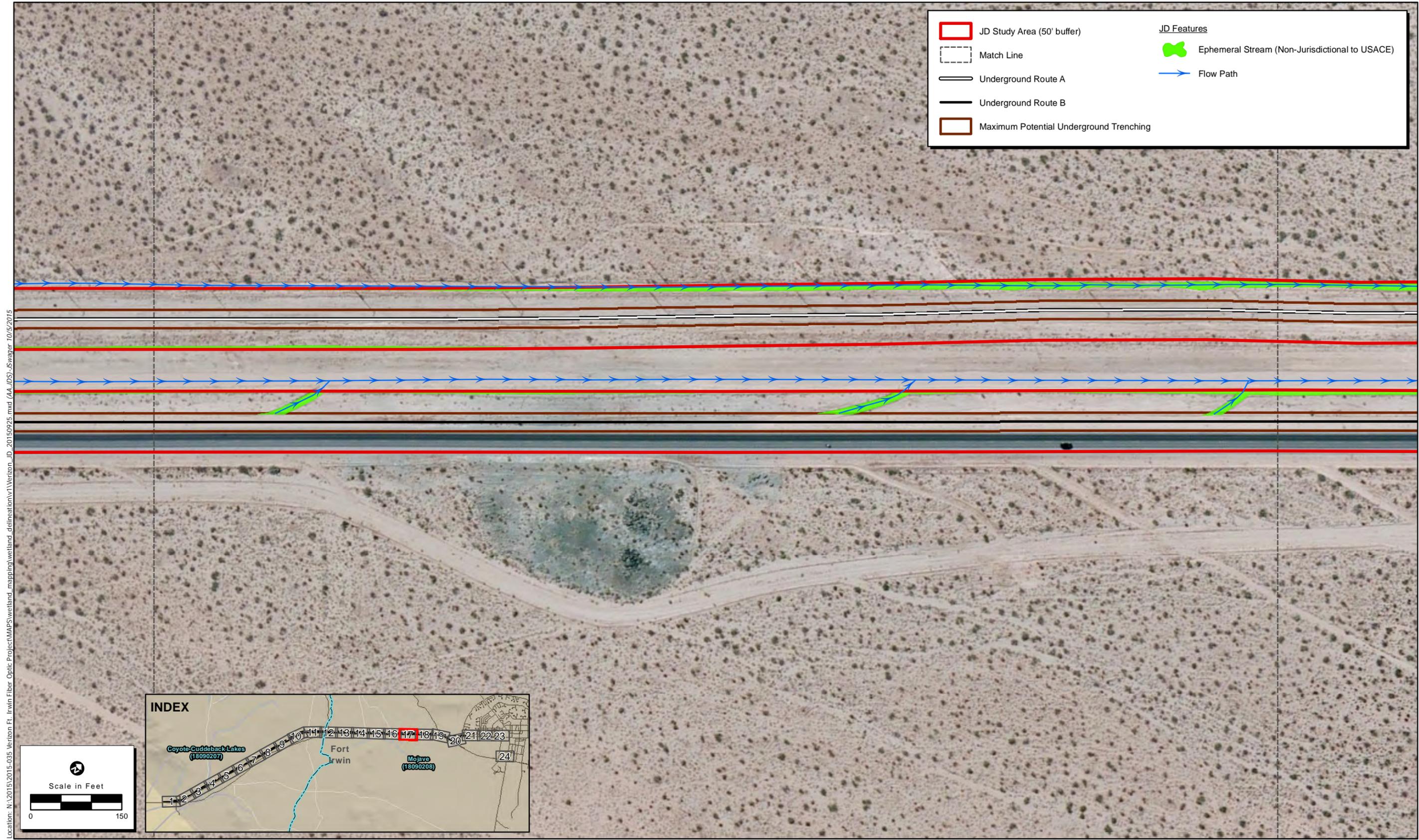


	JD Study Area (50' buffer)	JD Features	
	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 16 of 24



	JD Study Area (50' buffer)	JD Features	
	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

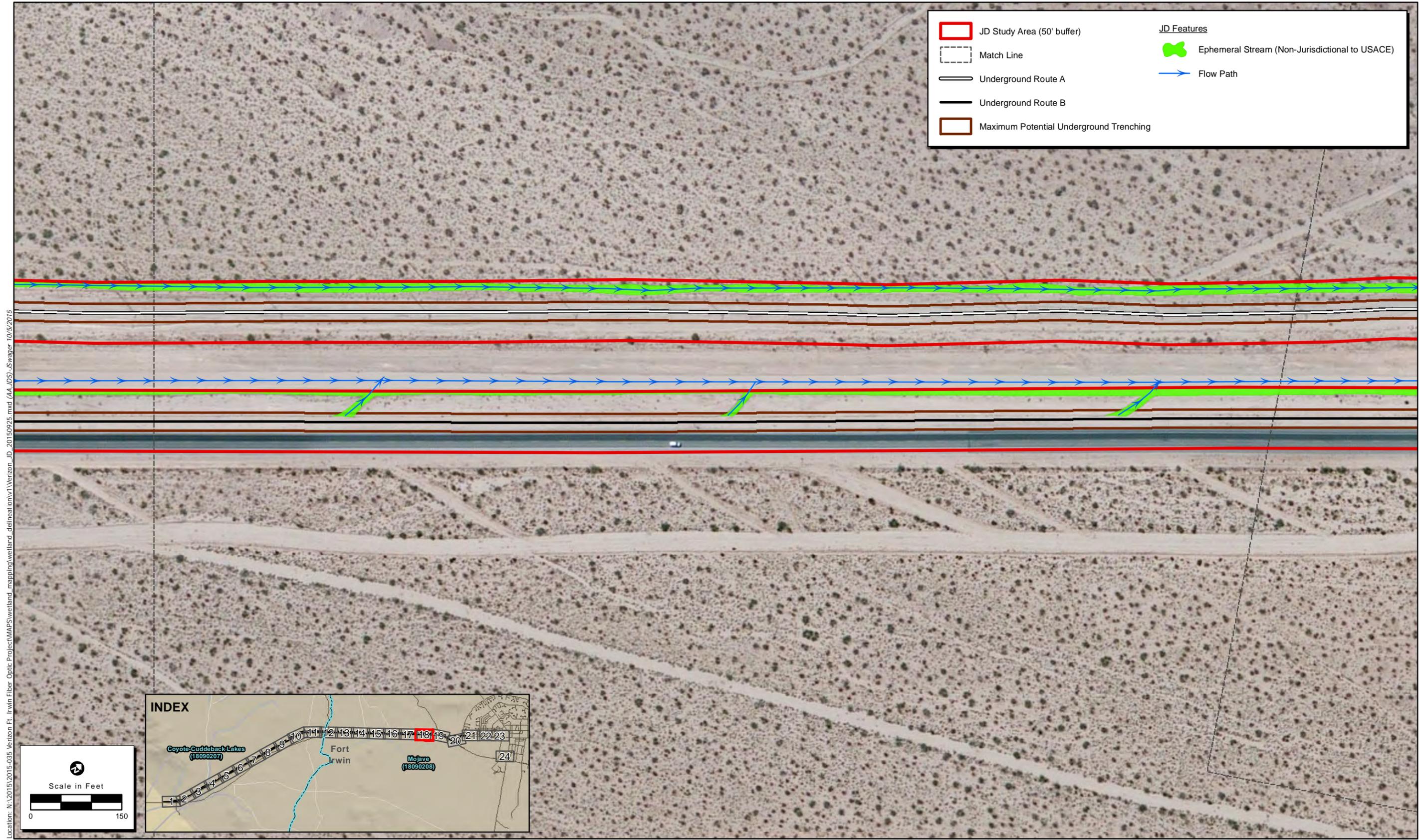
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Scale in Feet



Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 17 of 24



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\Wetland_delineation\1\Verizon_JD_20150925.mxd (AA_JDS)_Svager 10/5/2015

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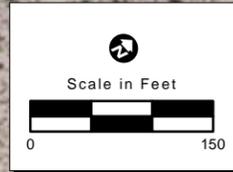
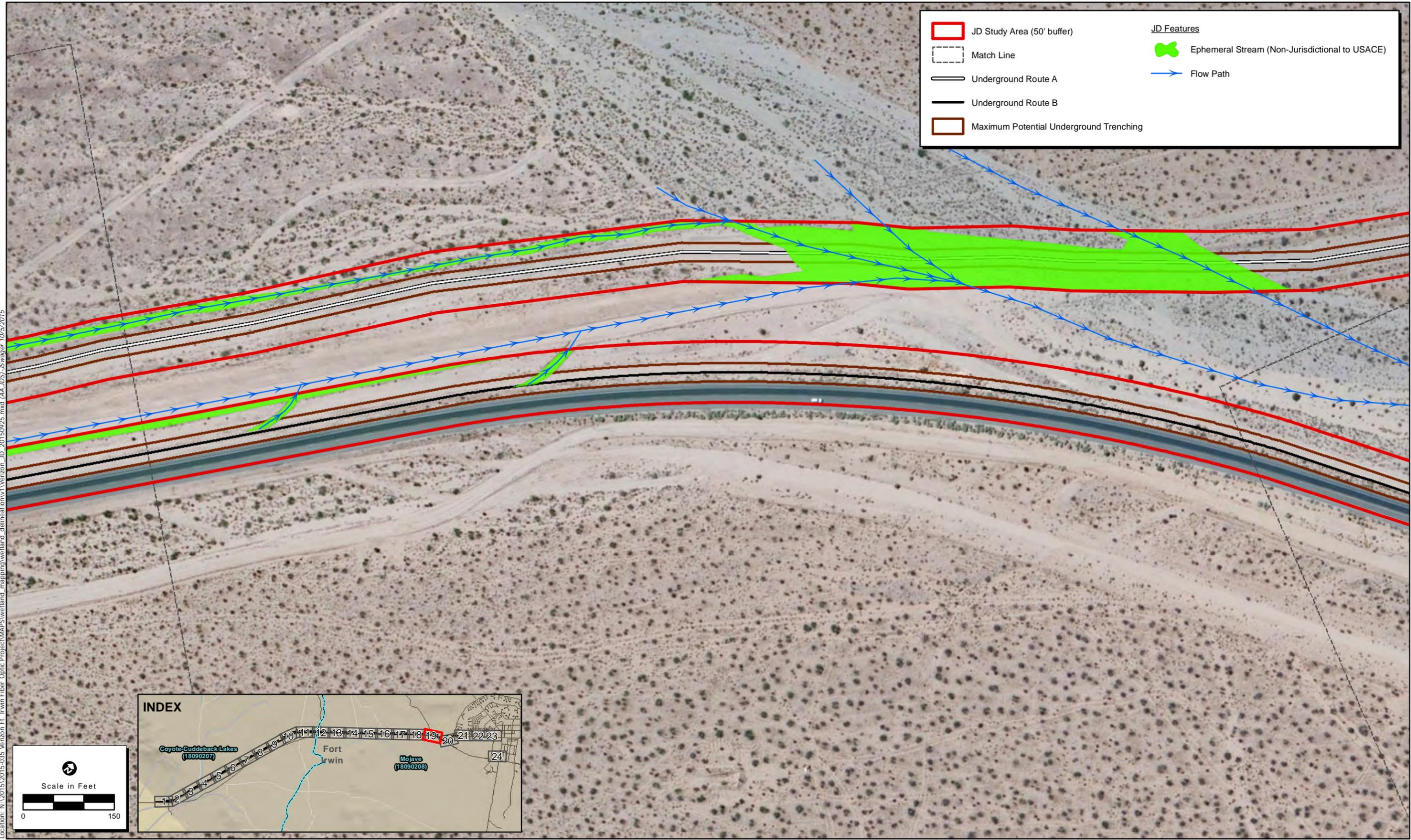


Figure 13. Jurisdictional Delineation: Sheet 18 of 24



	JD Study Area (50' buffer)	JD Features	
	Match Line		Ephemeral Stream (Non-Jurisdictional to USACE)
	Underground Route A		Flow Path
	Underground Route B		
	Maximum Potential Underground Trenching		

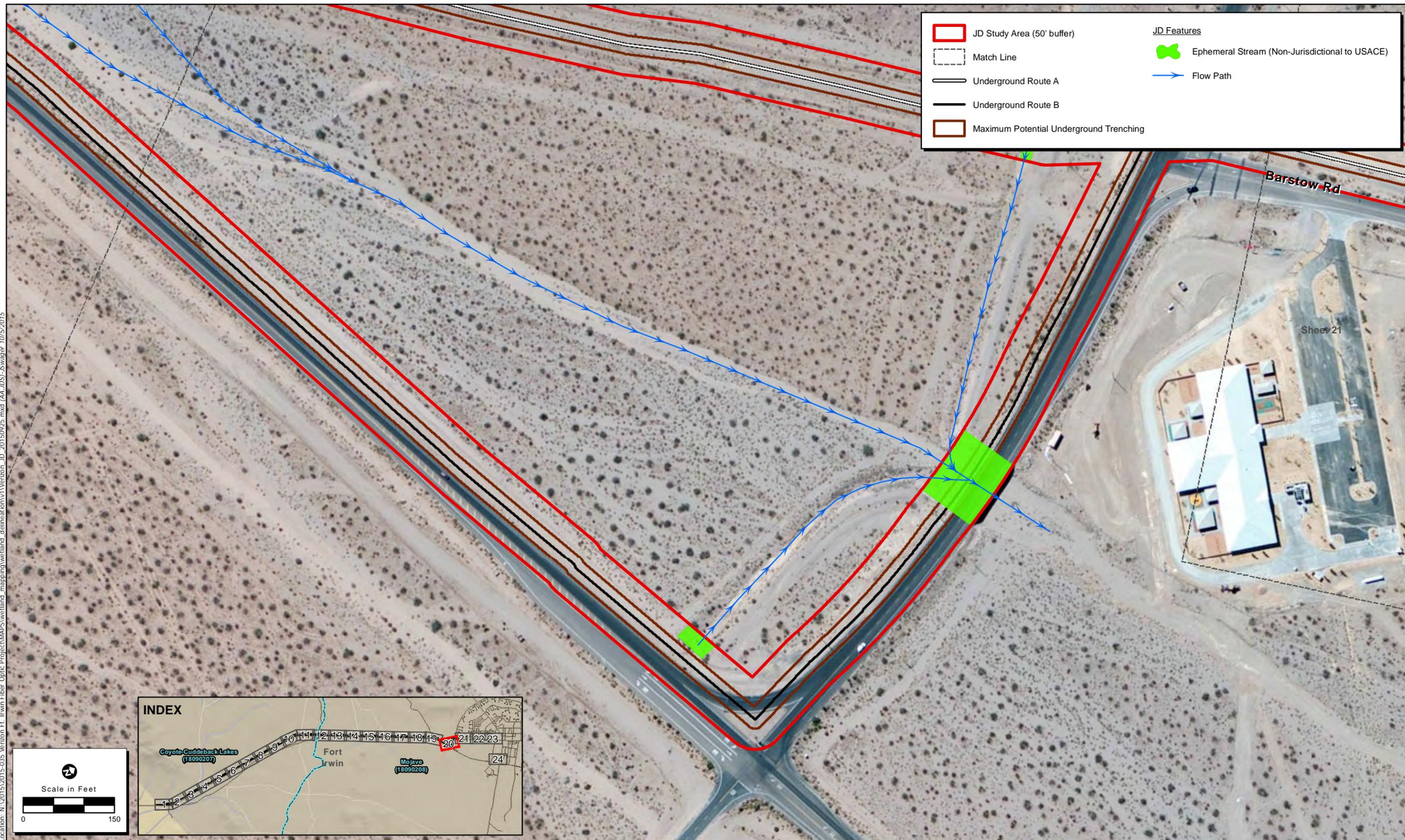
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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015



Figure 13. Jurisdictional Delineation: Sheet 19 of 24

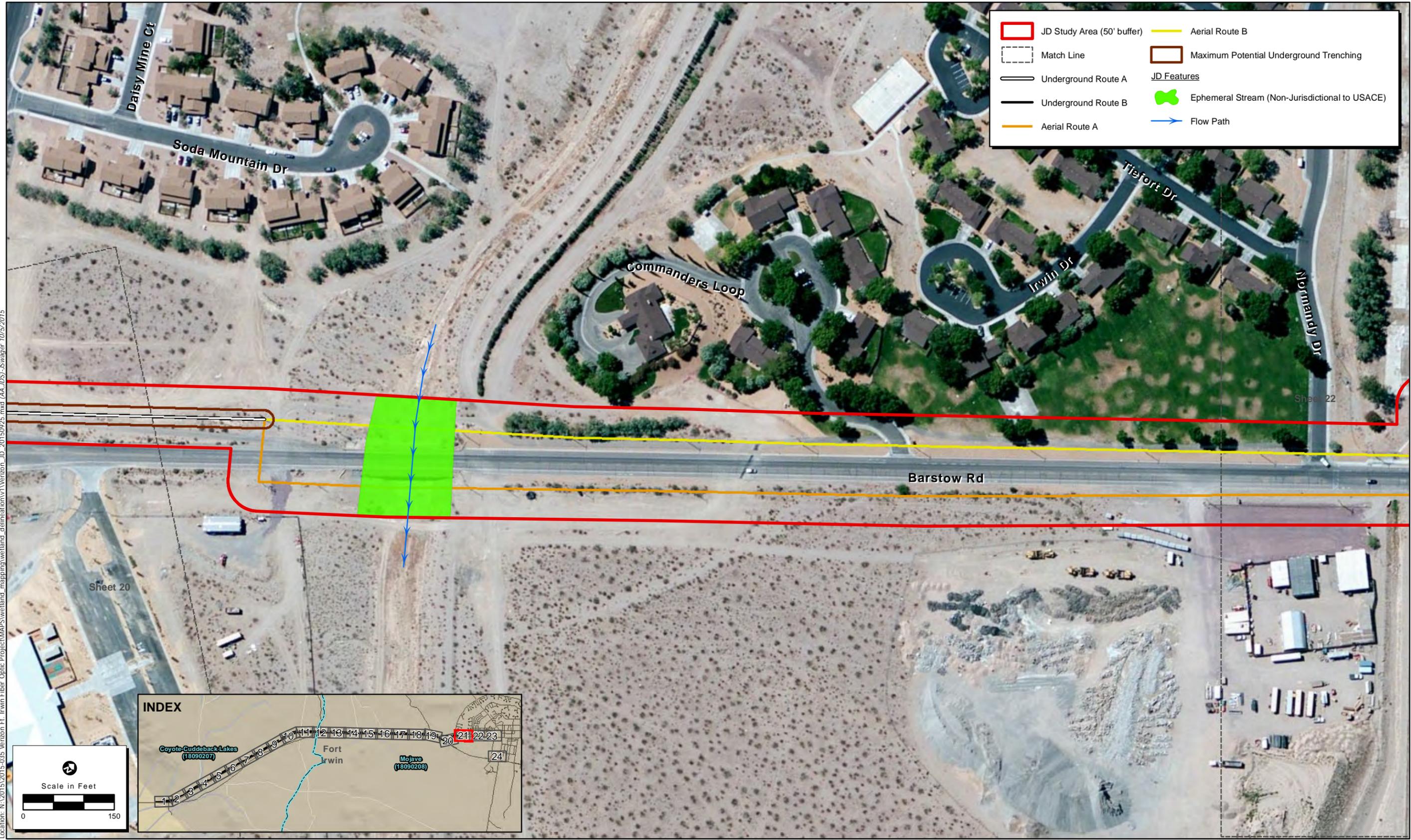
2015-035 Ft. Irwin Verizon



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Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 20 of 24



	JD Study Area (50' buffer)		Aerial Route B
	Match Line		Maximum Potential Underground Trenching
	Underground Route A	JD Features	
	Underground Route B		Ephemeral Stream (Non-Jurisdictional to USACE)
	Aerial Route A		Flow Path

Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\Map\Wetland_mapping\Wetland_delineation\1\Verizon_JD_20150925.mxd (AA_JDS)_Svager 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 21 of 24

Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\Wetland_delineation\1\Verizon_ID_20150925.mxd (AA_IDS)_Svager 10/5/2015

Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 22 of 24



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\Wetland_mapping\wetland_delineation\Verizon_ID_20150925.mxd (AA_IDS)_Svagner_10/5/2015

Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 23 of 24



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\wetland_mapping\wetland_delineation\1\Verizon_JD_20150925.mxd (AA_JDS)_Svager 10/5/2015

Map Date: 10/5/2015
 Photo Source: ArcGIS USA Imagery - Accessed 10/5/2015

Figure 13. Jurisdictional Delineation: Sheet 24 of 24

4.6.2 Potential RWQCB Jurisdiction

Although the various streams identified within the Project area are considered to be isolated and not subject to USACE jurisdiction, they are potentially regulated by the Regional Water Quality Control Board (RWQCB) because they support surface water runoff. Isolated non-navigable waters and wetlands excluded from USACE jurisdiction are subject to RWQCB authority and any discharge of waste (including fill) may require a Report of Waste Discharge and may be subject to Waste Discharge Requirements by the RWQCB.

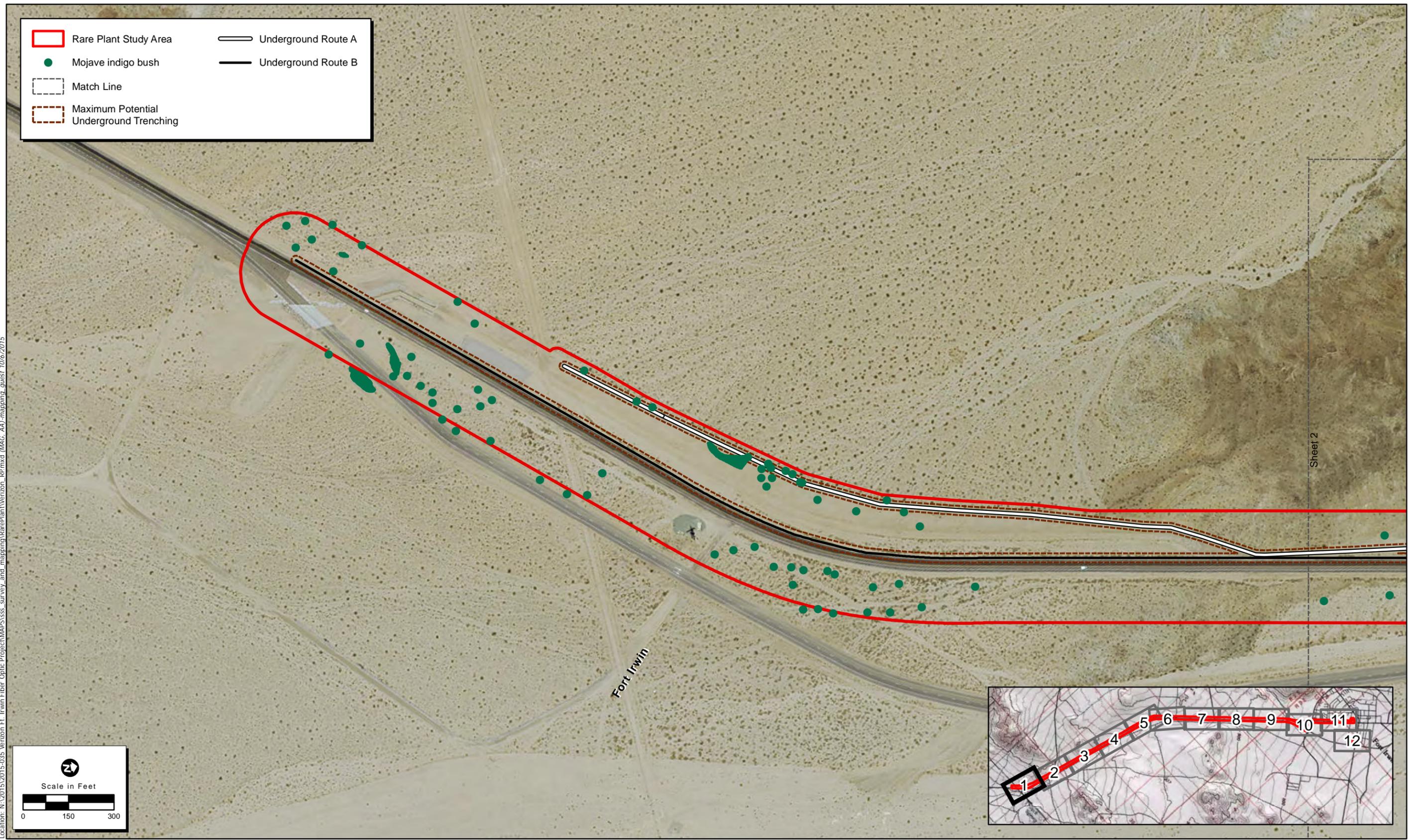
4.7 Focused Biological Surveys

4.7.1 Rare Plant Surveys

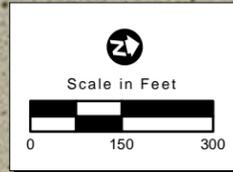
After visiting two reference populations (Table 7) ECORP did not find any observable Lane Mountain milkvetch specimens or dead growth from the previous year. However, the 2015 annual survey for Lane Mountain milkvetch conducted by Fort Irwin botanists yielded numerous observations of this species (Clarence Everly, personal communication, July 30, 2015), indicating that the species would have been detected had it been present during surveys. When the desert cymopterus reference population was checked it was found to be observable with mature seeds. Based on the vegetation map, it was determined that suitable habitat for rare plants was not present for either Aerial Placement Routes A or B, nor the Staging Area, therefore the rare plant survey did not include those components. During the focused rare plant survey none of the target rare plant species were observed. One CRPR 4.3 (limited distribution, not very threatened in California) plant species, Mojave indigo bush (*Psoralea arborescens* var. *arborescens*), was encountered throughout the survey (Figure 14). This species is not considered to be a special-status species as defined by the Fort Irwin INRMP. This shrub was observed growing within desert wash scrub and margins of desert wash scrub that overlapped with creosote bush scrub. Sixteen individual indigo bushes were observed within the maximum potential temporary impact area for Underground Route A and two polygons (areas where more than one plant was concentrated) were observed. The first polygon, located on Sheet 1 on Figure 14, occupied a total of 3,311 square feet, however only 448 square feet (13.5 percent) of that polygon fell within the maximum potential temporary impact area. The second polygon, located on Sheet 2 on Figure 14, occupied a total of 1,337 square feet; however, only 15 square feet (1.1 percent) of that polygon fell within the maximum potential temporary impact area. One individual Mojave indigo bush was observed within the maximum potential temporary impact area for Underground Route B.

Table 7. Rare Plant Reference Populations Visited

Date Visited	Scientific Name	Common Name	Location	Status	Results
April 13, 2015	<i>Cymopterus deserticola</i>	Desert cymopterus	Harper Lake Road and Santa Fe Avenue within a desert wash. Lockhart, CA.	CRPR 1B.2	Observable, with mature seeds.
April 17, 2015	<i>Astragalus jaegerianus</i>	Lane Mountain milkvetch	Unnamed Road within Fort Irwin NTC that is west of Fort Irwin Road and begins 1.2 miles north intersection of Sandy Lane and Fort Irwin Road. 2013 RECORD: UC2025798.	Federally Endangered; CRPR 1B.1	No observable specimens.
April 17, 2015	<i>Astragalus jaegerianus</i>	Lane Mountain milkvetch	0.3 miles north-northwest of intersection of Coolgardie Road and Route 96. 2010 RECORD: RSA792523.	Federally Endangered; CRPR 1B.1	No observable specimens.

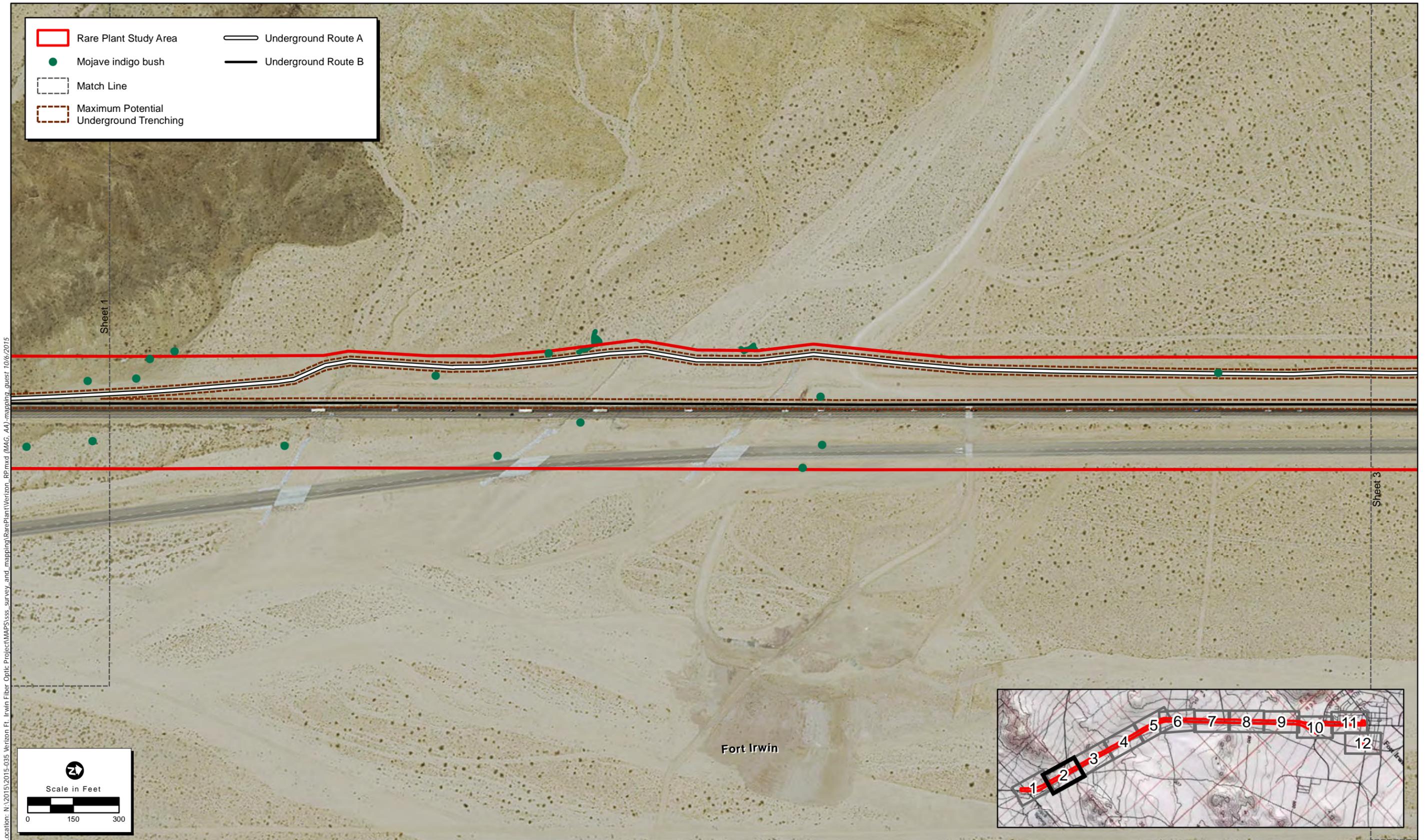


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Map Date: 10/6/2015
Photo Source: NAIP 2012

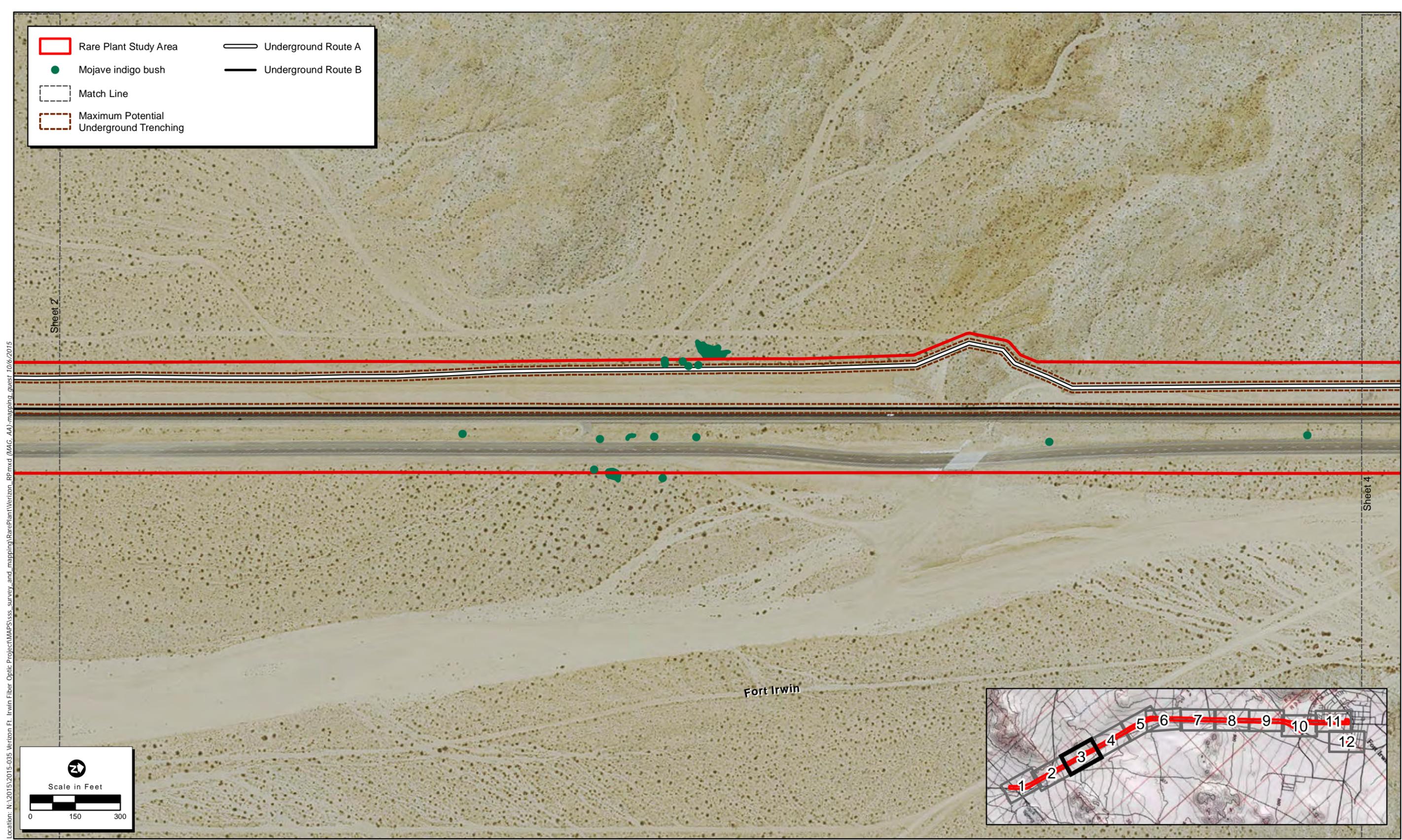
Figure 14. Rare Plant Survey Results Sheet 1 of 12



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ss_survey_and_mapping\RarePlant\Verizon_RP.mxd (MAG_A4).mapinfo_guest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 2 of 12

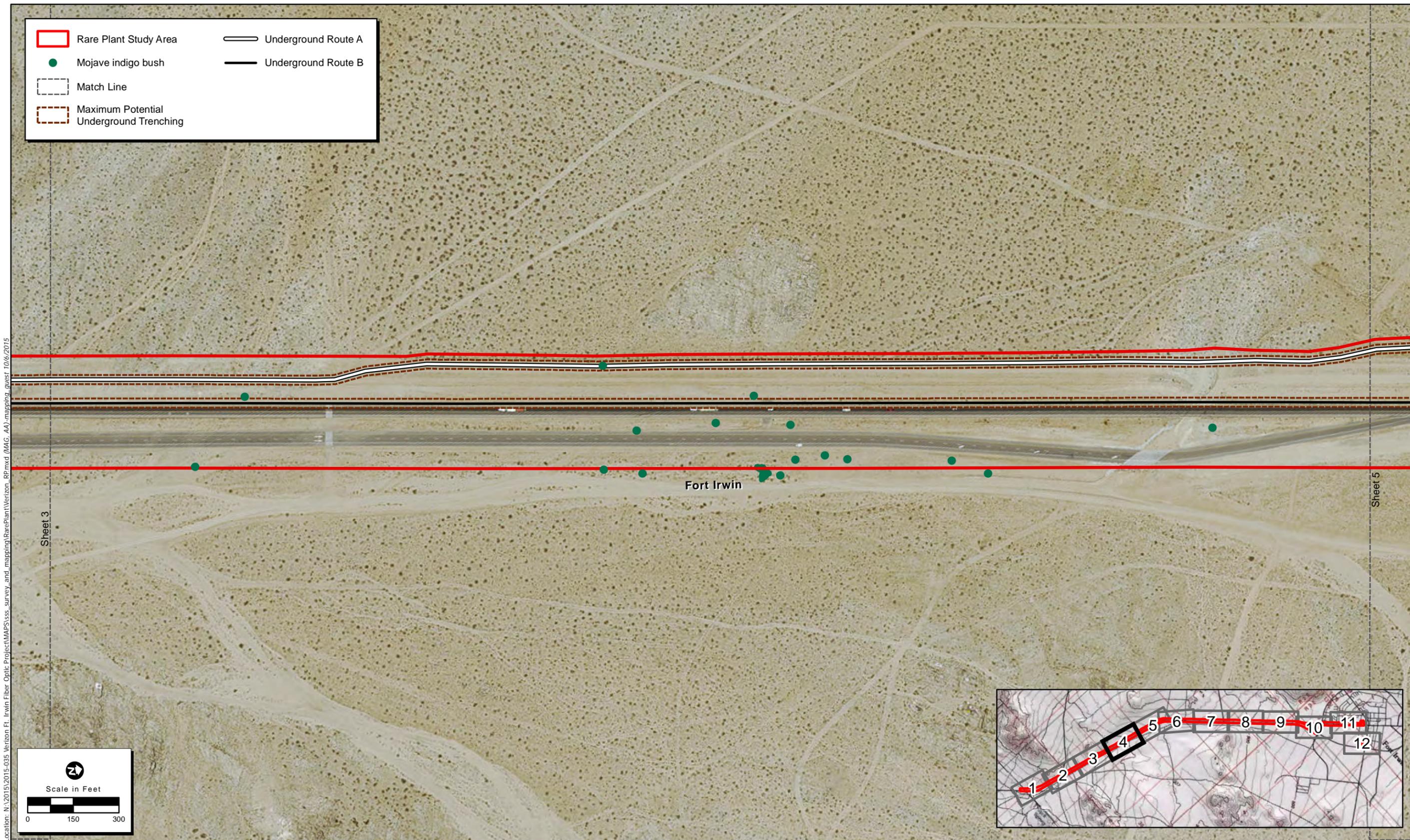


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Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 3 of 12

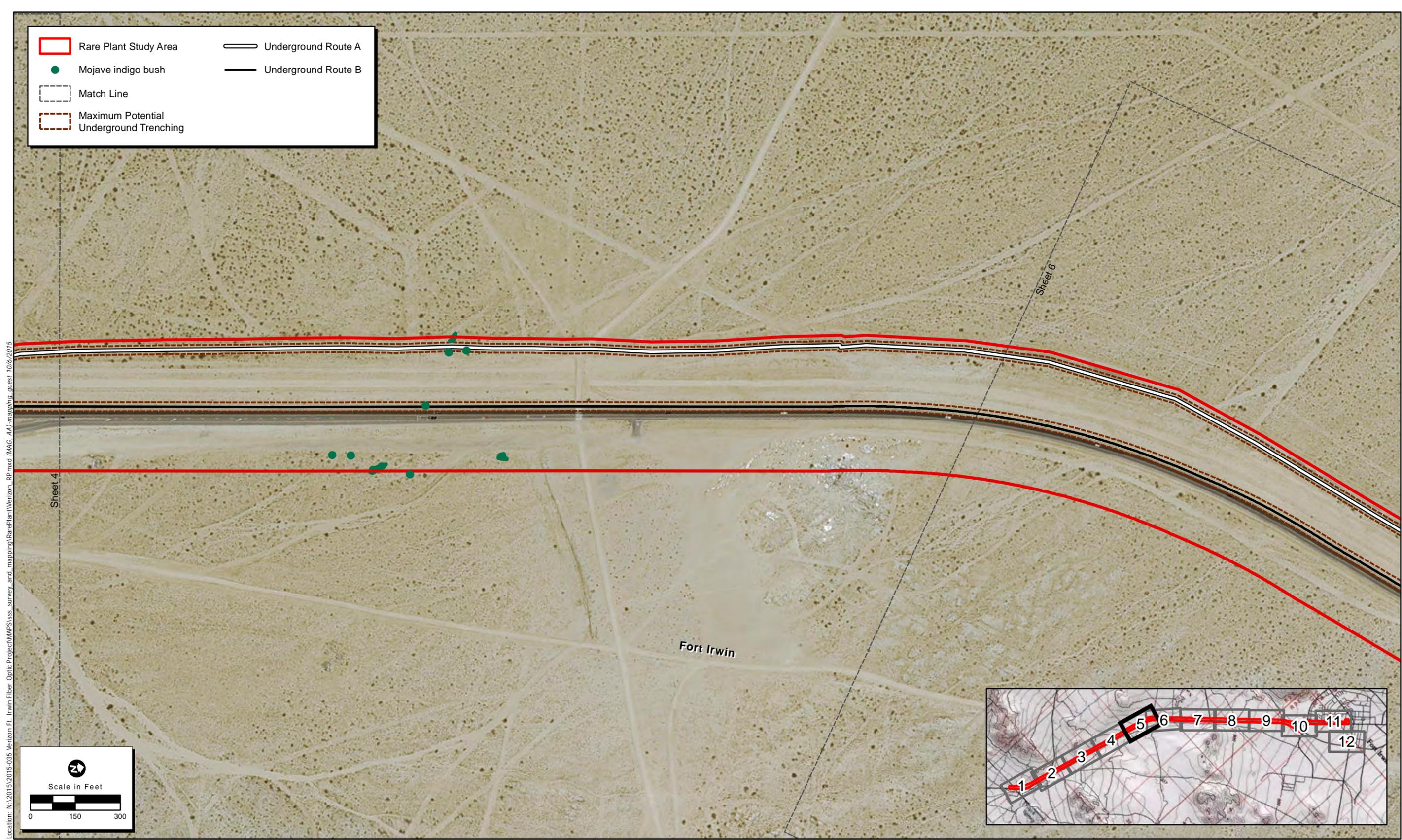
2015-035 Ft. Irwin Verizon



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\sss_survey_and_mapping\RarePlant\Verizon_RB.mxd (MAG_AA).mapping_quest 10/6/2015

Map Date: 10/6/2015
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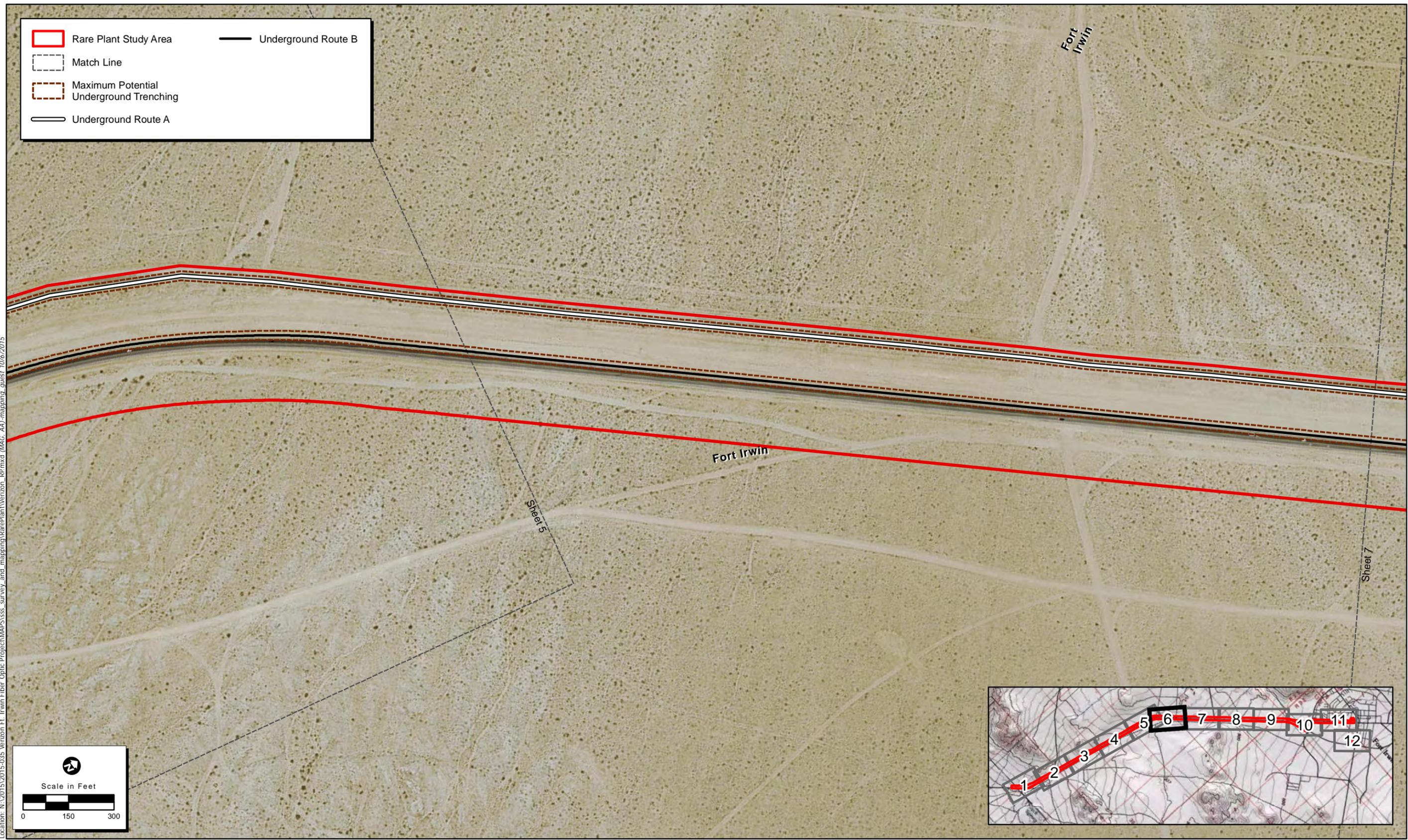
Figure 14. Rare Plant Survey Results Sheet 4 of 12



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ss_survey_and_mapping\RarePlant\Verizon_RB.mxd (MAG_A4).mapping_quest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 5 of 12



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\sss_survey_and_mapping\RarePlant\Verizon_RP.mxd (MAG_AA)_mapping_quest_10/6/2015

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Photo Source: NAIP 2012

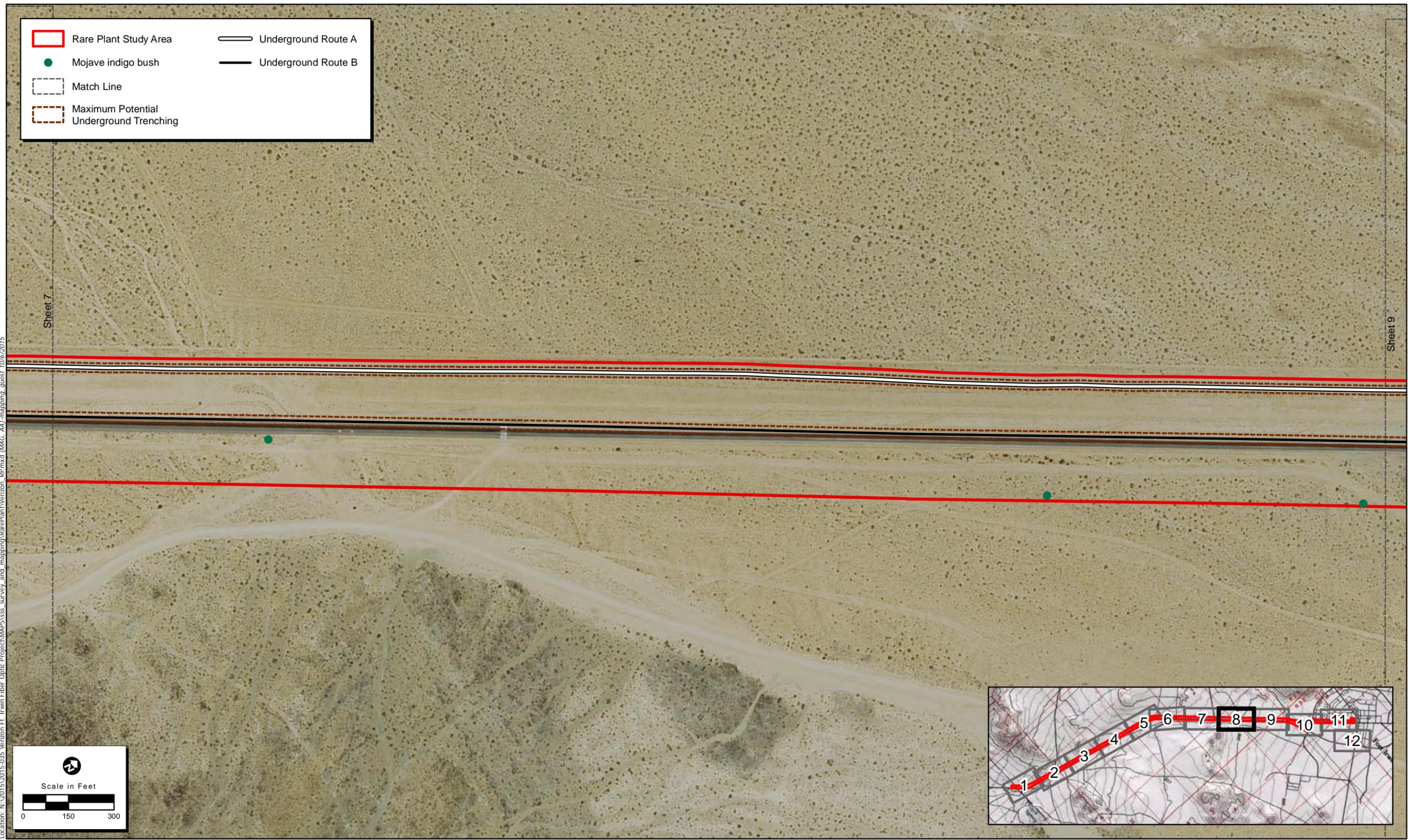
Figure 14. Rare Plant Survey Results Sheet 6 of 12



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ss_survey_and_mapping\RarePlant\Verizon_RP.mxd (MAG_AA)_mapping_quest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 7 of 12

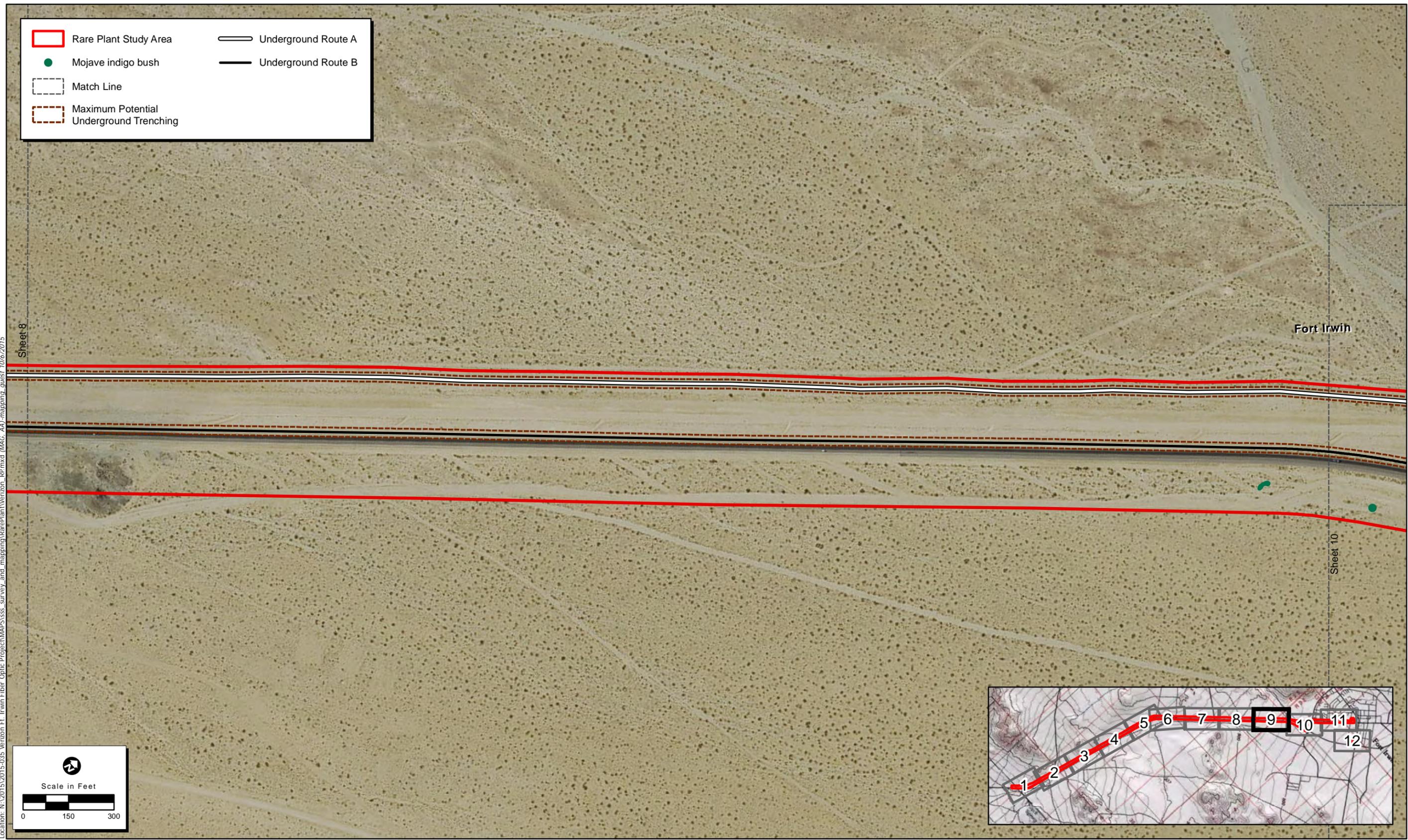


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Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 8 of 12

2015-035 Ft. Irwin Verizon

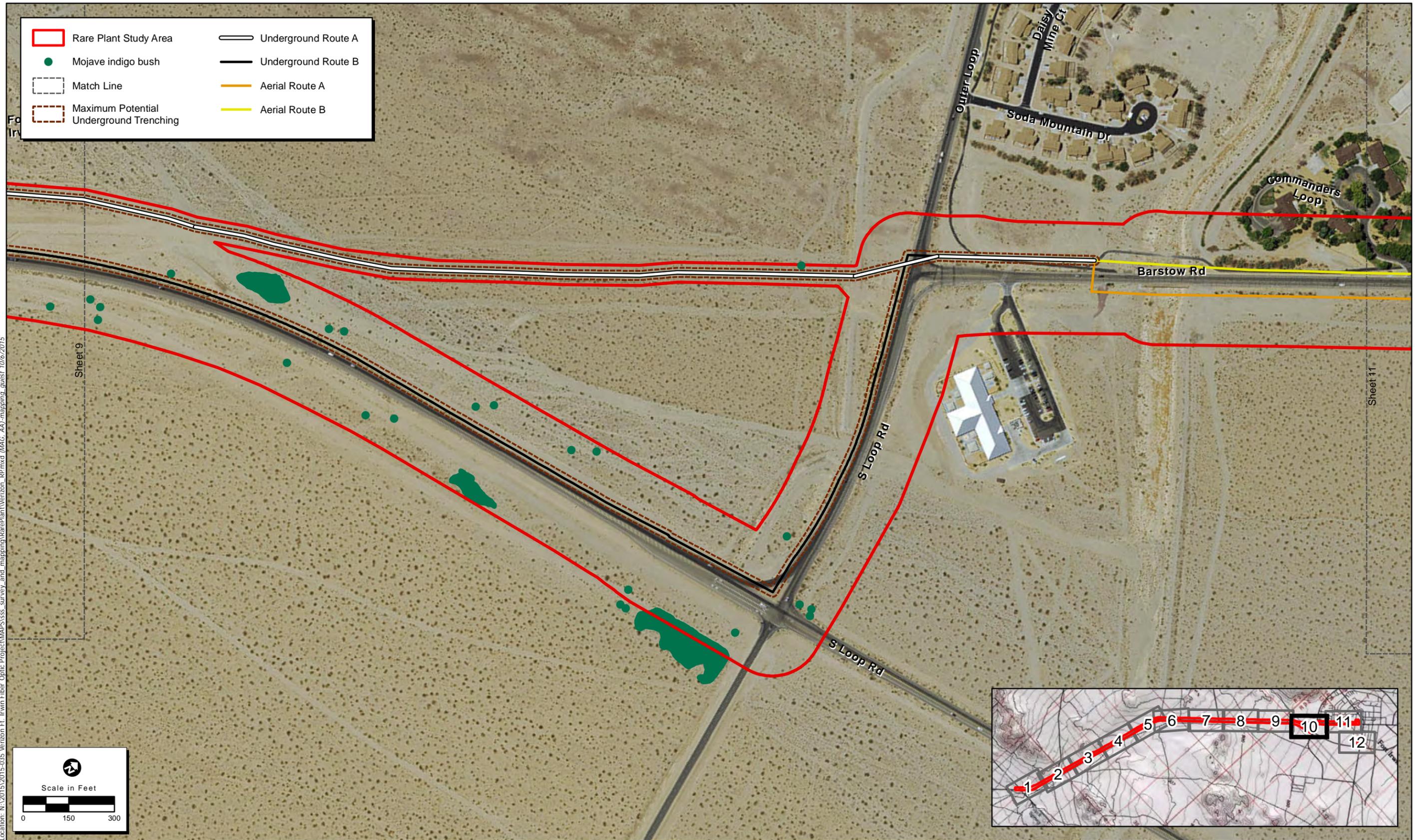


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Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 9 of 12

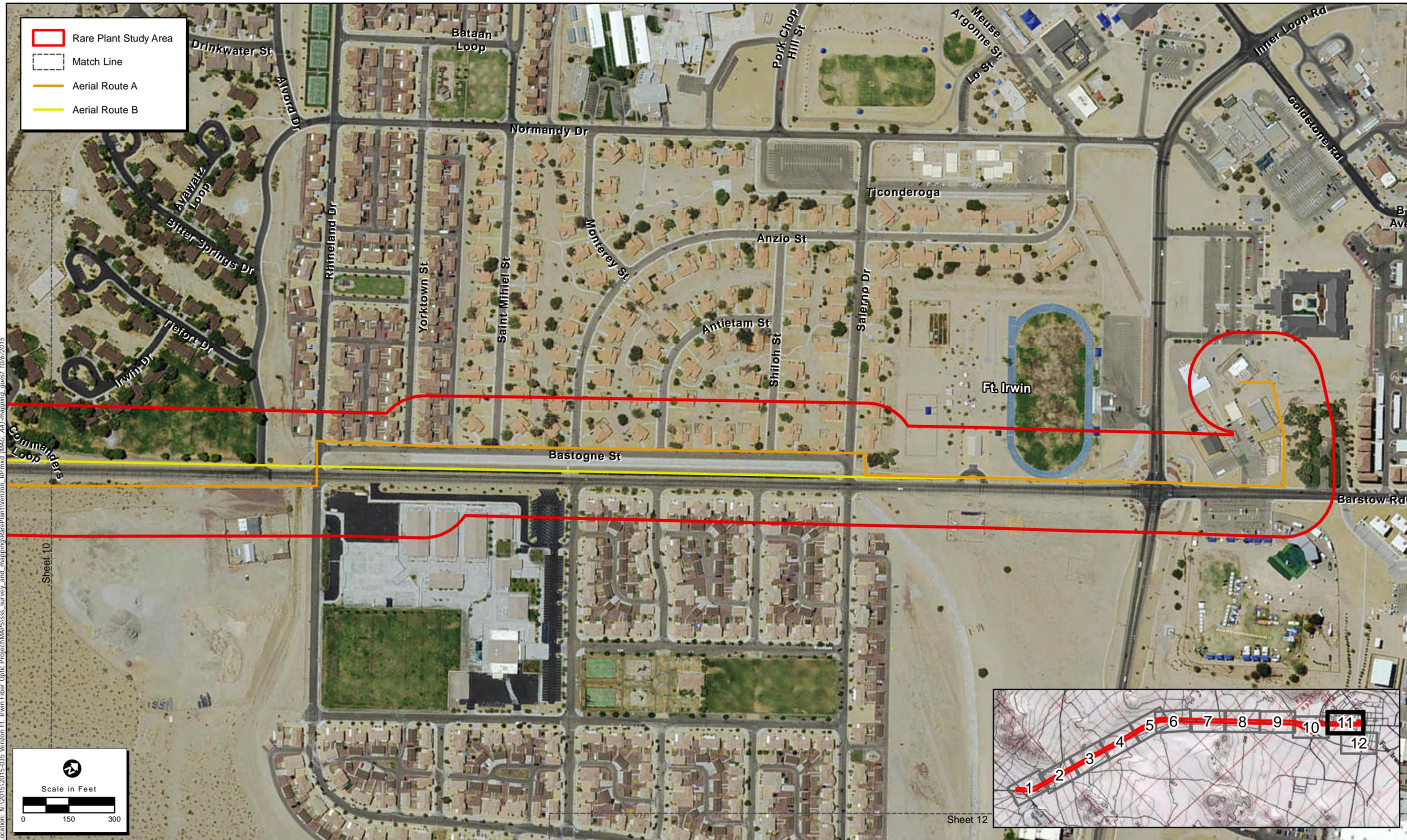
2015-035 Ft. Irwin Verizon



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Map Date: 10/6/2015
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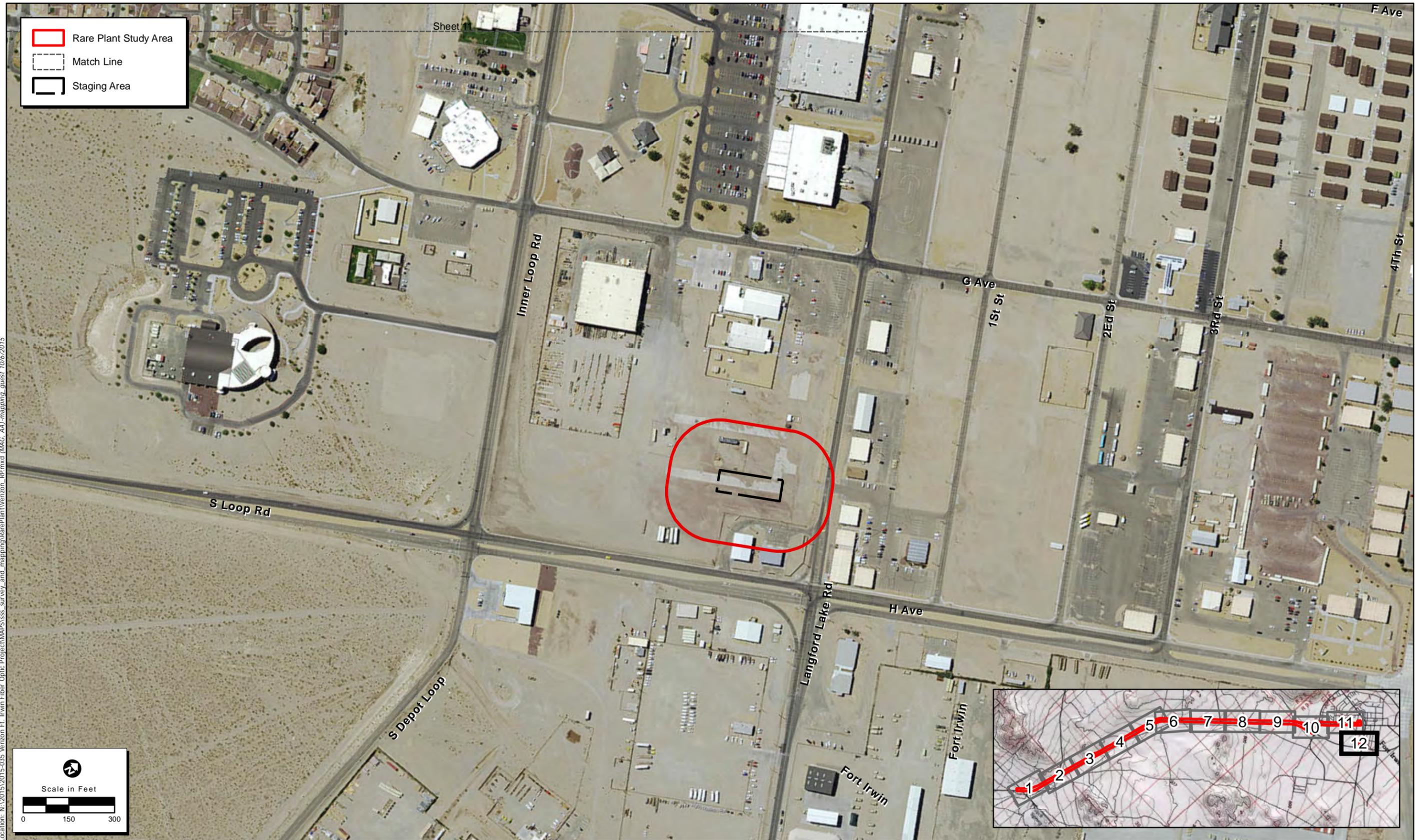
Figure 14. Rare Plant Survey Results Sheet 10 of 12



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Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 11 of 12



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ssss_survey_and_mapping\RarePlant\Verizon_RP.mxd (MAG_AA)_mapping_quest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 14. Rare Plant Survey Results Sheet 12 of 12

4.7.2 *Desert Tortoise*

ECORP biologists Josh Corona-Bennett, Wendy Turner, and Kristen (Mobraaten) Wasz conducted protocol USFWS desert tortoise presence/absence surveys from April 14 through 17, 2015 for the Underground Route B action area (164-foot buffer). The Underground Route A action area (33-foot buffer) survey was conducted by Josh Corona-Bennett and Wendy Turner on May 19 and 20, 2015. The majority of the Underground Route A action area was slightly wider than the original action area (Underground Route B) except on the north end where an approximately 2,100-foot stretch continued north directly to Barstow Road. All surveys took place when atmospheric conditions were conducive to observing desert tortoise (low winds and temperatures between 50°F and 104°F). Weather conditions recorded during desert tortoise surveys are reported in Table 8 below. Appendix C contains the daily desert tortoise survey data sheets.

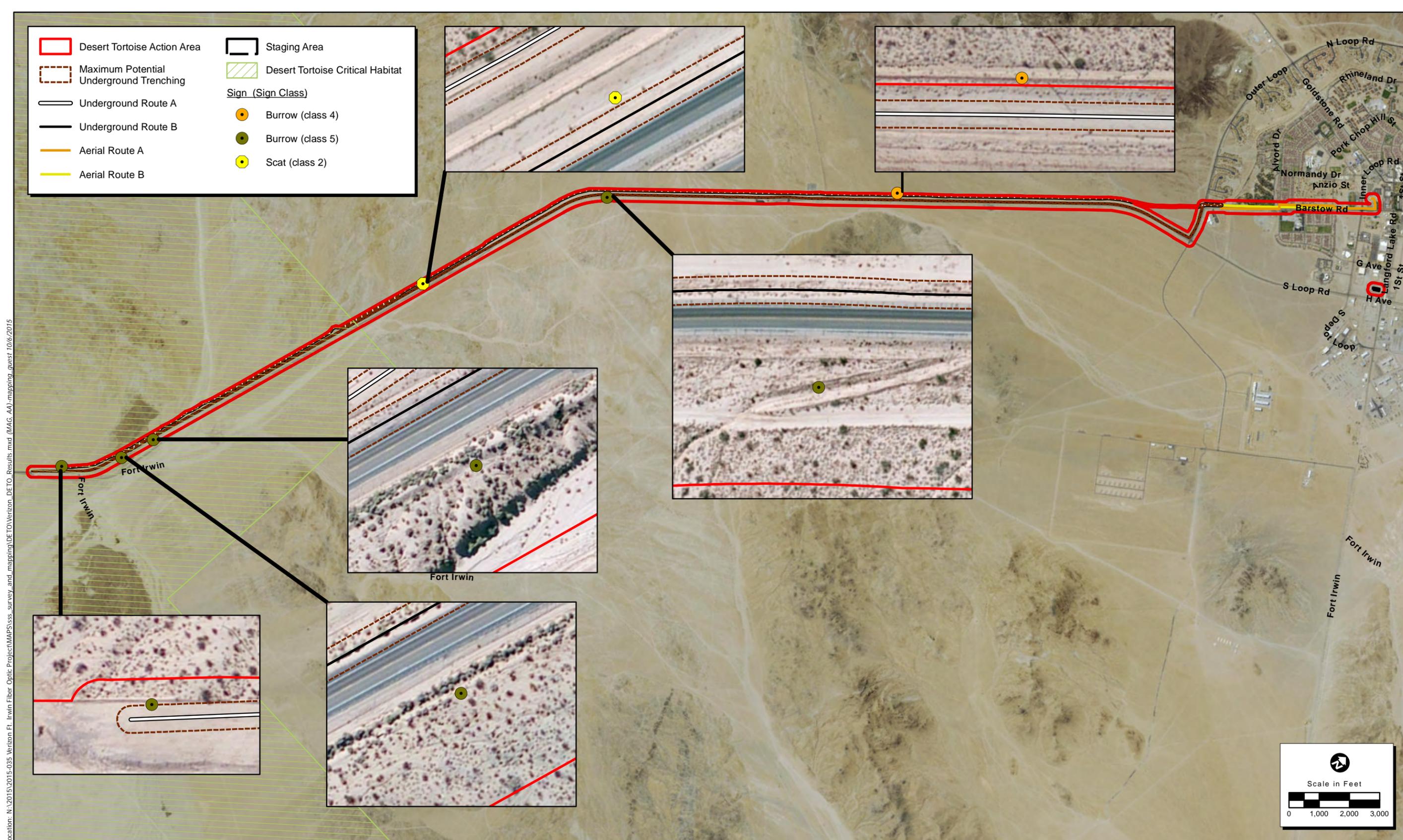
Table 8. Desert Tortoise Survey Weather Conditions

Date	Time		Temperature (°F)		Wind (mph)		Cloud Cover (percent)	
	Start	End	Start	End	Start	End	Start	End
4/14/2015	0830	1630	62	77	8-15	15-20	5	0
4/15/2015	0800	1635	55	73	15-25	5-15	0	0
4/16/2015	0800	1715	68	75	0-3	3-5	0	0
4/17/2015	0735	1245	70	75	0	2-5	0	0
5/19/2015	1330	1700	70	65	0-3	2-5	50	80
5/20/2015	0830	1700	48	75	0-3	0-3	80	70

Survey results for desert tortoise were positive within the Project area (Figure 15). Due to the presence of desert tortoise sign within the survey area, the three additional belt transects at 656, 1312, and 1,969 feet were not required and, therefore, were not conducted. Three pieces of class two tortoise scat (dry with glaze and some odor, no bleaching, dark brown) were detected, as well as one class four burrow (good condition, possibly tortoise) and four class five burrows (deteriorated condition, possibly tortoise) (Table 9). Photographs of sign observed during the survey can be found in Appendix D. Of the eight observations of desert tortoise sign only one, a class five burrow, was observed within the maximum potential temporary impact area for Underground Route A. This burrow was located at the southernmost extent of Underground Route A, south of the Fort Irwin welcome sign, on the west side of Fort Irwin Road. All other sign observed was located outside of the maximum potential temporary impact area for Underground Routes A and B. No live tortoises were observed during the survey; however, the presence of recent scat indicates that desert tortoise are active within the action area.

Table 9. Desert Tortoise Sign Observed

Date	Sign Type	Class	Coordinates (UTM 11S)		Notes
			Easting	Northing	
4/15/2015	Scat	2	522335	3894250	Three adult scat, each approximately 2-inches long, found together
4/16/2015	Burrow	5	522952	3896203	SE aspect, 5 inches x 6 inches, no sign, lots of debris present
4/16/2015	Burrow	5	521654	3891187	E aspect, 7 inches x 7 inches, 4 feet deep, no sign
4/16/2015	Burrow	5	521571	3890829	W aspect, 7 inches x 8 inches, lots of debris present, no sign
5/19/2015	Burrow	4	524899	3898386	E aspect, 5 inches x 8 inches, deteriorating condition, half-moon shape, 2.5 feet deep, no sign
5/20/2015	Burrow	5	521224	3890324	SE aspect, 3 inches x 5 inches, 18 inches deep, lots of debris, no sign



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ssss_survey_and_mapping\DETO\Verizon_DETO_Results.mxd (MAG, A4)-mapping_guest 10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 15. Desert Tortoise Survey Results

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All plant and wildlife species observed or detected during the focused surveys are included in the attached plant and wildlife compendia (Appendices A and B, respectively). The developed and disturbed areas of Aerial Placement Routes A and B and the Staging Area were not surveyed for desert tortoise because those areas do not represent suitable tortoise habitat (unvegetated/developed).

4.7.3 Mohave Ground Squirrel Remote Camera Surveys

The initial field assessment was conducted by ECORP biologist Wendy Turner on May 19 and 20, 2015. The biologist flagged 47 potential camera stations during this effort. Remote camera stations were placed as close to the locations selected during the initial field effort as possible to maintain a consistent naming schema. Figure 16 shows the locations of all camera stations sampled throughout the study.

Thirty-five remote cameras were installed on May 22 and 23, 2015 by ECORP biologists Amy Trost and Kevin Cornell. These cameras were active for six consecutive days and were removed from the field on May 28 and 29, 2015, depending on their setup day. On May 29, 2015, 12 additional remote cameras were installed by ECORP biologists Kevin Cornell and Rebecca Valdez. These cameras were also active for six consecutive days and were removed from the field on June 4, 2015.

The camera stations sampled a total of 278 trap-days (the total number of cameras multiplied by the number of operational days) throughout the survey. A total of four trap-days were lost due to camera malfunction or error. Appendix E contains a list of all the camera stations, representative photographs of the stations, habitat and topography associated with them, and details on daily camera checks conducted during the sampling effort.

A total of 162,562 photos were taken by remote cameras throughout the survey. Of those photos, 60,514 were white-tailed antelope ground squirrel and 1,101 RTGS. AGS were observed at 46 of the camera stations and RTGS were observed at four of the camera stations (C-19, C-21, C-34, and C-50) (Figure 16).

Incidental species observed on camera included coyote, black-tailed jackrabbit, kangaroo rat, pocket mouse, deer mouse (*Peromyscus maniculatus*), desert woodrat, greater roadrunner, western whiptail, and long-nosed leopard lizard.

4.7.4 Mohave Ground Squirrel Trapping Surveys

Trapping was conducted June 10 through 14, 2015 by ECORP biologists Kristen (Mobraaten) Wasz, Phillip Wasz, and Amy Trost at four locations where *Xerospermophilus* squirrels were captured on remote camera photographs. Trapping was conducted at the locations where camera stations C-19, C-21, C-34, and C-50 were established for the remote camera study (see Section 3.5.3 for detailed methodology on the remote camera trapping study). The number of traps at each trapping web varied based on the presence of suitable habitat; 29 traps were placed at C-19, 27 traps were placed at C-21, and 33 traps each were placed at C-34 and C-50 (Figure 16).

Weather during the study was typical to the Mojave Desert ecosystem with high temperatures often reaching 90°F before noon during the late spring season. The average temperature during the survey was 81°F. During most of the survey, the temperatures reached 90°F by late morning and all traps were closed.

Trapping web C-21 was closed on the second day and web C-19 was closed on the third day of trapping after two RTGS were captured and two tissue samples were collected from the RTGS individuals at each of the webs. Only one RTGS was captured at web C-34, so five full days of trapping were completed at this location. No RTGS were captured at C-50 and five full days of trapping were conducted at this location as well.

The two species of squirrels observed during the camera trapping (AGS and RTGS) were captured during the trapping study (Table 10). Slightly more AGS females (51.51 percent) were trapped than males (45.45 percent). More than 73 percent of the males showed signs of reproductive readiness (scrotal or post-scrotal), while 35 percent of the females exhibited signs of reproductive readiness and/or reproduction (lactating or post-lactating). AGS were captured on all trapping webs.

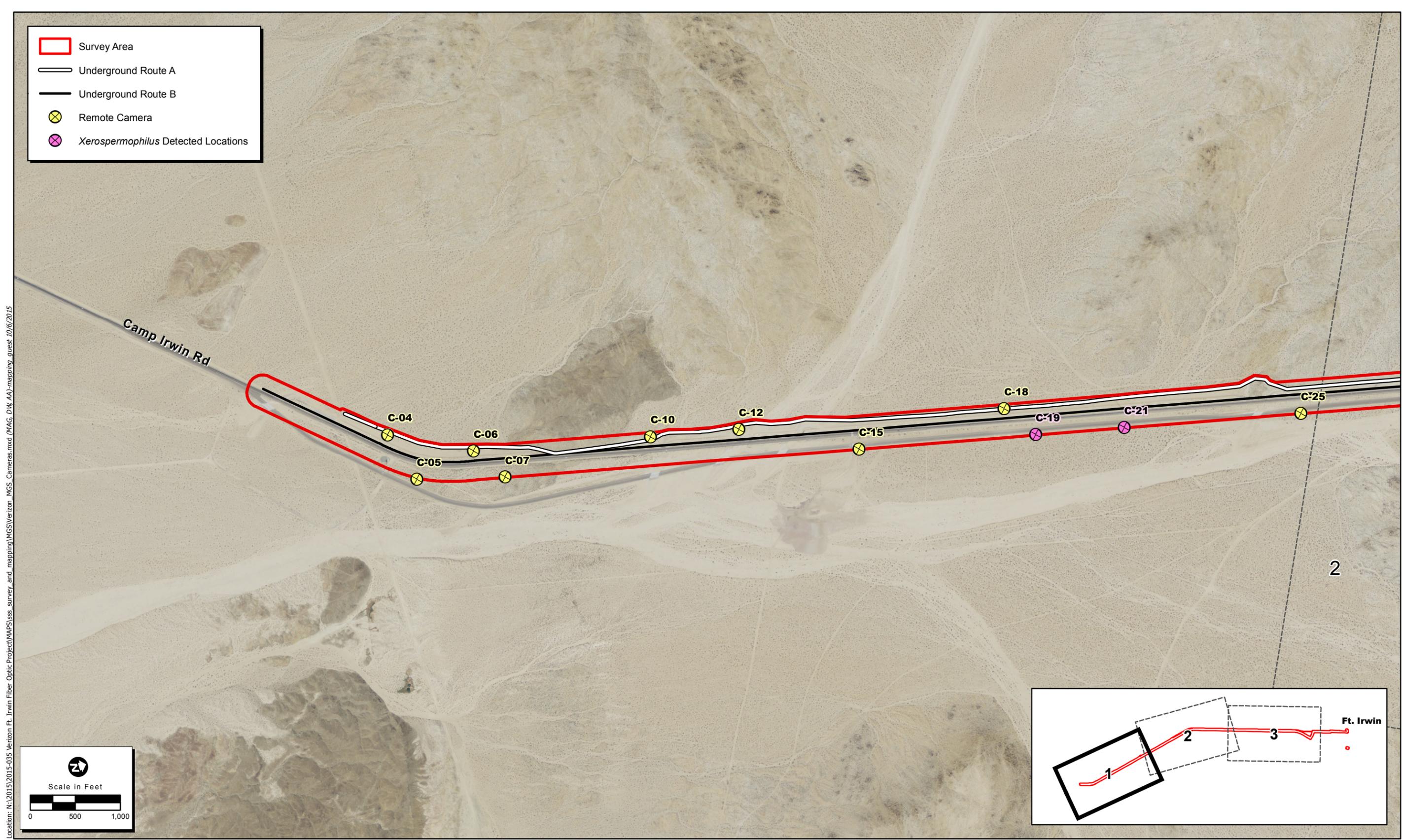
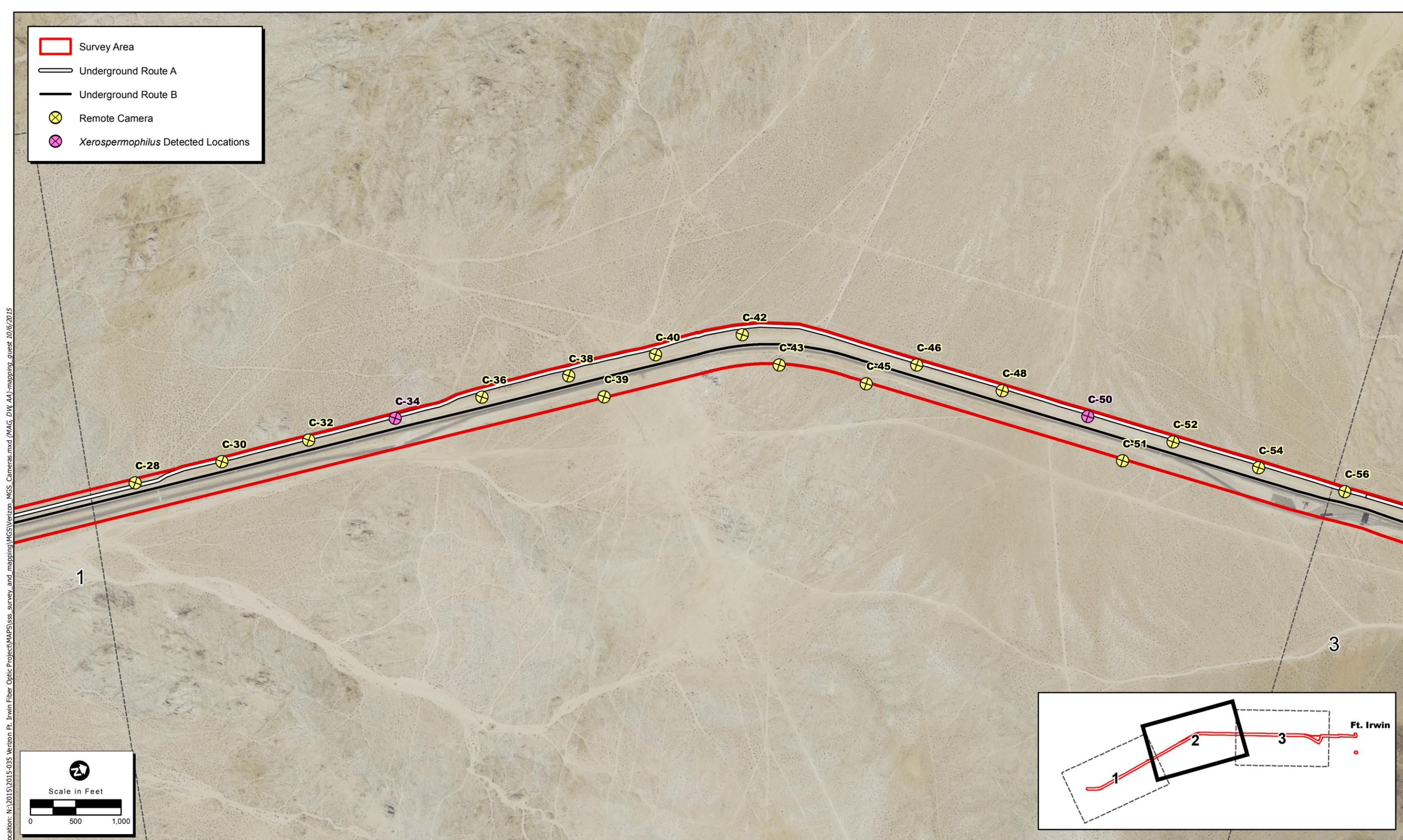


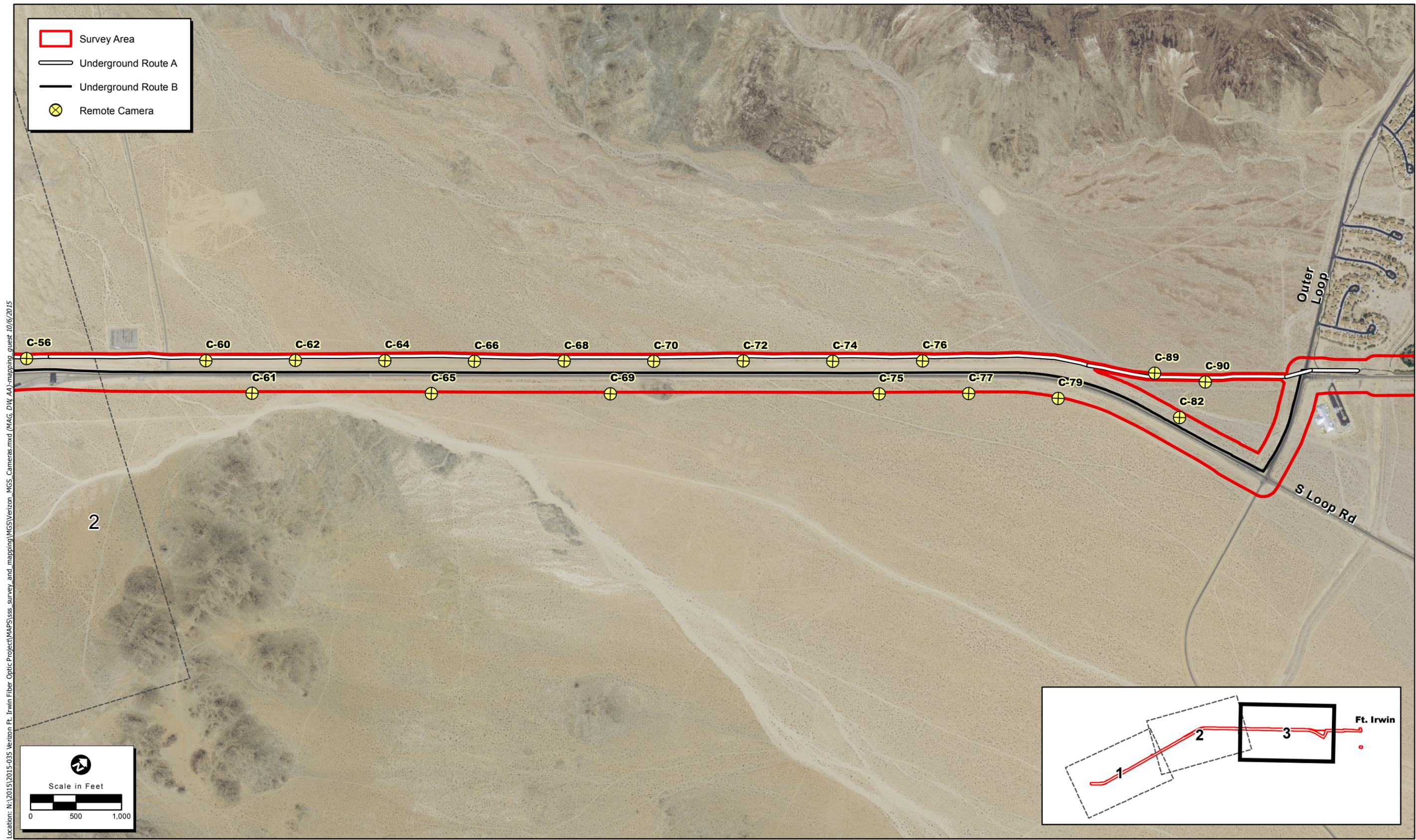
Figure 16. Remote Camera and Xerospermophilus Trapping Locations



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\lss_survey_and_mapping\MGS\Cameras.mxd (MAG, DW, AA)-mapping_guest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 16. Remote Camera and Xerospermophilus Trapping Locations



Location: N:\2015\2015-035 Verizon Ft. Irwin Fiber Optic Project\MAPS\ss_survey_and_mapping\MGS_Cameras.mxd (MAG, DW, AA)-mapping_quest_10/6/2015

Map Date: 10/6/2015
Photo Source: NAIP 2012

Figure 16. Remote Camera and Xerospermophilus Trapping Locations

Table 10. Mohave Ground Squirrel Trapping Results Summary

Grid#

XETE	Female				Male				Unknown	Recap- tures	Total XETE Captures
	Adult	Sub-adult	Juvenile	Total # Repro	Adult	Sub-adult	Juvenile	Total # Repro			
C-19	0	2	0	0	0	0	0	0	0	0	2
C-21	0	0	0	0	0	1	1	0	0	0	2
C-34	1	0	0	1	0	0	0	0	0	0	1
C-50	0	0	0	0	0	0	0	0	0	0	0
Age Class Subtotal	1	2	0		0	1	1				
Gender Subtotal	3			1	2			0			
TOTAL	5									0	5
<i>Amount Reproductive from TOTAL</i>	1										

AMLE	Female				Male				Unknown	Recap- tures	Total AMLE Captures
	Adult	Sub-adult	Juvenile	Total # Repro	Adult	Sub-adult	Juvenile	Total # Repro			
C-19	1	0	0	0	5	0	0	4	0	3	9
C-21	4	0	0	1	1	0	0	0	0	3	8
C-34	5	0	0	3	4	0	0	3	1	7	17
C-50	6	1	0	2	4	1	0	4	0	12	24
Age Class Subtotal	16	1	0		14	1	0				
Gender Subtotal	17			6	15			11			
TOTAL	33									25	58
<i>Amount Reproductive from TOTAL</i>	17										

XETE = *Xerospermophilus tereticaudus*

AMLE = *Ammospermophilus leucurus*

A total of five RTGS were captured on three of the webs (C-19, C-21, and C-34), two of which were male and three were female. One female was an adult, one male and two females were subadults, and one male was a juvenile. The adult female that was captured showed signs of reproduction this year (post-lactating). Table 11 is a summary of the data collected for the RTGS captures.

Table 11. Round-Tailed Ground Squirrel Captures

ID/Sample #	Web #	Date of Capture	Age	Sex	Reproductive Condition	Coordinates of Capture Location (UTM, NAD 83)
#1	C-19	6/10/2015	Subadult	Female	Non	522048 E, 3892545 N
#2	C-21	6/10/2015	Subadult	Male	Non	522091 E, 3892800 N
#3	C-21	6/11/2015	Juvenile	Male	Non	522080 E, 3892800 N
#4	C-19	6/12/2015	Subadult	Female	Non	522022 E, 3892530 N
#10	C-34	6/11/2015	Adult	Female	Post-lactating	522386 E, 3894742 N

The remote cameras established at the center of the trapping webs did not result in additional detections of RTGS on the trapping web that did not capture RTGS, C-50. RTGS were not captured on the remote cameras placed at the center of the other three trapping webs.

The trapping data, photographs of RTGS individuals captured, and data sheets for the MGS surveys are provided in Appendix F. Weather data and photographs of the trapping webs are included in Appendix G.

4.7.4.1 Tissue Sampling

Five tissue samples were collected from RTGS captured at three trapping webs. At the time of report production, authorization was not received for the samples to be sent to an approved genetic laboratory for processing. Once approval is obtained, the samples will be sent and the results will be sent to appropriate parties. Until then, the tissue samples will be kept in a climate controlled environment.

5.0 Recommended Mitigation Measures

Desert Tortoise

To avoid potential effects to this federally listed species, the following measures would be implemented consistent with USFWS guidelines during implementation of the Project.

- B-1: Within two weeks prior to the onset of construction, a pre-construction desert tortoise survey shall be conducted by an authorized biologist within all work areas that contain desert tortoise habitat and that would be affected, directly or indirectly, by project activities. If no tortoises or active burrows are identified, then construction would proceed without interruption. If active burrows or tortoises are identified, construction would be delayed and consultation with the Fort Irwin Directorate of Public Works (DPW) Environmental Division regarding compliance with the USFWS Biological Opinion for Operations and Activities at Fort Irwin would occur.
- B-2: Before construction begins, personnel working on the site shall receive a briefing on the desert tortoise, detailing the life history of a desert tortoise and the protocol to follow if a tortoise is encountered at the work site.
- B-3: During construction, a biological monitor shall be available to observe construction activities and verify that no tortoises wander into the construction site. If a tortoise is present, construction in the immediate vicinity would be halted and coordination with the Fort Irwin Directorate of Public Works (DPW) Environmental Division regarding compliance with the USFWS BO for Operations and Activities at Fort Irwin would occur.
- B-4: To avoid wildlife pitfalls, at the end of each day, the biological monitor shall ensure that all potential wildlife pitfalls, such as trenches and bores, have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends or at certain distances to provide wildlife escape ramps, or covered completely to prevent wildlife

access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations shall be inspected periodically throughout the day and at the beginning and end of the work day. Any wildlife encountered during the construction process shall be allowed to leave the construction area unharmed.

- B-5: To avoid entrapment of desert tortoise, any construction pipe, culvert, or similar structure with a diameter greater than three inches, stored less than eight inches above ground for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. These structures may be capped or placed on pipe racks as an alternative to required inspections.
- B-6: Workers shall check underneath each on-site, parked vehicle or piece of equipment prior to moving it. If a desert tortoise is observed, the vehicle shall not be moved until the tortoise is relocated from the area.
- B-7: Prior to construction start construction boundaries will be clearly delineated on the ground using flagging, survey lath, or wooden stakes.

Mohave Ground Squirrel

Implementation of mitigation measures B-1 through B-7 will also avoid impacts to MGS. In addition to the above mentioned mitigation measures, the following mitigation measure shall be implemented to further avoid impacts to MGS.

- B-8: To the most practicable extent possible, the construction crews shall site bore pits and other excavation in areas where squirrel burrows are not located.

Other Special-status Species (Fauna)

Prairie falcon, burrowing owl, long-eared owl, Vaux's swift, loggerhead shrike, and Bendire's thrasher have the potential to breed, forage, or inhabit the Project area. Additionally, pallid bat, American badger, and desert kit fox potentially occur in the vicinity of the Project area due to the presence of suitable habitat. To avoid potential effects on nesting birds, including birds protected under the MBTA, and other special-status wildlife species the following measures shall be implemented as a part of the Project.

- B-9: To avoid take of any species protected under the MBTA, a pre-construction nesting bird survey shall be conducted by a qualified biologist not more than seven (7) days prior to the onset of ground disturbance that is to occur between February 15 and September 15. The nest surveys shall include the Project area and adjacent areas within 500 feet where Project activities have the potential to cause nest failure. If nesting migratory birds are not observed during the survey, site preparation and construction activities may begin. If an active migratory bird nest is located, the nest buffer shall be delineated to a distance recommended by the monitoring biologist in coordination with the Fort Irwin DPW Environmental Division. Typically, this is a minimum of 300 feet from the nest site in all directions (500 feet is typically recommended by CDFW for raptors), until juveniles have fledged and there is no evidence of a second attempt of nesting. Construction shall not be permitted within the buffer areas while the nest continues to be active. The monitoring biologist will monitor the nest(s) during construction and document any findings. Once the monitoring biologist determines that the nest is no longer active then the buffer area shall no longer be in effect.
- B-10: Land and vegetation clearing should occur outside the breeding season for birds listed under the MBTA, defined as February 15 to August 31. If land and vegetation clearing occurs during the breeding season, then implementation of B-9 will prevent impacts to nesting birds during these activities.
- B-11: A pre-construction take avoidance survey for burrowing owl shall be conducted no less than 14 days prior to initiating ground disturbing activities using the methods described in CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012) and in consultation with the Fort Irwin DPW Environmental Division. Identified active nests shall be protected from disturbance with a buffer distance determined through monitoring the behavior of the owls and according to CDFW

guidelines (2012) which identifies buffer distances based on the time of year and level of disturbance associated with construction activities.

- B-12: During the pre-construction survey, biologists shall survey for desert kit fox dens. Active dens that are identified shall be flagged for avoidance and protected from ground-disturbing activities with a buffer distance determined through monitoring the behavior of the fox(es) and coordination with the Fort Irwin DPW Environmental Division. During the pup-rearing season, maternity dens shall be protected and avoided (1 January through 31 July). If avoidance of a non-maternity den is not feasible, the Fort Irwin DPW Environmental Division shall be contacted about approved kit fox passive relocation measures (den collapse after burrow scoping) outside of breeding and pup-rearing season (August 1 to January 1).
- B-13: Domestic dogs will not be allowed on the construction site.
- B-14: During the pre-construction survey, biologists shall survey for badger dens. If present, occupied badger dens shall be flagged for avoidance and protected from ground-disturbing activities with a buffer distance determined through monitoring the behavior of the badger(s) and coordination with the Fort Irwin DPW Environmental Division. During the pup-rearing season, maternity dens shall be avoided (March 1 through August 31 [Ahlborn 1990; Sullivan 1996]). Buffers may be modified with the concurrence of the Fort Irwin DPW Environmental Division. If avoidance of a non-maternity den is not feasible, the Fort Irwin DPW Environmental Division shall be contacted about approved badger relocation techniques.

Pest Species

Construction activity might attract additional pest species, including ravens, where additional food, trash, or water is available. To avoid potential impacts, the following measures would be implemented at the work areas:

- B-15: To preclude attraction of common ravens and coyotes, construction trash, including construction worker food trash, shall be placed in sealed containers and emptied at the close of each business day. The Project area shall be kept as clean of debris as possible. Each water source will be caged or netted to prevent use by ravens.
- B-16: All road-killed animals shall be reported to the Fort Irwin DPW Environmental Division, Natural Resources Section immediately.
- B-17: Water used for construction shall be used in a manner that does not result in the formation of standing water that may attract pest species. Water trucks with open tops shall be covered securely at the end of each work day.
- B-18: All structures/poles used as part of the aerial placement route shall have appropriate nesting deterrent mechanisms installed such as bird spikes and auditory or visual deterrents to discourage and/or prevent common ravens from using structures as nesting substrates.

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APPENDIX A

Plant Compendium

2015 PLANT SPECIES COMPENDIUM

Scientific Name	Common Name
VASCULAR PLANTS	
GYNOSPERMS (GNETALES)	
EPHEDRACEAE	EPHEDRA FAMILY
<i>Ephedra californica</i>	California jointfir
<i>Ephedra nevadensis</i>	Nevada jointfir
ANGIOSPERMS (EUDICOTS)	
APIACEAE	CARROT FAMILY
<i>Lomatium mohavense</i>	Mojave lomatium
ASTERACEAE	SUNFLOWER FAMILY
<i>Acamptopappus sphaerocephalus</i>	golden head
<i>Ambrosia ancanthocarpa</i>	annual bur-sage
<i>Ambrosia confertiflora</i>	weak leaved burweed
<i>Ambrosia dumosa</i>	white bur-sage
<i>Ambrosia salsola</i>	cheesebush
<i>Bebbia juncea</i>	sweetbush
<i>Brickellia incana</i>	woolly brickellia
<i>Brickellia cf. desertorum</i>	desert brickellia
<i>Chaenactis fremontii</i>	Fremont's pincushion
<i>Chaenactis carphoclinia var. carphoclinia</i>	pebble pincusion
<i>Encelia actoni</i>	Acton encelia
<i>Encelia farinosa</i>	brittlebush
<i>Ericameria cooperi</i>	Cooper's goldenbush
<i>Ericameria paniculata</i>	black-banded rabbitbrush
<i>Eriophyllum ambiguum</i>	annual woolly sunflower
<i>Eriophyllum wallacei</i>	Wallace eriophyllum
<i>Geraea canescens</i>	hairy desert sunflower
<i>Leptosyne bigelovii</i>	Bigelow coreopsis
<i>Logfia depressa</i>	dwarf cottonrose
<i>Malacothrix coulteri</i>	snake's head
<i>Malacothrix glabrata</i>	desert dandelion
<i>Monoptilon belloides</i>	Mojave desert star
<i>Nicolletia occidentalis</i>	hole-in-the-sand plant
<i>Pleurocoronis pluriseta</i>	arrow leaf
<i>Psathyrotes ramosissima</i>	turtleback
<i>Rafinesquia neomexicana</i>	desert chicory
<i>Senecio flaccidus var. monoensis</i>	smooth threadleaf ragwort
<i>Stephanomeria pauciflora</i>	wire lettuce
<i>Tetradymia stenolepis</i>	Mojave cottonthorn
<i>Xylorhiza tortifolia var. tortifolia</i>	Mojave woodyaster
BIGNONIACEAE	TRUMPET-CREEPER FAMILY
<i>Chilopsis linearis subsp. arcuata</i>	desert-willow
BORAGINACEAE	BORAGE FAMILY
<i>Amsinckia tessellata</i>	bristly fiddleneck

2015 PLANT SPECIES COMPENDIUM

Scientific Name	Common Name
<i>Cryptantha angustifolia</i>	narrow leaved cryptantha
<i>Cryptantha circumscissa</i> var. <i>circumscissa</i>	cushion cryptantha
<i>Cryptantha nevadensis</i> var. <i>nevadensis</i>	Nevada cryptantha
<i>Cryptantha pterocarya</i> var. <i>pterocarya</i>	winged-nut cryptantha
<i>Emmenanthe penduliflora</i> var. <i>penduliflora</i>	whispering bells
<i>Nama demissum</i>	purple mat
<i>Pectocarya linearis</i> subsp. <i>ferocula</i>	slender pectocarya
<i>Pectocarya heterocarpa</i>	chuckwalla pectocarya
<i>Pectocarya platycarpa</i>	broadfruit combseed
<i>Phacelia crenulata</i>	notch leaved phacelia
<i>Pholisma arenarium</i>	desert pholisma
BRASSICACEAE	MUSTARD FAMILY
<i>Brassica nigra</i> *	black mustard
<i>Brassica tournefortii</i> *	Saharan mustard
<i>Caulanthus lasiophyllus</i>	California mustard
<i>Lepidium fremontii</i>	desert alyssum
<i>Lepidium lasiocarpum</i> subsp. <i>lasiocarpum</i>	shaggyfruit pepperweed
<i>Sisymbrium altissimum</i> *	tumble mustard
<i>Sisymbrium irio</i> *	London rocket
<i>Stanleya</i> (cf.) <i>pinnata</i> var. <i>pinnata</i>	prince's plume
CACTACEAE	CACTUS FAMILY
<i>Cylindropuntia echinocarpa</i>	silver cholla
<i>Echinocactus polycephalus</i> var. <i>polycephalus</i>	clustered barrel cactus
<i>Opuntia basilaris</i> var. <i>basilaris</i>	beavertail cactus
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Atriplex polycarpa</i>	allscale
<i>Atriplex semibaccata</i> *	Australian saltbush
<i>Grayia spinosa</i>	hopsage
<i>Salsola tragus</i> *	Russian thistle
CLEOMACEAE	SPIDER PLANT FAMILY
<i>Peritoma arborea</i>	bladderpod
CONVOLVULACEAE	MORNING GLORY FAMILY
<i>Cuscuta</i> sp.	dodder
CUCURBITACEAE	GOURD FAMILY
<i>Cucurbita palmata</i>	coyote melon
EUPHORBIACEAE	SPURGE FAMILY
<i>Chamaesyce albomarginata</i>	whitemargin sandmat
<i>Chamaesyce micromera</i>	desert spurge
<i>Croton setigerus</i>	turkey-mullein
FABACEAE	LEGUME FAMILY
<i>Astragalus acutirostris</i>	sharpkeel milkvetch
<i>Acmispon argyraeus</i> var. <i>argyraeus</i>	canyon lotus
<i>Dalea mollissima</i>	silky dalea

2015 PLANT SPECIES COMPENDIUM

Scientific Name	Common Name
<i>Lupinus concinnus</i>	bajada lupine
<i>Parkinsonia aculeata</i> *	Mexican palo verde
<i>Prosopis glandulosa</i> var. <i>torreyana</i>	honey mesquite
<i>Psoralethamnus arborescens</i> var. <i>arborescens</i> (CNPS List 4.3)	Mojave indigo bush
<i>Psoralethamnus arborescens</i> var. <i>minutifolius</i>	Johnson's indigo bush
<i>Psoralethamnus polydenius</i>	dotted dalea
<i>Senna armata</i>	desert senna
GERANIACEAE	GERANIUM FAMILY
<i>Erodium cicutarium</i> *	redstem stork's bill
KRAMERIACEAE	RHATANY FAMILY
<i>Krameria erecta</i>	pima rhatany
LAMIACEAE	MINT FAMILY
<i>Salvia columbariae</i>	chia
<i>Salvia mohavensis</i>	Mohave sage
<i>Scutellaria mexicana</i>	bladder sage
LOASACEAE	LOASA FAMILY
<i>Mentzelia albicaulis</i>	whitestem blazingstar
<i>Petalonyx thurberi</i>	sandpaper plant
MALVACEAE	MALLOW FAMILY
<i>Eremalche rotundifolia</i>	desert five spot
<i>Sphaeralcea ambigua</i> var. <i>ambigua</i>	apricot mallow
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
<i>Allonia incarnata</i> var. <i>incarnata</i>	trailing windmills
<i>Mirabilis laevis</i> var. <i>villosa</i>	wishbone bush
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Camissonia campestris</i> ssp. <i>campestris</i>	Mojave sun cups
<i>Chylismia brevipes</i> ssp. <i>brevipes</i>	golden sun cups
<i>Chylismia claviformis</i> ssp. <i>claviformis</i>	browneyes
<i>Eremothera boothii</i> ssp. <i>desertorum</i>	Booth's desert suncup
PAPAVERACEAE	POPPY FAMILY
<i>Argemone corymbosa</i>	prickly poppy
<i>Eschscholzia munitiflora</i>	pygmy poppy
POLEMONIACEAE	PHLOX FAMILY
<i>Gilia</i> (cf.) <i>cana</i> ssp. <i>speciformis</i>	showy gilia
<i>Langloisia setosissima</i> ssp. <i>punctata</i>	lilac sunbonnet
<i>Loeseliastrum matthewsii</i>	desert calico
POLYGONACEAE	BUCKWHEAT FAMILY
<i>Chorizanthe brevicornu</i>	brittle spineflower
<i>Chorizanthe rigida</i>	rigid spiny herb
<i>Eriogonum deflexum</i>	skeleton weed
<i>Eriogonum inflatum</i>	desert trumpet
<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	Mojave Desert California buckwheat

2015 PLANT SPECIES COMPENDIUM

Scientific Name	Common Name
<i>Eriogonum nidularium</i>	bird nest buckwheat
<i>Eriogonum pusillum</i>	yellow turbans
<i>Eriogonum reniforme</i>	kidney leaf buckwheat
<i>Oxytheca perfoliata</i>	roundleaf puncturebract
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Delphinium parishii</i> ssp. <i>parishii</i>	Mojave larkspur
RESEDACEAE	MIGNONETTE FAMILY
<i>Oligomeris linifolia</i>	oligomeris
RUTACEAE	RUE FAMILY
<i>Thamnosma montana</i>	turpentine broom
SOLANACEAE	NIGHTSHADE FAMILY
<i>Datura wrightii</i>	sacred thorn-apple
<i>Lycium andersonii</i>	water jacket
<i>Lycium cooperi</i>	peach thorn
<i>Nicotiana obtusifolia</i>	desert tobacco
<i>Solanum elaeagnifolium</i> *	white horse-nettle
TAMARICACEAE	TAMARISK FAMILY
<i>Tamarix</i> cf. <i>aphylla</i> *	athel tree
ZYGOPHYLLACEAE	CALTROP FAMILY
<i>Tribulus terrestris</i> *	puncture vine
ANGIOSPERMS (MONOCOTS)	
POACEAE	GRASS FAMILY
<i>Bromus madritensis</i> *	red brome
<i>Bromus tectorum</i> *	cheatgrass
<i>Hordeum murinum</i> *	wall barley
<i>Schismus arabicus</i> *	split grass
<i>Schismus barbatus</i> *	common Mediterranean grass
<i>Stipa speciosa</i>	desert needlegrass
* - Nonnative species.	
cf. - From the latin <i>confer</i> , imperative of <i>conferre</i> , to compare. Indicates a species was not identified via dichotomous key (e.g., Jepson Manual), but that appeared to be a particular species.	
CNPS Rare Plant Listing Status:	
List 4.3 Uncommon in California. Not very endangered in California.	

APPENDIX B

Wildlife Compendium

Appendix B. Wildlife Compendium

Scientific Name	Common name
REPTILIA	REPTILES
Colubridae	Colubrids
<i>Coluber flagellum pice</i>	red racer
Crotaphytidae	Collard and Leopard Lizards
<i>Gambelia wislizenii</i>	long-nosed leopard lizard
Phrynosomatidae	Spiny lizards
<i>Callisaurus draconoides</i>	zebra-tailed lizard
<i>Sceloporus occidentalis</i>	western fence lizard
<i>Sceloporus graciosus gracilis</i>	western sagebrush lizard
<i>Sceloporus magister</i>	desert spiny lizard
<i>Uta stansburiana elegans</i>	western side-blotch lizard
Teiidae	Whiptails and Relatives
<i>Aspidoscelis tigris tigris</i>	Great Basin whiptail
Testudinidae	Land Tortoises
<i>Gopherus agassizii</i>	desert tortoise (scat)
Viperidae	Vipers
<i>Crotalus cerastes</i>	sidewinder rattlesnake
AVES	BIRDS
Accipitridae	Hawks, Kites, Harriers, and Eagles
<i>Buteo jamaicensis</i>	red-tailed hawk
Alaudidae	Larks
<i>Eremophila alpestris</i>	horned lark
Cathartidae	New World Vultures
<i>Cathartes aura</i>	turkey vulture
Charadriidae	Plovers
<i>Charadrius semipalmatus</i>	semipalmated plover (migrating)
Columbidae	Pigeons and Doves
<i>Streptopelia decaocto*</i>	Eurasian collared-dove
Corvidae	Jays and Crows
<i>Corvus corax</i>	common raven
Cuculidae	Cuckoos and Roadrunners
<i>Geococcyx californianus</i>	greater roadrunner
Emberizidae	American Sparrows
<i>Artemisiospiza belli</i>	sage sparrow
<i>Zonotrichia leucophrys</i>	white-crowned sparrow
Fringillidae	Songbirds
<i>Haemorhous mexicanus</i>	house finch
Sturnidae	Starlings
<i>Sturnus vulgaris*</i>	European starling
Trochilidae	Hummingbirds
<i>Calypte anna</i>	Anna's hummingbird
Troglodytidae	Wrens
<i>Salpinctes obsoletus</i>	rock wren
MAMMALIA	MAMMALS
Canidae	Dogs
<i>Canis latrans</i>	coyote
Cricetidae	Cricetine Mice and Rats
<i>Neotoma lepida</i>	desert woodrat
<i>Peromyscus maniculatus</i>	deer mouse
Equidae	Asses, Horses, and Zebras
<i>Equus asinus*</i>	feral burro

Appendix B. Wildlife Compendium

Scientific Name	Common name
Heteromyiadae	Kangaroo Rats, Pocket Mice, and Kangaroo Mice
<i>Chaetodipus</i> sp.	unidentified pocket mouse
<i>Dipodomys</i> spp.	unidentified kangaroo rat
<i>Perognathus</i> sp.	unidentified pocket mouse
Leporidae	Rabbits and Hares
<i>Lepus californicus</i>	black-tailed jackrabbit
Scuridae	Squirrels and Relatives
<i>Ammospermophilus leucurus</i>	white-tailed antelope squirrel
<i>Xerospermophilus tereticaudus</i>	round-tailed ground squirrel
* = non-native species	

APPENDIX C

Desert Tortoise Survey Data Sheets

Species Codes for Focused Survey Data Sheets

Coachwhip	red racer	<i>Coluber flagellum pice</i>
DT	desert tortoise	<i>Gopherus agassizii</i>
Uta	side-blotched lizard	<i>Uta stansburiana</i>
Whiptail	Great Basin whiptail	<i>Aspidoscelis tigris tigris</i>
Zebratail	zebra-tailed lizard	<i>Callisaurus draconoides</i>
ANHU	Anna's hummingbird	<i>Calypte anna</i>
CORA	common raven	<i>Corvus corax</i>
EUST	European starling	<i>Sturnus vulgaris</i>
HOLA	horned lark	<i>Eremophila alpestris</i>
HOFI	house finch	<i>Haemorhous mexicanus</i>
RTHA	red-tailed hawk	<i>Buteo jamaicensis</i>
SGSP	sage sparrow	<i>Artemisiospiza belli</i>
WCSP	white-crowned sparrow	<i>Zonotrichia leucophrys</i>
AMLE	White-tailed antelope ground squirrel	<i>Ammospermophilus leucurus</i>
XETE	Round-tailed ground squirrel	<i>Xerospermophilus tereticaudus</i>

Ft. Irwin Verizon Fiber Optic Project (2015-035/001/1.1)

4/14

Desert Tortoise Sign					
Time (24 hr)	Sign°	Class*	Easting UTM NAD83	Northing UTM NAD83	Comments (note aspect of burrows, Unique DT ID, measurements, behavior, etc.)
1	No sign observed				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

° T - tortoise, B - burrow, P - Pallet, S - scat, Tr - tracks, C - carcass, O - other (specify)

*BURROW / PALLET (Note Aspect) 1 - Currently active, w/tortoise or recent sign 2 - Good condition, definitely tortoise, no evidence of recent use 3 - Deteriorated condition (describe), definitely tortoise 4 - Good condition, possibly tortoise (describe) 5 - Deteriorated condition, possibly tortoise (describe)		*SCAT 1 - Wet or freshly dried, obvious odor 2 - Dry w/glaze and some odor, no bleaching, dark brown 3 - Dry, no glaze/odor, light brown, tightly packed, signs of bleaching 4 - Dry, very light brown to yellow, loose material; scaly appearance 5 - Bleached or consisting only of plant fiber	
*LIVE TORTOISE (MCL, Max Width, Width at 7/8 Marginal, Height)		*CARCASS	
1 - Healthy	A - Foraging	1 - Fresh or putrid	A - signs of predation
2 - URTD	B - Basking	2 - Normal color, scutes adhered to bone	B - No signs of predation
3 - Shell Cracked	C - In burrow	3 - Scutes peeled off bone	
4 - Peeling scutes	D - Digging	4 - Shell bone is falling apart; growth rings on scutes are peeling	
5 - Ticks	E - Traveling	5 - Disarticulated and scattered	

Ft. Irwin Verizon Fiber Optic Project (2015-035/001/1.1)

4/15/15

General Information	Weather Data		
Observers: Wendy Turner Kristen Wasz Josh C-B	Time (24 hr) Start: <u>0800</u> End: <u>1635</u> Temp* (°F) Start: <u>55F</u> End: <u>73F</u> <small>6" above ground in shade</small>	Wind (mph) Start: <u>15-25</u> End: <u>5-15</u> % Cloud Cover Start: <u>0</u> End: <u>0</u>	GPS File Name: <u>FIV 2015 0415_wt</u>

Area(s) surveyed
 West side of road from Gate South to area B3

Site Information	
Project Name: <u>SR-138 Corridor NW Improvement Project</u>	
Location: <u>Northwest of Lancaster</u>	UTM Coordinates (NAD 83)
County: <u>Los Angeles</u>	N: [PHOTOS? ___]
Quad:	E: [PHOTOS? ___]
T _____ R _____ S _____	S: [PHOTOS? ___]
Parcel #:	W: [PHOTOS? ___]

Physical Characteristics		
Elevation:	Aspect:	Soils:
Land Form*:	% Slope:	Other:
* e.g. mesa, bajada, wash		
Land Uses:		
NW:	SE:	
NE:	SW:	
Disturbances on Site: [e.g. tracks (vehicle, human, livestock, dog); trash; dump sites; bullet shells; blading; ravens; other]		
Is site staked or marked? [Y] [N]		
Transect Width:		

Field Observations

Vegetation Communities:

Plants

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

Whiptail, Sage brush lizard, ANLE
 HOLA Zebra tail
 W. Fence lizard Coyote (track)
 SGSP DT (scat)
 CORA Rock Wren

4/15

Ft. Irwin Verizon Fiber Optic Project (2015-035/001/1.1)

Desert Tortoise Sign						
Time (24 hr)	Sign°	Class*	Easting UTM NAD83	Northing UTM NAD83	Comments (note aspect of burrows, Unique DT ID, measurements, behavior, etc.)	
1	1213	S	2	522335	63894250	Roadside, disturbed, 3 adult scat 12:22
2						~2 in long, together, 2 photos taken
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
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25						
26						
27						

* T - tortoise, B - burrow, P - Pallet, S - scat, Tr - tracks, C - carcass, O - other (specify)

*BURROW / PALLET (Note Aspect) 1 - Currently active, w/tortoise or recent sign 2 - Good condition, definitely tortoise, no evidence of recent use 3 - Deteriorated condition (describe), definitely tortoise 4 - Good condition, possibly tortoise (describe) 5 - Deteriorated condition, possibly tortoise (describe)		*SCAT 1 - Wet or freshly dried, obvious odor 2 - Dry w/glaze and some odor, no bleaching, dark brown 3 - Dry, no glaze/odor, light brown, tightly packed, signs of bleaching 4 - Dry, very light brown to yellow, loose material; scaly appearance 5 - Bleached or consisting only of plant fiber	
*LIVE TORTOISE (MCL, Max Width, Width at 7/8 Marginal, Height)		*CARCASS	
1 - Healthy	A - Foraging	1 - Fresh or putrid	A - signs of predation
2 - URTD	B - Basking	2 - Normal color, scutes adhered to bone	B - No signs of predation
3 - Shell Cracked	C - In burrow	3 - Scutes peeled off bone	
4 - Peeling scutes	D - Digging	4 - Shell bone is falling apart; growth rings on scutes are peeling	
5 - Ticks	E - Traveling	5 - Disarticulated and scattered	

General Information	Weather Data		
Observers: - Wendy Turner Kristen Wasz Josh CB	Time (24 hr)	Start: <u>0800</u>	End: <u>1715</u>
	Temp* (°F) 6" above ground in shade	Start: <u>68</u>	End: <u>75</u>
	Wind (mph)	Start: <u>0-3</u>	End: <u>3-5</u>
	% Cloud Cover	Start: <u>0</u>	End: <u>0</u>
	GPS File Name:	<u>FIV 20150416 JCB</u>	

Area(s) surveyed
 C1 east of Rd, south of Main Gate

Site Information

Project Name: SR-138 Corridor NW Improvement Project

Location: <u>Northwest of Lancaster</u>	UTM Coordinates (NAD 83)	
County: <u>Los Angeles</u>	N:	[PHOTOS? ___]
Quad:	E:	[PHOTOS? ___]
T _____ R _____ S _____	S:	[PHOTOS? ___]
Parcel #:	W:	[PHOTOS? ___]

Physical Characteristics

Elevation:	Aspect:	Soils:
Land Form*:	% Slope:	Other:
* e.g. mesa, bajada, wash		

Land Uses:

NW:	SE:
NE:	SW:

Disturbances on Site: [e.g. tracks (vehicle, human, livestock, dog); trash; dump sites; bullet shells; blading; ravens; other]

Is site staked or marked? [Y] [N]

Transect Width:

Field Observations

Vegetation Communities:

Plants

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

HOLA
 whiptail
 CORA
 SESP
 Jackrabbit (scat)

EUST
 B.T. Jackrabbit

General Information	Weather Data		
Observers: - Wendy Turner Kristen Wasz Josh C-B	Time (24 hr)	Start: 0735	End: 1245
	Temp* (°F) 8" above ground in shade	Start: 70	End: 75
	Wind (mph)	Start: 2-5	End: 2-5
	% Cloud Cover	Start: 0	End: 0
	GPS File Name:	FIV20150417.wt	

Area(s) surveyed
 West side of Rd. Area B3, Garrison

Site Information		
Project Name: SR-138 Corridor NW Improvement Project		
Location: Northwest of Lancaster	UTM Coordinates (NAD 83)	
County: Los Angeles	N:	[PHOTOS? ___]
Quad:	E:	[PHOTOS? ___]
T _____ R _____ S _____	S:	[PHOTOS? ___]
Parcel #:	W:	[PHOTOS? ___]

Physical Characteristics		
Elevation:	Aspect:	Soils:
Land Form*:	%Slope:	Other:
* e.g. mesa, bajada, wash		
Land Uses:		
NW:	SE:	
NE:	SW:	
Disturbances on Site: [e.g. tracks (vehicle, human, livestock, dog); trash; dump sites; bullet shells; blading; ravens; other]		
Is site staked or marked? [Y] [N]		
Transect Width:		

Field Observations

Vegetation Communities:

Plants

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

HOLA coach whip
~~HOPE~~ SGSP CORA
 ANHU Zebra tail
 Whiptail Eurasian Collared Dove
 WCSP HOPE

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Ft. Irwin Verizon Fiber Optic Project (2015-035/001/1.1)

Desert Tortoise Sign					
Time (24 hr)	Sign°	Class*	Easting UTM NAD83	Northing UTM NAD83	Comments (note aspect of burrows, Unique DT ID, measurements, behavior, etc.)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					

° T - tortoise, B - burrow, P - Pallet, S - scat, Tr - tracks, C - carcass, O - other (specify)

*BURROW / PALLET (Note Aspect) 1 - Currently active, w/tortoise or recent sign 2 - Good condition, definitely tortoise, no evidence of recent use 3 - Deteriorated condition (describe), definitely tortoise 4 - Good condition, possibly tortoise (describe) 5 - Deteriorated condition, possibly tortoise (describe)		*SCAT 1 - Wet or freshly dried, obvious odor 2 - Dry w/glaze and some odor, no bleaching, dark brown 3 - Dry, no glaze/odor, light brown, tightly packed, signs of bleaching 4 - Dry, very light brown to yellow, loose material; scaly appearance 5 - Bleached or consisting only of plant fiber	
*LIVE TORTOISE (MCL, Max Width, Width at 7/8 Marginal, Height)		*CARCASS	
1 - Healthy	A - Foraging	1 - Fresh or putrid	A - signs of predation
2 - URTD	B - Basking	2 - Normal color, scutes adhered to bone	B - No signs of predation
3 - Shell Cracked	C - In burrow	3 - Scutes peeled off bone	
4 - Peeling scutes	D - Digging	4 - Shell bone is falling apart; growth rings on scutes are peeling	
5 - Ticks	E - Traveling	5 - Disarticulated and scattered	

5/19/2015

General Information	Weather Data		
Observers: Wendy Turner Josh Corra-Bennett	Time (24 hr)	Start: 1330	End: 1700
	Temp* (°F) 6" above ground in shade	Start: 70	End: 65
	Wind (mph)	Start: 0-3	End: 2-5
	% Cloud Cover	Start: 50%	End: 80%
	GPS File Name: FIVEnzon 20150519		

Area(s) surveyed
New alignment

Site Information	
Project Name: SR-138 Corridor NW Improvement Project 2015-035 / 001 / 1.1	
Location: Northwest of Lancaster Ft. Irwin	UTM Coordinates (NAD 83)
County: Los Angeles	N: [PHOTOS? ___]
Quad:	E: [PHOTOS? ___]
T _____ R _____ S _____	S: [PHOTOS? ___]
Parcel #:	W: [PHOTOS? ___]

Physical Characteristics	
Elevation:	Aspect:
Land Form*:	%Slope:
* e.g. mesa, bajada, wash	
Soils:	
Other:	
Land Uses:	
NW:	SE:
NE:	SW:
Disturbances on Site: [e.g. tracks (vehicle, human, livestock, dog); trash; dump sites; bullet shells; blading; ravens; other]	
Is site staked or marked? [Y] [N]	
Transect Width:	

Field Observations
Vegetation Communities:
Plants

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

CORA
SGSP
Whiptail
UTA
AMLE

5/20/2015

General Information	Weather Data		
Observers: Wendy Turner Josh Corona-Bennett	Time (24 hr)	Start: 0830	End: 1700
	Temp* (°F) 6" above ground in shade	Start: 48	End: 75
	Wind (mph)	Start: 0-3	End: 0-3
	% Cloud Cover	Start: 80%	End: 70%
	GPS File Name: FI_Verizon_20150520		

Area(s) surveyed
New Alignment

Site Information

Project Name: SR-138 Corridor NW Improvement Project 2015-035/001/0.1

Location: Northwest of Lancaster Ft. Irwin	UTM Coordinates (NAD 83)	
County: Los Angeles	N:	[PHOTOS? ___]
Quad:	E:	[PHOTOS? ___]
T _____ R _____ S _____	S:	[PHOTOS? ___]
Parcel #:	W:	[PHOTOS? ___]

Physical Characteristics

Elevation:	Aspect:	Soils:
Land Form*:	% Slope:	Other:
* e.g. mesa, bajada, wash		

Land Uses:

NW:	SE:
NE:	SW:

Disturbances on Site: [e.g. tracks (vehicle, human, livestock, dog); trash; dump sites; bullet shells; blading; ravens; other]

Is site staked or marked? [Y] [N]

Transect Width:

Field Observations

Vegetation Communities:

Plants

Animals: [include: B - burrow, S - scat, O - observed, T - tracks, C - carcass, or Other (specify)]

CORA UTA
 SB-SP. Coyote (tracks, scat)
 Whiptail AMLE
 Zebra tail
 RTHA

APPENDIX D

Desert Tortoise Sign Photographs

Appendix D. Photographs of Desert Tortoise Sign



Figure 1. Class 2 scat observed during desert tortoise surveys.



Figure 2. Example of class 4 burrow observed during desert tortoise surveys.



Figure 3. Example of a class 5 burrow observed during desert tortoise surveys.

APPENDIX E

Wildlife Camera Station Information

Appendix E. Remote Camera Station Location Information

Station #	Station Location				Camera Direction	Setup Date	Removal Date	Number of Days Operational	Number of Days Non-operational	Total # of Photos Taken	Camera Check #1		Camera Check #2		Camera Check #3		Camera Check #4		Camera Check #5		Camera Check #6	
	Easting	Northing	Description	Topography							Date	SD Card #										
C-4	521335.115	3890432.657	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	3421	5/24/2015	11	5/25/2015	218	5/26/2015	11	5/27/2015	218	5/28/2015	11	5/29/2015	218
C-5	521508.035	3890480.339	Near creosote	Creosote bush scrub	N	5/23/2015	5/29/2015	6	0	4801	5/24/2015	39	5/25/2015	227	5/26/2015	39	5/27/2015	227	5/28/2015	39	5/29/2015	227
C-6	521476.095	3890692.508	Under ambrosia	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	3922	5/24/2015	12	5/25/2015	226	5/26/2015	12	5/27/2015	226	5/28/2015	12	5/29/2015	226
C-7	521592.41	3890767.057	Under creosote	Creosote bush scrub	SE	5/23/2015	5/29/2015	6	0	8086	5/24/2015	37	5/25/2015	215	5/26/2015	37	5/27/2015	215	5/28/2015	37	5/29/2015	215
C-10	521611.939	3891276.708	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	9729	5/24/2015	10	5/25/2015	220	5/26/2015	10	5/27/2015	220	5/28/2015	10	5/29/2015	220
C-12	521680.668	3891568.623	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	4502	5/24/2015	09	5/25/2015	219	5/26/2015	09	5/27/2015	219	5/28/2015	09	5/29/2015	219
C-15	521866.838	3891934.83	Under creosote	Creosote bush scrub	NE	5/23/2015	5/29/2015	6	0	5311	5/24/2015	40	5/25/2015	236	5/26/2015	40	5/27/2015	236	5/28/2015	40	5/29/2015	236
C-18	521886.649	3892444.415	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	2176	5/24/2015	03	5/25/2015	208	5/26/2015	03	5/27/2015	208	5/28/2015	03	5/29/2015	208
C-19	522002.997	3892518.964	Under creosote	Creosote bush scrub	NE	5/23/2015	5/29/2015	6	0	3530	5/24/2015	34	5/25/2015	203	5/26/2015	34	5/27/2015	203	5/28/2015	34	5/29/2015	203
C-21	522071.199	3892811.002	Behind creosote	Creosote bush scrub	NE	5/29/2015	6/4/2015	6	0	3780	5/30/2015	221	5/31/2015	31	6/1/2015	221	6/2/2015	31	6/3/2015	221	6/4/2015	31
C-25	522208.201	3893394.937	Behind creosote	Creosote bush scrub	E	5/29/2015	6/4/2015	5	1	1760	5/30/2015	214	5/31/2015	15	6/1/2015	214	6/2/2015	15	6/3/2015	214	6/4/2015	15
C-28	522228.129	3893904.492	Under creosote	Rocky. Creosote bush scrub	SW	5/23/2015	5/29/2015	6	0	3702	5/24/2015	01	5/25/2015	201	5/26/2015	01	5/27/2015	201	5/28/2015	01	5/29/2015	201
C-30	522296.761	3894196.43	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	2408	5/24/2015	08	5/25/2015	216	5/26/2015	08	5/27/2015	216	5/28/2015	08	5/29/2015	216
C-32	522364.828	3894488.499	Under creosote	Creosote bush scrub	SW	5/23/2015	5/29/2015	6	0	4856	5/24/2015	07	5/25/2015	217	5/26/2015	217	5/27/2015	07	5/28/2015	217	5/29/2015	7
C-34	522432.236	3894780.722	Under creosote	Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	2184	5/24/2015	05	5/25/2015	213	5/26/2015	05	5/27/2015	213	5/28/2015	05	5/29/2015	213
C-36	522500.903	3895072.65	Under creosote	Dirt road. Creosote bush scrub	NW	5/23/2015	5/29/2015	6	0	3792	5/24/2015	06	5/25/2015	225	5/26/2015	06	5/27/2015	225	5/28/2015	06	5/29/2015	225
C-38	522569.414	3895364.615	Under creosote	Creosote bush scrub	SW	5/23/2015	5/29/2015	6	0	3148	5/24/2015	04	5/25/2015	209	5/26/2015	04	5/27/2015	209	5/28/2015	04	5/29/2015	209
C-39	522686.068	3895439.093	Behind creosote, E of road	Creosote bush scrub	E	5/29/2015	6/4/2015	5	1	2464	5/30/2015	223	5/31/2015	33	6/1/2015	223	6/2/2015	33	6/3/2015	223	6/4/2015	33
C-40	522637.543	3895656.67	Under creosote	Dirt road	NW	5/22/2015	5/28/2015	6	0	1170	5/23/2015	13	5/24/2015	234	5/25/2015	234	5/26/2015	13	5/27/2015	243	5/28/2015	13
C-42	522711.151	3895947.204	Under creosote	Dirt road	SW	5/22/2015	5/28/2015	6	0	5728	5/23/2015	15	5/24/2015	214	5/25/2015	48	5/26/2015	15	5/27/2015	214	5/28/2015	15
C-43	522857.417	3896011.196	Behind creosote, N of rocks	Creosote bush scrub	SE	5/29/2015	6/4/2015	5	1	1210	5/30/2015	211	5/31/2015	36	6/1/2015	211	6/2/2015	36	6/3/2015	211	6/4/2015	36
C-45	523046.026	3896243.221	Behind creosote, E of road	Creosote bush scrub	N	5/29/2015	6/4/2015	6	0	2788	5/30/2015	230	5/31/2015	22	6/1/2015	230	6/2/2015	22	6/3/2015	230	6/4/2015	22
C-46	523066.976	3896423.144	Under creosote	Dirt road	NW	5/22/2015	5/28/2015	6	0	4427	5/23/2015	16	5/24/2015	210	5/25/2015	41	5/26/2015	16	5/27/2015	210	5/28/2015	16
C-48	523273.915	3896640.2	Next to creosote	Dirt road	SW	5/22/2015	5/28/2015	6	0	4602	5/23/2015	14	5/24/2015	205	5/25/2015	C	5/26/2015	14	5/27/2015	205	5/28/2015	14
C-50	523480.893	3896857.22	Under creosote	Dirt road, Wash	N	5/22/2015	5/28/2015	6	0	3634	5/23/2015	17	5/24/2015	238	5/25/2015	238	5/26/2015	17	5/27/2015	238	5/28/2015	17
C-51	523667.072	3896894.172	Behind creosote, E of road	Creosote bush scrub	SE	5/29/2015	6/4/2015	6	0	1240	5/30/2015	235	5/31/2015	23	6/1/2015	235	6/2/2015	23	6/3/2015	235	6/4/2015	23
C-52	523687.796	3897074.311	Behind creosote	Dirt road, Wash	N	5/22/2015	5/28/2015	6	0	5911	5/23/2015	23	5/24/2015	235	5/25/2015	A	5/26/2015	23	5/27/2015	235	5/28/2015	23
C-54	523894.566	3897291.529	In group of creosote	Wash	NW	5/22/2015	5/28/2015	6	0	2072	5/23/2015	19	5/24/2015	212	5/25/2015	240	5/26/2015	19	5/27/2015	212	5/28/2015	19
C-56	524097.199	3897512.48	Under creosote	Berm, road	NW	5/22/2015	5/28/2015	6	0	2447	5/23/2015	22	5/24/2015	230	5/25/2015	239	5/26/2015	22	5/27/2015	230	5/28/2015	22
C-60	524515.664	3897941.95	Under ephedra	Wash	NW	5/22/2015	5/28/2015	6	0	2316	5/23/2015	21	5/24/2015	202	5/25/2015	206	5/26/2015	21	5/27/2015	202	5/28/2015	21
C-61	524701.63	3897979.104	Near ephedra, E of road, N of check-in	Creosote bush scrub	SW	5/29/2015	6/4/2015	6	0	3716	5/30/2015	231	5/31/2015	24	6/1/2015	231	6/2/2015	24	6/3/2015	231	6/4/2015	24
C-62	524722.237	3898159.354	Under ephedra	Dirt road	W	5/22/2015	5/28/2015	6	0	2592	5/23/2015	20	5/24/2015	204	5/25/2015	237	5/26/2015	20	5/27/2015	204	5/28/2015	20
C-64	524929.209	3898376.379	Under creosote	Dirt road	N	5/22/2015	5/28/2015	6	0	2196	5/23/2015	18	5/24/2015	224	5/25/2015	228	5/26/2015	18	5/27/2015	224	5/28/2015	18
C-65	525115.886	3898412.854	Behind creosote, E of road	Creosote bush scrub	SE	5/29/2015	6/4/2015	6	0	1132	5/30/2015	222	5/31/2015	32	6/1/2015	222	6/2/2015	32	6/3/2015	222	6/4/2015	32
C-66	525137.225	3898592.403	Under creosote	Dirt road	SW	5/22/2015	5/28/2015	6	0	6142	5/23/2015	26	5/24/2015	207	5/25/2015	02	5/26/2015	26	5/27/2015	207	5/28/2015	26
C-68	525343.757	3898809.844	Under creosote	Dirt road	SW	5/22/2015	5/28/2015	6	0	5378	5/23/2015	31	5/24/2015	221	5/25/2015	38	5/26/2015	31	5/27/2015	221	5/28/2015	31

Appendix E. Remote Camera Station Location Information

Station #	Station Location				Camera Direction	Setup Date	Removal Date	Number of Days Operational	Number of Days Non-operational	Total # of Photos Taken	Camera Check #1		Camera Check #2		Camera Check #3		Camera Check #4		Camera Check #5		Camera Check #6	
	Easting	Northing	Description	Topography							Date	SD Card #										
C-69	525529.759	3898846.964	Behind creosote, E of road	Creosote bush scrub	SW	5/29/2015	6/4/2015	6	0	1452	5/30/2015	205	5/31/2015	14	6/1/2015	205	6/2/2015	14	6/3/2015	205	6/4/2015	14
C-70	525550.545	3899027.043	Under creosote	Dirt road	NW	5/22/2015	5/28/2015	6	0	5264	5/23/2015	28	5/24/2015	229	5/25/2015	45	5/26/2015	28	5/27/2015	229	5/28/2015	28
C-72	525757.022	3899244.538	Under creosote	Dirt road and wash	NW	5/22/2015	5/28/2015	6	0	4188	5/23/2015	27	5/24/2015	233	5/25/2015	46	5/26/2015	27	5/27/2015	233	5/28/2015	27
C-74	525964.319	3899461.252	Under creosote looking in wash	Next to dirt road	E	5/22/2015	5/28/2015	6	0	2566	5/23/2015	24	5/24/2015	231	5/25/2015	42	5/26/2015	24	5/27/2015	231	5/28/2015	24
C-75	526150.021	3899498.654	Behind creosote, E of road	Creosote bush scrub	SE	5/29/2015	6/4/2015	6	0	2428	5/30/2015	212	5/31/2015	19	6/1/2015	212	6/2/2015	19	6/3/2015	212	6/4/2015	19
C-76	526169.956	3899679.539	Under creosote	Next to dirt road	NW	5/22/2015	5/28/2015	6	0	5930	5/23/2015	32	5/24/2015	222	5/25/2015	15A	5/26/2015	32	5/27/2015	222	5/28/2015	32
C-77	526355.891	3899716.721	Behind creosote, E of road	Creosote bush scrub	SE	5/29/2015	6/4/2015	6	0	1296	5/30/2015	229	5/31/2015	23	6/1/2015	229	6/2/2015	28	6/3/2015	229	6/4/2015	28
C-79	526573.529	3899922.158	Behind creosote	Creosote bush scrub	SE	5/29/2015	6/4/2015	6	0	1152	5/30/2015	238	5/31/2015	17	6/1/2015	238	6/2/2015	17	6/3/2015	238	6/4/2015	17
C-82	526900.518	3900172.978	Under creosote	Creosote bush scrub	N	5/22/2015	5/28/2015	6	0	2264	5/23/2015	33	5/24/2015	223	5/25/2015	44	5/26/2015	33	5/27/2015	223	5/28/2015	33
C-89	526735.378	3900214.157	Under creosote	Next to wash Flat. Near	SW	5/22/2015	5/28/2015	6	0	1461	5/23/2015	36	5/24/2015	211	5/25/2015	25	5/26/2015	36	5/27/2015	211	5/28/2015	36
C-90	526873.668	3900317.139	Under creosote	dirt berm	SW	5/22/2015	5/28/2015	5	1	2288	5/23/2015	35	5/24/2015	232	5/25/2015	47	5/26/2015	35	5/27/2015	232	5/28/2015	35

Appendix E. Remote Camera Station Site Photographs



Figure 1 – Station C-04.



Figure 3 – Station C-06.



Figure 2 – Station C-05.



Figure 4 – Station C-07.

Appendix E. Remote Camera Station Site Photographs



Figure 5 – Station C-10.



Figure 7 – Station C-15.



Figure 6 – Station C-12.



Figure 8 – Station C-18.

Appendix E. Remote Camera Station Site Photographs



Figure 9 – Station C-19.



Figure 11 – Station C-25.



Figure 10 – Station C-21.



Figure 12 – Station C-28.

Appendix E. Remote Camera Station Site Photographs



Figure 13 – Station C-30.



Figure 15 – Station C-34.



Figure 14 – Station C-32.



Figure 16 – Station C-36.

Appendix E. Remote Camera Station Site Photographs



Figure 17 – Station C-38.



Figure 19 – Station C-40.



Figure 18 – Station C-39.



Figure 20 – Station C-42.

Appendix E. Remote Camera Station Site Photographs



Figure 21 – Station C-43.



Figure 23 – Station C-46.



Figure 22 – Station C-45.



Figure 24 – Station C-48.

Appendix E. Remote Camera Station Site Photographs



Figure 25 – Station C-50.



Figure 27 – Station C-52.



Figure 26 – Station C-51.



Figure 28 – Station C-54.

Appendix E. Remote Camera Station Site Photographs



Figure 29 – Station C-56.



Figure 31 – Station C-61.



Figure 30 – Station C-60.



Figure 32 – Station C-62.

Appendix E. Remote Camera Station Site Photographs



Figure 33 – Station C-64.



Figure 35 – Station C-66.



Figure 34 – Station C-65.



Figure 36 – Station C-68.

Appendix E. Remote Camera Station Site Photographs



Figure 37 – Station C-69.



Figure 39 – Station C-72.



Figure 38 – Station C-70.



Figure 40 – Station C-74.

Appendix E. Remote Camera Station Site Photographs



Figure 41 – Station C-75.



Figure 43 – Station C-77.



Figure 42 – Station C-76.



Figure 44 – Station C-79.

Appendix E. Remote Camera Station Site Photographs



Figure 45 – Station C-82.



Figure 47 – Station C-90.



Figure 46 – Station C-89.

APPENDIX F

Mohave Ground Squirrel Trapping Data

Appendix F. Mohave Ground Squirrel Trapping Data

DATE	WEB	TIME	TRAP #	SPECIES	RECAP	SEX	AGE	REPRO*	Weight (g)	COMMENTS
06/10/15	C-19	12:08	C1	AMLE	N	Female	Adult	NON		
06/10/15	C-19	9:32	A3	AMLE	N	Male	Adult	NON		
06/10/15	C-19	9:31	A4	AMLE	N	Male	Adult	PSCR		
06/10/15	C-19	12:11	E4	AMLE	N	Male	Adult	PSCR		
06/10/15	C-19	11:48	A3	AMLE	Y					
06/10/15	C-19	11:50	B1	XETE	N	Female	Subadult	NON	67	#1; T:71, HF:31, E:6-7, HB:125; 522048 E, 3892545 N
06/10/15	C-21	9:47	A4	AMLE	N	Female	Adult	NON		
06/10/15	C-21	12:29	E3	AMLE	N	Female	Adult	NON		
06/10/15	C-21	12:25	B3	AMLE	N	Female	Adult	PLAC		
06/10/15	C-21	12:22	A2	AMLE	N	Male	Adult	NON		
06/10/15	C-21	12:23	A3	AMLE	Y					
06/10/15	C-21	12:33	E4	XETE	N	Male	Subadult	NON	47.5	#2; T:72, HF:31, E:6, HB:123; 522091 E, 3892800 N
06/10/15	C-34	13:17	A5	AMLE	N	Female	Adult	NON		
06/10/15	C-34	13:15	A3	AMLE	N	Female	Adult	NON		
06/10/15	C-34	13:20	H3	AMLE	N	Female	Adult	NON		
06/10/15	C-34	13:13	00	AMLE	N					escaped
06/10/15	C-50	13:00	F5	AMLE	N	Female	Adult	NON		
06/10/15	C-50	13:04	H4	AMLE	N	Female	Adult	NON		
06/10/15	C-50	9:34	G4	AMLE	N	Male	Adult	NON		
06/11/15	C-19	9:44	B3	AMLE	N	Male	Adult	PSCR		previous injury on left flank, healing/scabbed
06/11/15	C-19	9:50	E4	AMLE	N	Male	Adult	PSCR		
06/11/15	C-19	9:48	C4	AMLE	Y					
06/11/15	C-21	10:04	D4	AMLE	N	Female	Adult	NON		
06/11/15	C-21	10:00	B4	AMLE	Y					
06/11/15	C-21	10:19	F3	AMLE	Y					
06/11/15	C-21	10:08	E4	XETE	N	Male	Juvenile	NON	53	#3; T:72, HF:32, E:6, HB:110; 522080 E, 3892822 N
06/11/15	C-34	10:21	H5	AMLE	N	Female	Adult	NON		tail previously injured, shortened
06/11/15	C-34	10:20	H2	AMLE	N	Female	Adult	PLAC		tail previously injured, shortened
06/11/15	C-34	10:15	B1	AMLE	N	Male	Adult	PSCR		
06/11/15	C-34	12:08	A1	AMLE	N	Male	Adult	PSCR		
06/11/15	C-34	10:20	G4	AMLE	Y					
06/11/15	C-34	12:29	H4	AMLE	Y					
06/11/15	C-34	12:10	E5	XETE	N	Female	Adult	PLAC	125	#10; T:75, TUFT: 15, HF:30, HB:135; 522386 E, 3894742 N
06/11/15	C-50	9:48	B4	AMLE	N	Female	Adult	PLAC		
06/11/15	C-50	11:53	H4	AMLE	N	Female	Adult	PLAC		
06/11/15	C-50	9:54	F5	AMLE	N	Female	Subadult	NON		

Appendix F. Mohave Ground Squirrel Trapping Data

DATE	WEB	TIME	TRAP #	SPECIES	RECAP	SEX	AGE	REPRO*	Weight (g)	COMMENTS
06/11/15	C-50	9:46	A2	AMLE	N	Male	Adult	PSCR		
06/11/15	C-50	9:52	F3	AMLE	N	Male	Adult	PSCR		
06/11/15	C-50	9:56	G3	AMLE	N	Male	Adult	PSCR		
06/11/15	C-50	9:48	A4	AMLE	N	Male	Subadult	PSCR		
06/11/15	C-50	9:46	B3	AMLE	Y					
06/11/15	C-50	11:50	B2	AMLE	Y					
06/12/15	C-19	9:11	C4	AMLE	Y					
06/12/15	C-19	9:14	E3	XETE	N	Female	Subadult	NON	62.5	#4; T:76, HF:30, E:6, HB:117; 522022 E, 3892530 N; beginning to get adult pelage
06/12/15	C-34	10:01	A1	AMLE	N	Male	Adult	NON		
06/12/15	C-34	10:04	H4	AMLE	Y					
06/12/15	C-34	10:05	H3	AMLE	Y					
06/12/15	C-50	9:46	F5	AMLE	N	Female	Adult	NON		
06/12/15	C-50	9:39	B3	AMLE	Y					
06/12/15	C-50	9:39	A4	AMLE	Y					
06/12/15	C-50	9:42	C1	AMLE	Y					
06/12/15	C-50	9:45	G4	AMLE	Y					
06/13/15	C-34	8:58	C1	AMLE	Y					
06/13/15	C-34	8:59	H2	AMLE	Y					
06/13/15	C-34	9:01	F5	AMLE	Y					
06/13/15	C-50	8:44	H2	AMLE	N	Female	Adult	NON		
06/13/15	C-50	8:42	H3	AMLE	Y					
06/13/15	C-50	8:46	G5	AMLE	Y					
06/14/15	C-34	9:20	G2	AMLE	N	Male	Adult	PSCR		
06/14/15	C-50	8:44	A1	AMLE	Y					
06/14/15	C-50	8:45	A3	AMLE	Y					
06/14/15	C-50	8:47	H4	AMLE	Y					
06/14/15	C-50	8:56	G3	AMLE	Y					

* Reproductive Conditions: NON: non-reproductive, PLAC: post-lactating, PSCR: post-scrotal

Appendix F. Round-tailed Ground Squirrel Photos



Figure 1 – Sample ID #1, subadult female, Grid C-19, captured 6/10/2015.



Figure 2 – Sample ID #1, subadult female, Grid C-19, captured 6/10/2015.



Figure 3 – Sample ID #1, subadult female, Grid C-19, captured 6/10/2015.



Figure 4 – Sample ID #2, subadult male, Grid C-21, captured 6/10/2015.



Figure 5 – Sample ID #2, subadult male, Grid C-21, captured 6/10/2015.



Figure 6 – Sample ID #2, subadult male, Grid C-21, captured 6/10/2015.



Figure 7 – Sample ID #3, juvenile male, Grid C-21, captured 6/11/2015.



Figure 8 – Sample ID #3, juvenile male, Grid C-21, captured 6/11/2015.



Figure 9 – Sample ID #3, juvenile male, Grid C-21, captured 6/11/2015.



Figure 10 – Sample ID #4, subadult female, Grid C-19, captured 6/12/2015.



Figure 11 – Sample ID #4, subadult female, Grid C-19, captured 6/12/2015.



Figure 12 – Sample ID #4, subadult female, Grid C-19, captured 6/12/2015.



Figure 13 – Sample ID #10, adult female, post-lactating, Grid C-34, captured 6/11/2015.



Figure 14 – Sample ID #10, adult female, post-lactating, Grid C-34, captured 6/11/2015.



Figure 15 – Sample ID #10, adult female, post-lactating, Grid C-34, captured 6/11/2015.

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Grid # C-19	Project Name: <u>Ft Irwin Verigons</u>	Township: _____
	Property Owner: <u>DOD</u>	Range: _____
	Quad Map/Series: _____	Section (1/4): _____
	County: <u>San Bernardino</u>	

UTM Coordinates of grid corners (NAD 83, error <6m)

NW Corner ()		NE Corner ()		SE Corner ()		SW Corner ()	
Easting	Northing	Easting	Northing	Easting	Northing	Easting	Northing

PICTURES (from each end of grid) X

web grid - center: 522026 | 3892537
remove camera @ center facing SE

Acreage of Project Site (or linear distance) _____

11 mi

Acreage of potential MGS habitat on site (or linear distance) _____

2.11 mi

All areas of potential MGS habitat were visually surveyed on _____

5/11-15/15

These visual surveys were conducted by _____

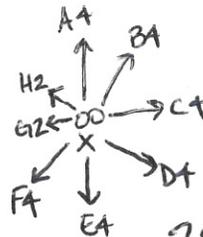
K. WASE

Total # of grids _____

4 (webs)

Session	Start Date	End Date	# Trap Nights
1	<u>6/10/15</u>	<u>6/12/15</u>	<u>3</u>
2			
3			

Days



Trapping conducted by:
<u>K. WASE</u>

Part II - General Habitat Description

Vegetation

dominant perennials	<u>creosote bush, burro bush</u>
other perennials	<u>Senna, indigo bush</u>
dominant annuals	<u>cryptantha, erodrum</u>
other annuals	

Disturbances

Land Forms (i.e. bajadas, washes)

Soils Description sandy / gravelly

Elevation

Slope flat

29 traps total
camera 1913
card: 232

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-21	Project Name: <u>Ft Irwin Verignon</u>	Township: _____
	Property Owner: <u>DOD</u>	Range: _____
	Quad Map/Series: _____	Section (1/4): _____
	County: <u>San Bernardino</u>	

UTM Coordinates of grid corners (NAD 83, error <6m)

NW Corner ()		NE Corner ()		SE Corner ()		SW Corner ()	
Easting	Northing	Easting	Northing	Easting	Northing	Easting	Northing

PICTURES (from each end of grid) X

Web grid: center: 522086 / 3892847
remote camera @ center facing SE

Acreeage of Project Site (or linear distance) _____

11 mi

Acreeage of potential MGS habitat on site (or linear distance) _____

~11 mi

All areas of potential MGS habitat were visually surveyed on _____

5/11 - 5/15/15

These visual surveys were conducted by _____

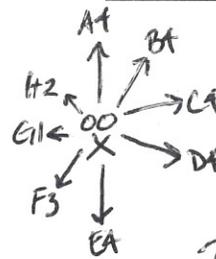
K. Wase

Total # of grids _____

4 (webs)

Session	Start Date	End Date	# Trap Nights
1	<u>6/10/15</u>	<u>6/11/15</u>	<u>2</u>
2	_____	_____	_____
3	_____	_____	_____

Days



Trapping conducted by:
<u>K. Wase</u>

Part II - General Habitat Description

Vegetation

dominant perennials	<u>Creosote Bush, burro bush</u>
other perennials	<u>Senna, indigo bush, chess bush, ephedra</u>
dominant annuals	<u>cryptantha, erodium</u>
other annuals	

27 traps total

Camera: 2108
Cond: 219

Disturbances

Land Forms (i.e. bajadas, washes)

Soils Description Sandy / gravelly

Elevation

Slope flat

Project Name: Ft Irwin Verigons

DATE 10/11/15	GRID C-21	Investigator(s): K. WASEZ	Project #: 2015-055/005
Circle when traps were closed <input checked="" type="checkbox"/>		Assistant(s):	GPS File:

	Opening		Check #1*		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
Time (24 hr)	0600	0608	0959	1033							Began closing traps after #3 XETE captured 1023:87 Picked up grid
Temp (°F)	68	68	85	88	* closed b/c obtained 2 XETE tissue samples						
Wind (mph)	3-5	1-3	0-3	0-3							
Cloud Cover (%)	0	0	0	0							

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
1000	BA	AMLE	(Y) N	M F	A SA J		KW	
1004	DA	AMLE	Y (N)	M (F)	(A) SA J	NON	KW	
1008	EA	XETE	Y (N)	(M) F	A SA (J)	NON	KW	W: 53, #3, T: 72, HF: 32, E: 4, HB: 110
			Y N	M F	A SA J			522080 3892822
1009	F3	AMLE	(M) N	M F	A SA J		KW	
6			Y N	M F	A SA J			
7			Y N	M F	A SA J			
8			Y N	M F	A SA J			
9			Y N	M F	A SA J			
10			Y N	M F	A SA J			
11			Y N	M F	A SA J			
12			Y N	M F	A SA J			
13			Y N	M F	A SA J			
14			Y N	M F	A SA J			
15			Y N	M F	A SA J			
16			Y N	M F	A SA J			
17			Y N	M F	A SA J			
18			Y N	M F	A SA J			
19			Y N	M F	A SA J			
20			Y N	M F	A SA J			
21			Y N	M F	A SA J			
22			Y N	M F	A SA J			
23			Y N	M F	A SA J			
24			Y N	M F	A SA J			
25			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations: XETE Vocalizations
 Chestnut ephedra
 Photo 1: looking S down A line
 Photo 2: looking N down E line
 Bag = 12

W

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-34	Project Name: <u>Verizon # Irvin</u>	Township: _____
	Property Owner: <u>DDD</u>	Range: _____
	Quad Map/Series: _____	Section (1/4): _____
	County: <u>San Bernardino</u>	

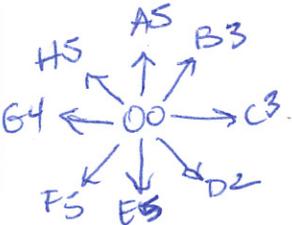
UTM Coordinates of grid corners (NAD 83, error <6m)

NW Corner ()		NE Corner ()		SE Corner ()		SW Corner ()	
Easting	Northing	Easting	Northing	Easting	Northing	Easting	Northing

PICTURES (from each end of grid) AS-S: 1529 ES-N: 1530 web grid center = 522275, 3894795
remote cam @ center facing NW

Acreage of Project Site (or linear distance) _____ 11 mi
 Acreage of potential MGS habitat on site (or linear distance) _____ ≈ 11 mi
 All areas of potential MGS habitat were visually surveyed on _____ 5/11 - 5/15/15
 These visual surveys were conducted by _____ K WASZ
 Total # of grids _____ 4

Session	Start Date	End Date	# Trap Nights
1	<u>6/10/15</u>	<u>6/14/15</u>	<u>5</u>
2	_____	_____	_____
3	_____	_____	_____



Trapping conducted by:
<u>P WASZ</u>
<u>AL TROST</u>

Part II - General Habitat Description

Cam: 0050 SD: 203

Vegetation	
dominant perennials	<u>Larrea tridentata, Ambrosia dumosa</u>
other perennials	<u>Cheesebush, Cholla</u>
dominant annuals	<u>Amsinkia, Schismus</u>
other annuals	<u>Bromus, Chia, Erodium cicutarium</u>

Disturbances	
Land Forms (i.e. bajadas, washes)	<u>Wash running SE on E side of web</u>
Soils Description	<u>Sandy, gravelly</u>
Elevation	Slope

MGS Trapping Survey

Project Name: Verizon FE Irwin

DATE <u>4/10/15</u>	GRID <u>C-34</u>	Investigator(s): <u>P WASE</u>	Project #: <u>2015-035/005</u>
		Assistant(s): <u>AL TROST</u>	GPS File:

	Opening		Check #1		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
Circle when traps were closed <input checked="" type="checkbox"/>											
Time (24 hr)	<u>0637</u>	<u>0715</u>	<u>0953</u>	<u>1004</u>	<u>1252</u>	<u>1305</u>	<u>1311</u>	<u>1320</u>			No animals Check 1
Temp (°F)	<u>70</u>	<u>72</u>	<u>82</u>	<u>84</u>	<u>90</u>	<u>91</u>	<u>91</u>	<u>92</u>			
Wind (mph)	<u>8-7</u>	<u>5-10</u>	<u>5-7</u>	<u>5-7</u>	<u>7-10</u>	<u>7-10</u>	<u>7-10</u>	<u>5-7</u>			
Cloud Cover (%)	<u>35</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>			

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
1300	F5	AMALE	Y (N)	M (F)	(A)SA J	NON	ALT	
1504	H2	AMALE	Y (N)	M (F)	(A)SA J	NON	ALT	
1313	00	AMLE	Y N	M F	A SA J		PW	escaped
1315	A3	AMLE	(Y) N	M (F)	(A)SA J	NON	PW	
1317	A5	AMLE	Y (N)	M (F)	(A)SA J	NLAC	PW	
1320	H3	AMLE	Y (N)	M (F)	(A)SA J	NON	ALT	
7			Y N	M F	A SA J			
8			Y N	M F	A SA J			
9			Y N	M F	A SA J			
10			Y N	M F	A SA J			
11			Y N	M F	A SA J			
12			Y N	M F	A SA J			
13			Y N	M F	A SA J			
14			Y N	M F	A SA J			
15			Y N	M F	A SA J			
16			Y N	M F	A SA J			
17			Y N	M F	A SA J			
18			Y N	M F	A SA J			
19			Y N	M F	A SA J			
20			Y N	M F	A SA J			
21			Y N	M F	A SA J			
22			Y N	M F	A SA J			
23			Y N	M F	A SA J			
24			Y N	M F	A SA J			
25			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations: Checking Temps: 1020=86° 1045=88° 1100=87° 1115=86°
1125=87° 1140=88° 1155=88.5° 1205=88° 1220=89° 1235=88°
1245=89°
Grid temps are from C-50

MGS Trapping Survey

Project Name: Verizon Ft Irwin

DATE <u>6/12/15</u>	GRID <u>C-34</u>	Investigator(s): <u>P WASEZ</u>	Project #: <u>2015-035/05</u>
		Assistant(s): <u>AL TROST</u>	GPS File:

Circle when traps were closed	Opening		Check #1		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
Time (24 hr)	<u>0607</u>	<u>0616</u>	<u>1000</u>	<u>1007</u>							
Temp (°F)	<u>77</u>	<u>77</u>	<u>94</u>	<u>94</u>							
Wind (mph)	<u>0-3</u>	<u>0-3</u>	<u>0-3</u>	<u>0-3</u>							
Cloud Cover (%)	<u>25</u>	<u>25</u>	<u>35</u>	<u>40</u>							

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
1	<u>1001</u>	<u>A1</u>	<u>AMLE</u>	<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>	<u>NSCR</u>	<u>PW</u>	
2	<u>1004</u>	<u>H4</u>	<u>AMLE</u>	<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>		<u>PW</u>	
3	<u>1005</u>	<u>H3</u>	<u>AMLE</u>	<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>		<u>PW</u>	
4			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
5			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
6			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
7			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
8			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
9			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
10			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
11			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
12			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
13			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
14			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
15			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
16			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
17			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
18			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
19			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
20			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
21			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
22			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
23			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
24			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				
25			<u>Y</u> <u>N</u> <u>M</u> <u>F</u>	<u>A</u> <u>SA</u> <u>J</u>				

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations:

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-50	Project Name: <u>Verizon Ft Irwin</u>	Township: _____
	Property Owner: <u>DOD</u>	Range: _____
	Quad Map/Series: _____	Section (1/4): _____
	County: <u>San Bernardino</u>	

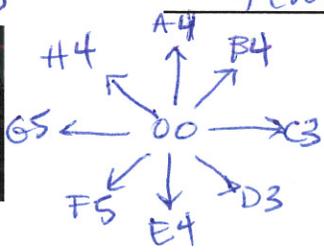
UTM Coordinates of grid corners (NAD 83, error <6m)

NW Corner ()		NE Corner ()		SE Corner ()		SW Corner ()	
Easting	Northing	Easting	Northing	Easting	Northing	Easting	Northing

PICTURES (from each end of grid) A4-S: 1527 E4-N: 1528 Web grid center: 523444, 3896205
remote cam @ center facing N
11 mi
11 mi
5/11 - 5/15/15
K WASZ
4 (webs)

Acreage of Project Site (or linear distance) _____
 Acreage of potential MGS habitat on site (or linear distance) _____
 All areas of potential MGS habitat were visually surveyed on _____
 These visual surveys were conducted by _____
 Total # of grids _____

Session	Start Date	End Date	# Trap Nights
1	<u>6/10/15</u>	<u>6/14/15</u>	<u>5</u>
2	_____	_____	_____
3	_____	_____	_____



Trapping conducted by:
<u>P WASZ</u>
<u>AL TROST</u>

Part II - General Habitat Description

Vegetation

Cam: 0057 SD: 233

dominant perennials	<u>Carnea tridentata, Ambrosia dumosa</u>
other perennials	<u>Joshua tree, Lycium, Beavertail cactus, Ephedra, Cheesebush</u>
dominant annuals	<u>Amsinckia, Schismus</u>
other annuals	<u>Bromus</u>

Disturbances _____

Land Forms (i.e. bajadas, washes) _____

Soils Description Sandy / gravelly

Elevation _____ Slope flat

MGS Trapping Survey

Project Name: Verizon Ft Irwin

DATE <u>10/10/15</u>	GRID <u>C-50</u>	Investigator(s): <u>P WASZ</u>	Project #: <u>2015-035/005</u>
		Assistant(s): <u>AL TROST</u>	GPS File:

Circle when traps were closed	Opening		Check #1		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
	<u>0530</u>	<u>0623</u>	<u>0930</u>	<u>0942</u>	<u>1252</u>	<u>1305</u>					
Time (24 hr)											
Temp (°F)	<u>66</u>	<u>69</u>	<u>79</u>	<u>82</u>	<u>90</u>	<u>91</u>					
Wind (mph)	<u>5-7</u>	<u>5-10</u>	<u>7-10</u>	<u>7-10</u>	<u>7-10</u>	<u>7-10</u>					
Cloud Cover (%)	<u>45</u>	<u>40</u>	<u>15</u>	<u>15</u>	<u>20</u>	<u>20</u>					

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
<u>0938</u>	<u>G4</u>	<u>AMLE</u>	Y <input checked="" type="radio"/> N	M <input checked="" type="radio"/> F	<u>A</u> SA J	<u>NSCR</u>	<u>PW</u>	
<u>1300</u>	<u>FS</u>	<u>↓</u>	Y <input checked="" type="radio"/> N	M <input checked="" type="radio"/> F	<u>A</u> SA J	<u>NLAC</u>	<u>AT</u>	
<u>1304</u>	<u>H2</u>	<u>↓</u>	Y <input checked="" type="radio"/> N	M <input checked="" type="radio"/> F	<u>A</u> SA J	<u>NLAC</u>	<u>AT</u>	
4			Y N	M F	A SA J			
5			Y N	M F	A SA J			
6			Y N	M F	A SA J			
7			Y N	M F	A SA J			
8			Y N	M F	A SA J			
9			Y N	M F	A SA J			
10			Y N	M F	A SA J			
11			Y N	M F	A SA J			
12			Y N	M F	A SA J			
13			Y N	M F	A SA J			
14			Y N	M F	A SA J			
15			Y N	M F	A SA J			
16			Y N	M F	A SA J			
17			Y N	M F	A SA J			
18			Y N	M F	A SA J			
19			Y N	M F	A SA J			
20			Y N	M F	A SA J			
21			Y N	M F	A SA J			
22			Y N	M F	A SA J			
23			Y N	M F	A SA J			
24			Y N	M F	A SA J			
25			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations:

MGS Trapping Survey

Project Name: Verizon Ft Irwin

DATE <u>4/11/15</u>	GRID <u>C-50</u>	Investigator(s): <u>P WASH</u>	Project #: <u>2015-035</u> / <u>1005</u>
		Assistant(s): <u>AL TROST</u>	GPS File:

Circle when traps were closed	Opening		Check #1		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
	0547	0600	0945	0959	1148	1159					
Time (24 hr)											
Temp (°F)	62	63	83	82	90	91					
Wind (mph)	0-3	0-3	0-3	0-3	0-3	0-3					
Cloud Cover (%)	0	0	0	0	10	10					

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
0946	A2	AMLE	Y (N)	(M) F	A SA J	PSCR	PW	
0946	B3	AMLE	(Y) N	M F	A SA J		ALT	
0948	A4	AMLE	Y (N)	(M) F	A SA J	PSCR	PW	
0948	B4	AMLE	Y (N)	M F	A SA J	PLAC	ALT	Nipple injured/infected
0952	F3	AMLE	Y (N)	(M) F	A SA J	PSCR	ALT	
0954	F5	AMLE	Y (N)	M F	A SA J	NON	PW	
0956	G3	AMLE	Y (N)	(M) F	A SA J	PSCR	PW	
1150	B2	AMLE	(Y) N	M F	A SA J		ALT	
1153	H4	AMLE	Y (N)	M F	A SA J	PLAC	KW	
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations: 1045 = 86° 11:00 = 88° 1120 = 88° 1135 = 88°

Project Name: Venison Ft Irwin

DATE <u>6/12/15</u>	GRID <u>C-50</u>	Investigator(s): <u>P WASZ</u>	Project #: <u>2015-035/005</u>
		Assistant(s): <u>ALTROST</u>	GPS File:

Circle when traps were closed <input type="checkbox"/>	Opening		Check #1		Check #2		Check #3		Check #4		NOTES
	Start	End	Start	End	Start	End	Start	End	Start	End	
	<u>0549</u>	<u>0557</u>	<u>0934</u>	<u>0951</u>							
Time (24 hr)											
Temp (°F)	<u>74</u>	<u>75</u>	<u>90</u>	<u>94</u>							
Wind (mph)	<u>1-3</u>	<u>1-3</u>	<u>0-3</u>	<u>0-3</u>							
Cloud Cover (%)	<u>25</u>	<u>25</u>	<u>35</u>	<u>35</u>							

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
<u>0939</u>	<u>B3</u>	<u>AMLE</u>	<u>(Y) N</u>	<u>M F</u>	<u>A SA J</u>		<u>ALT</u>	
<u>0939</u>	<u>A4</u>	<u>AMLE</u>	<u>(Y) N</u>	<u>M F</u>	<u>A SA J</u>		<u>PW</u>	
<u>0942</u>	<u>C1</u>	<u>AMLE</u>	<u>(Y) N</u>	<u>M F</u>	<u>A SA J</u>		<u>ALT</u>	
<u>0945</u>	<u>G4</u>	<u>AMLE</u>	<u>(Y) N</u>	<u>M F</u>	<u>A SA J</u>		<u>PW</u>	
<u>0946</u>	<u>FS</u>	<u>AMLE</u>	<u>Y (N)</u>	<u>M (F)</u>	<u>(A) SA J</u>	<u>NLAC</u>	<u>PW</u>	
6			Y N	M F	A SA J			
7			Y N	M F	A SA J			
8			Y N	M F	A SA J			
9			Y N	M F	A SA J			
10			Y N	M F	A SA J			
11			Y N	M F	A SA J			
12			Y N	M F	A SA J			
13			Y N	M F	A SA J			
14			Y N	M F	A SA J			
15			Y N	M F	A SA J			
16			Y N	M F	A SA J			
17			Y N	M F	A SA J			
18			Y N	M F	A SA J			
19			Y N	M F	A SA J			
20			Y N	M F	A SA J			
21			Y N	M F	A SA J			
22			Y N	M F	A SA J			
23			Y N	M F	A SA J			
24			Y N	M F	A SA J			
25			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations: Temps: 0745=82° 0800=84° 0830=86° 0905=88°

MGS Trapping Survey

Project Name: Verizon FE Irwin

DATE <u>4/13/15</u>	GRID <u>C-50</u>	Investigator(s): <u>K WASTZ</u>	Project #: <u>2015-035</u>			
Circle when traps were closed <input checked="" type="checkbox"/>		Assistant(s): <u>AL TROST</u>	GPS File:			
	Opening	<u>Check #1</u>	Check #2	Check #3	Check #4	NOTES
	Start End	Start End	Start End	Start End	Start End	
Time (24 hr)	<u>0540 0554</u>	<u>0834 0849</u>				
Temp (°F)	<u>70 71</u>	<u>90 92</u>				
Wind (mph)	<u>0-3 0-3</u>	<u>0-3 0-3</u>				
Cloud Cover (%)	<u>20 20</u>	<u>1 1</u>				

Time (24 hr)	Trap #	Species	Recap?	Sex	Age	Repro condition	Handler's Initials	COMMENTS (GPS NAD 83 coordinates; species measurements, etc.)
<u>0842</u>	<u>H3</u>	<u>AMLE</u>	<u>Y</u> N	M F	A SA J		<u>KW</u>	
<u>0844</u>	<u>H2</u>	<u>AMLE</u>	Y <u>N</u>	M <u>F</u>	<u>A</u> SA J	<u>NON</u>	<u>KW</u>	
<u>0846</u>	<u>G5</u>	<u>AMLE</u>	<u>Y</u> N	M F	A SA J		<u>KW</u>	
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			
			Y N	M F	A SA J			

**Reproductive Condition: scrotal (SCR); non-scrotal (NSCR); post-scrotal (PSCR); pregnant (PREG); lactating (LAC); post-lactating (PLAC); perforate (PERF); imperforate (IMP)

General Notes or Observations:

APPENDIX G

Mohave Ground Squirrel Trapping Web Information

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-19	Project Name: <u>Verizon Ft Irwin</u>	Township: <u>13N</u>
	Property Owner: <u>Department of Defense</u>	Range: <u>2E</u>
	Quad Map/Series: <u>Paradise Range</u>	Section: <u>34</u>
	County: <u>San Bernardino</u>	

UTM Coordinates of grid web center (NAD 83, error < 6m)

Center (00)		H2	A4	B4
Easting	Northing	G2	00	C4
522026	3892537	F4	E4	D4

Total # of Traps: 29

PICTURES (from each end of grid) _____

Acreage of Project Site (or linear distance)	<u>11 miles</u>
Acreage of potential MGS habitat on site (or linear distance)	<u>~11 miles</u>
All areas of potential MGS habitat were visually surveyed on	<u>5/11-5/15/2015</u>
These visual surveys were conducted by	<u>K. Wasz</u>
Total # of grids	<u>4 (web grids)</u>

Start Date	End Date	Trap Nights
6/10/2015	6/12/2015	3

Trapping conducted by:
<u>K. Wasz</u>

Part II - General Habitat Description

Remote Camera: 1913	SD Card: 232
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Vegetation

dominant perennials	<u>creosote bush, burro bush</u>
other perennials	<u>senna, indigo bush</u>
dominant annuals	<u><i>Cryptantha, Erodium</i></u>
other annuals	

Land Forms (i.e. bajadas, washes)

Soils Description	<u>sandy/gravelly</u>		
Elevation	<u>2703</u>	Slope	<u>flat</u>

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid #	Project Name: <u>Verizon Ft Irwin</u>	Township: <u>13N</u>
C-21	Property Owner: <u>Department of Defense</u>	Range: <u>2E</u>
	Quad Map/Series: <u>Paradise Range</u>	Section: <u>34</u>
	County: <u>San Bernardino</u>	

UTM Coordinates of grid web center (NAD 83, error <6m)

Center (00)		H2	A4	B4
Easting	Northing	G1	00	C4
522086	3892847	F3	E4	D4

Total # of Traps: 27

PICTURES (from each end of grid) _____

Acreage of Project Site (or linear distance)	<u>11 miles</u>
Acreage of potential MGS habitat on site (or linear distance)	<u>~11 miles</u>
All areas of potential MGS habitat were visually surveyed on	<u>5/11-5/15/2015</u>
These visual surveys were conducted by	<u>K. Wasz</u>
Total # of grids	<u>4 (web grids)</u>

Start Date	End Date	Trap Nights
6/10/2015	6/11/2015	2

Trapping conducted by:
K. Wasz

Part II - General Habitat Description

Remote Camera: 0108	SD Card: 219
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Vegetation

dominant perennials	<u>creosote bush, burro bush</u>
other perennials	<u>senna, indigo bush, cheesebush, <i>Ephedra</i></u>
dominant annuals	<u><i>Cryptantha, Erodium</i></u>
other annuals	

Land Forms (i.e. bajadas, washes)

Soils Description	<u>sandy/gravelly</u>
Elevation	<u>2757</u>
Slope	<u>flat</u>

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-34	Project Name: <u>Verizon Ft Irwin</u>	Township: <u>13N</u>
	Property Owner: <u>Department of Defense</u>	Range: <u>2E</u>
	Quad Map/Series: <u>Langford Well</u>	Section: <u>14</u>
	County: <u>San Bernardino</u>	

UTM Coordinates of grid web center (NAD 83, error < 6m)

Center (00)		H5	A5	B3
Easting	Northing	G4	00	C3
522395	3894795	F5	E5	D2

Total # of Traps: 33

PICTURES (from each end of grid) _____

Acreage of Project Site (or linear distance)	<u>11 miles</u>
Acreage of potential MGS habitat on site (or linear distance)	<u>~11 miles</u>
All areas of potential MGS habitat were visually surveyed on	<u>5/11-5/15/2015</u>
These visual surveys were conducted by	<u>K. Wasz</u>
Total # of grids	<u>4 (web grids)</u>

Start Date	End Date	Trap Nights
6/10/2015	6/14/2015	5

Trapping conducted by:
P. Wasz
K. Wasz
A. Trost

Part II - General Habitat Description

Remote Camera: 0050	SD Card: 203
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Vegetation

dominant perennials	<u>creosote bush, burro bush</u>
other perennials	<u>cheesebush, cholla cactus</u>
dominant annuals	<u>Amsinkia, Schismus</u>
other annuals	<u>Bromus, Chia, Erodium cicutarium</u>

Land Forms (i.e. bajadas, washes)	<u>wash running SE on W side of web</u>
Soils Description	<u>sandy/gravelly</u>
Elevation	<u>3196</u>
Slope	

Mohave Ground Squirrel (MGS) Survey and Trapping Form

Part I - Project Information



Grid # C-50	Project Name: <u>Verizon Ft Irwin</u>	Township: <u>13N</u>
	Property Owner: <u>Department of Defense</u>	Range: <u>2E</u>
	Quad Map/Series: <u>Langford Well</u>	Section: <u>27</u>
	County: <u>San Bernardino</u>	

UTM Coordinates of grid web center (NAD 83, error < 6m)

Center (00)		H4	A4	B4
Easting	Northing	G5	00	C3
523444	3896905	F5	E4	D3

Total # of Traps: 33

PICTURES (from each end of grid) _____

Acreage of Project Site (or linear distance)	<u>11 miles</u>
Acreage of potential MGS habitat on site (or linear distance)	<u>~11 miles</u>
All areas of potential MGS habitat were visually surveyed on	<u>5/11-5/15/2015</u>
These visual surveys were conducted by	<u>K. Wasz</u>
Total # of grids	<u>4 (web grids)</u>

Start Date	End Date	Trap Nights
6/10/2015	6/14/2015	5

Trapping conducted by:
P. Wasz
K. Wasz
A. Trost

Part II - General Habitat Description

Remote Camera: 0057 SD Card: 233

Vegetation

dominant perennials	<u>creosote bush, burro bush</u>
other perennials	<u>Joshua tree, <i>Lycium</i>, beavertail cactus, <i>Ephedra</i>, cheesebush</u>
dominant annuals	<u><i>Amsinckia</i>, <i>Schismus</i></u>
other annuals	<u><i>Bromus</i></u>

Land Forms (i.e. bajadas, washes)

Soils Description	<u>sandy/gravelly</u>		
Elevation	<u>3024</u>	Slope	<u>flat</u>

Mohave Ground Squirrel (MGS) Survey and Trapping Form

PART III - WEATHER ALL GRIDS

Grid	Day	Date	Air Temperature (°F)				Cloud Cover (%)				Wind Speed (mph)			
			Maximum	Time	Minimum	Time	Maximum	Time	Minimum	Time	Maximum	Time	Minimum	Time
C-19	1	06/10/15	90	11:45	71	5:30	40%	5:30	5%	11:45	3-7	11:45	2-6	9:30
	2	06/11/15	92	10:48	68	5:45	0%	5:45	0%	10:58	3-5	5:45	0-2	10:48
	3	06/12/15	94	9:33	77	5:50	20%	9:33	10%	6:00	0-2	5:50	0-2	9:33
C-21	1	06/10/15	94	12:45	73	6:45	35%	6:45	5%	12:20	3-7	9:51	1-4	7:45
	2	06/11/15	88	10:33	68	6:00	0%	6:00	0%	10:33	0-3	9:59	3-5	6:00
C-34	1	06/10/15	92	13:20	70	6:37	15%	7:15	35%	6:37	7-10	13:11	5-7	6:37
	2	06/11/15	98	12:30	66	6:10	30%	12:30	0%	6:10	0-3	6:10	0-3	12:30
	3	06/12/15	94	10:00	77	6:07	40%	10:07	25%	6:07	0-3	6:07	0-3	10:07
	4	06/13/15	92	8:55	74	6:00	20%	6:00	1%	8:55	0-3	6:00	0-3	9:02
	5	06/14/15	92	9:33	70	5:50	1%	9:33	0%	5:50	0-3	5:50	0-3	9:33
C-50	1	06/10/15	91	13:05	66	5:36	45%	5:36	15%	9:30	7-10	9:30	5-7	5:36
	2	06/11/15	91	11:59	62	5:47	10%	11:48	0%	5:47	0-3	5:47	0-3	11:59
	3	06/12/15	94	9:51	74	5:49	35%	9:34	25%	5:49	1-3	5:49	0-3	9:34
	4	06/13/15	92	8:49	70	5:40	20%	5:40	1%	8:34	0-3	5:40	0-3	8:49
	5	06/14/15	90	9:03	70	5:45	3%	9:03	1%	8:42	0-3	5:36	0-3	9:03

Appendix G. Representative Photos of Trapping Webs



Figure 1 – Grid C-19, Facing North at Trap E4.



Figure 2 – Grid C-19, Facing South at Trap A4.

Appendix G. Representative Photos of Trapping Webs



Figure 3 – Grid C-21, Facing North at Trap E4.



Figure 4 – Grid C-21, Facing South at Trap A4.

Appendix G. Representative Photos of Trapping Webs



Figure 5 – Grid C-34, Facing North at Trap E5.



Figure 6 – Grid C-34, Facing South at Trap A5.

Appendix G. Representative Photos of Trapping Webs



Figure 7 – Grid C-50, Facing North at Trap E4.



Figure 8 – Grid C-50, Facing South at Trap A4.