Appendix B-5
Delineation of Waters of the United States and Department of Fish and Game Jurisdictional Habitats for the Eldorado—Ivanpah Transmission Project, March 2010

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Delineation of Waters of the United States and Department of Fish and Game Jurisdictional Habitats for the Eldorado-Ivanpah Transmission Project
San Bernardino County, California and Clark County, Nevada

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Table of Contents

1.0 Introduction 1
2.0 Project Description 1
2.1 Project Location 2
2.2 Environmental Setting 4
2.2.1 Climate 4
2.2.2 Hydrology 5
2.2.3 Vegetation 5
2.3 Soils 7
2.3.1 Hydric Soils 16
3.0 Delineation of Waters of the United States 16
3.1 Regulatory Background 16
3.2 Methods 17
3.3 Results 18
3.3.1 Waters of the United States 18
3.3.2 Summary of Potentially Jurisdictional Features 20
4.0 Delineation of CDFG Jurisdictional Habitats 23
4.1 Regulatory Background 23
4.2 Methods 23
4.3 Results 24
4.3.1 Summary of Potentially Jurisdictional Areas 24
5.0 References 27

List of Figures

Figure 1. Project vicinity map. 3
Figure 2. Soils map. 8

List of Tables

Table 1. Summary of potential USACE jurisdiction by watershed. 18
Table 2. Summary of impacts to potential USACE – jurisdictional waters. 21
Table 3. Species composition of CDFG – jurisdictional wash habitats 25
Table 4. Summary of impacts to potential CDFG – jurisdictional habitats. 26

Appendices

Appendix A. Pant species observed in the EITP project site.
Appendix B. Representative Photographs of Jurisdictional Features.
Appendix C. Maps of potential USACE – Jurisdictional Waters
Appendix D. Maps of potential CDFG – Jurisdictional Habitats

1.0 Introduction

Southern California Edison (SCE) is proposing to construct the Eldorado-Ivanpah Transmission Project (EITP) to service proposed solar generation facilities near the California-Nevada border near Primm, Nevada. The project will consist of the replacement of a 35-mile portion of an existing SCE transmission line connecting the new Ivanpah Substation to the existing SCE Eldorado Substation near Boulder City, Nevada, upgrading the support facilities at the Eldorado Substation to accommodate the connection of the new transmission lines, and construction of a telecommunications line (telecom line) to connect the project to existing SCE telecommunications systems.

This report presents the findings of a delineation of Waters of the United States and California Department of Fish and Game Jurisdictional Habitats for the SCE-proposed EITP project. The information presented in this report is intended to assist the U.S. Army Corps of Engineers (USACE) determine the extent of jurisdictional Waters of the U.S. within the proposed project area. Data have been collected in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and additional supplemental manuals (USACE 1987, 2008a, and 2008b). This report is also intended to aid the California Department of Fish and Game (CDFG) with determination of the extent of jurisdictional habitats in the California portion of the project.

2.0 Project Description

Transmission line

The transmission line rebuild involves the removal of the existing 115kV transmission line and installation of a new double-circuit 220kV transmission line between the proposed Ivanpah Substation and the existing Eldorado Substation. Due to differences in the tower heights and span lengths for the new line, new towers will not generally be sited in the same location as the original towers, with the exception of corner points and the part of the route through the McCullough Range where the locations are limited by topography and adjacent transmission lines. New spurs roads will be required for the new towers since the existing towers have no spur roads (they were built in 1930 - 31).

Permanent impacts include the new tower locations (25 foot clearance around tower legs) and spur roads. Temporary impacts include: 115kV tower removal areas and conductor pulling sites; new 115kV steel pole installation (around the Ivanpah Substation), conductor pulling, splicing, and tensioning areas; 220kV tower installation areas, conductor pulling, tensioning, and splicing sites; laydown and staging areas for equipment and supplies; and, temporary access routes.

The total length of the transmission line route is approximately 36 linear miles. In total, construction of this portion of the project will result in approximately 385 acres temporary

impacts and approximately 41 acres of permanent impacts across all of habitat types falling within the project alignment.

Telecommunication line

Two telecommunication paths are required for the project. The first telecom line will be OPGW (optical ground wire) on the new 220kV transmission line, and the second telecom line will be comprised of OPGW on the existing Eldorado-Lugo 500kV transmission line from Eldorado Substation to Nipton Road (Highway 164) where it will then be undergrounded along the north side of Nipton Road to the town of Nipton, California. Installing the OPGW on the 500kV line will require some towers (approximately 45 towers) to be reinforced. All towers have existing access roads. At Nipton, the telecom line extends north approximately 0.6 miles to a new microwave tower, and then by microwave to the Ivanpah Substation. The microwave site at Nipton will also require installing a wood pole distribution line for power.

Permanent impacts include: underground vault locations for the underground fiber optic cable; wood distribution pole locations; and, the microwave site. Temporary impacts include: OPGW pulling, splicing, and tensioning locations and work areas around towers requiring retrofitting; underground fiber optic cable installation, pulling and splicing areas; installation of wood poles and conductors for the distribution line.

The total length of the telecommunication line route is approximately 30 linear miles. In total, construction of this portion of the project will result in approximately 27 acres temporary impacts and approximately 0.25 acres of permanent impacts across all of habitat types falling within the alignment.

Substations

Grading and contouring for the proposed Ivanpah Substation site will be done by the company building the solar generating station and will permitted separately. Substation construction will take place within the substation footprint with the exception of poles or towers required to bring the transmission lines into the substation. Construction at Eldorado Substation will take place within the existing fenced substation area.

2.1 Project Location

The proposed project is located in the Mojave Desert in eastern San Bernardino County, California, and Clark County Nevada (Figure 1). The project is predominantly located on land managed by the Bureau of Land Management (BLM). In California, the project spans Township 16N Ranges 14E and 16E, and Township 17N Ranges 14E and 15E. In Nevada, the project spans Township 27S Ranges 59E, 61E and 62E; Township 26S Ranges 59E, 60E, and 62E; Township 25S Ranges 59E, 60E, 61E, and 62E; and Township 28S Ranges 60E and 61E. One segment of the project (the 35-mile long transmission line) runs from the proposed Ivanpah

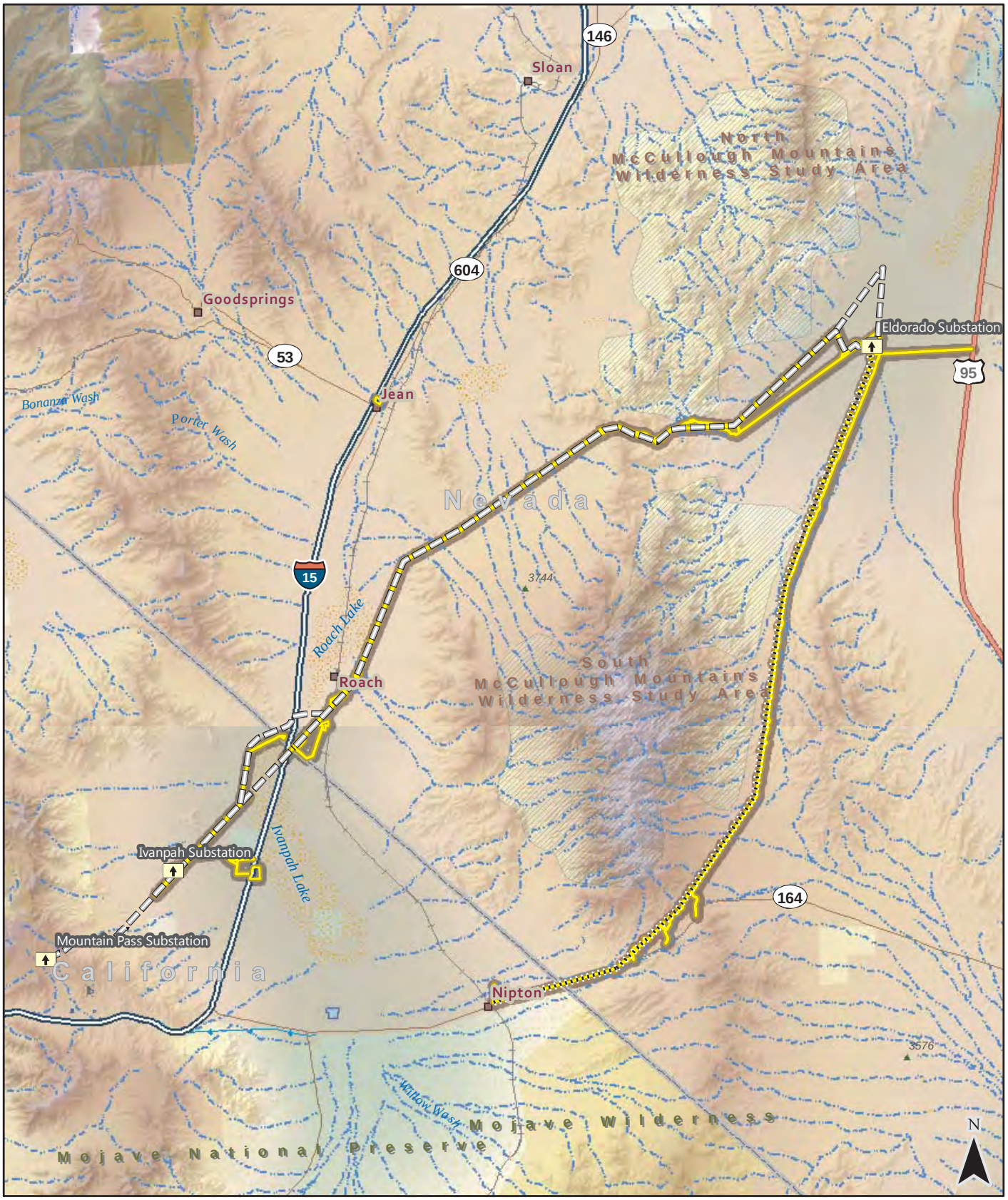


Figure 1. Project location.

substation 7 miles west of the California-Nevada border to the existing Eldorado Substation near Boulder City, Nevada. The second segment of the project (the telecom line) runs from the Eldorado Substation southwest to Highway 164, and then proceeds west paralleling the highway to the town of Nipton (Figure 1).

The Ivanpah Substation site and associated transmission line can be accessed off Interstate 15 at Yates Well Road and off East Primm Boulevard near Primm. The Eldorado Substation and portions of the transmission and telecom lines can be accessed off Interstate 95. The southern portion of the telecom line can be accessed directly off Highway 164, and the central portions can be accessed off existing dirt roads north of Highway 164 approximately 5.5 miles east of Nipton.

2.2 Environmental Setting

The project starts on an alluvial fan in the Ivanpah Valley at an elevation of approximately 1,000 meters. The transmission line crosses Ivanpah Lake, then runs along the eastern edge of Roach Lake before turning east and ascending another large complex of alluvial fans. The transmission line peaks at approximately 3,400 meters elevation as it crosses the McCullough Mountain Range before descending the east side of the range to the Eldorado Substation at approximately 1,800 meters. From the Eldorado Substation, the telecom line ascends a bajada within the Eldorado Valley and runs south between the McCullough Mountain Range and the Highland Range before turning southwest and crossing the hilly, southern extent of the McCullough Range. The line then parallels Highway 164 and descends another bajada through the town of Nipton. A large portion of the project is located on alluvial fans, or bajadas that are crossed by ephemeral wash drainages.

2.2.1 Climate

The hot, dry climate of the project site is typical of the Mojave Desert region. The area receives less than 10 inches (250 mm) of rain a year on average, mostly occurring during the winter months, though thunderstorms often occur during the summer. Precipitation can be highly variable from place to place within the Mojave Desert. Flash floods are a common occurrence when precipitation events occur, contributing to the extensive formation of alluvial fans throughout the region.

Summer daily high temperatures can exceed 100°F with lows in the 70°F range. On average, the region experiences 300 sunny days per year with no measureable precipitation. Summers are dry, but thunderstorms typically develop in July and August. Pacific storms produce some rainfall during the winter months, however the Sierra Nevada mountain range produces a barrier to moisture (rain shadow effect), contributing to the dry climate of the region. Winter temperatures average near 60°F and can fall as low as 20°F on valley floors and below 0°F at higher elevations, however during long periods between storms, valley temperatures can reach

80°F. Wind is very common throughout the region. Winds over 50 mph can occur associated with thunderstorms. Prevailing wind direction in the area is typically from the southwest.

Though precipitation can vary widely over short distances in the Mojave Desert area, the National Oceanic and Atmospheric Association (NOAA) reported 2009 as the 8th driest year on record for Las Vegas, receiving only 1.59 inches of rain. However, by the time field work began on this project on February 15, Las Vegas had received 2.71 inches of rain in 2010 (the most significant storms during this time period were: 1.7 inches between January 20 and 23; 0.34 inches on January 27; 0.36 inches on February 6; and 0.13 inches on February 10) (NOAA 2010).

2.2.2 Hydrology

The majority of the project area falls within the Great Basin Watershed region (NDEP 2009), which does not have an outlet to the ocean. The California portion of the project falls within the Ivanpah Unit of the South Lahontan Hydrologic region (CalWater 1999). The project site drains to a series of dry lakes: Ivanpah Lake (mostly in California), and Roach, Jean, and Eldorado Lakes (all in Nevada). A small portion of the project is in the Piute Wash Watershed, which drains to the Lower Colorado River. Surface water is only present within the project area in response to storm events, and ground water is generally deeper than 80 inches (NRCS 2006 and 2007).

2.2.3 Vegetation

The project area crosses six distinct habitat types: Desert Saltbush Scrub (DSS), Joshua Tree Woodland (JTW), Mojave Creosote Bush Scrub (MCBS), Mojave Desert Wash Scrub (MDWS), Rabbitbrush Scrub (RS), and ruderal. With the exception of Joshua Tree Woodland and Rabbitbrush Scrub, all habitat types are found in both California and Nevada (JTW and RS are only found in Nevada within the project boundary). Each habitat type is described briefly below.

Desert Saltbush Scrub – California and Nevada

The washes near the dry lake margins of Ivanpah Lake and Roach Lake are dominated by Desert Saltbush Scrub. Desert Saltbush Scrub corresponds to the Holland type of the same name (Holland 1986) and corresponds to the *Atriplex polycarpa* Shrubland Alliance (Allscale scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Desert Saltbush Scrub is composed of low, widely spaced shrubs with much bare ground in between, strongly dominated by a single *Atriplex* species. Sites supporting Desert Saltbush Scrub are typically found surrounding playas, and are generally characterized by fine-textured, poorly drained soils with high alkalinity. Allscale (*Atriplex polycarpa*) is the dominant species, and creosote bush (*Larrea tridentata*), and white bursage (*Ambrosia dumosa*) are common associates. Cheesebush (*Hymenoclea salsola*) and galleta grass (*Pleuraphis rigida*) were frequently observed in this

habitat type within the project area. Two species of cacti, buckhorn cholla (*Opuntia acanthocarpa*) and beavertail pricklypear (*Opuntia basilaris*) are also observed.

Joshua Tree Woodland - Nevada
The higher elevation habitats near the southern extent of the McCullough Range are dominated by Joshua Tree Woodland. Joshua Tree Woodland corresponds to the Holland (1986) type of the same name and corresponds to the *Yucca brevifolia* Woodland Alliance of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Joshua Tree Woodland is an open woodland type habitat with Joshua tree (*Yucca brevifolia*) as the only arborescent species, and numerous shrub species between 1 and 4 meters tall. There is little or no herbaceous understory during the majority of the year. Dominant plant forms of this habitat type include evergreen trees and shrubs, deciduous shrubs, and succulents. Sites are generally characterized by well-drained alluvial soils, and this habitat is primarily found on gentle alluvial fans, ridges, and moderate slopes within the project area. The dominant plant species of this association are Joshua tree, blackbrush (*Coleogyne ramosissima*), white bur sage, wooly bursage (*Ambrosia eriocentra*), catclaw acacia (*Acacia greggii*), desert almond (*Prunus fasciculata*), cheesebush, and California buckwheat (*Eriogonum fasciculatum* var. *polifolium*). Other common species encountered in this habitat within the project boundary were snakeweed (*Gutierrezia* sp.), banana yucca (*Yucca baccata*), Mojave yucca (*Yucca schidigera*), Nevada ephedra (*Ephedra nevadensis*), Anderson's desert thorn (*Lycium andersonii*), desert sage (*Salvia dorrii*), Apache plume (*Fallugia paradoxa*) buckhorn cholla, and bladdersage (*Salazaria mexicana*).

Mojave Creosote Bush Scrub – California and Nevada
Many of the alluvial fan and valley areas of the project site are dominated by Mojave Creosote Bush Scrub. Mojave Creosote Bush Scrub corresponds to the Holland (1986) type of the same name, and corresponds to the *Larrea tridentata* Shrubland Alliance (Creosote bush scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). Mojave Creosote Bush Scrub is an open, shrub-dominated habitat type composed of shrubs less than 3 meters tall, with an open, intermittent, seasonal herbaceous layer. This vegetation type generally occurs on alluvial fans, bajadas, upland slopes, and on minor washes. Soils are well drained, sometimes with desert pavement. Creosote bush is the dominant in this community, with white bursage as a co-dominant. Additional species encountered in this habitat type within the project area include galletta grass, littleleaf ratany (*Krameria erecta*), pencil cholla (*Opuntia ramosissima*), allscale, buckhorn cholla, Mojave yucca, and Nevada ephedra.

Mojave Desert Wash Scrub – California and Nevada
The majority of the larger washes on the project site were dominated by Mojave Desert Wash Scrub. Mojave Desert Wash Scrub corresponds to the Holland (1986) type of the same name, and for some washes corresponds to the *Acacia greggii* Shrubland Alliance (Catclaw acacia thorn scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009).

Mojave Desert Wash Scrub is a diverse scrubby association found typically in sandy arroyos, washes, and bajadas. Soils are coarse and well drained. The shrub canopy is generally less than 3 meters high, open to intermittent, and herbaceous cover is sparse with seasonal annuals. The dominant species in this community are cheesebush, cat claw acacia, white bursage, wooly bursage, creosote bush, and Mojave rabbitbrush (*Chrysothamnus paniculatus*). Other common species include Parish's goldeneye (*Viguiera parishii*), sweetbush (*Bebbia juncea*), California buckwheat, spiny senna (*Senna armata*), buckhorn cholla, bladdersage, Nevada ephedra, pencil cholla, and littleleaf ratany.

Rabbitbrush Scrub - Nevada

Portions of the project area are dominated by Rabbitbrush Scrub, which corresponds to the Holland (1986) type of the same name. Rabbitbrush Scrub also corresponds with the *Ericameria paniculata* Shrubland Alliance (Black-stemmed rabbitbrush scrub) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). (*Ericameria paniculata* is the revised name for *Chrysothamnus paniculatus*). Rabbitbrush scrub is an association dominated by rabbitbrush, generally 1 meter tall, with fairly even spacing between shrubs. Soils are generally well drained, coarse to fine sand. The dominant species in this association include Mojave rabbitbrush, cheesebush, and cat claw acacia with white bursage, shortleaf baccharis (*Baccharis brachyphylla*), spiny senna, wooly bursage, creosote bush, California buckwheat, and Nevada ephedra.

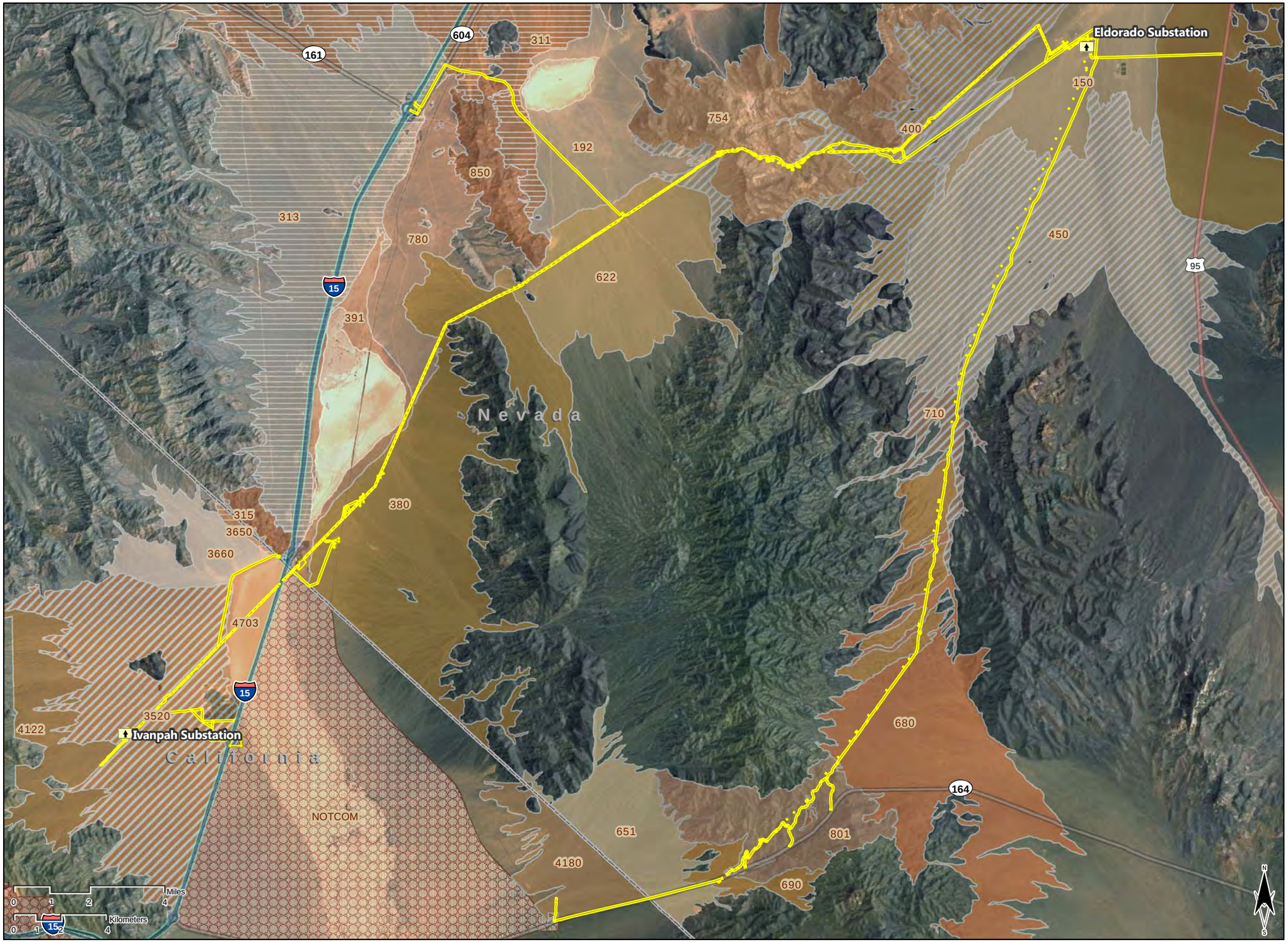
Ruderal – California and Nevada

There is a small section within the project area that has been classified as Ruderal. This habitat may correspond to the Tamarisk Scrub association of Holland (1986), and the *Tamarix* spp. Semi-natural Shrubland Stands (Tamarisk thickets) of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). This habitat association is generally found in arroyos, ditches, washes, and other watercourses. On the project site, this habitat consists of what appears to be a periodically maintained drainage ditch long the parking lot of the Primm Valley casinos. The area is vegetated with sparse tamarisk (*Tamarix* sp.) shrubs, and Russian thistle (*Salsola tragus*). This area is directly adjacent to the Ivanpah Lake margin; sparse allscale and creosote bush are present in addition to the non-native invasive species.

2.3 Soils

The project area crosses numerous soil types (Figure 2). Information was not available for all project areas. Some areas of Clark County do not have soils data available (NRCS 2006), and mapping has not yet been completed for the Mojave Desert Area. Brief descriptions of each soil type are presented below. Where given, soil colors follow the Munsell Soil Colors Chart.

Figure 2. Soil mapping units.



Survey area

Soil Mapping Units

- Arizo association- 450
- Arizo loamy sand, 2 to 8 percent slopes- 3520
- Arizo-Cafetal association- 400
- Arizo-Lanfair-Riverwash association - 710
- Birdspring association- 850
- Bluepoint association- 192
- Colosseum Association, 2 to 4 percent slopes- 3660
- Haleburu-Hiddensun association - 754
- Hoppswell-Ustidur association- 690
- Hypoint gravelly sandy loam, 0 to 4 percent slopes- 150
- Lanfair-Hoppswell association- 680
- Nippeno-Newera association- 801
- Orwash-Arizo-Lanip association - 622
- Peskah-Arizo association- 4180
- Peskah-Arizo association- 651
- Popups sandy loam, 4 to 30 percent slopes- 4122
- Prisonear fine sand, 2 to 8 percent slopes- 780
- Tipnat-Bluepoint-Hypoint association - 391
- Tonopah-Arizo association- 380
- Typic Haplosalids, 0 to 2 percent slopes- 4703
- Unmapped areas- NOTCOM
- Weiser Association- 315
- Weiser association, 2 to 8 percent slopes- 3650
- Weiser-Oldspan-Wechech association - 313
- Weiser-Threelakes association- 311

Arizo Association - California and Nevada
The Arizo series consists of very deep, excessively drained soils that formed in mixed alluvium. Arizo soils develop on recent alluvial fans, inset fans, fan aprons, fan skirts, stream terraces, and floodplains of intermittent streams and channels. Slopes range from 0 to 15 percent. Arizo soils with sandy loam and loam surface textures have moderate to very rapid permeability. The surface horizon (0 to 8 inches) is light brownish gray (10YR 6/2) very gravelly fine sand (dark grayish brown (10YR 4/2) moist), with a weak coarse platy structure and moderate alkalinity (pH 8.2). Below 8 inches the soil is light brownish gray (10YR 6/2) extremely gravelly sand (dark grayish brown (10YR 4/2) moist) with moderate alkalinity (pH 8.2).

Arizo Loamy Sand, 2 to 8 Percent Slopes - California
Arizo loamy sands form on fan aprons from metamorphic and sedimentary derived alluvium and are excessively drained. The top 0-2 inches are loamy sand, with gravelly sand below 2 inches.

Colosseum Association, 2 to 4 percent slopes - California
The Colosseum Association consists of deep, somewhat excessively drained soils that formed in alluvium derived from limestone and dolomite. Colosseum soils are found on fan aprons and drainageways. Slopes range from 2 to 4 percent. The typical profile for the Colosseum series is 0 to 1 inch pale brown (10YR 6/3) fine sandy loam, (brown (10YR 5/3) moist) with moderate thick platy structure and moderate alkalinity (pH 8.2). From 1 to 4 inches pale brown (10YR 6/3) gravelly loamy sand, (brown (10YR 5/3) moist) with weak fine subangular blocky structure with moderate alkalinity (pH 8.2). From 4 to 45 inches the soil is pale brown (10YR 6/3) extremely gravelly loamy sand, (brown (10YR 5/3) moist) with massive structure and moderate alkalinity (pH 8.4). From 45 to 59 inches the soil is light yellowish brown (10YR 6/4) very gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with massive parting to weak medium subangular blocky structure and moderate alkalinity (pH 8.4).

Copperworld Association, 30 to 60 percent slopes - California
The Copperworld series consists of very shallow or shallow to bedrock, somewhat excessively drained soils that formed in residuum and colluvium from metamorphic rocks. Copperworld soils are on mountains. Slopes range from 30 to 60 percent. The surface 0 to 1 inches is gravelly sandy loam, dark yellowish brown (10YR 3/4) moist with weak medium platy structure and a neutral pH (pH 7.2). From 1 to 6 inches the soil is gravelly sandy loam, dark brown (10YR 3/3) moist, with massive parting to weak fine subangular blocky structure and slight alkalinity (pH 7.4). Below 6 inches is indurated metamorphic bedrock.

Copperworld-Lithic Ustic Haplargids Association, 30 to 60 percent slopes - California
The Copperworld-Lithic Ustic Haplargids Association consists of shallow, somewhat excessively drained soil formed from residuum and colluviums derived from metamorphic rock. These soils are found on mountains, and slopes range from 30 to 60 percent. The typical profile

for this series is 0 to 1 inches: very gravelly loamy coarse sand; 1 to 7 inches: very gravelly sandy clay loam; below 7 inches: bedrock.

Peskah-Arizo Association – California and Nevada
The Peskah series consists of deep to a duripan, well drained soils that formed in alluvium derived from volcanic rocks. Peskah soils are on fan remnants. Slopes range from 2 to 8 percent. The surface 0 to 1 inch is pale brown (10YR 6/3) extremely gravelly fine sandy loam, (brown (10YR 4/3) moist) with moderate thin and medium platy structure and is moderately alkaline (pH 8.2). From 1 to 4 inches the soil is very pale brown (10YR 7/3) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong thick platy structure and moderate alkalinity (pH 8.4). From 4 to 8 inches the soil is strong brown (7.5YR 5/6) gravelly sandy clay loam, (strong brown (7.5YR 4/6) moist) with strong fine and medium subangular blocky structure and moderate alkalinity (pH 8.2). The Arizo series has been described above.

Playas – California and Nevada
The playas are composed of lacustrine deposits and are very poorly drained. Ponding is frequent, and slopes range from 0 to 1 percent. The typical playa profile is 0 to 6 inches: Silty clay loam; 6 to 60 inches: Clay. Playa soils are included on the National Hydric Soils List.

Popups Sandy Loam, 4 to 30 percent slopes - California
The Popups series consists of moderately deep, well drained soil over duripan derived from mixed alluvium. The typical profile is 0 to 2 inches, brown (10YR 5/3) very gravelly sandy loam, (dark brown (10YR 3/3) moist) with weak medium platy structure and slight alkalinity (pH 7.6). From 2 to 12 inches the soil is yellowish brown (10YR 5/4) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and a slightly alkaline pH (pH 7.6). From 12 to 33 inches the soil is light brown (7.5YR 6/4) gravelly sandy loam, (brown (7.5YR 4/4) moist) with moderate coarse subangular blocky structure, and is moderately alkaline (pH 8.0). From 33 to 60 inches the soil is very pale brown (10YR 8/2) weakly cemented duripan (pale brown (10YR 6/3) moist) with massive structure.

Typic Haplosalids, 0 to 2 percent slopes - California
The Typic Haplosalids are somewhat poorly drained lacustrine deposits derived from volcanic and sedimentary rock and are found on playas. These soils occasionally pond. A typical profile is 0 to 1 inches: Clay loam; 1 to 8 inches: Clay loam; 8 to 59 inches: Loam.

Weiser Association – California and Nevada
The Weiser series consists of very deep, well drained soils that formed in alluvium from limestone and dolomite. Weiser soils are on fan remnants and inset fans. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is very pale brown (10YR 7/3) extremely gravelly loam, (dark yellowish brown (10YR 4/4) moist) with strong very thick platy structure and is

moderately alkaline (pH 8.4). From 2 to 10 inches the soil is light yellowish brown (10YR6/4) gravelly loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and is moderately alkaline (pH 8.4).

Arizo-Cafetal Association - Nevada
The Arizo-Cafetal Association consists of deep, excessively drained soils that form in mixed alluvium often derived from basalt and andesite. Arizo-Cafetal soils form on inset fans and fan remnants. Slopes range from 2 to 8 percent. The typical profile for the Arizo is 0 to 4 inches: Extremely stony sandy loam;
4 to 60 inches: Stratified very gravelly loamy sand to extremely stony coarse sand. The typical profile for the Cafetal is 0 to 3 inches, pale brown (10YR 6/3) extremely stony loam, (brown (10YR 4/3) moist) with strong thin and medium platy structure and moderate alkalinity (pH 8.4). From 3 to 13 inches the soil is light brown (7.5YR 6/4) very cobbly loam, (brown (7.5YR 4/4) moist) with moderate fine and medium subangular blocky structure and a moderately alkaline pH (pH 8.4). From 13 to 22 inches the soil is pink (7.5YR 7/4) extremely stony loam, (brown (7.5YR 5/4) moist) with massive structure and a strongly alkaline pH (pH 8.6). From 22 to 38 inches the soil is pale brown (10YR 6/3) stratified extremely cobbly loam to loamy sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and moderate alkalinity (pH 8.4). From 38 to 60 inches the soil is pale brown (10YR 6/3) extremely cobbly coarse sandy loam, (dark yellowish brown (10YR 4/4) moist) with massive structure and is moderately alkaline (pH 8.4).

Arizo-Lanfair-Riverwash Association - Nevada
The Arizo-Lanfair-Riverwash Association consists of deep, excessively drained soils that form in mixed alluvium on inset fans, fan remnants, and drainageways. Slopes range from 2 to 8 percent. The Arizo series is described above. The typical profile for Lanfair is 0 to 2 inches, pale brown (10YR 6/3) extremely gravelly sandy loam, (brown (10YR 4/3) moist) with weak thick platy structure and is moderately alkaline (pH 8.4). From 2 to 9 inches the soil is light yellowish brown (10YR 6/4) gravelly sandy loam, (brown (10YR 4/3) moist) with moderate medium subangular blocky structure and is moderately alkaline (pH 8.4). From 9 to 15 inches the soil is yellowish brown (10YR 5/4) very gravelly sandy loam, (brown (10YR 4/3) moist) with moderate fine subangular blocky structure and is moderately alkaline (pH 8.4). From 15 to 26 inches the soil is light yellowish brown (10YR 6/4) very gravelly coarse sand, (brown (10YR 4/3) moist) with massive structure and is moderately alkaline (pH 8.4). From 26 to 60 inches the soil is pale brown (10YR 6/3) very gravelly coarse sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and is moderately alkaline (pH 8.4). The typical profile for Riverwash series is 0 to 6 inches: extremely gravelly coarse sand; 6 to 60 inches: stratified extremely gravelly coarse sand to gravelly sand.

Birdspring Association - Nevada

The Birdspring series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium from limestone and dolomite. Birdspring soils occur on mountains. Slopes range from 8 to 75 percent. The surface horizon (0 to 1 inch) is very pale brown (10YR 7/3) extremely gravelly fine sandy loam (brown (10YR 5/3) moist) with moderate thick platy structure and moderate alkalinity (pH 8.2). The lower horizon (1 to 4 inches) is very pale brown (10YR 7/3) very gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with weak medium subangular blocky structure and moderate alkalinity (pH 8.4). Below 4 inches is hard limestone bedrock.

Bluepoint Association - Nevada
The Bluepoint series consists of very deep, somewhat excessively drained soils that formed in eolian materials from mixed rock sources. Bluepoint soils are on dunes and sand sheets (and on the playas within the project boundary). Slopes range from 0 to 30 percent. The Surface horizon (0 to 2 inches) is very pale brown (10YR 7/3) fine sand, (brown (10YR 5/3) moist) with moderate thin and medium platy structure and moderate alkalinity (pH 8.2). From 2 to 14 inches the soil is very pale brown (10YR 7/3) fine sand, (brown (10YR 5/3) moist) with weak, very thick platy structure (due to stratification), and is moderately alkaline (pH 8.0).

Haleburu-Hiddensun Association - Nevada
The Haleburu series consists of shallow (and very shallow) to bedrock, well drained soils that formed in colluvium and residuum from mainly volcanic sources. The Haleburu soils are on mountains and hills. Slopes range from 4 to 75 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) extremely gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with moderate medium platy structure and moderate alkalinity (pH 8.4). From 2 to 8 inches the soil is pale brown (10YR 6/3) very gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak subangular blocky structure and moderate alkalinity (pH 8.4). The Hiddensun series consists of somewhat shallow, well drained soils that formed in residuum weathered from volcanic rock influenced by calcareous loess. Hiddensun soils are found in mountains. Slopes range from 8 to 30 percent. The typical Hiddensun profile is 0 to 3 inches: very gravelly fine sandy loam; 3 to 15 inches: very cobbly fine sandy loam; 15 to 25 inches: Bedrock.

Hoppswell-Ustidur Association - Nevada
The Hoppswell series consists of very deep, well drained soils that formed in alluvium from igneous sources. Hoppswell soils are on fan remnants. Slopes range from 2 to 15 percent. The surface horizon (0 to 2 inches) is brown (7.5YR 5/4) extremely gravelly sandy loam, (dark brown (7.5YR 3/4) moist) with moderate medium and thick platy structure, and moderate alkalinity (pH 8.0). From 2 to 15 inches the soil is yellowish red (5YR 5/6) very gravelly sandy clay loam, (yellowish red (5YR 4/6) moist) with moderate fine and medium subangular blocky structure and moderate alkalinity (pH 8.0). The Ustidur series consists of shallow, well drained

soils formed from alluvium derived from metamorphic rock. Slopes range from 4 to 8 percent. The typical Ustidur profile is 0 to 2 inches: extremely gravelly sandy loam; 2 to 15 inches: very gravelly sandy clay loam; 15 to 64 inches: stratified extremely gravelly coarse sand to very gravelly sandy loam.

Hypoint Gravelly Sandy Loam, 0 to 4 percent slopes - Nevada
The Hypoint series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Hypoint soils are on fan aprons, fan skirts and alluvial fans. Slopes range from 0 to 4 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) gravelly sandy loam, (brown (10YR 4/3) moist) with weak medium subangular blocky structure, with a 1/4 inch surface crust and moderate alkalinity (pH 8.4). From 2 to 60 inches the soil is pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) stratified sand to very gravelly coarse sand, (brown (10YR 4/3) and dark yellowish brown (10YR 4/4) moist) and is strongly alkaline (pH 8.6).

Lanfair-Hoppswell Association - Nevada
The Lanfair series consists of very deep, well drained soils that formed in alluvium from metamorphic sources. Lanfair soils are on inset fans or alluvial fans. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is pale brown (10YR 6/3) extremely gravelly sandy loam, (brown (10YR 4/3) moist) with weak thick platy structure and moderate alkalinity (pH 8.4). From 2 to 9 inches the soil is light yellowish brown (10YR 6/4) gravelly sandy loam, (brown (10YR 4/3) moist) with moderate medium subangular blocky structure and moderate alkalinity (pH 8.4). The Hoppswell Association is described above.

Nippeno-Newera Association - Nevada
The Nippeno series consists of shallow, well drained soils that formed in residuum and colluvium from metamorphic and altered granitic rocks. Nippeno soils are found on mountains. Slopes range from 8 to 50 percent. The surface horizon (0 to 2 inches) is yellowish brown (10YR 5/4) very gravelly loam, (dark yellowish brown (10YR 4/4) moist) with weak fine subangular blocky structure and slight alkalinity (pH 7.6). From 2 to 6 inches the soil is brown (7.5YR 4/4) very gravelly sandy clay loam, (brown (7.5YR 4/4) moist) with moderate fine subangular blocky structure with slight alkalinity (pH 7.6). From 6 to 15 inches is gravel (95 percent angular pebbles). The Newera series is a shallow, somewhat excessively drained soil formed from colluvium and/or residuum weathered from volcanic and metamorphic rock. Newera soils occur on hills. Slopes range from 15 to 50 percent. The typical Newera profile is 0 to 2 inches: extremely gravelly sandy loam; 2 to 6 inches: very gravelly sandy clay loam; 6 to 16 inches: bedrock.

Orwash-Arizo-Lanip Association - Nevada
The Orwash series consists of very deep, somewhat excessively drained soils that formed from mixed alluvium derived from granitic sources. Orwash soils are formed on fan aprons, fan skirts,

and alluvial flats. Slopes range from 2 to 8 percent. The surface horizon (0 to 2 inches) is light yellowish brown (10YR 6/4) gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong medium platy structure and moderate alkalinity (pH 8.4). From 2 to 16 inches the soil is light yellowish brown (10YR 6/4) loamy sand, (dark yellowish brown (10YR 4/4) moist) and is strongly alkaline (pH 8.6). The Arizo series is described above. The Lanip series consists of deep, well drained soils formed from mixed alluvium on fan remnants. Slopes range from 2 to 8 percent. The typical Lanip series profile is 0 to 2 inches: gravelly sandy loam; 2 to 15 inches: gravelly loam; 15 to 39 inches: clay loam; 39 to 48 inches: gravelly sandy loam; 48 to 60 inches: very gravelly sandy loam.

Prisonear Fine Sand, 2 to 8 percent slopes - Nevada
The Prisonear series consists of moderately deep to a petrocalcic horizon, somewhat excessively drained soils that formed in eolian sands over alluvium from limestone. Prisonear soils are on sand sheets over fan remnants. Slopes range from 2 to 8 percent. The surface 0 to 3 inches is light brown (7.5YR 6/4) fine sand, (brown (7.5YR 5/4) moist) with moderate medium platy structure and is strongly alkaline (pH 8.8). From 3 to 9 inches the soil is light brown (7.5YR 6/4) fine sand, (brown (7.5YR 5/4) moist) with weak coarse subangular blocky structure and is strongly alkaline (pH 8.8).

Tipnat-Bluepoint-Hypoint Association - Nevada
The Tipnat series consists of very deep, well drained soils that formed in mixed alluvium. The Tipnat soils are on alluvial flats. Slopes range from 0 to 4 percent. The surface 0 to 1 inch is pale brown (10YR 6/3) loamy sand, (brown (10YR 4/3) moist) with strong medium and thick platy structure and is strongly alkaline (pH 8.6). From 1 to 3 inches the soil is light yellowish brown (10YR 6/4) loamy sand, (brown (7.5YR 5/3) moist) with strong alkalinity (pH 8.6). From 3 to 13 inches the soil is light brown (7.5YR 6/4) sandy clay loam, (brown (7.5YR 4/4) moist) with weak medium and coarse prismatic structure parting to moderate medium and thick platy structure and is very strongly alkaline (pH 9.2). The Bluepoint and Hypoint series have been described above.

Tonopah-Arizo Association - Nevada
The Tonopah series consists of very deep, excessively to well drained soils that formed in mixed alluvium. Tonopah soils are on fan remnants and fan piedmonts. Slopes range from 2 to 8 percent. The surface 0 to 1 inch is brown (10YR 5/3) extremely gravelly sandy loam, (dark brown (10YR 4/3) moist) with weak medium platy structure and is moderately alkaline (pH 8.2). From 1 to 8 inches the soil is pale brown (10YR 6/3) very gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak fine subangular blocky structure and moderate alkalinity (pH 8.4). The Arizo series has been described above.

Weiser-Oldspan-Wechech Association - Nevada

The Weiser series has been described above. The Oldspan series consists of deep, well drained soils formed from limestone and sandstone derived mixed alluvium. Oldspan soils form on fan remnants. Slopes range from 2 to 8 percent. A typical Oldspan profile is 0 to 3 inches, light yellowish brown (10YR 6/4) gravelly fine sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong thick and very thick platy structure and moderate alkalinity (pH 8.2). From 3 to 10 inches the soil is light yellowish brown (10YR 6/4) fine sandy loam, (dark yellowish brown (10YR 4/4) moist) with weak medium subangular blocky structure and a moderately alkaline pH (pH 8.4). From 10 to 20 inches the soil is light yellowish brown (10YR 6/4) loam, (yellowish brown (10YR 5/4) moist) with weak coarse subangular blocky structure and is moderately alkaline (pH 8.4). From 20 to 40 inches the soil is light yellowish brown (10YR 6/4) stratified extremely gravelly loam to extremely gravelly loamy coarse sand, (yellowish brown (10YR 5/4) moist) with massive structure and is strongly alkaline (pH 9.0). From 40 to 60 inches the soil is light yellowish brown (10YR 6/4) stratified extremely gravelly fine sandy loam to extremely gravelly loamy coarse sand, (dark yellowish brown (10YR 4/4) moist) with massive structure and is strongly alkaline (pH 8.8). The Wechech series consists of shallow, well drained soils formed from limestone and dolomite derived alluvium. Slopes range from 2 to 8 percent. A typical profile for Wechech is 0 to 2 inches, very pale brown (10YR 7/4) very gravelly sandy loam, (dark yellowish brown (10YR 4/4) moist) with strong medium platy structure and strong alkalinity (pH 8.6). From 2 to 7 inches the soil is light yellowish brown (10YR 6/4) very gravelly sandy loam, (dark yellowish brown (10YR 4/6) moist) with moderate fine and medium subangular blocky structure and is strongly alkaline (pH 8.6). From 7 to 13 inches the profile is light brown (7.5YR 6/4) very gravelly sandy loam, (brown (7.5YR 5/4) moist) with massive structure and is strongly alkaline (pH 8.6). From 13 to 60 inches the soil is very pale brown (10YR 8/2) indurated petrocalcic hardpan, (very pale brown (10YR 7/3) moist) with massive structure and strong alkalinity (pH 8.8).

Weiser-Threelakes Association - Nevada

The Weiser series has been described above. The Threelakes series consists of very deep, well drained soils that formed in mixed alluvium mainly from limestone. Threelakes soils form on fan aprons. Slope ranges from 2 to 8 percent. From 0 to 3 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (brown (10YR 5/3) moist) with moderate medium subangular blocky structureand are strongly alkaline (pH 8.6). From 3 to 9 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with weak fine subangular blocky structure and are strongly alkaline (pH 8.6). From 9 to 31 inches the soils are pale brown (10YR 6/3) extremely gravelly fine sandy loam, (yellowish brown (10YR 5/4) moist) with massive structure and are strongly alkaline (pH 9.0). From 31 to 60 inches the soils are pale brown (10YR 6/3) stratified extremely gravelly fine sandy loam to extremely gravelly loamy coarse sand, (yellowish brown (10YR 5/4) moist) with massive structure and strong alkalinity (pH 9.0).

2.3.1 Hydric Soils

The majority of the soils in the project area are deep, well drained soils that formed from alluvium. The National Hydric Soils List (NRCS 2010) includes Playas (NRCS 2007) and the Tipnat-Bluepoint-Hypoint series on playas (NRCS 2006) as the only hydric soils present in the project area.

3.0 Delineation of Waters of the United States

3.1 Regulatory Background

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires authorization for all discharges of dredged or fill material in waters of the United States, including jurisdictional wetlands. Waters of the United States are defined in 33 CFR Part 328.3 as:

> 1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters, which are subject to the ebb and flow of the tide;
> 2) All interstate waters including interstate wetlands;
> 3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie pot holes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
>
> > (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
> >
> > (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
> >
> > (iii)Which are used or could be used for industrial purpose by industries in interstate commerce;
>
> 4) All impoundments of waters otherwise defined as waters of the United States under the definition;
> 5) Tributaries of waters identified in paragraphs (1) through (4) above;
> 6) The territorial seas;
> 7) Wetlands adjacent to waters identified in paragraphs (1) through (6) above.

The project is located in a region of the arid Southwest where the dominant hydrologic features are braided ephemeral channels typically located on large alluvial fans which drain into playa lakes that are dry for most of the year. Other than the playa lakes themselves, no wetlands occur within the project area, and jurisdictional features are limited to ephemeral channels meeting one or more of the criteria defining waters of the United States listed above.

In the absence of adjacent wetlands, the extent of the Corps jurisdiction is defined by the "Ordinary Highwater Mark" (OHWM). In 33 CFR Part 329.1, the "Ordinary Highwater Mark" for non-tidal rivers is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter

and debris. In dryland fluvial systems typical of the desert areas, the most common physical characteristics indicating the OHWM for a channel usually include, but are not limited to: a clear natural scour line impressed on the bank; recent bank erosion; destruction of native terrestrial vegetation; and the presence of litter and debris (USACE 2001). A complete list of potential geomorphic and vegetation OHWM indicators can be found in USACE (2008b). Drainage features that dissipate into sheet flow, and historic channels that convey flow only during extremely large storm events generally do not fall under Corps jurisdiction (USACE 2001, 2008b).

3.2 Methods

All project-related temporary and permanent impact areas including a 50 ft. buffer surrounding all impact areas and access roads were surveyed for desert washes potentially falling under the regulatory jurisdiction of USACE. Field investigations were carried out from February 16th through February 27th 2010, during which all project-related temporary and permanent impact areas and newly proposed roads were surveyed on foot, and all existing access roads were surveyed either on foot or by vehicle. Washes falling within the survey buffer of access roads were mapped only in cases where the washes crossed the road. The width and depth at ordinary high water mark (OHWM), habitat type, and up to six of the dominant and/or characteristic plant species and their cover were recorded for each drainage feature. Foliar cover was scored on a scale of 1-4 (4= abundant, 3 = common, 2 = scattered, 1 = sparse). A photograph of each mapped feature was taken along with notes on channel characteristics and hydrologic indicators. All potentially jurisdictional drainage channels with positive OHWM indicators (USACE 1987, 2001, 2007b) were mapped in the field using a Trimble GeoXT GPS unit with sub-meter accuracy. Many washes lacking the channel characteristics indicative of jurisdictional washes were also mapped, and notes justifying their exclusion from consideration as jurisdictional waters were taken.

Following the field work, the subwatershed and terminal water body of each mapped drainage was determined using the digital hydrologic unit boundary layer data set available from NRCS (2009). Recent Jurisdictional Determinations issued by USACE for nearby projects and communications with USACE staff (Patricia McQueary personal communication) were used to determine the likely jurisdictional status of the tributaries in each watershed traversed by the project. Tributaries to isolated waters with no nexus to interstate or foreign commerce were excluded from further consideration as jurisdictional features. All of the remaining mapped features were further analyzed using Geographic Information Systems (GIS) software and high resolution aerial imagery, and drainage features observed to dissipate or otherwise lack connectivity to jurisdictional water bodies were excluded from further consideration. Finally, the total acreage of all potentially jurisdictional features occurring in permanent impact areas, temporary impact areas, and in the surrounding buffers were calculated using GIS software.

3.3 Results

3.3.1 Waters of the United States

Determination of Jurisdictional Status

The project area traverses five watersheds in California and Nevada including tributaries of Ivanpah Lake (CA, NV), Roach Lake (NV), Jean Lake (NV), Eldorado Valley Dry Lake (NV), and Piute Wash (NV), a tributary to the Colorado River. The jurisdictional status of the tributaries in each of these watersheds and the rational for their status under Section 404 of the Clean water Act is summarized in Table 1. The rational is explained further in the paragraphs that follow.

Table 1. Summary of potential USACE jurisdiction by watershed.

Watershed	USACE Status	Section 404 Rational
Ivanpah Lake - Interstate tributaries	Jurisdictional	Interstate waters
Ivanpah Lake Playa	Jurisdictional	Nexus to interstate or foreign commerce
Piute Wash tributaries	Jurisdictional	Nexus to Traditional Navigable Water
Roach Lake tributaries	Jurisdictional	Nexus to interstate or foreign commerce
Eldorado Valley Dry Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce
Ivanpah Lake intrastate tributaries	Non-Jurisdictional	Recent determination by USACE
Jean Lake tributaries	Non-Jurisdictional	Isolated -No nexus to interstate or foreign commerce

Ivanpah Lake is the terminal water body for subwatersheds occurring in both California and Nevada. Tributaries to Ivanpah lake that cross the border between California and Nevada are interstate waters falling under the jurisdiction of USACE. Additionally, the playa surface at Ivanpah Lake is used for land sailing and has been determined to jurisdictional under the interstate commerce clause of the Clean Water Act (Patricia McQueary personal communication). However, a recent Jurisdictional Determination issued by USACE for proposed solar generating facilities in the Ivanpah Valley found the intrastate tributaries to Ivanpah lake to be non-jurisdictional (USACE 2009). Therefore, following this precedent, all intrastate tributaries to Ivanpah Lake occurring in the project area are considered non-jurisdictional in this report.

Roach Lake has been proposed as the site of a new Las Vegas airport and its jurisdictional status is currently under review. It is likely that it will be considered a jurisdictional feature under the interstate commerce clause, and tributaries to Roach lake are therefore considered to be USACE-jurisdictional in this report.

A small portion of the project area in Nevada contains ephemeral drainages that are tributaries to Piute Wash, which is itself a tributary to the Colorado River, a traditional navigable water (TNW). Under guidance issued by USACE Headquarters, non-navigable tributaries of TNWs

that typically flow year-round or have continuous flow at least seasonally are considered jurisdictional (USACE 2007). Additionally, jurisdiction is asserted over water bodies that are not relatively permanent if that body is determined to have a significant nexus with a TNW (USACE 2007). In this report it is assumed that the tributaries to Piute Wash have a significant nexus to the Colorado river and are therefore considered to be jurisdictional.

Jean Lake and Eldorado Valley Dry Lake are isolated intrastate playa lakes with no significant nexus to interstate or foreign commerce. Tributaries to these waters are therefore considered non- jurisdictional under the Clean Water Act in this report.

Description of Jurisdictional Features

Two general types of features qualifying as waters of the United States occur within the project area: Ivanpah Lake, a playa lake that is dry for most of the year, and numerous ephemeral desert washes. The portion of Ivanpah dry lake that is within the project area is composed of lacustrine deposits that are very poorly drained. Ponding is frequent following sufficient rain events, and the lake bed is devoid of vegetation. Surrounding the lake are alkaline soils supporting Desert Saltbush Scrub dominated by allscale and creosote bush.

The project area is dissected by numerous ephemeral desert washes and drainage channels supporting six vegetation communities. A list of the dominant and/or characteristic plant species observed within the proposed project areas is presented in Appendix A. Because of the timing of the survey, it was not possible to compile a complete vascular plant species list. About a quarter of the mapped potentially jurisdictional washes have sandy or gravelly unvegetated channel bottoms, and banks with vegetation that is not distinct from the surrounding Mojave Creosote Brush Scrub (Holland 1986), the predominant vegetation type for most of the project area. A majority of the mapped drainage features are vegetated with Mojave Desert Wash Scrub (Holland 1986), which supports species such as cheesebush and catclaw acacia that are indicative of regular surface flows during rain events. Washes near the margins of Roach Lake typically have sandy bottoms and support Desert Saltbush Scrub (Holland 1986). Along the telecommunications route within the watershed north-west of Highway 164 that drains to Piute Wash, the uplands are dominated by Joshua Tree Woodland (Holland 1986), and the margins of many of the mapped drainages, and occasionally the channel bottoms are dominated by this habitat type. Other channels within this area have channels dominated by species more characteristic of active channels such as catclaw acacia, desert almond, and wooly bur-sage. The habitat of one potentially jurisdictional wash in this area was characterized as Rabbitbrush Scrub (Holland 1986), but this habitat type becomes more abundant along the telecommunications route in the watershed that drains to Eldorado Valley Dry Lake. Finally, several highly degraded drainages that cross the state line near Primm, Nevada are characterized as ruderal habitat, and are dominated by non-native species such as tamarisk and Russian thistle. Representative

photographs of typical washes vegetated with each of the observed habitat types are presented in Appendix B.

3.3.2 Summary of Potentially Jurisdictional Features

Overall, the construction of the project will result in 13.857 acres of temporary and 1.699 acres of permanent impacts to potential waters of the United States. Impacts to jurisdictional features including the geographic coordinates, the habitat type, and type of construction impact of each feature are summarized in Table 2. Maps depicting all potential waters of the United States including waters likely to be permanently or temporarily impacted by the construction of the project, and waters occurring within a 50 ft survey buffer surrounding all project construction sites, laydown areas and access roads are presented in Appendix C.

Table 2. Summary of impacts to potential USACE – jurisdictional waters.

Feature	Location UTM NAD 83	Watershed	Habitat type	OHWM width (ft.)	OHWM depth (in.)	Permanent Impacts (acres)		Temporary Impacts (acres)						Buffer (acres)
						220kV clearance	Microwave tower	115kV tower rem[2].	220 kV P-S-T sites[3]	220kV tower const	Fiber optic underground	Fiber optic work areas	Laydown areas	
Ivanpah lk.	11S 644475.6 3939582.2	N/A	Playa	N/A	N/A	1.651		3.714	0.689	8.876				N/A
CA-357	11S 656984.5 3926552.9	Ivanpah Lake - Interstate	MDWS	3	1						0.001			0.007
CA-375	11S 657027.2 3926881	Ivanpah Lake - Interstate	MDWS	3	2						0.002			0.018
CA-380	11S 657035.4 3926999.8	Ivanpah Lake - Interstate	MDWS	10	2						0.009			0.039
CA-382	11S 657036.8 3927024.9	Ivanpah Lake - Interstate	MCBS	3	2						0.001			0.006
CA-383	11S 657036.6 3927032.9	Ivanpah Lake - Interstate	MCBS	3.25	1						0.001			0.007
CA-384	11S 657042.9 3927045.4	Ivanpah Lake - Interstate	MCBS	4.5	1						0.002			0.010
CA-389	11S 657034.1 3927135.8	Ivanpah Lake - Interstate	MDWS	9	1.5						0.009			0.040
CA-392	11S 657036.6 3927175.1	Ivanpah Lake - Interstate	MCBS	4.5	4						0.002			0.009
CA-396	11S 657041.2 3927207	Ivanpah Lake - Interstate	MDWS	5	2						0.002			0.011
CA-400	11S 657042.8 3927279.1	Ivanpah Lake - Interstate	MDWS	5	1.5						0.003			0.011
CA-402	11S 657036.9 3927301.2	Ivanpah Lake - Interstate	MDWS	4	1		0.010							0.012
CA-455	11S 645841.9 3941220.6	Ivanpah Lake - Interstate	DSS	7	0.5	0.004		0.012		0.070				0.133
CA-457	11S 645939.3 3941284.3	Ivanpah Lake - Interstate	DSS	4	2									0.004
NV-001	11S 645995.9 3941340.5	Ivanpah Lake - Interstate	Ruderal	2.5	3					0.005				0.004
NV-002	11S 646209.5 3941510.6	Ivanpah Lake - Interstate	Ruderal	2.5	1.5								0.034	0.003
NV-005	11S 647350.1 3941681.2	Roach Lake	MCBS	3.5	3									0.009
NV-009	11S 648101.7 3943507.7	Roach Lake	MCBS	6	3			0.002						0.020
NV-011	11S 663981.4 3927924.6	Ivanpah Lake - Interstate	MCBS	2.5	1							0.009		0.006
NV-013	11S 663977.6 3927974.9	Ivanpah Lake - Interstate	MDWS	6	1									0.051
NV-014	11S 663969.9 3927983.1	Ivanpah Lake - Interstate	MDWS	3.5	1									0.007
NV-016	11S 648478.2 3944148.3	Roach Lake	DSS	2.5	1									0.008
NV-018	11S 648649.5 3944055.7	Roach Lake	DSS	3.5	1									0.009
NV-021	11S 664585.8 3928407.2	Ivanpah Lake - Interstate	MDWS	2.5	1									0.006
NV-028	11S 664803 3928505.2	Ivanpah Lake - Interstate	MDWS	3	1									0.016
NV-029	11S 664779.1 3928538.5	Ivanpah Lake - Interstate	MDWS	3	1									0.012
NV-031	11S 665092.9 3928563.5	Ivanpah Lake - Interstate	RS	3.5	1									0.010
NV-033	11S 649299.5 3944694.7	Roach Lake	DSS	2	1									0.005
NV-038	11S 665743 3929637.4	Ivanpah Lake - Interstate	MDWS	2.25	2									0.006
NV-039	11S 665852.8 3929727.7	Ivanpah Lake - Interstate	MDWS	2.5	2									0.006
NV-041	11S 666389.7 3930063.8	Ivanpah Lake - Interstate	MDWS	2.5	2									0.011
NV-044	11S 667270.7 3930618.3	Ivanpah Lake - Interstate	JTW	2.5	2									0.006
NV-047	11S 667662.7 3931080.1	Ivanpah Lake - Interstate	JTW	2.25	2									0.005
NV-050	11S 667876.2 3931306.8	Ivanpah Lake - Interstate	JTW	2.25	2									0.007
NV-057	11S 668770.1 3931505.7	Ivanpah Lake - Interstate	JTW	3	0.5									0.011
NV-059	11S 668322.1 3932052.1	Ivanpah Lake - Interstate	JTW	3.5	2									0.011
NV-060	11S 651443.2 3949194.8	Roach Lake	DSS	3.75	2	0.008				0.012				0.011
NV-066	11S 668927.5 3932787.7	Piute wash	JTW	3.5	2									0.008
NV-067	11S 669095.5 3933009.5	Piute wash	JTW	2.5	2									0.006
NV-070	11S 669097 3933177.8	Piute wash	JTW	2.25	3							0.008		0.011
NV-073	11S 652074.6 3950581	Roach Lake	MDWS	4	1									0.046

Feature	Location UTM NAD 83	Watershed	Habitat type	OHWM width (ft.)	OHWM depth (in.)	Permanent Impacts (acres)		Temporary Impacts (acres)						Buffer (acres)
						220kV clearance	Microwave tower	115kV tower rem[2].	220 kV P-S-T sites[3]	220kV tower const	Fiber optic underground	Fiber optic work areas	Laydown areas	
NV-074	11S 669359.5 3933374.6	Piute wash	JTW	2.25	1									0.006
NV-075	11S 652094.1 3950667	Roach Lake	MCBS	2.5	1	0.002		0.004		0.010				0.013
NV-076	11S 652114 3950660.3	Roach Lake	MCBS	4	1	0.007				0.014				0.031
NV-078	11S 669470.9 3933522.2	Piute wash	JTW	2.75	1									0.007
NV-079	11S 652230.7 3950853.1	Roach Lake	MDWS	3	2					0.001				0.009
NV-080	11S 652229.6 3950890.3	Roach Lake	MDWS	4	2			0.007		0.019				0.018
NV-081	11S 652317.8 3951070.2	Roach Lake	MDWS	12.5	2					0.006				0.032
NV-082	11S 669626.1 3933846	Piute wash	JTW	2.75	2							0.010		0.013
NV-083	11S 652419.1 3951347	Roach Lake	MCBS	6.75	2	0.006		0.014		0.014				0.020
NV-084	11S 652581.9 3951696.2	Roach Lake	MDWS	13.5	2				0.042					0.080
NV-086	11S 653179.9 3952133.4	Roach Lake	MDWS	3	1			0.005		0.011				0.019
NV-087	11S 670598.9 3935062.6	Piute wash	JTW	3.5	2									0.010
NV-088	11S 653472 3952248.3	Roach Lake	MDWS	3.25	1			0.002						0.015
NV-089	11S 653466.5 3952268.6	Roach Lake	MDWS	15	1			0.018	0.064					0.096
NV-090	11S 653615.5 3952334.5	Roach Lake	MDWS	3.5	2	0.001		0.007		0.016				0.009
NV-091	11S 670736.9 3935237.3	Piute wash	JTW	2.5	1									0.013
NV-092	11S 653789.2 3952395.2	Roach Lake	MCBS	2.25	3									0.012
NV-094	11S 670896 3935463.6	Piute wash	JTW	3.25	2									0.008
NV-096	11S 653978.7 3952504.8	Roach Lake	MDWS	3.5	2									0.011
NV-097	11S 654026.2 3952514.1	Roach Lake	MDWS	11	2					0.028				0.037
NV-098	11S 654182.2 3952599.1	Roach Lake	MDWS	22.5	1									0.055
NV-099	11S 654207.1 3952631.6	Roach Lake	MCBS	4.25	1									0.009
NV-100	11S 654226.4 3952637.4	Roach Lake	MDWS	13.5	1					0.049				0.051
NV-101	11S 654309.5 3952663.8	Roach Lake	MCBS	2.75	1									0.008
NV-103	11S 654486.9 3952774.2	Roach Lake	MCBS	4.5	1					0.004				0.029
NV-106	11S 671373.9 3936125.4	Piute wash	JTW	2.5	2									0.014
NV-107	11S 654671.2 3952879.5	Roach Lake	MCBS	2.5	1			0.008		0.001				0.002
NV-111	11S 654876.7 3952976.6	Roach Lake	MDWS	2.5	1			0.007		0.006				0.008
NV-112	11S 654948.6 3952969.9	Roach Lake	MCBS	3.5	1									0.009
NV-114	11S 655043.2 3953024.8	Roach Lake	MDWS	3.5	1									0.009
NV-116	11S 655168.6 3953083.6	Roach Lake	MCBS	2.5	1									0.006
NV-117	11S 655216.6 3953101.9	Roach Lake	MCBS	2.5	1									0.007
NV-118	11S 655272.9 3953123.7	Roach Lake	MCBS	4	1									0.010
NV-122	11S 655495.5 3953287.4	Roach Lake	MCBS	3	1	0.004		0.006		0.005				0.007
NV-123	11S 655524.6 3953296	Roach Lake	MCBS	3	1	0.004				0.013				0.009
NV-126	11S 655664.8 3953303	Roach Lake	MCBS	3.5	1									0.010
NV-165	11S 651499.5 3961152.4	Roach Lake	Ruderal	9.5	3									0.235
					Totals	**1.688**	**0.010**	**3.808**	**0.795**	**9.160**	**0.033**	**0.027**	**0.034**	**1.560**

[1]Habitat types: Playa = Ivanpah Lake bed; DDS = Desert Saltbush Scrub; JTW = Joshua Tree Woodland; MCBS = Mojave Creosote Brush Scrub; MDWS = Mojave Desert Wash Scrub; Ruderal = Disturbed area devoid of native vegetation

[2] 115 kV tower removal areas

[3] 220 kV pulling, splicing and tensioning areas

4.0 Delineation of CDFG Jurisdictional Habitats

4.1 Regulatory Background

California Fish and Game Code section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, and requires any person, state or local governmental agency, or public utility to notify the Department of Fish and Game (CDFG) before beginning any activity that will do one or more of the following:

1) substantially obstruct or divert the natural flow of a river, stream, or lake;
2) substantially change the bed, channel, or bank of a river, stream, or lake;
3) use any material from the bed, channel, or bank of a river, stream, or lake; and/or
4) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

This requirement may apply to any work undertaken within the 100-year floodplain of a body of water or its tributaries, including intermittent streams and desert washes (CDFG 1994). In addition, under the Porter-Cologne Water Quality Control Act, a water quality certification from the Regional Water Quality Control Board is required for discharge or fill into any waterway falling under the jurisdiction of CDFG.

4.2 Methods

Field investigations to identify desert washes potentially falling under the regulatory jurisdiction of CDFG were carried out from February 16th through February 27th 2010, concurrently with surveys to identify USACE jurisdictional washes. In California, all temporary and permanent impact areas including a 50 ft. buffer surrounding all impact areas and access roads were surveyed on foot. Washes falling within the survey buffer of access roads were mapped only in cases where the washes crossed the road. The overall wash width, width and depth at OHWM (as defined by USACE), habitat type, and up to six of the dominant and/or characteristic plant species and their cover were recorded in the field for each feature. Foliar cover estimates for each dominant or characteristic species were scored on a scale of 1-4 (4= abundant, 3 = common, 2 = scattered, 1 = sparse). A photograph of each mapped feature was taken along with notes on channel characteristics and hydrologic indicators. All drainage features larger than one ft. in width were mapped in the field using a Trimble GeoXT GPS unit with sub-meter accuracy. Features less than about 5 ft wide were mapped as line features and their acreage extrapolated from the average total wash width recorded in the field. Features greater than about 5 ft. wide were mapped as polygons and their acreages calculated directly.

The location of all riparian trees greater than two inches diameter at breast height (dbh) were marked with a GPS unit in the field.

4.3 Results

Description Of Jurisdictional Features

In California, all desert wash channels were mapped, including many washes that are likely to carry flows only during extreme storm events, and therefore do not support vegetation typical of channels that are frequently wetted. Although such channels are not considered to be jurisdictional by USACE (2001, 2008b), CDFG may exert jurisdiction these features (CDFG 1994). The following habitat types were observed within potentially CDFG-jurisdictional areas subject to disturbance by the proposed project: the playa surface of Ivanpah Lake, Desert Saltbush Scrub, Mojave Creosote Brush Scrub, Mojave Desert Wash Scrub, and a ruderal area devoid of native vegetation.

The playa surface of Ivanpah Lake is composed of lacustrine deposits that are very poorly drained, ponding is frequent following sufficient rain events, and the lake bed is devoid of vegetation. The habitat of one wash within California was characterized as ruderal and was vegetated exclusively by the invasive species Russian thistle. The species composition of the remaining wash habitats occurring within the California portion of the project area is summarized in Table 3.

4.3.1 Summary of Potentially Jurisdictional Areas

In California, the proposed project will result in a total of 15.436 acres of temporary impacts and 1.970 acres of permanent impacts to playa and desert wash habitats likely to fall under the jurisdiction of CDFG. The total acreage of temporary and permanent impacts to potential CDFG jurisdictional habitats broken down by habitat type and type of construction impact is summarized in Table 4. Maps depicting all potential CDFG jurisdictional habitats likely to be permanently or temporarily impacted by the construction of the project in addition to these habitats occurring within a 50 ft survey buffer surrounding all project construction sites, laydown areas and access roads are presented in Appendix D.

The application for a stream alteration agreement under section 1602 of the Fish and Game Code requires the reporting of the number of all riparian trees greater than four inches in diameter at breast height (DBH). The only riparian tree species occurring within the project impact areas is catclaw acacia. Six catclaw acacias greater than four inches DBH occur within temporary impact areas and four catclaw acacias occur within permanent impact areas. The location of these trees and all catclaw acacias occurring within the 50 ft. survey buffer is depicted in the CDFG maps of Appendix D.

Table 3. Species composition of CDFG – jurisdictional wash habitats

Mojave Desert Wash Scrub		Mojave Creosote Brush Scrub		Desert Saltbush Scrub	
Species	**Ave Cov[1]**	**Species**	**Ave Cov[1]**	**Species**	**Ave Cov[1]**
Ambrosia dumosa	3	*Ambrosia dumosa*	3	*Atriplex polycarpa*	3
Hymenoclea salsola	2.5	*Larrea tridentata*	2.5	*Ambrosia dumosa*	1
Achnatherum speciosum	2	*Eriogonum fasciculatum* var. *polifolium*	2	*Larrea tridentata*	1
Encelia virginensis	2	*Achnatherum speciosum*	1.5		
Eriogonum fasciculatum var. *polifolium*	2	*Ephedra* sp.	1.5		
Larrea tridentata	2	*Opuntia echinocarpa*	1.5		
Acacia greggii	1.5	*Pleuraphis rigida*	1.5		
Ephedra sp.	1.5	*Salsola tragus*	1.5		
Krameria erecta	1.5	*Atriplex polycarpa*	1		
Porophyllum gracile	1.5	*Echinocactus polycephalus*	1		
Unknown	1.5	*Ephedra nevadensis*	1		
Baccharis brachyphylla	1	*Eriogonum inflatum*	1		
Echinocereus engelmannii	1	*Erioneuron pulchellum*	1		
Encelia sp.	1	*Hymenoclea salsola*	1		
Ephedra nevadensis	1	*Krameria erecta*	1		
Eriogonum inflatum	1	*Lycium* sp.	1		
Erioneuron pulchellum	1	*Opuntia acanthocarpa*	1		
Lycium andersonii	1	*Opuntia basilaris*	1		
Lycium sp.	1	*Opuntia ramosissima*	1		
Mammillaria tetrancistra	1	*Porophyllum gracile*	1		
Menodora spinescens	1	*Yucca schidigera*	1		
Opuntia acanthocarpa	1	*Salazaria mexicana*	0.5		
Opuntia basilaris	1				
Opuntia echinocarpa	1				
Opuntia ramosissima	1				
Prunus fasciculata	1				
Salazaria mexicana	1				
Sphaeralcea ambigua	1				
Yucca schidigera	1				

Table 4. Summary of impacts to potential CDFG – jurisdictional habitats.

Habitat type[1]	Permanent Impacts (acres)		Temporary Impacts (acres)						Buffer (acres)
	220kV clearance	Microwave tower	115kV tower removal	220 kV P-S-T sites[2]	220kV tower const.	Culvert replacement	Fiber optic underground	Laydown or equip yard	
Playa	1.651		3.714	0.689	8.875				
DSS	0.003		0.040		0.124			0.055	0.496
MCBS	0.054		0.134	0.036	0.176	0.055	0.035	0.048	1.393
MDWS	0.252	0.010	0.801	0.307	0.337		0.095		5.261
Ruderal								0.002	0.000
Totals	1.960	0.010	4.690	1.031	9.513	0.055	0.130	0.106	7.151

[1]Habitat types: Playa = Ivanpah Lake bed; DDS = Desert Saltbush Scrub; MCBS = Mojave Creosote Brush Scrub; MDWS = Mojave Desert Wash Scrub; Ruderal = Disturbed area devoid of native vegetation

[2] 220 kV pulling, splicing and tensioning areas

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Appendix A

Dominant and/or characteristic plant species observed in the wash habitats of the EITP project site

Scientific Name[1]	Common Name	Indicator Status[3]	
		CA (Reg. 0)	NV (Reg. 8)
Gymnosperms			
Ephedraceae	**Mormon-tea family**		
Ephedra sp.	ephedra		
Ephedra nevadensis	Nevada ephedra		
Pinaceae	**Pine family**		
Pinus monophylla	singleleaf pinyon		
Dicots			
Anacardiaceae	**Sumac family**		
Rhus trilobata	skunkbush sumac	NI	NI
Asteraceae	**Aster family**		
Adenophyllum cooperi	Cooper's dogweed		
Ambrosia dumosa	white bursage		
Ambrosia eriocentra	woolly bur-sage		
Baccharis brachyphylla	shortleaf baccharis		
Bebbia juncea	sweetbush		
Brickellia sp.	brickellbush		
Chrysothamnus paniculatus	Mojave rabbitbrush		
Encelia sp.	brittlebush		
Encelia farinosa	brittlebush		
Encelia frutescens	button brittlebush		
Encelia virginensis	Virgin River brittlebush		
Ericameria laricifolia	turpentine bush		
Gutierrezia sp.	snakeweed		
Hymenoclea salsola	cheesebush		
Malacothrix glabrata	smooth desertdandelion		
Porophyllum gracile	slender poreleaf		
Viguiera parishii	Parish's goldeneye		
Bignoniaceae	**Trumpet-creeper family**		
Chilopsis linearis	desert willow	FACW	FAC
Boraginaceae	**Borage family**		
Cryptantha spp.	cryptantha		
Cactaceae	**Cactus family**		
*Coryphantha** sp.	beehive cactus		
Echinocereus engelmannii	Engelmann's hedgehog cactus		
Ferocactus cylindraceus	California barrel cactus		
Mammillaria tetrancistra	common fishhook cactus		
Opuntia acanthocarpa	buckhorn cholla		
Opuntia basilaris	beavertail pricklypear		
Opuntia echinocarpa	silver cholla		
*Grusonia parishii**	club cholla		

Scientific Name[1]	Common Name	Indicator Status[3]	
		CA (Reg. 0)	NV (Reg. 8)
Opuntia ramosissima	pencil cholla		
Chenopodiaceae	**Goosefoot family**		
Atriplex canescens	fourwing saltbush	FACU	UPL
Atriplex polycarpa	allscale	FACU	FACU
Salsola tragus	prickly Russian thistle		
Fabaceae	**Pea family**		
Acacia greggii	catclaw acacia	FACU	FACU
Psorothamnus fremontii	Fremont's dalea		
Senna armata	spiny senna		
Krameriaceae	**Krameria family**		
Krameria sp.	ratany		
Krameria erecta	littleleaf ratany		
Lamiaceae	**Mint family**		
Salazaria mexicana	bladdersage		
Salvia dorrii	desert sage		
Malvaceae	**Mallow family**		
Sphaeralcea ambigua	desert globemallow		
Oleaceae	**Olive family**		
Menodora spinescens	spiny desert olive		
Polygonaceae	**Buckwheat family**		
Chorizanthe rigida	devil's spineflower		
Eriogonum sp.	buckwheat		
Eriogonum deflexum	flatcrown buckwheat		
Eriogonum fasciculatum var. *polifolium*	California buckwheat		
Eriogonum inflatum	desert trumpet		
Rosaceae	**Rose family**		
Coleogyne ramosissima	blackbrush		
Fallugia paradoxa	Apache plume		
Prunus fasciculata	desert almond		
Scrophulariaceae	**Figwort family**		
Penstemon bicolor	pinto beardtongue		
Solanaceae	**Potato family**		
Lycium sp.	desert-thorn		
Tamaricaceae	**Tamarix family**		
Tamarix sp.	tamarisk		
Zygophyllaceae	**Creosote-bush family**		
Larrea tridentata	creosote bush		
Monocots			
Agavaceae	**Century-plant family**		
Yucca baccata	banana yucca		
Yucca brevifolia	Joshua tree		
Yucca schidigera	Mojave yucca		
Poaceae	**Grass family**		
Achnatherum sp.	needlegrass		
Achnatherum speciosum	desert needlegrass		
Aristida sp.	threeawn		

Scientific Name[1]	Common Name	Indicator Status[3]	
		CA (Reg. 0)	NV (Reg. 8)
Bouteloua sp.	grama		
Erioneuron pulchellum	fluff grass		
Pleuraphis rigida	galleta grass		
Schismus sp.	Mediterranean grass		

[1] Names follow Hickman (1993) except where indicated by *.

[3] National List of Plant Species that Occur in Wetlands (Reed 1988).

Plants for which no indicator status is presented are not included on the 1988 list.

FACW = Facultative Wetland Species; Estimated probability of 67% to 99% chance of occurring in wetlands.

FACU = Facultative Upland Species; Estimated probability of 1% to 33% chance of occurring in wetlands.

NI = No Indicator; Insufficient information was available to determine an indicator status.

UPL = Upland Species; Occurs in wetland is another region, but occurs almost always under natural conditions in nonwetlands in the Regions listed in the table. Estimated <1% probability of occurring in a wetlands

Appendix B.

Representative Photographs of Jurisdictional Features

Photo 1. Desert Saltbush Scrub. USACE-jurisdictional wash NV-016.

Photo 2. Desert Saltbush Scrub. CDFG-jurisdictional wash.

Photo 3. Joshua Tree Woodland. USACE-jurisdictional wash NV-082

Photo 4. Mojave Creosote Brush Scrub. USACE-jurisdictional wash NV-103.

Photo 5. Mojave Desert Wash Scrub. USACE-jurisdictional wash NV-084

Photo 6. Mojave Desert Wash Scrub. CDFG-jurisdictional wash.

Photo 7. Playa at Ivanpah Lake

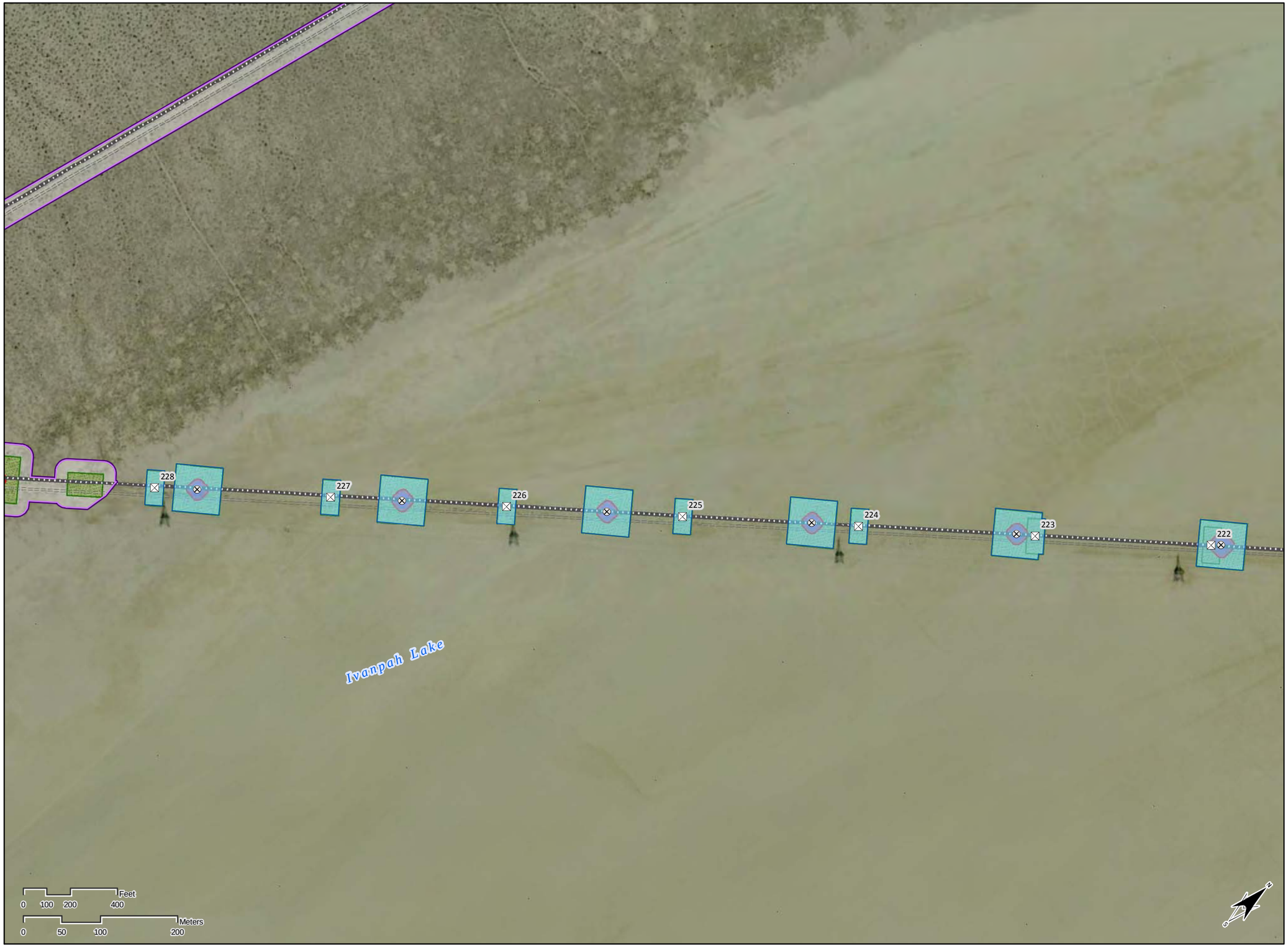
Photo 8. Rabbitbrush Scrub. USACE-jurisdictional wash NV-031.

Photo 9. Ruderal habitat. USACE-jurisdictional wash NV-165.

Appendix C
Maps of potential USACE – Jurisdictional Waters

Figure 3. Wetland and water feature types. Map 1 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

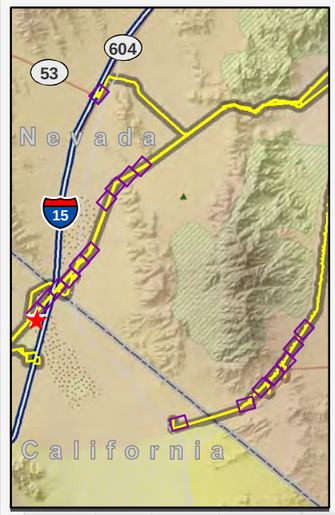


Figure 3. Wetland and water feature types. Map 2 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

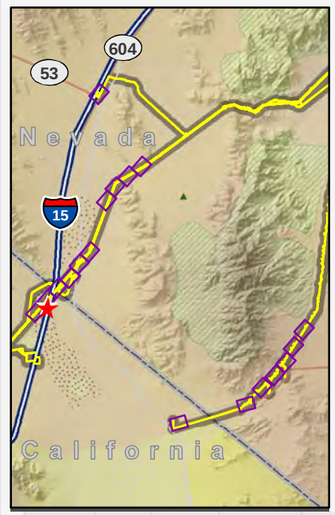


Figure 3. Wetland and water feature types. Map 3 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

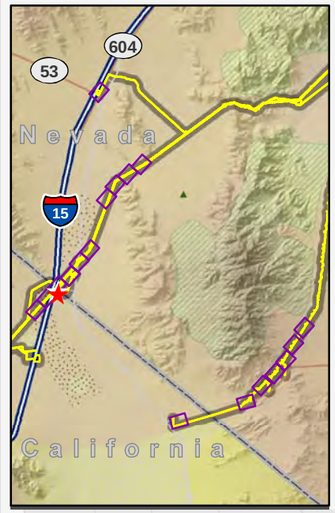


Figure 3. Wetland and water feature types. Map 4 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

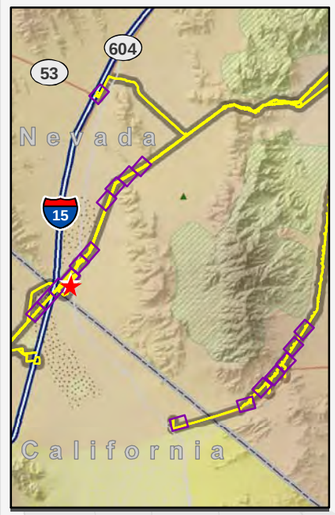
Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary



GANDA

Figure 3. Wetland and water feature types. Map 5 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

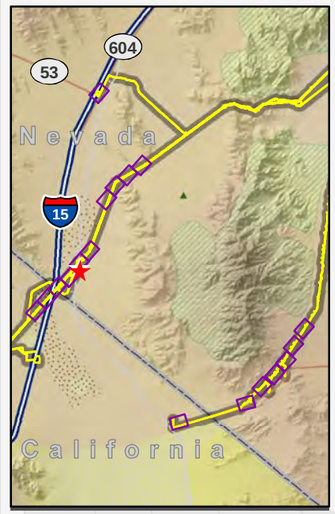


Figure 3. Wetland and water feature types. Map 6 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

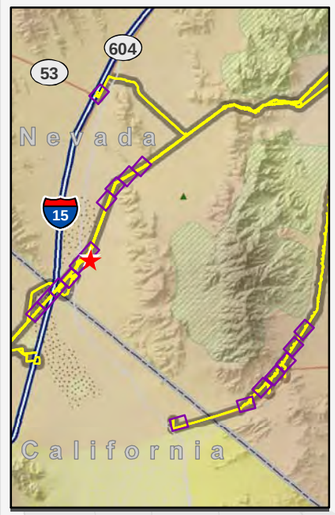


Figure 3. Wetland and water feature types. Map 7 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

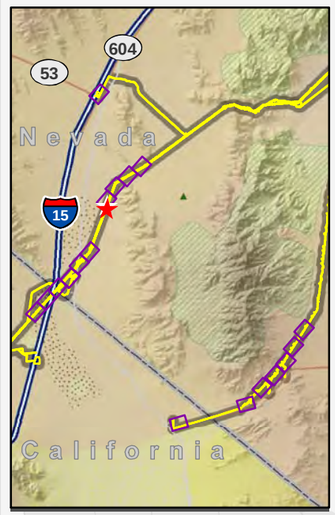
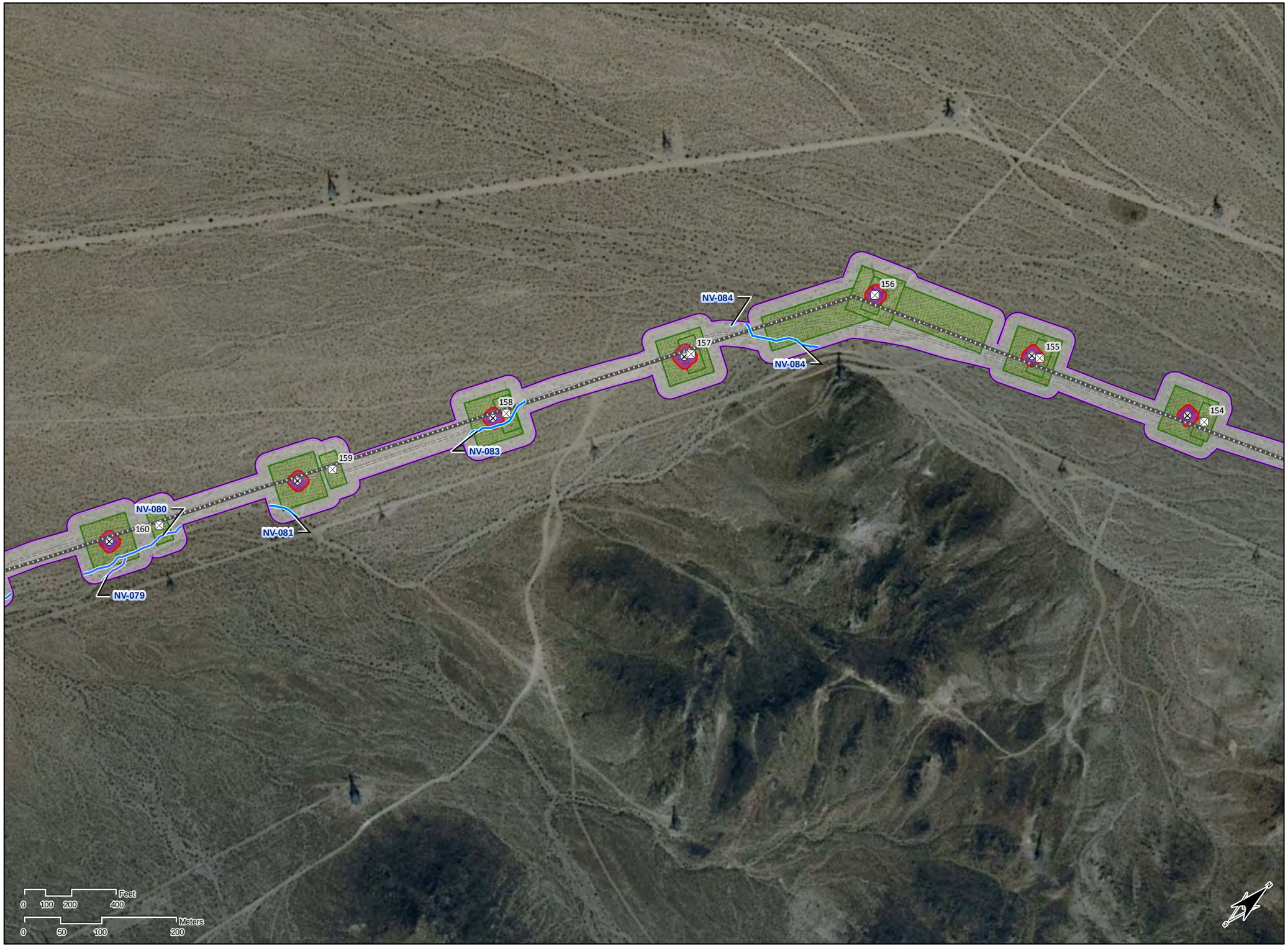


Figure 3. Wetland and water feature types. Map 8 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

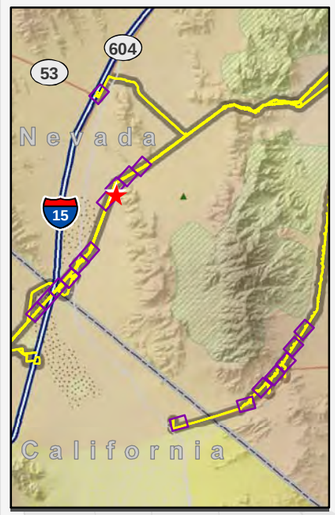


Figure 3. Wetland and water feature types. Map 9 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

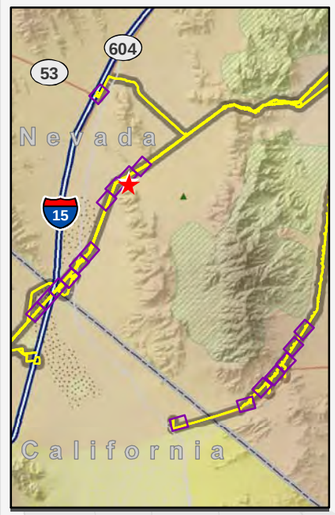


Figure 3. Wetland and water feature types. Map 10 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

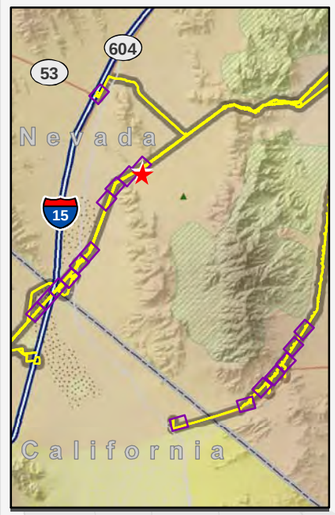


Figure 3. Wetland and water feature types. Map 11 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

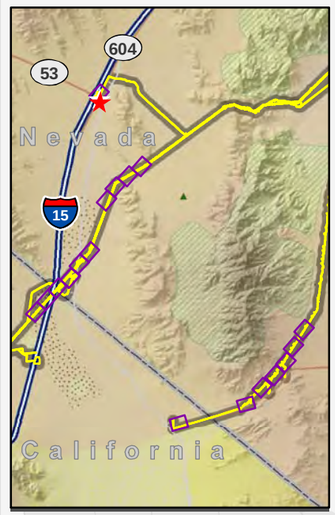


Figure 3. Wetland and water feature types. Map 12 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

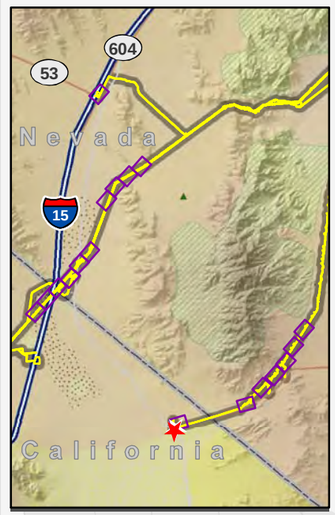
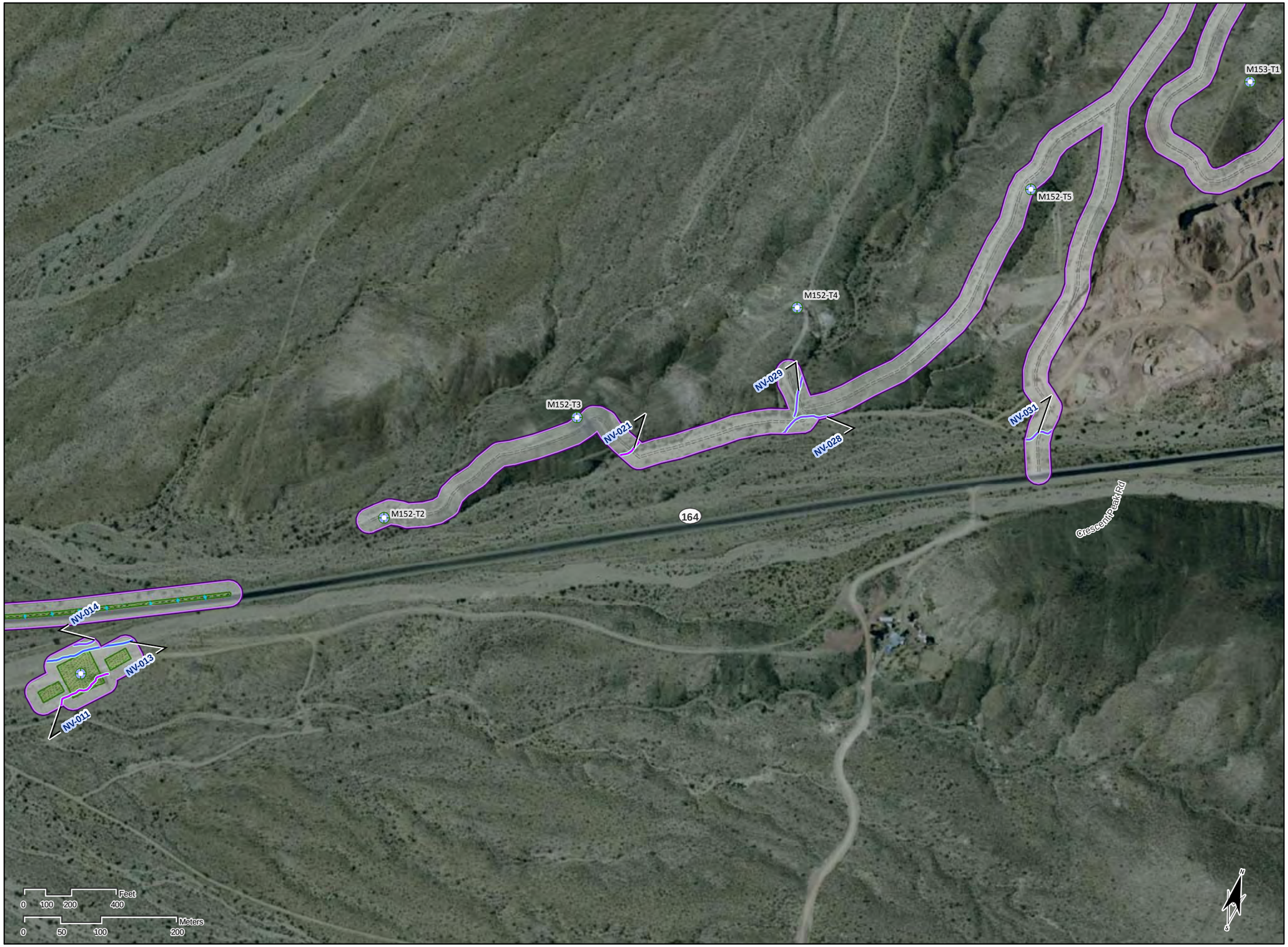


Figure 3. Wetland and water feature types. Map 13 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

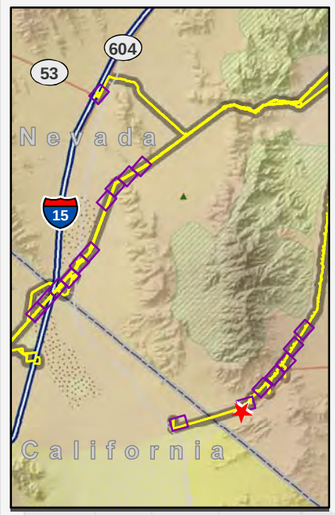


Figure 3. Wetland and water feature types. Map 14 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

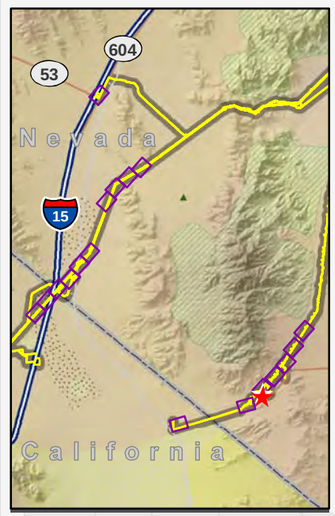


Figure 3. Wetland and water feature types. Map 15 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

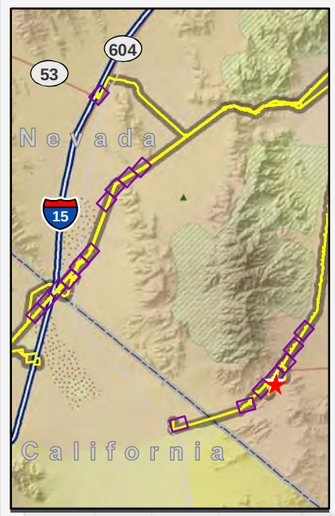
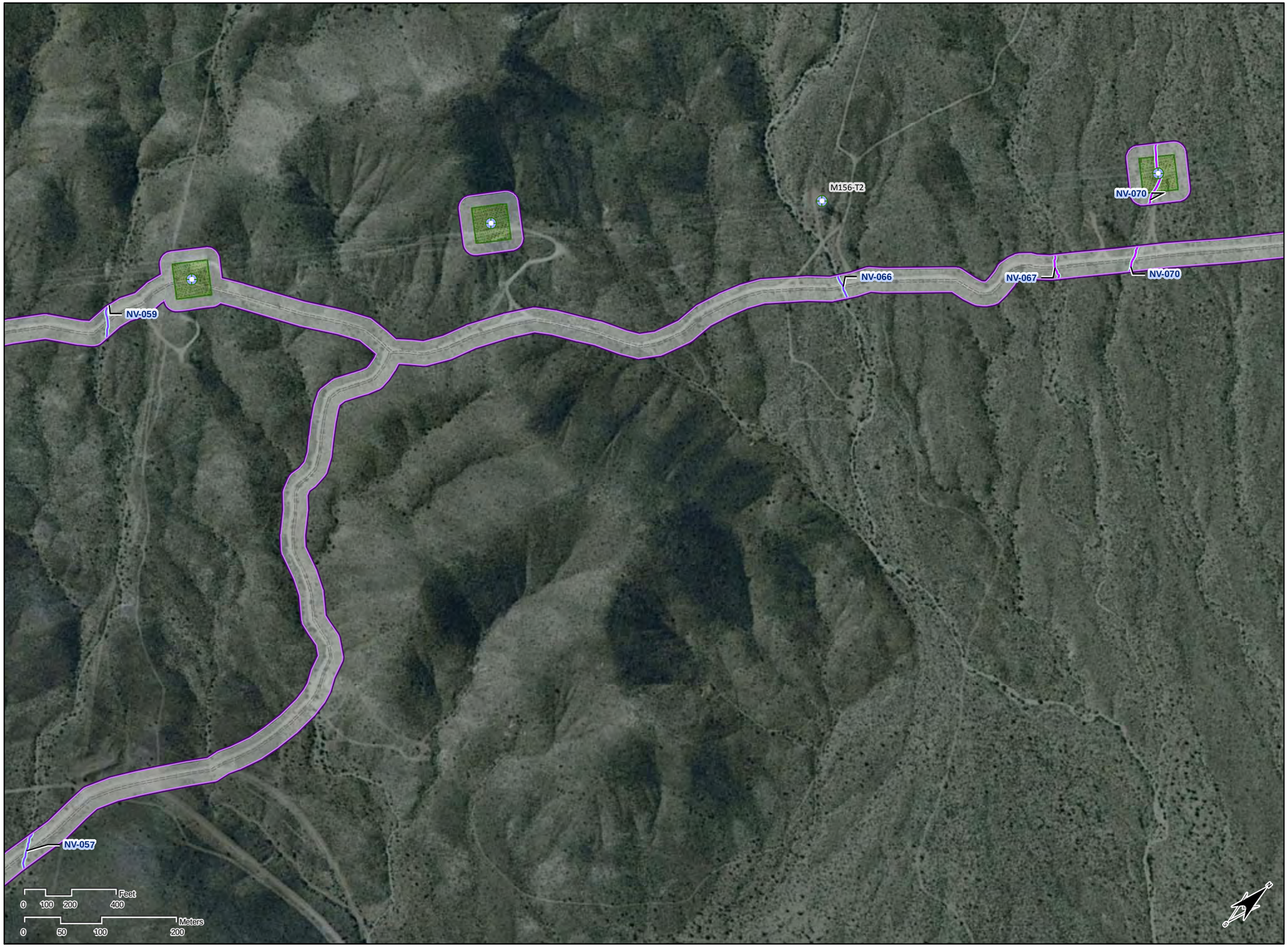


Figure 3. Wetland and water feature types. Map 16 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary

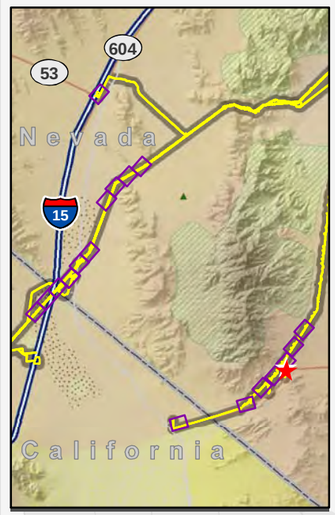
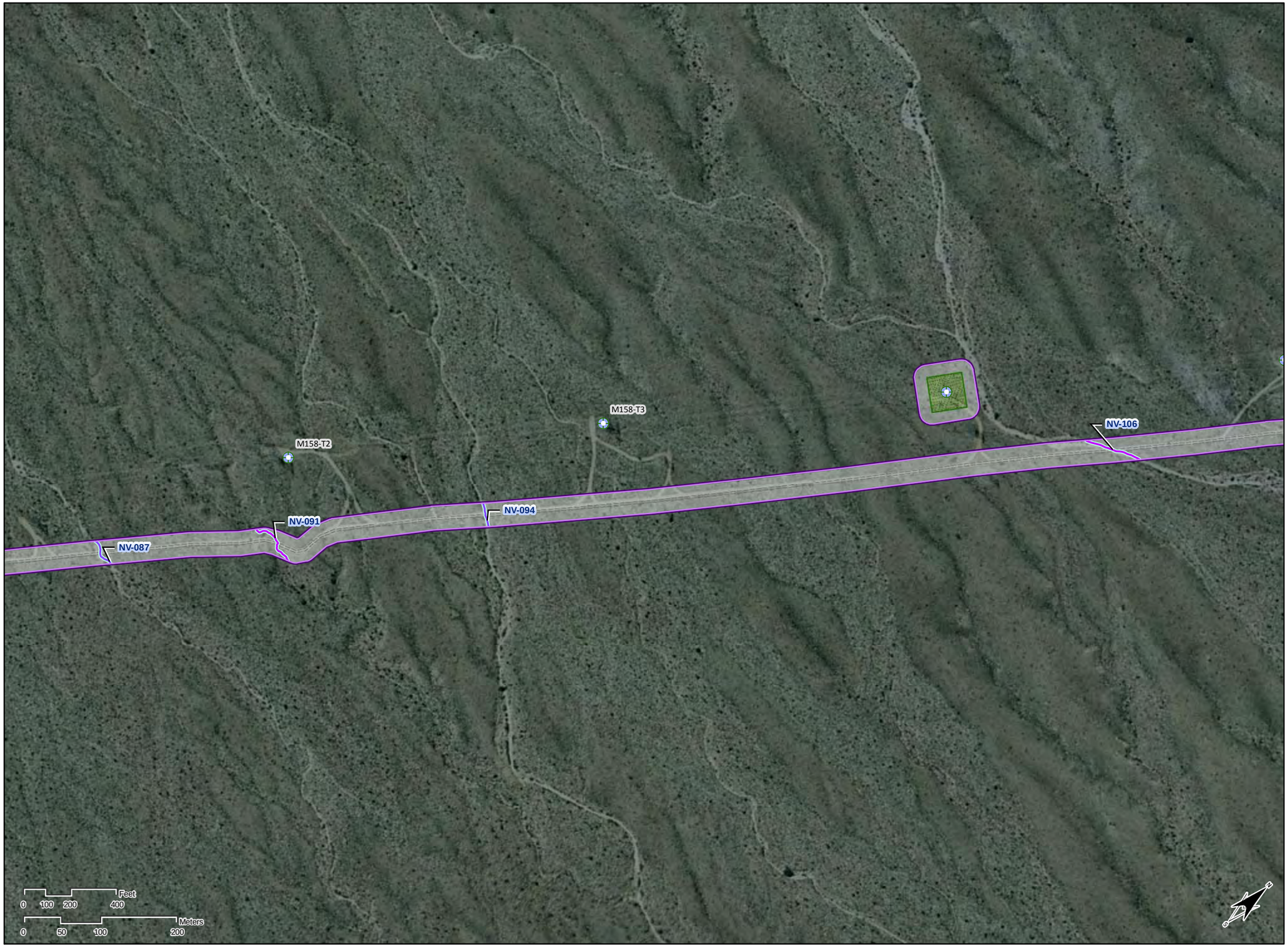


Figure 3. Wetland and water feature types. Map 17 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



- Pole
- Transmission line
- Telecom
- Access road
- Tower
- Tower- bio
- Survey area
- Ivanpah Lake

Wash Width in Feet

- 2.0 - 2.5
- 2.6 - 3.5
- 3.6 - 6.0
- 6.1 - 22.5

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

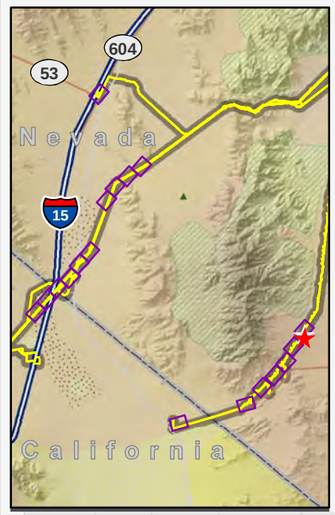
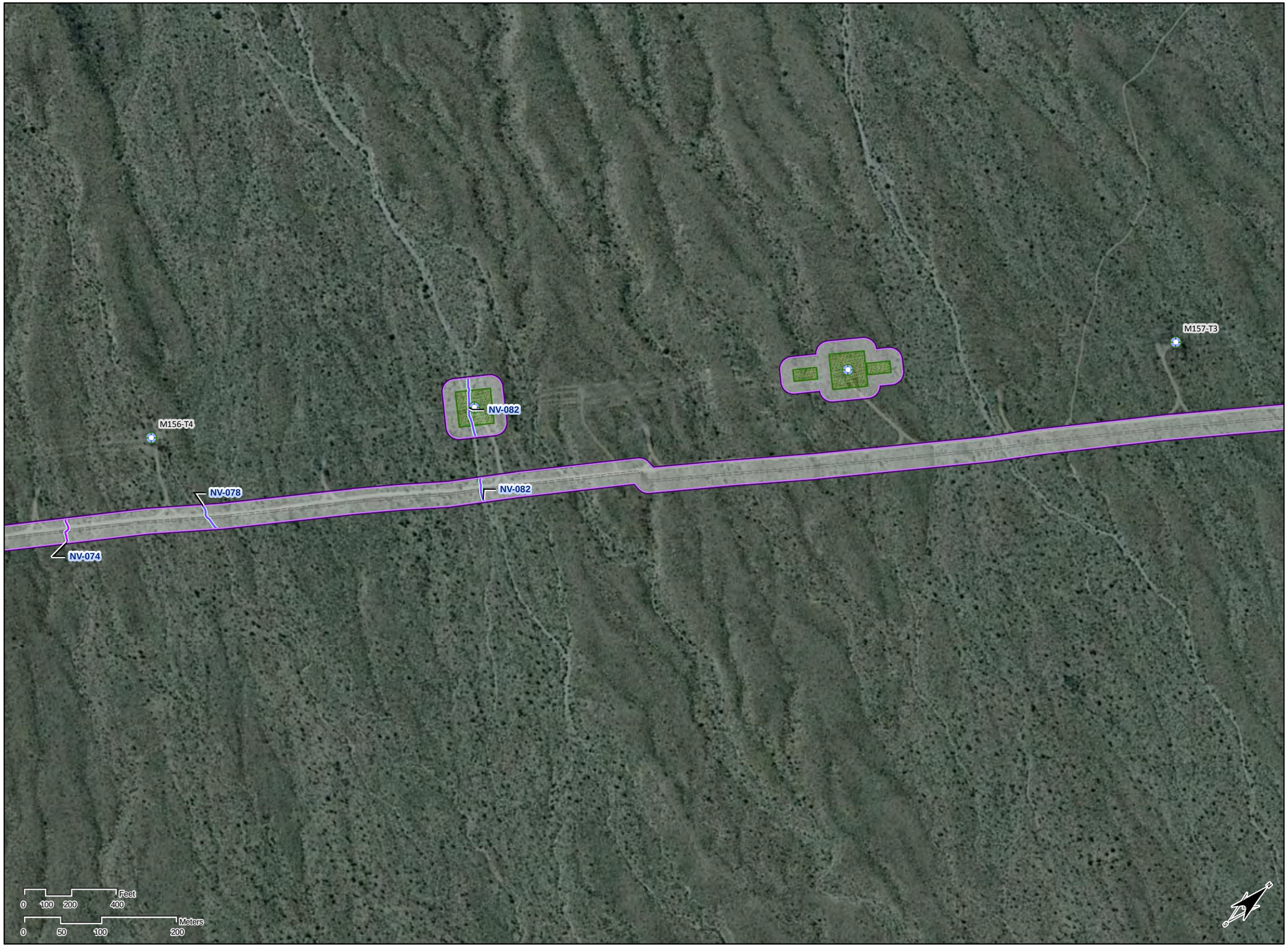


Figure 3. Wetland and water feature types. Map 18 of 18

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



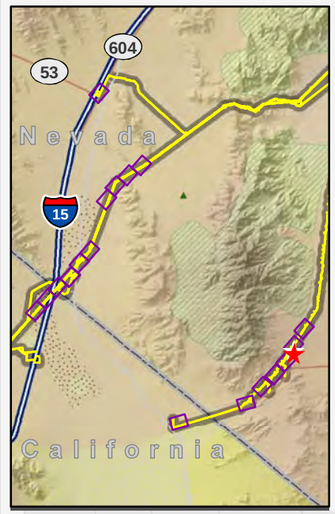
Pole
Transmission line
Telecom
Access road
Tower
Tower- bio
Survey area
Ivanpah Lake

Wash Width in Feet

2.0 - 2.5
2.6 - 3.5
3.6 - 6.0
6.1 - 22.5

Work Area Impact Type

50ft survey buffer
Permanent
Temporary



Appendix D
Maps of potential CDFG – Jurisdictional Habitats

Figure 3. Wetland and water feature types. Map 1 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

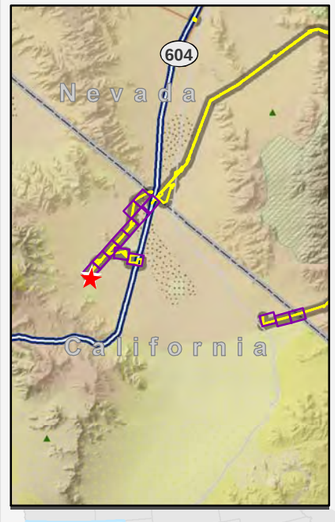


Figure 3. Wetland and water feature types. Map 2 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

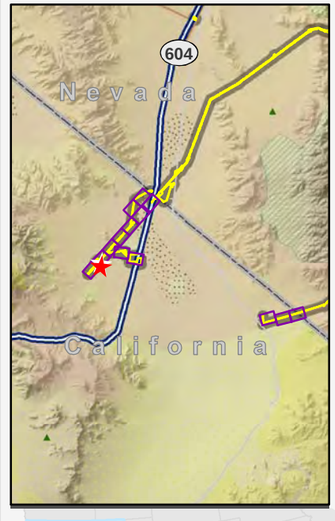
- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



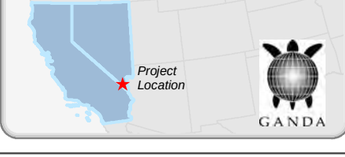
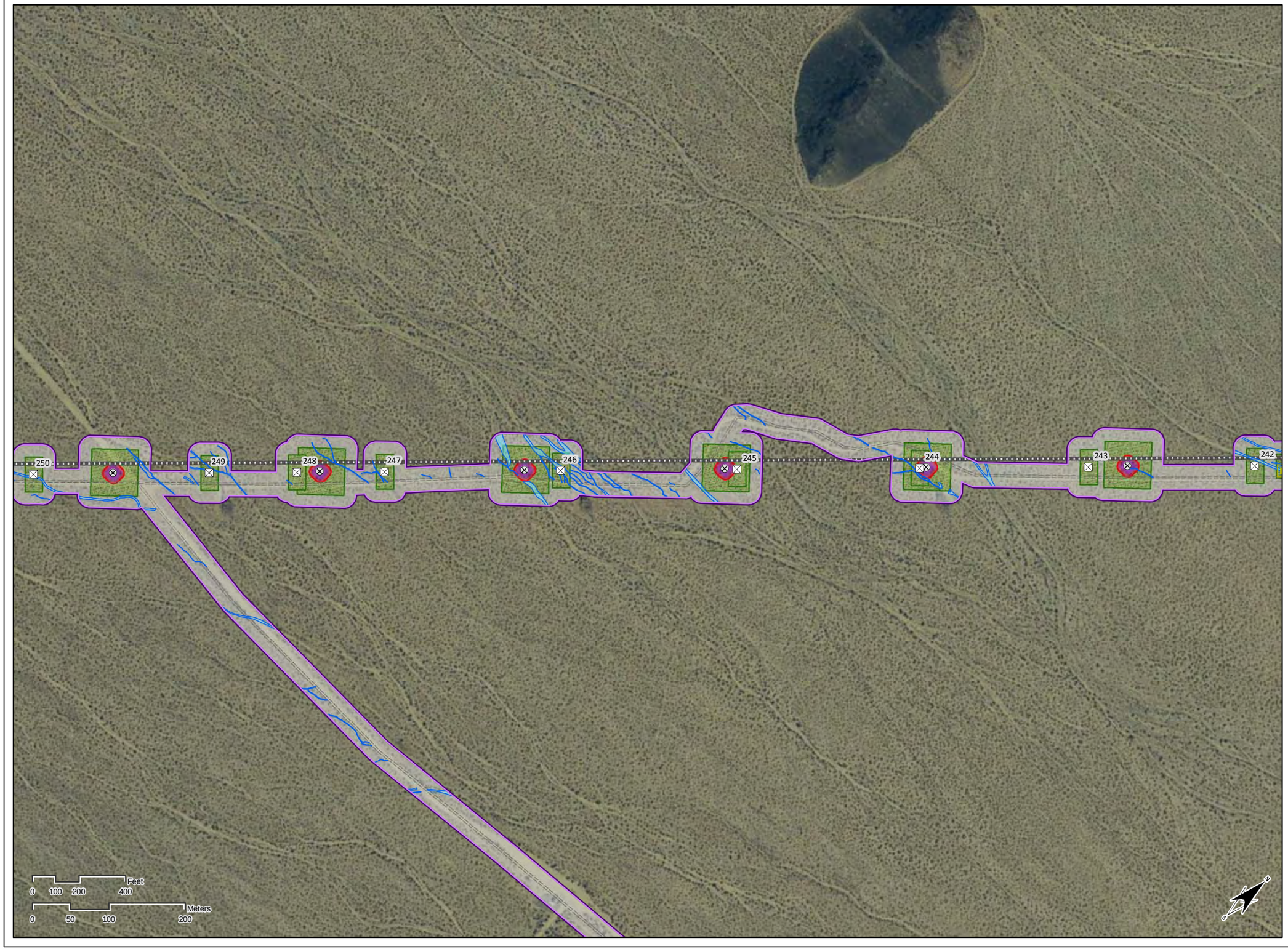


Figure 3. Wetland and water feature types. Map 3 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

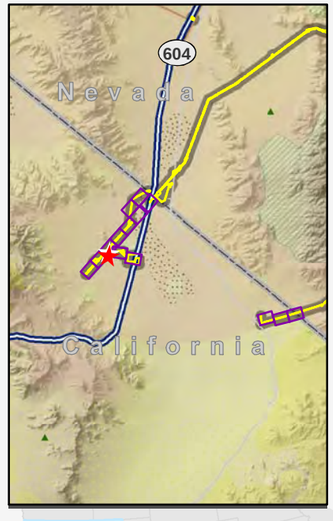


Figure 3. Wetland and water feature types. Map 4 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

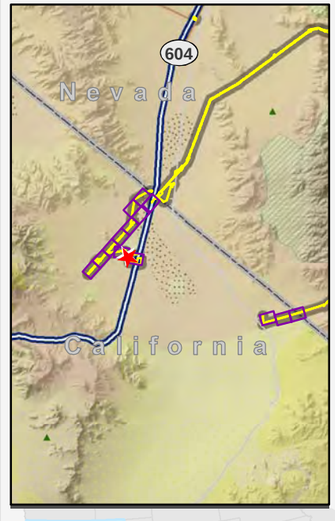
- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



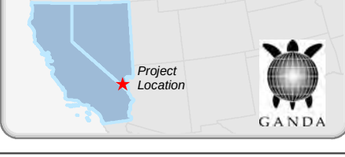


Figure 3. Wetland and water feature types. Map 5 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

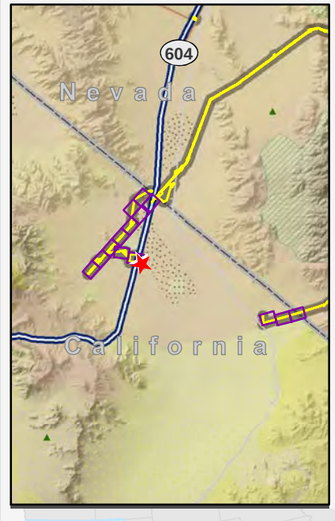
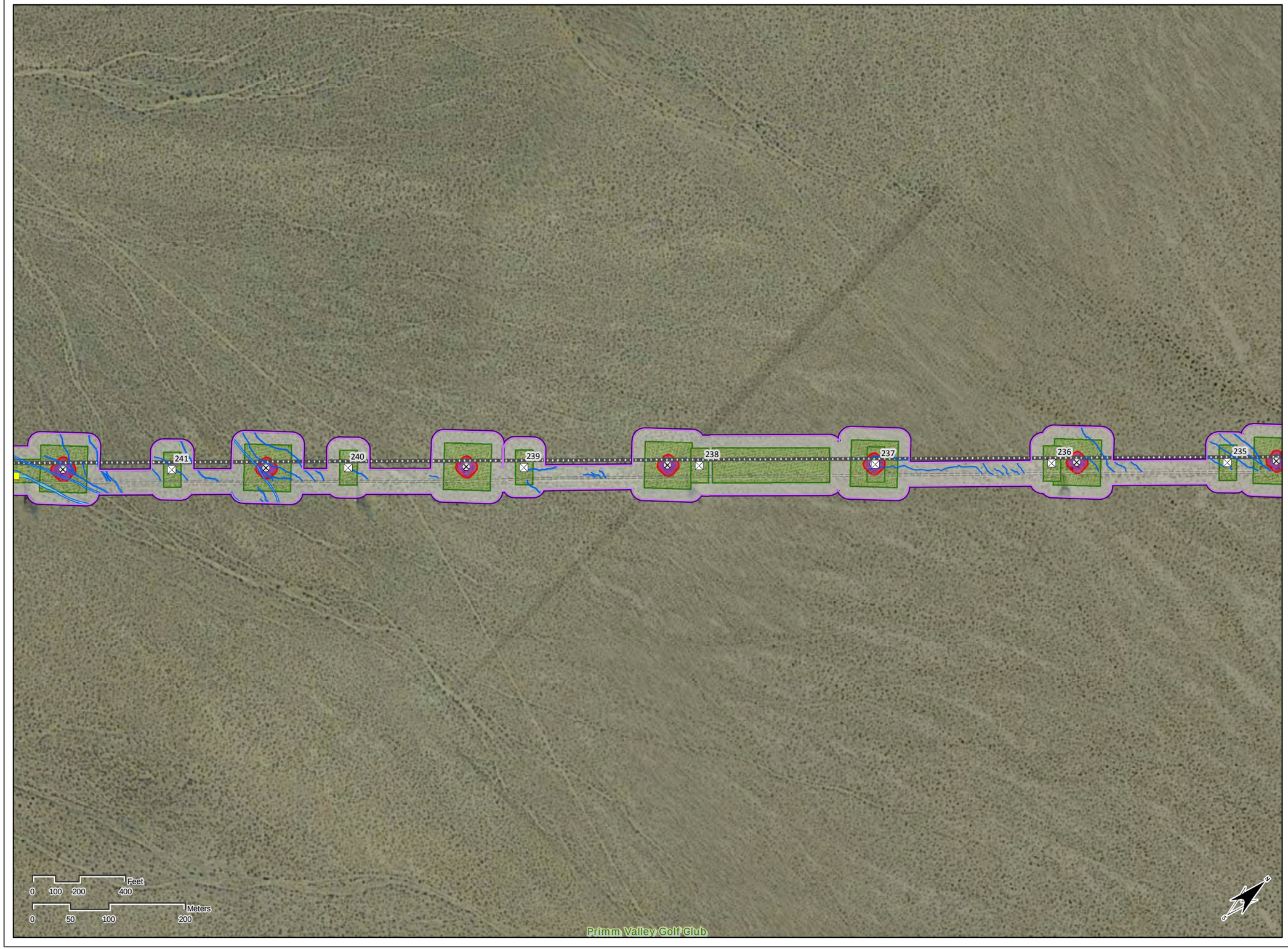


Figure 3. Wetland and water feature types. Map 6 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

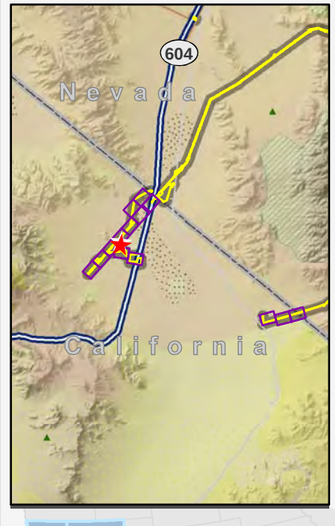
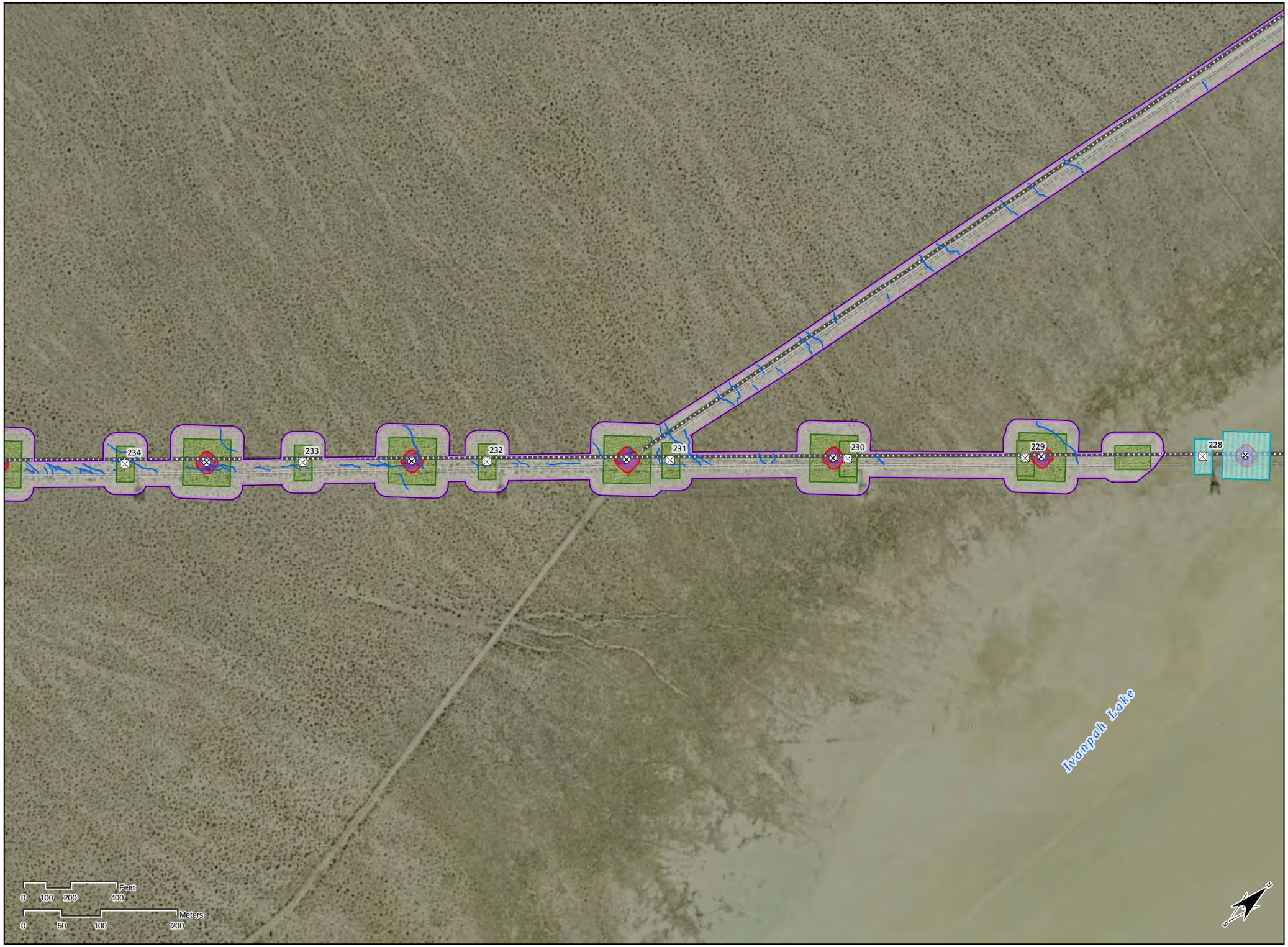


Figure 3. Wetland and water feature types. Map 7 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information



- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

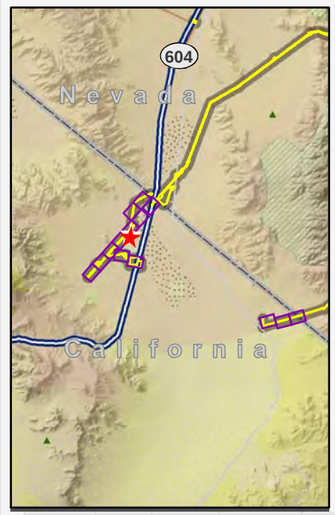


Figure 3. Wetland and water feature types. Map 8 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

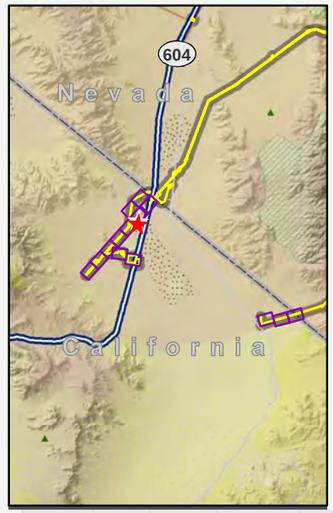


Figure 3. Wetland and water feature types. Map 9 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

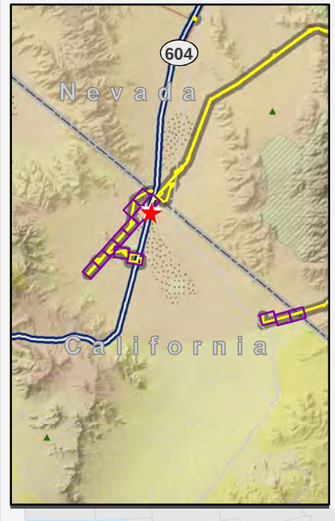
Acacia greggii
Pole
Transmission line
Telecom line
Access road
Tower
Tower- bio
Survey area

Water Feature Types

Constructed drainage ditch
Ivanpah Lake
Wash

Work Area Impact Type

50ft survey buffer
Permanent
Temporary



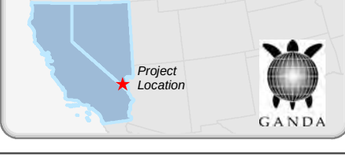


Figure 3. Wetland and water feature types. Map 10 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

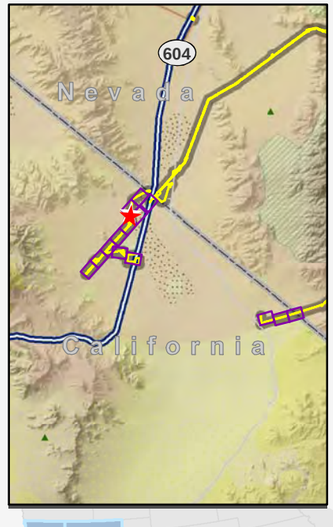


Figure 3. Wetland and water feature types. Map 11 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

Ivanpah Lake

Feet
0 100 200 400

Meters
0 50 100 200

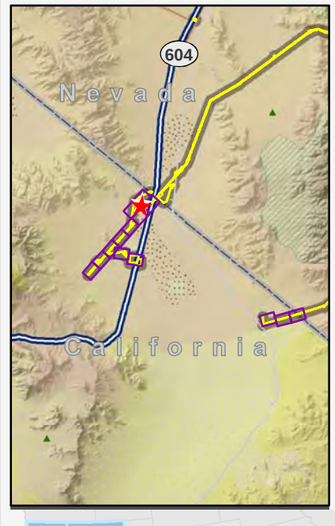


Figure 3. Wetland and water feature types. Map 12 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

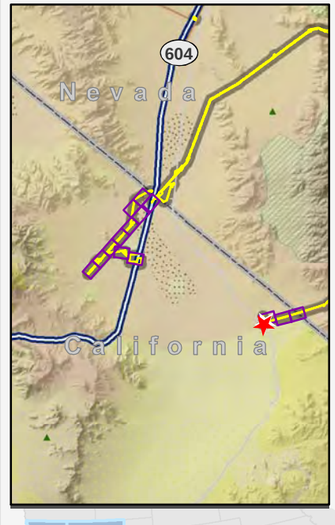
- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary



Nipton Rd

Castle Rifles Dr

Nipton Rd

0 100 200 400 Feet

0 50 100 200 Meters

S

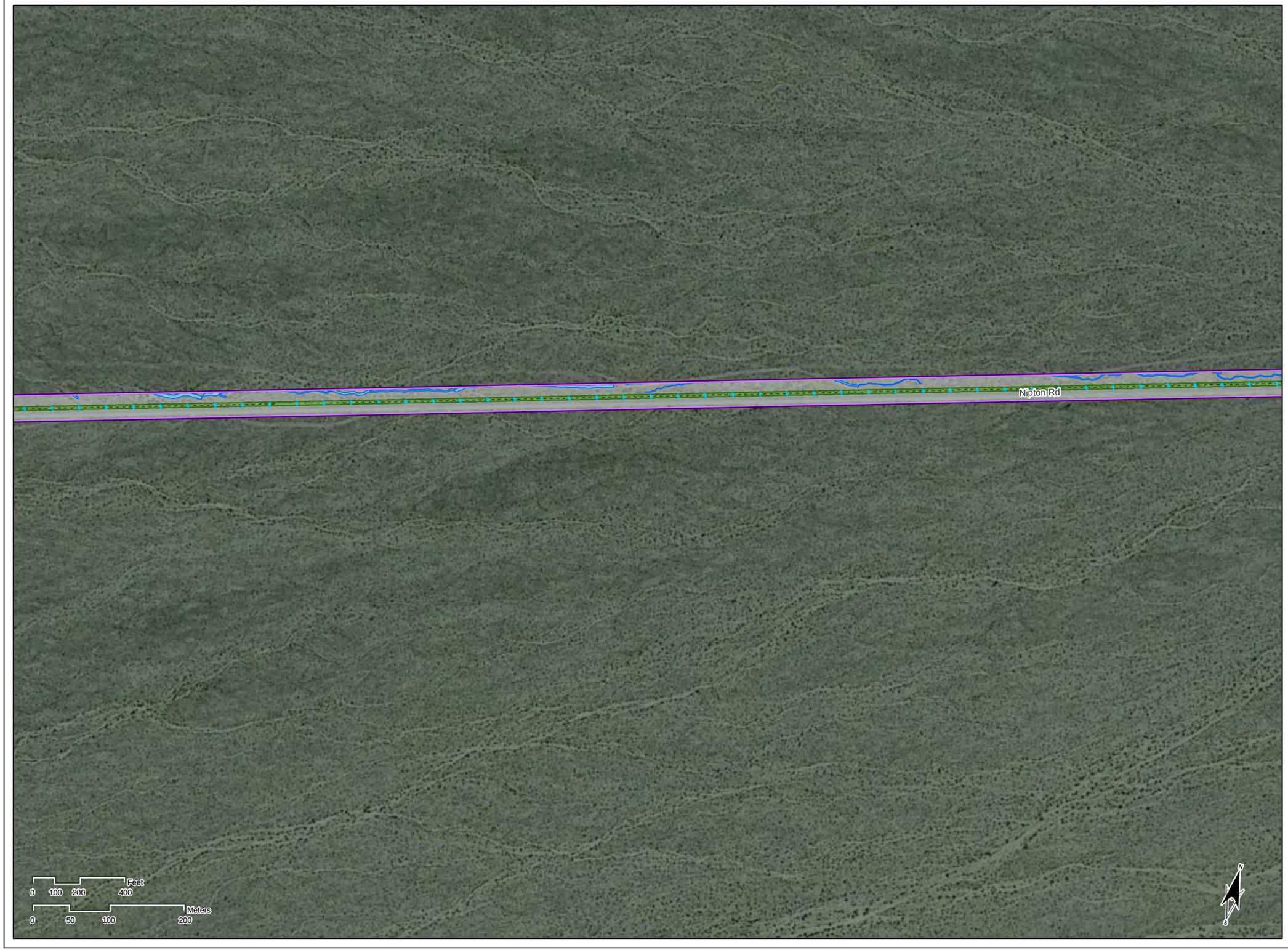


Figure 3. Wetland and water feature types. Map 13 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary

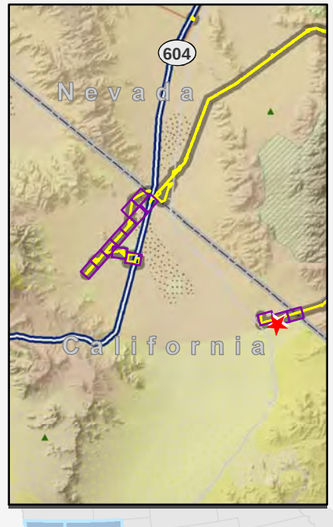


Figure 3. Wetland and water feature types. Map 14 of 14

PROTECTED MATERIALS- Contains Critical Energy Infrastructure Information

- Acacia greggii
- Pole
- Transmission line
- Telecom line
- Access road
- Tower
- Tower- bio
- Survey area

Water Feature Types

- Constructed drainage ditch
- Ivanpah Lake
- Wash

Work Area Impact Type

- 50ft survey buffer
- Permanent
- Temporary