BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN	)	Application No._____
CALIFORNIA EDISON COMPANY (U 338-E)	)	
for a Permit to Construct Electrical Facilities	)	
With Voltages Between 50 kV and 200 kV:	)	
Valley South Subtransmission Project	)	

PROPONENT'S ENVIRONMENTAL ASSESSMENT: VALLEY SOUTH 115 kV SUBTRANSMISSION PROJECT

VOLUME 4 of 4 (Part 3 of 5)

BETH GAYLORD

TAMMY L. JONES

ROBERT D. PONTELLE

Attorneys for

SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-6634
Facsimile: (626) 302-1926
E-mail: tammy.jones@sce.com

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Appendices (Volume 4)

(3 of 5)

Appendix F: Biological Resources Assessment – Segment 1 and Biological Resources Assessment - Segment 2

Appendix F: Biological Resources Assessment – Segment 1 and Biological Resources Assessment – Segment 2

Rare Plant Species Survey Report

Southern California Edison
Valley South 115kV Subtransmission Line Project

Riverside, California
USGS Bachelor Mountain, Murrieta, Romoland, and Winchester Quadrangles

July, 2013

Prepared For:

Southern California Edison
1218 S. Fifth Ave
Monrovia, CA 91016

Prepared By:

TRC Solutions, Inc.
123 Technology Drive West
Irvine, CA 92618

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Acronyms List

Acronym	Definition
Alternative Project	Alternative 115 kV Subtransmission Line Project
CAPS	Criteria Area Plant Species
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CSS	coastal sage scrub
DBESP	Determination of Biological Equivalent or Superior Preservation
GIS	Geographic Information System
GPS	Global Positioning System
HCP	Habitat Conservation Plan
kV	kilovolt
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
NCCP	Natural Communities Conservation Plan
NEPS	Narrow Endemic Plant Species
NRCS	Natural Resources Conservation Service
Project survey area	250 foot buffer surrounding the Proposed and Alternative projects
Proposed Project	Valley South 115 KV Subtransmission Line Project
SCE	Southern California Edison
TRC	TRC Solutions, Inc.
TSP	Tubular Steel Pole

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1.0 INTRODUCTION

TRC Solutions, Inc. (TRC) was contracted by Southern California Edison (SCE) to conduct a special status plant species survey in 2013 within the survey area designated for the proposed Valley South 115 kilovolt (kV) Subtransmission Line Project (Proposed Project), located in southwestern Riverside County, California (Figure 1, Vicinity Map). The 2013 survey supplements a similar survey conducted for the Project by TRC in 2012, the results of which were submitted to SCE in a report dated September 11, 2012 (TRC 2012).

The Valley South Subtransmission Line Project consists of Proposed and Alternative Projects occurring within the area of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), which was developed as a large-scale planning mechanism pursuant to the Natural Communities Conservation Planning Act of 1991.

Under the MSHCP Section 6.1.3, required survey areas for specific Narrow Endemic Plant Species (NEPS) have been delineated based primarily on the distribution of select, restricted soils with special chemical and/or physical characteristics and, to a lesser degree, distribution of certain vegetation and other habitat (e.g., wetlands) types. NEPS are also defined as being highly restricted geographically, within only a portion of the areas supporting apparently suitable conditions within the region. The Project occurs within designated Species of Concern Areas 3 and 4, as shown in Figure 6-1 of the MSHCP.

Criteria Area Plant Species (CAPS) are those for which insufficient information exists to meet conditions of coverage under the MSHCP (see MSHCP section 6.3.2). Therefore, surveys for these species are required within the defined Criteria Area, where potentially suitable habitat occurs.

This assessment provides an inventory of all non-cultivated, vascular plant species occurring within the project survey area, as defined below, and includes an analysis and discussion of the occurrences and habitat conditions for NEPS and CAPS based on field survey.

1.1 PROJECT OVERVIEW

SCE is proposing the construction of the Proposed or Alternative Project to serve current and projected demand for electricity and maintain electric system reliability in portions of Murrieta, Menifee, and unincorporated communities within the southern portion of Riverside County. The following points briefly describe the components included in the Proposed Project:

- Modification of SCE's existing Valley 500/115 kV Substation, which would include equipping an existing 115 kV line position and providing protection equipment as required.
- Construction of a new 115 kV Subtransmission Line originating at SCE's existing Valley 500/115 kV Substation and terminating at a Tubular Steel Pole (TSP), which is located south of the intersection of Leon and Benton Roads, hereinafter referred to as "Terminal TSP." The Terminal TSP is the common point of the three-point existing 115 kV subtransmission line Valley-Auld-Triton; thus the project would create the Valley-Auld

No. 2 and Valley-Triton 115 kV subtransmission lines. The new 115 kV Subtransmission Line would be approximately 12 miles in length.

- Installation of communication equipment at Triton and Valley Substations to support the new 115 kV Subtransmission Line.

Displayed in Figure 1, Vicinity Map, are the Proposed Project and Alternative 115 kV Subtransmission Line Project (Alternative Project). The project survey area is defined by the 250-foot buffer surrounding the Proposed and Alternative projects (500-foot total width), describing an area of approximately 1,064 acres. Subsequent addition of outlying staging yards to the project area in late 2012 resulted in an increase of the project survey to approximately 1,118 acres.

1.2 REGULATORY BACKGROUND

The Proposed and Alternative Projects occur within the coverage area of the MSHCP, a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan (NCCP) focusing on conservation of species and their associated habitats in western Riverside County. The MSHCP is a criteria-based plan, wherein area-specific criteria for species survey, conservation, and preserve design are designated with the objective of effective regional conservation of biodiversity.

The NCCP recognizes "coverage" of species under the planning process as anticipated adequate, long-term conservation of those species under full implementation of the particular local plan, which is also designed to account for human development. The MSHCP covers 146 species, including many locally sensitive and special status species. Among these, 106 are adequately conserved with no additional surveys or conservation required. The remaining 40 species, including three vernal pool crustaceans, three riparian birds, 14 NEPS, 13 CAPS, three amphibians, the burrowing owl, and three mammals, are covered with conditional survey requirements. Maps of the aforementioned designated survey areas for these species are provided in Section 6.0 of the MSHCP. The areas are also depicted here in Figure 2, MSHCP Survey Areas Map. Species-specific surveys are required if a project falls within a survey area and if species-specific habitat conditions are present.

Based on the location of the Proposed and Alternative Projects with respect to designated Species of Concern Areas 3 and 4, it was determined that a survey for the NEPS (MSHCP Section 6.1.3) and CAPS (MSHCP Section 6.3.2), identified in Table 1, was required. If any of the species are present within their respective Criteria Areas, avoidance of 90 percent of those portions of the property that provide for long-term conservation value for the species is required until the MSHCP has met the species-specific conservation objectives (MSHCP, Table 9-2). If 90 percent avoidance cannot be achieved, a Determination of Biological Equivalent or Superior Preservation (DBESP) analysis is required.

Table 1: MSHCP Narrow Endemic and Criteria Area Plants

Scientific Name	Common Name	Status	Habitat/Elevation	Blooming Period
Narrow Endemic Species				
Ambrosia pumila	San Diego ambrosia	List 1B.1 FE 7/02	Chaparral , Coastal scrub, Valley and foothill grassland, Vernal pools/often in disturbed areas, sometimes alkaline 20 – 415 m	Apr-Oct
Allium marvinii	Yucaipa Onion	List 1B.1	Chaparral (clay openings) 760 – 1,065 m	Apr-May
Allium munzii	Munz's Onion	List 1B.1 ST 1/90 FE 10/98	Chaparral, Cismontane woodland, Coastal scrub, Pinyon and juniper woodland, Valley and foothill grassland /mesic, clay 300 – 1,070 m	Mar-May
Arabis johnstonii	Johnston's Rockcress	List 1B.2	Chaparral , Lower montane coniferous forest/often on eroded clay 1350 – 2,150 m	Feb-Jun
Calochortus palmeri var. munzii	Munz's Mariposa lily	List 1B.2 CA-Endemic	Chaparral , Lower montane coniferous forest 1200 – 2,200 m	Jun-Jul
Dodecahema leptoceras	Slender-Horned Spine Flower	List 1B.1 SE 1/82 FE 9/87	Chaparral, Cismontane woodland, Coastal scrub (alluvial fan)/sandy 200 – 760 m	Apr-Jun
Dudleya multicaulis	Many-Stemmed Dudleya	List 1B.2	Chaparral, Coastal Scrub, Valley & Foothill grassland/often clay 15 – 790 m	Apr-Jul
Galium angustifolium ssp. jacinticum	San Jacinto Mountains Bedstraw	List 1B.3 CA-Endemic	Lower montane coniferous forest 1,350 – 2,100 m	Jun-Aug
Navarretia fossalis	Spreading Navarretia	List 1B.1 FE 10/98	Chenopod scrub, Marshes and swamps (assorted shallow freshwater), Playas, Vernal pools	Apr-Jun
Orcuttia californica	California Orcutt Grass	List 1B.1 SE 9/79 FE 8/93	Vernal pools 15 – 660 m	Apr-Aug
Phacelia stellaris	Brands Phacelia	List 1B.1 FC	Coastal dunes, Coastal scrub 1 – 400 m	Mar-Jun

Table 1 (cont.): MSHCP Narrow Endemic and Criteria Area Plants

Scientific Name	Common Name	Status	Habitat/Elevation	Blooming Period
Satureja chandleri	San Miguel Savory	List 1B.2	Chaparral , Cismontane woodland, Coastal scrub Riparian woodland, Valley and foothill grassland/rocky, gabbroic or metavolcanic 120 – 1,075 m	Mar-Jul
Sibaropsis hammittii	Hammitt's Clay-Cress	List 1B.2	Chaparral (openings), Valley and foothill grassland/clay 720 – 1,065 m	Mar-Apr
Trichocoronis wrightii var. wrightii	Wright's Trichocoronis	List 2.1	Meadows and seeps, Marshes and swamps, Riparian forest, Vernal pools/alkaline 5 – 435 m	May- Sep
Criteria Area Species				
Atriplex coronata var. notatior	San Jacinto Valley Crownscale	List 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, Valley & Foothill grassland/alkaline or clay 3 – 460 m	Mar-Oct
Atriplex parishii	Parish's Brittlescale	List 1B.1	Chenopod scrub, Playas, Vernal pools 25 – 1,900 m	Jun-Oct
Atriplex serenana var. davidsonii	Davidson's Saltscale	List 1B.2	Coastal bluff scrub, Coastal scrub/alkaline 10 – 200 m	Apr-Oct
Berberis nevinii	Nevin's Barberry	List 1B.1 SE 01/87 FE 10/13/98	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub/sandy or gravelly 295 – 825 m	Mar-Apr
Brodiaea filifolia	Thread-Leaved Brodiaea	1B.1 SE 01/82 FT 10/13/98	Chaparral, cismontane woodland, coastal scrub, playas, Valley & Foothill 25 – 860 m	Mar-Jun
California macrophyllum	Round-Leaved Filaree	List 1B.1	Cismontane woodland, Valley & Foothill grassland/clay 15 – 1,200 m	Mar-May
Ceanothus ophiochilus	Vail Lake Ceanothus	List 1B.1 SE 1/94 FT 10/98	Chaparral(gabbroic or pyroxenite-rich outcrops) 580 – 1,065 m	Feb-Mar
Centromadia pungens	Smooth Tarplant	List 1B.1	Chenopod scrub, meadows, playas, riparian woodland, Valley & Foothill grassland 0 – 480 m	Apr-Sept

Table 1 (cont.): MSHCP Narrow Endemic and Criteria Area Plants

Scientific Name	Common Name	Status	Habitat/Elevation	Blooming Period
Lasthenia glabrata ssp. coulteri	Coulter's Goldfields	List 1B.1	Marshes and swamps(coastal salt), Playas, Vernal pools 1 – 1,220 m	Feb-Jun
Lepechinia cardiophylla	Heart-Leaved Pitcher Sage	List 1B.2	Closed-cone coniferous forest, Chaparral, Cismontane woodland 520 – 1,370 m	Apr-Jun
Myosurus minimus	Little Mousetail	List 3.1	Valley and foothill grassland, Vernal pools (alkaline) 20 – 640 m	Mar-Jun
Nama stenocarpum	Mud Nama	List 2.2	Marshes and swamps (lake margins, riverbanks) 5 – 500 m	Jan-Jul
Navarretia prostrata	Prostrate Navarretia	List 1B.1	Coastal scrub, Meadows and seeps, Valley and foothill grassland (alkaline), Vernal pools/mesic 125 – 700 m	Apr-Jul
Source: CNPS, 2012; MSHCP, 2003				

California Department of Fish and Game

SE	State listed, endangered
ST	State listed, threatened
SR	State listed, rare

U.S. Fish and Wildlife Service

FE	Federally listed, endangered
FT	Federally listed, threatened
FC	Federal candidate species

California Native Plant Society

List 1B	Rare, threatened, or endangered in California and elsewhere
List 2	Rare, threatened, or endangered in California but more common elsewhere
List 4	Limited distribution – a watch list

2.0 METHODS

2.1 LITERATURE SEARCH

Prior to field surveys, records from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CNDDB, 2012) and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants (CNPS, 2012) were reviewed for potential occurrence of any sensitive species or habitats within the quadrangles containing the Proposed and Alternative Projects. Additionally, results of the 2012 special status plant survey within the project survey area (TRC 2012) were referred to as guidance for the 2013 effort. Species identified by the MSHCP as NEPS or CAPS were included in the assessment of potential occurrence. A list of the CNDDB rare plants, CNPS list species, NEPS, and CAPS occurring in the vicinity of the project survey area is included as Appendix A.

2.2 FIELD SURVEY

Field aerial photograph maps at a scale of 1:2400 (1 inch = 200 feet) were created for the entire project survey area prior to field visits. These were supplemented with detailed vegetation type (i.e., community) maps developed within a 250-foot buffer surrounding the Proposed and Alternative Projects (total width 500 feet) during the spring of 2012 to provide a context for all biological studies. Mapped vegetation polygons, in conjunction with information on soils, topography, and land uses, were used to define plant habitats and identify focal survey areas, as discussed below.

Between March 19 and June 19, 2013, TRC biologists conducted a focused rare plant survey within the project survey area. Survey oversight, plant identification, and specimen vouchering were conducted by Teresa Salvato, on contract from the U.C. Riverside Herbarium. This botanical survey was conducted following the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW, 2009) and the CNPS Botanical Survey Guidelines (CNPS, 2001). The survey was conducted over the course of several months to cover the various blooming seasons of all potentially occurring rare plant species. Areas with potential habitat for special status plant species (i.e., mesic sites, rocky outcrops, clay or alkaline soils, etc.) were surveyed on foot. These areas are identified on Figure 3, Rare Plant Habitat. The areas were surveyed in such a pattern and spacing of transects (linear or irregular) as to allow visual inspection of all areas appropriate to the detectability of anticipated special status species. This pattern varied with topography and density of vegetation. All plant habitats and micro-habitats in the survey area were represented. Areas with less potential to support rare plants (e.g., highly disturbed areas such as agricultural fields and recently disked sites) were surveyed using binoculars. Survey dates, times, conditions, and personnel are summarized in Table 2.

Table 2: Plant Survey Effort, Conditions, and Personnel

Date	Hours	Surveyors
March 19, 2013	10:45 to 16:00	T. Salvato, J. Lovio
March 21, 2013	07:30 to 15:30	T. Salvato, M. Landers
March 22, 2013	07:30 to 15:30	T. Salvato, M. Landers
April 22, 2013	09:30 to 16:00	T. Salvato, J. Lovio
May 7, 2013	09:30 to 12:30	J. Lovio
May 15, 2013	09:30 to 16:30	T. Salvato, J. Lovio
June 5, 2013	10:30 to 16:30	T. Salvato, J. Lovio
June 12, 2013	10:15 to 16:15	T. Salvato, J. Lovio
June 19, 2013	09:00 to 16:30	T. Salvato, J. Lovio

Approximately 57 hours of field effort were devoted to the 2013 rare plant survey.

Special status plant species locations were documented as either points or polygons, depending on stand size, using Global Positioning System (GPS) technology or by plotting on the aerial photograph maps. Locations were uploaded or digitized into TRC's Geographic Information System (GIS). Photographs were taken of representative survey areas, special status plant species, and their habitats. All non-cultivated, vascular plant species observed during the field survey were recorded and are included in Appendix B. Scientific and common names of plants follow the Jepson Manual (Baldwin et al., 2012) or more recently published taxonomical revisions of genera.

3.0 EXISTING CONDITIONS

3.1 TOPOGRAPHY, VEGETATION, AND LAND USE

The Proposed and Alternative Projects occur within the predominantly rural and natural landscape comprising the interior valleys, rolling hills, and rugged peaks between the Santa Ana and San Jacinto Mountain ranges of western Riverside County. The alternative routes primarily follow existing roadways that pass through relatively gradual terrain of the Perris, Domenigoni, Paloma, and French Valleys, as well as portions of the northeast Sedco Hills.

The southern portion of the project survey area is drained by the Warms Springs Creek watershed and the northern portion by the Domenigoni Channel. Portions of the valleys have no drainage outlets to the ocean.

The location of the Proposed and Alternative Projects on the east side of coastal mountains, in combination with relatively low elevation range of 1,300 to 2,600 feet above sea level, imposes arid conditions that are reflected in the vegetation. Xeric scrub vegetation dominates the steeper terrain, whereas the valley bottoms support mostly herbaceous types, such as grassland. Much of the steep terrain is extremely rocky, with many large granitic outcrops. Drainages and basins support willow-dominated riparian growth and/or marsh.

Historical human land uses in this area have consisted primarily of extensive agricultural conversion of the valley bottoms to dry grain and irrigated crops, as well as livestock grazing. Human dwellings are sparse and widely separated, but typically associated with non-native tree and shrub plantings. Although relatively steep terrain within the project survey area supports a high percentage of native scrub vegetation, much of it shows evidence of past disturbance, such as through grazing or fire. The topography and/or vegetation of almost every drainage bear some evidence of past disturbance from crop cultivation, vegetation removal, channelization, or grazing. Much of the current riparian vegetation appears to be re-established growth following earlier disturbance. Vegetation on several drainages adjacent to recent suburban development have been actively enhanced or restored.

Human-caused modifications to the landscape include artificial water reservoirs and large tracts of non-native trees. Dense suburban and commercial development with associated landscaping and water control features constitute the most recent addition to the landscape of the Proposed and Alternative Projects. Dense development accounts for approximately a quarter of the area mapped within the 250-foot survey buffer. This human habitat occurs in discrete areas within the matrix of rural or undeveloped lands.

3.2 CLIMATE AND WEATHER

The Proposed and Alternative Projects are located within a Mediterranean climate region characterized by warm, dry summers and mild, wet winters. In summer, day temperatures often reach or exceed 100º F and overnight winter temperatures can drop below freezing. Average annual daytime temperature ranges for the area are fairly moderate, ranging from 50º F to 80º F. Average total precipitation for the area is approximately 10 to 12 inches per year (Western Regional Climate Center, 2012). Rainfall typically occurs during the winter months, November to February, and consists of large individual storm events providing the bulk of the precipitation.

Weather during the 2012 and 2013 rare plant survey seasons in western Riverside County was typical in temperature regime, but below average in rainfall total for both years. Rainfall years are measured between 1 July and 30 June. Table 3 presents monthly precipitation totals for the 2011-2012 and 2012-2013 rainfall years. Units are in inches and data are from the National Oceanic and Atmospheric Administration, National Weather Service (2013).

Table 3: Monthly Rainfall Totals at the Elsinore Monitoring Station for Two Consecutive Rainfall Years: 2011-2012 and 2012-2013

Month-Year	Total Inches	Month-Year	Total Inches
Jul-2011	0.09	Jul-2012	0.32
Aug-2011	0.09	Aug-2012	0.05
Sep-2011	0.03	Sep-2012	0.24
Oct-2011	0.44	Oct-2012	0.36
Nov-2011	1.37	Nov-2012	0.14
Dec-2011	0.74	Dec-2012	1.73
Jan-2012	0.55	Jan-2013	0.91
Feb-2012	0.51	Feb-2013	0.46
Mar-2012	1.51	Mar-2013	0.46
Apr-2012	1.18	Apr-2013	0.00
May-2012	0.02	May-2013	0.14
Jun-2012	0.00	Jun-2013	0.00
Total 6.53	**Total**		**4.81**

The 30-year mean rainfall for the Elsinore station is 12.1 inches, so the 2011-2012 and 2012-2013 rainfall years measured only 54 percent and 40 percent of this average, respectively.

3.3 SOILS

Soils within the natural portions of the project survey area are compositionally suitable to potentially support NEPS and CAPS. The Project survey area supports 85 soil types, according to the Natural Resources Conservation Service (NRCS) Soil Survey: Western Riverside Area California (2012). The soil types present within the project survey area are identified in Appendix C. The suitability of these soils to support the NEPS and CAPS is discussed below. A map depicting the location of Clay and Saline/Alkaline soils is provided as Figure 4, Soils Map.

3.3.1 Clay Soils

The following NEPS and CAPS are generally associated with clay soils: Munz's onion, many-stemmed dudleya, California orcutt grass, Parish's brittlescale, thread-leaved brodiaea, and round-leaved filaree. The Auld clay, Bosanko clay, Porterville clay, and Willows clay soil series are present within the Project survey area.

3.3.2 Sandy, Rocky, Gravelly, or Loamy Soils

The following NEPS and CAPS are generally associated with sandy, rocky, gravelly or loamy soils: Brand's phacelia, Munz's mariposa lily, San Diego, San Miguel savory, slender-horned spine flower, heart-leaved pitcher sage, and Nevin's barberry. Sandy, gravelly, or loamy soil types are present throughout the Project survey area.

3.3.3 Saline or Alkaline Soils

The following NEPS and CAPS plant species are generally associated with saline or alkaline soils: San Diego ambrosia, spreading navarretia, California orcutt grass, Wright's trichocoronis, Parish's brittlescale, Davidson's saltscale, thread-leaved brodiaea, smooth tarplant, Coulter's goldfields, and little mousetail. The Chino silt loam, Domino loam, Exeter sandy loam, Grangeville fine sandy loam, Porterville clay, and Willows silty clay soil series all contain saline or alkaline components within the Project survey area.

4.0 RESULTS

4.1 VEGETATION COMMUNITIES

Geographically, the project survey area occurs within the Southwestern California region of the California Floristic Province, and more specifically, in the South Coast subregion. The South Coast subregion extends along the Pacific Coast from Point Conception to Mexico. Seventeen vegetation types, sub-types, and other land cover types were documented and mapped within the project survey area. These are identified in Table 3: Vegetation Communities Within 250 Feet of the Proposed and Alternative Projects and their distributions are depicted in Figure 5: Vegetation Communities Map (Sheets 1 through 18). Vegetation is classified and mapped according to the system of Holland (1986), as modified by Oberbauer et al. (2008). All vegetation types are discussed in detail here because of the comprehensive scope of the plant survey and the potential for all natural and some altered vegetation types to support special status plant species.

Table 4: Vegetation Types Within 250 Feet of the Proposed and Alternatives Projects

Acres	Standard Classification[1]
5.1	Southern Cottonwood - Willow Riparian Forest (61330)
1.6	Central Coast Arroyo Willow Riparian Forest (61230)
0.9	Southern Willow Scrub (63320)
4.0	Mulefat Scrub (63310)
8.5	Diegan Coastal Sage Scrub: Inland Form (32520)
74.2	Coastal Sage Scrub (32500)
3.5	Chamise Chaparral (37200)
5.3	Coastal Sage - Chaparral Scrub (37G00)
248.8	Ruderal / Disturbed Habitat (11300)[2]
88.1	Non-native Grassland (42200)
309.1	Urban / Developed (12000)[2]
24.4	Eucalyptus Woodland (79100)[2]
3.3	Valley Freshwater Marsh (52410)
1.3	San Diego Mesa Claypan Vernal Pool (44322)[2]
332	Agriculture (18000)[2]
4.1	Disturbed Wetland (11200)[2]
3.8	Fresh water (64140)[2]
1118.2	Total Acreage

[1] Framework classification according to Holland 1986.
[2] Vegetation types not addressed in Holland 1986, so classified according to Oberbauer et al. 2008.

4.1.1 Upland Herbaceous Vegetation

Non-woody, seasonally dry upland vegetation accounts for approximately 60 percent of the project survey area. Dry herbaceous types occur mostly on level or gently sloping terrain, although they provide significant cover within open shrub vegetation on gradual to steep slopes as well. This general vegetation structural form consists of several defined types that vary in their degree of native composition and direct human origin. Upland herbaceous vegetation includes ruderal, nonnative grasslands, and agricultural habitats.

4.1.1.1 Ruderal (Holland-Oberbauer code 11300)

Ruderal is defined as consisting predominantly of non-native, short-lived annual plants adapted to colonizing disturbed areas. Ruderal areas typically have been disturbed to the degree where they no longer bear any resemblance to the original vegetation occurring in these places. Some

native "weed" species and few small, fast-growing woody species may occur as part of this association. Ruderal vegetation establishes naturally on areas that have been disturbed by human-related activities such as tilling, grazing/trampling, scraping, or earth-moving. It occupies waste areas, often on roadsides with heavily compacted soils with little available oxygen. Ruderal areas are typically maintained in a disturbed condition on an infrequent basis, therefore allowing the establishment and proliferation of rank vegetation cover.

Approximately 250 acres of ruderal vegetation is distributed widely throughout the project survey area, occurring on field edges, road margins, untended agricultural fields, and other areas previously mechanically disturbed, such as abandoned graded construction pads. Typical species vary depending on the location and level of disturbance, but are often dominated by herbaceous annuals and grasses. Species can include mustards (*Brassica* sp.), radish (*Raphanus sativus*), wild oat (*Avena* spp.), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), Australian saltbush (*Atriplex semibaccata*), tocalote (*Centaurea melitensis*), fennel, telegraph weed (*Heterotheca grandiflora*), castor bean (*Ricinus communis*), pineapple-weed (*Chamomilla suaveloens*), sowthistle (*Sonchus oleraceus*), horseweed, Russian thistle (*Salsola tragus*), tree tobacco (*Nicotiana glauca*), bristly ox-tongue (*Lactuca serriola*), tarweeds (*Deinandra* sp.), and goosefoot (*Chenopodium* spp.). Ornamental species may also colonize and proliferate in ruderal communities (Holland and Keil, 1995).

4.1.1.2 Non-Native Grassland (Holland-Oberbauer code 42200)

The distinction between ruderal and non-native grassland vegetation is based on a subjective threshold of proportion of grasses versus non-grass species. These types apparently share a common origin in disturbance, combined with invasion by non-natives. Non-native grassland may be more typically associated with livestock grazing and ruderal may correspond more with former soil disturbance. The proportions of grass and forb vary, but predominance of dense grasses with a small proportion of forbs and few sparse or open areas defines non-native grassland. This vegetation is self-perpetuating.

Approximately 88 acres of non-native grassland occurs widely throughout the project survey area on valley bottoms and gradual slopes. It often intergrades with and resembles dry grain agriculture and in places may represent fallow agricultural fields. It is also widespread in the openings within sparse, formerly disturbed coastal sage scrub (CSS), although it was not mapped separately as a component of scrub vegetation. Grassland is typically dominated by a mixture of non-native species such as wild oat (*Avena fatua*) and various bromes (*Bromus mollis, B. tectorum*, and *B. rubens*).

Grassland likely originally occupied much of the valley bottoms and gradual slopes in the inter-mountain lowlands of western Riverside County. Invasion of non-native herbaceous weedy species has been widespread, largely in response to ground disturbance, but areas only moderately disturbed and retaining relatively natural soil conditions often support a significant component of native grass and forb species. One area of non-native grassland, located southeast of the Menifee and Keller Road intersection, has more open characteristics and provides potential habitat for rare plant species and Quino checkerspot (*Euphydryas editha quino*). This area consists largely of non-native species and is dominated by wild oat, with lesser amounts of various bromes, dot-seed plantain (*Plantago erecta)* and tarweeds.

4.1.1.3 Agriculture (Holland-Oberbauer code 18000)

The predominant form of agriculture in the inter-mountain lowland area of western Riverside County is dry grain cultivation, particularly wheat. Actively tended agricultural lands account for approximately 332 acres of the project survey area. Agriculture is confined to valley bottoms and low-gradient slopes and is characterized by monocultures of crops requiring cultivation (ground disturbance) and subject to regular, mechanical harvest. As such, these types are not self-perpetuating, actually representing a form of human development, and thus provide little habitat value for native plants and animals. However, the presence of vegetation cover, seasonal food source, and lack of human structures and roads provides some resources, including dispersal corridors, for adaptable animal species. Some disturbance-adapted, but geographically restricted (i.e., special status) native plant species also occur in agricultural margins.

4.1.2 Wetland Herbaceous Vegetation

Drainages and basins in the project survey area are natural collecting places for water, either ephemerally or perennially. Water sources are either natural (e.g., rainfall, springs) or anthropogenic (e.g., irrigation, runoff). Localized surface or subsurface water of any persistence results in abrupt vegetation changes in generally arid landscapes such as western Riverside County. Wetland vegetation often provides a disproportionate amount of cover and food resources in a landscape. Wetland herbaceous vegetation includes valley freshwater marsh, disturbed freshwater seep, and disturbed wetland habitats.

4.1.2.1 Valley Freshwater Marsh (Holland-Oberbauer Code 52410)

A total of 3.3 acres of valley freshwater marsh habitat are present within the project survey area. Valley freshwater marsh is dominated by perennial, emergent monocots and occurs in areas of persistent, but not necessarily perennial, surface water. The interplay between marsh and woody riparian growth is complex, but generally marsh prevails in open wet areas with persistent, deep surface inundation and lacking significant flow. The prolonged saturation typically results in the accumulation of deep, peaty soils (Holland, 1986). Marsh establishment also occurs shortly after disturbance in wet areas. Marsh frequently occurs on the open peripheries of or in openings within woody riparian stands. The structural dominants in lowland inter-mountain western Riverside County marshes are bulrush (*Scirpus* spp.) and cattail (*Typha* spp.), which often form dense stands up to 3 meters tall. Many smaller native and non-native species such as spike rush (*Eleocharis* spp.), rush (*Juncus* spp.), sedge (*Cyperus* spp.), dock (*Rumex crispus*), salt grass (*Distichlis spicata*), and rabbit foot grass (*Polypogon monspeliensis*) also occur. These marshes often include a few small, scattered individuals of woody species such as salt cedar (*Tamarix* spp.), mule fat (*Baccharis salicifolia*), and willow (*Salix* spp.).

Valley freshwater marsh habitat is scattered throughout the project survey area along natural and channelized drainages and in natural and artificial storm water retention basins, where this vegetation type establishes shortly after disturbance. A large area of marsh occurs on the natural drainage basin near the southern end of The Proposed Project, which follows Leon Road.

4.1.2.2 San Diego Mesa Claypan Vernal Pool (Holland-Oberbauer code 44322)

A total of 1.3 acres of disturbed ephemeral basin hydrology and vegetation occur within the project survey area. Although no true vernal pools occur within the project survey area, one localized basin provides wet conditions of sufficient seasonal duration to support prolonged growth of hydric and mesic herbaceous species, none of which are restricted to vernal pools. This disturbed vegetation type includes low wetland plant species such as common knotweed (*Polygonum aviculare* ssp. *depressum*), rush, spike rush, sedge, dock, salt grass, rabbit foot grass, and brass buttons (*Cotula coronopifolia*). This basin, which occurs immediately northeast of the intersection of Menifee and Scott Roads, also supports components of non-native grasses, which become more prevalent seasonally, as the soil dries.

4.1.2.3 Disturbed Wetland (Holland-Oberbauer code 11200)

A total of 4.1 acres of disturbed wetland habitat are present within the project survey area. Disturbed wetlands are characterized by emergent monocots and forbs that are subject to a wide array of anthropogenic disturbance. The Domenigoni Channel, located north of and paralleled by Domenigoni Parkway, is a natural drainage that has been widely channelized for flood control. It supports low, disturbed wetland vegetation that experiences seasonal drying and livestock grazing. Dominant vegetation included brass buttons, various flat sedges (*Cyperus* sp.), cattails, bulrush, saltgrass, and alkali heliotrope (*Heliotropium curassavicum*).

4.1.3 Native Shrublands

Associations of shrub-forming species are the dominant vegetation form throughout much of arid, lowland southern California. This woody or semi-woody form reflects adaptation to seasonal drought conditions and irregular disturbance through wildfire. Shrublands typically dominate on dry, often steep slopes of relatively poor, well-drained soils. Density and species composition vary with location and conditions, but most shrublands include an herbaceous component that ranges from sparse understory to extensive, floristically diverse associations in the shrub interstices.

4.1.3.1 Diegan Coastal Sage Scrub and Diegan Coastal Sage Scrub: Inland Form (Holland-Oberbauer codes 32500, 32520)

A total of 74.2 acres of Diegan CSS and 8.5 acres of Diegan CSS: Inland Form habitats are present within the project survey area. Diegan CSS is an association of relatively low-stature, woody or semi-woody shrubs and subshrubs averaging less than 2 meters in height. Diegan CSS: Inland Form occurs farther from the coast and at somewhat higher elevations than the typical form, often intermixed with stands of chaparral vegetation. Although it shares the typical dominant shrub species with the coastal form of Diegan CSS, the inland form also includes a higher proportion of taller, woody species such as white sage (*Salvia apiana*) and bush penstemon (*Keckiella antirrhinoides*) resulting in a taller, more dense structure. These vegetation sub-types occur on lower elevation, more exposed, and highly drained slopes relative to other shrub types, therefore typically existing under the harshest conditions in the landscape. Component species have adapted to seasonal drought through a variety of means such as drought-deciduousness, reduced leaf surfaces, and/or hard leaf cuticles that resist water loss, and

large root masses. Many species contain aromatic compounds in their tissues to discourage herbivory. This vegetation is adapted to fire by such means as resistant basal tissues (i.e., crown-sprouting) and persistent seed bank.

Dominant shrub species of CSS vary depending on local site factors (e.g., slope aspect, soil) and levels of disturbance. Approximately 83 acres of sage scrub is distributed widely throughout the Proposed and Alternative Project survey areas. Most of the Diegan CSS is uniformly dominated by buckwheat (*Eriogonum fasciculatum*). California sagebrush (*Artemisia californica*) occurs in varying proportions, but is rarely equal to buckwheat in dominance. Brittle bush (*Encelia farinosa*), which is an indicator of desert transition conditions, is very infrequent within the project survey area survey buffer, suggesting coastal affinities of the vegetation. Cacti such as cholla (*Cylindropuntia californica*) and prickly pear (*Opuntia littoralis*) occur in small proportion. This sage scrub vegetation is variably open, ranging from approximately 30 percent to 80 percent shrub cover and the average height is about 1 meter.

4.1.3.2 Coastal Sage – Chapparal Scrub (Holland-Oberbauer code 37G00)

A total of 5.3 acres of coastal sage – chapparal scrub habitat is present within the project survey area. Coastal Sage – Chapparal Scrub is generally located within the transition area located between Diegan CSS and chamise chaparral and is composed of species from both vegetation communities. Buckwheat is still the common element to all stands, but California sagebrush is relatively more prevalent and other species such as white sage, black sage (*Salvia mellifera*), bush penstemon, spiny red berry (*Rhamnus crocea*), skunk brush (*Rhus trilobata*), thick leaf yerba santa (*Eriodictyon crassifolium*), and deer weed (*Lotus scoparius*) occur in variably high proportions. Buckwheat is typically not a sole dominant in these stands. The structure of these stands is dense (60 percent or greater shrub cover) and tall (average greater than 1 meter). Stands are located within the southwestern portion of the project survey area, surrounding Clinton Keith Road.

4.1.3.3 Chamise Chaparral (Holland-Oberbauer code 37200)

A total of 3.5 acres of chamise chapparal habitat is present within the project survey area. Chaparral differs from CSS in being composed of species with taller stature that grow in higher density. These species are somewhat less tolerant of seasonal drought than typical CSS species, generally occurring at higher elevations and/or on more sheltered slopes (e.g., north-facing) with relatively moist conditions. They nevertheless exhibit drought-tolerant features, such as reduced leaf area and hard cuticles, and are adapted to survive wildfire.

Two small stands of chaparral consisting soley of chamise (*Adenostema fasciculatum*) occur in the southern part of the Alternative Project survey area. Several nearby stands of the taller, more diverse sage scrub described above include species that also occur in chaparral.

4.1.4 Woody Riparian Vegetation

Watercourses or basins with persistent to perennial surface or subsurface water flow or water table naturally support localized growth of trees and shrubs dependent on such available water. Such trees are characteristically winter-deciduous. Marsh vegetation also occurs under these

conditions, as discussed above. Riparian stands often provide marked contrast against surrounding xeric vegetation in arid southern California.

Tree-dominated riparian stands vary significantly in height and density, depending on local hydrology and disturbance history. The distinction between scrubs and forest is somewhat imprecise, with the term scrub representing relatively open stands, typically with smaller trees. Riparian forest categories are defined as containing trees over 6 meters in height. Occasional isolated riparian trees of tall stature were mapped as "forest" to reflect the vegetation structure they provide. Riparian forest within the project survey area reaches a maximum height of approximately 13 meters. Most stands are natural, but some within developed areas have been actively restored or enhanced, presumably as mitigation for construction impacts elsewhere. Restoration sites also include peripheral areas of riparian scrub.

4.1.4.1 Central Coast Arroyo Willow Riparian Forest (Holland-Oberbauer code 61230)

A total of 1.6 acres of central coast arroyo willow riparian forest are located within the project survey area. Although species composition varies among forest stands within the project survey area, the common element in all is the presence of one or more species of willow: arroyo (*Salix lasiolepis*), red (*S. laevigata*), black (*S. gooddingii*), and yellow (*S. lasiandra*). Willow-dominated riparian growth occurs in the southwesterrn portion of the survey area. Western sycamore (*Platanus racemosa*) occurs in some stands, but generally appears to have been planted as part of restoration efforts.

4.1.4.2 Southern Cottonwood – Willow Riparian Forest (Holland-Oberbauer code 61330)

Several willow-dominated stands support varying proportions of Fremont cottonwood (*Populus fremontii*), the presence of which generally correlates with taller structure and apparently indicates greater stand maturity and longevity. Approximately 5 acres of this vegetation occurs primarily within the Alternative Project survey area.

4.1.4.3 Mulefat Scrub (Holland-Oberbauer code 63310)

Approximately 4 acres of mulefat scrub occur within the project survey area. Mulefat (*Baccharis salicifolia*) scrub is composed of moderate to tall (4 meters or less) shrubs in disturbance-prone areas of washes and floodplains or along lower order drainages with less persistent water flow. It is often closely mixed with marsh growth and often occurs on the relatively dry peripheries of riparian forest stands. Mulefat is typically dominant with minor components of seasonal herbaceous plants, various willow species, or other low-growing, native woody plants. Stands are inherently variable in structure, depending on the amount of inundation and scouring they are subject to.

4.1.4.4 Southern Willow Scrub (Holland-Oberbauer code 63320)

Approximately 1 acre of southern willow scrub occurs within the project survey area. Willow scrub is generally less than 6 meters in average height and tends to be relatively open and composed of smaller individual plants than forest or woodland, including certain species that do not naturally exceed this height. This vegetation rarely exceeds 4 meters in height and is often associated with former disturbance on watercourses or with lower order drainages with less

persistent water flow. It is often closely mixed with marsh growth and genrally occurs on the relatively dry peripheries of riparian forest stands. This vegetation type is dominated by arroyo and/or red willow species, as well as lower-growing co-dominant species such as mulefat, mexican elderberry (*Sambucus mexicanus*), sandbar willow, black willow, and non-native salt cedar. This vegetation also includes a high proportion of non-native herbaceous wetland plants.

4.1.5 Anthropogenic Vegetation and Other Land Cover Types

Direct human modification of the natural landscape ranges from ground disturbance and non-native plantings, to water flow modification and storage, to development of structures and roads.

4.1.5.1 Developed and Ornamental Vegetation (Holland-Oberbauer codes 12000 and 79100)

Approximately 310 acres of human development consisting of residential, commercial, infrastructure, roadway development, and associated ornamental vegetation occur within the project survey area. Ornamental vegetation includes intentionally planted and maintained non-native vegetation of a variety of structures and compositions. These comprise herbaceous to woody species requiring varying levels of active effort to maintain and include ornamental and shade plantings around residences, agricultural shelter belts, and tree stands originally planted as sources of wood. This vegetation provides some habitat structure for human commensal wildlife, particularly bird species adapted to, or tolerant of, human habitations. Eucalyptus trees (*Eucalyptus* spp.) were mapped separately because of their prevalence, relatively long history in the California landscape, and use by wildlife.

4.1.5.2 Eucalyptus (Holland-Oberbauer code 11100)

Approximately 24 acres of mapped eucalyptus stands are located within the project survey area. Areas mapped as eucalyptus consist of stands of trees that consist entirely or primarily of one or more species of eucalyptus (*Eucalyptus* spp.), including silver dollar gum Eucalyptus (*E. polyanthemos*) and blue gum (*E. globulus*). Eucalyptus stands often provide nesting habitat for birds of prey.

4.1.5.3 Open Water (Holland-Oberbauer code 64140)

A total of 3.8 acres of open water are located within the project survey area. Open water is included in the anthropogenic communities because it is only associated with human development in the form of treatment ponds, agricultural settling ponds, or flood control facilities. Open water habitat consists of large areas with standing water that are primarily unvegetated, but may support a few water-loving species such as pondweed (*Potamogeton* sp.) and filamentous algae. In areas with natural banks, the perimeter of open water habitat may be vegetated with wetland or riparian plant species.

4.2 MSHCP NARROW ENDEMIC, CRITE RIA AREA, AND OTHER SPECIAL STATUS PLANT SPECIES

Seven special status plant species were documented by the 2013 survey within the project survey area. Only one of these, the smooth tarplant (*Centromadia / Hemizonia pungens laevis*), is a CAPS under the MSHCP. Although not necessary to meet MSHCP requirements, populations of

CNPS listed species were identified and mapped throughout the project survey area. Locations of species observations are provided in Figure 6, Rare Plant Species Location Map, Sheets 1 through 13. The species are listed below with their respective conservation status:

- Smooth tarplant - *Centromadia pungens laevis* (CNPS 1B.1, WRMSHCP CAPS)
- Parry's spineflower - *Chorizanthe parryi parryi* (CNPS 1B.1)
- Long-spined spineflower - *Chorizanthe polygonoides longispina* (CNPS 1B.2)
- Small-flowered morning-glory - *Convolvulus simulans* (CNPS 4.2)
- Paniculate tarplant - *Hemizonia paniculata* (CNPS 4.2)
- Robinson's peppercress - *Lepidium virginicum robinsonii* (CNPS 1B.2)
- Small-flowered microseris - *Microseris douglasii platycarpha* (CNPS 4.2)

Locations of these species are presented in Table 4 to an accuracy of quarter-quarter section (40-acre area). More precise locations of individual, subjectively grouped "populations" and separate "stands" (separated by relatively small barriers) are shown in Figure 6. Approximate counts of individuals were collected at some of these locations.

Table 5: Special Status Plant Species Locations

Species	Township / Range	Section	Quarter Section	Quarter-quarter Section	Approximate Number of Individuals
Centromadia pungens laevis	5S / 2W	32	NW	NW	?
Centromadia pungens laevis	5S / 2W	31	NE	NE	?
Centromadia pungens laevis	5S / 2W	31	SE	NE	100
Centromadia pungens laevis	5S / 2W	31	SE	SE	?
Centromadia pungens laevis	6S / 2W	5	SW	NW	200
Centromadia pungens laevis	6S / 2W	17	SW	SW	?
Centromadia pungens laevis	6S / 3W	36	SE	SW	?
Chorizanthe parryi parryi	6S / 3W	35	NE	SE	?
Chorizanthe polygonoides longispina	6S / 3W	25	NW	NW&SW	thousands
Chorizanthe polygonoides longispina	6S / 3W	25	SW	NW	thousands
Chorizanthe polygonoides longispina	6S / 3W	35	NE	SE	?

Table 5: Special Status Plant Species Locations (Continued)

Species	Township / Range	Section	Quarter Section	Quarter-quarter Section	Approximate Number of Individuals
Convolvulus simulans	6S / 3W	25	NW	NW&SW	thousands
Convolvulus simulans	6S / 3W	25	SW	NW	thousands
Convolvulus simulans	6S / 3W	25	SW	SW	thousands
Hemizonia paniculata	5S / 2W	19	NW	SW	170
Hemizonia paniculata	5S / 2W	32	SW	NW	?
Hemizonia paniculata	5S / 2W	32	SW	SW	thousands
Hemizonia paniculata	6S / 2W	5	SW	NW	100
Hemizonia paniculata	6S / 2W	8	SW	NW	?
Hemizonia paniculata	6S / 2W	8	SW	SW	?
Hemizonia paniculata	6S / 2W	17	SW	NW	?
Hemizonia paniculata	6S / 2W	18	SE	NE	20
Hemizonia paniculata	6S / 2W	17	SW	SW	?
Hemizonia paniculata	6S / 2W	18	SE	SE	?
Hemizonia paniculata	6S / 3W	13	SW	SW	?
Hemizonia paniculata	6S / 3W	25	SW	NW	500
Hemizonia paniculata	6S / 3W	25	SW	SW	300
Hemizonia paniculata	6S / 3W	36	SE	SW	?
Lepidium virginicum robinsonii	6S / 3W	36	SE	SW	?
Microseris douglasii platycarpha	6S / 3W	25	NW	NW&SW	?

4.2.1 Smooth tarplant

Smooth tarplant is a moderately sized annual with prickly foliage. It occurs in a variety of habitats, including alkali scrub, alkali playas, riparian woodland, watercourses, and grasslands with alkaline affinities. The majority of the populations in western Riverside County are associated with alkali vernal plains. Smooth tarplant is found in southwestern California and northwestern Baja California, Mexico. It occurs in San Bernardino, Riverside, and San Diego Counties (CNPS, 2012).

Within the project survey area, smooth tarplant was found in disturbed ephemeral basins or shallow watercourses, particularly in the northern portions of the Proposed Project (see Figure 6, sheets 2,3,4,7, and 13).

4.2.2 Parry's spineflower

Parry's spineflower, is a small prostrate annual bearing a profusion of tiny white flowers that hide the dusky rose branches. The involucre awns are hooked on this subspecies. It is found on bare patches in clay loam soil and sandy alluvium supporting CSS and chaparral. This subspecies is generally found in the inland foothills between the coast and the desert at low elevations (90-800 m), specifically the flats and foothills of the San Gabriel, San Bernardino and San Jacinto Mountains within Los Angeles, San Bernardino and Riverside Counties (Reveal, 1989).

A few immature plants were found in open CSS just north of the junction of Menifee Road and Lee Lane (see Figure 6, sheet 12).

4.2.3 Long-spined spineflower

Long-spined spine flower is a prostrate annual found predominantly on heavy clay soil and shallow clay lenses, such as those found in some grasslands. It occurs from about 100 to 1,400 meters in elevation in southwestern California and northwestern Baja California, Mexico, from western Riverside County south, through San Diego County (CNDDB, 2012). Occasionally, it grows on silty banks of ephemeral ponds and streams. In Riverside County, this plant blooms from March to June. By mid-June, most plants are dead, though they retain their form and are easily recognizable. The tepals are white to rose and anthers are dark red. Early in its life cycle, stems appear dark red. In a wet habitat, leaves are semi-fleshy and retain their green appearance longer.

An extensive, dispersed stand of this species was found in the disturbed grassland and open CSS east of Menifee Road and south of Keller Road. Several thousand plants were observed. Most of these were on the margins of the dirt road and in bare patches in the field. The part of this population that extended beyond the boundary of the survey area was neither mapped nor counted. The location of this stand is shown in Figure 6, sheets 9 and 10.

4.2.4 Small-flow ered morning-glory

This species is a low-growing annual with ascending to erect stems. It is found on clay lenses within annual grasslands and on bare, seasonally moist clay slopes. In Riverside County, this species blooms from March to May. The blossom is small, about 4 mm wide and ranges in color from white to pink to pale blue. It is a delicate plant that does not persist during the period of summer dryness. Under low-rainfall conditions during the spring of 2013 many plants in the project survey area dried before fully maturing and setting fruit.

Small-flowered morning-glory was found carpeting the dirt utility access road (extension of Menifee Road) south of Keller Road (see Figure 6, sheets 9 through 11). In the early spring, the population covered a swath approximately 100 feet wide and numbered at least a thousand plants, but by late spring most were dead (dry) and the species was barely visible.

4.2.5 Paniculate tarplant

Paniculate tarplant is an erect annual that varies in height from about 5 to 24 inches. It blooms from March through December in Riverside Co., depending on specific weather conditions. Generally, this species blooms later than the other, more common tarplants in this area that it might be confused with such as, *H. kelloggii*, and *H. fasciculata.* Inflorescences are solitary on a bracted peduncle and usually have eight ray flowers. In contrast, the inflorescence of *H. kelloggi* has five ray flowers and a naked peduncle and the inflorescences of *H. fasciculata* are in tight groups of three or four, each with five ray flowers. *Hemizonia paniculata* is found in open grasslands, coastal sage scrub, and ruderal areas, mostly on loam soils and even appears to thrive in disturbed, weedy areas. Most collections in the last 50 years were made in Riverside County and very few were made elsewhere.

Large local populations were found throughout the project survey area, mainly on disturbed road edges (non-native grassland and ruderal), but also in open CSS and at the edges of seasonally wet basins and riparian zones. Locations are shown on Figure 6, sheets 1 through 11 and sheet 13.

4.2.6 Robinson's peppercress

Robinson's peppercress is an erect and rather bushy annual traditionally distinguished from its nearest relatives by its short stature, deeply dissected leaves, branching low on the stem and a terete pedicel. This subspecies is not recognized by the Jepson Manual II (Baldwin et al. 2012) and is lumped with taller plants having a flattened pedicel, under the name *Lepidium virginicum ssp. menziesii.* To date, it is not known what the status of this plant will be in the future or even if the two subspecies of *Lepidium virginicum* that are differentiated in the field, will be differentiated by academics.

A single population of about five plants was found in a seepy, roadside ditch on the south side of Los Alamos Road at its crossing with Warm Springs Creek (see Figure 6, sheet 13).

4.2.7 Small-flow ered microseris

Small-flowered microseris is an erect annual with distinctively nodding buds and pale yellow ray flowers. The pappus scales lack a notch at the scale tip and are longer than the fruit. This species is found on clay soils and occasionally near serpentine. It can share habitat with *Microseris/Uropappus lindleyi* and *Microseris/Stebbinsoseris heterocarpa*, though heavier clay soils appear to favor *Microseris douglasii ssp. platycarpha.* Most collections have been made from Los Angeles County to San Diego County and do not extend eastward beyond western Riverside County on the coastal slope.

Only five plants were observed intermingled with *Convolvulus simulans* over a long section of the infrequently traveled dirt extension Menifee Road south of Keller Road (see Figure 6, sheets 9 and 10). The plants were depauperate due to drought. A few additional plants observed east of the 500-foot survey corridor were neither mapped nor counted. Observation locations are shown in Figure 6.

4.3 WEATHER, PLANT GERMINATION AND PHENOLOGY

Observed effects of the drought conditions on plant germination and other phenological measures in the spring and summer of 2012 (see section 3.2) are discussed in the rare plant survey report for the Proposed and Alternative Projects for that year (TRC 2012). The effects of two consecutive dry years are difficult to ascertain, but may be expected to exacerbate the reduction in seed bank for annual species. Many annuals, particularly those species restricted to certain special soil types, are sensitive to drought and may not grow or persist long enough to set seed in dry years. The effects of drought differ among plant habitats, with species in ephemeral wetlands being most vulnerable. All native species are adapted to persist through periods of extended drought, but often with concomitant short-term population declines. Failure of these species to achieve suitable growth for reproduction in dry years affects their detectability by observers.

4.4 FLORISTI C INVENTORY

The focused survey for rare plants was floristic in nature, meaning that an exhaustive inventory of all plant species was conducted within the project survey area. A comprehensive species list is provided in Appendix B.

In accordance with CNPS procedure, voucher specimens of special status and some additional species were collected and will be stored at the University of California, Riverside Herbarium. Vouchered species are indicated in Appendix B.

5.0 CONCLUSION AND RECOMMENDATIONS

The project survey area supports various special status plant species habitats in various stages of disturbance and integrity. TRC field personnel did not detect any federally or state listed plant species. TRC did, however, detect smooth tarplant, which is a MSHCP-defined CAPS. Smooth tarplant was present throughout the project survey area. This species is generally associated with seasonally mesic sites located in loamy soils. The goals and conservation guidelines in the MSHCP for CAPS, and specifically for smooth tarplant, are outlined below.

5.1 CRITERIA AREA PLANT SPECIES AVOIDANCE AND MINIMIZATION

The MSHCP specifically states for Criteria Area Survey Plant Species populations identified as part of the survey process that:

> "*... for locations with positive survey results, 90 percent of those portions of the property that provide for long-term conservation value for the identified species shall be avoided until it is demonstrated that conservation goals for the particular species are met*."

This objective applies to the smooth tarplant observations located within the Criteria Area 4 survey area. Smooth tarplants located within Criteria Area 4 are recommended to be conserved in accordance with procedures described in Section 3.1.2 of the MSHCP, Volume 1. The development footprint is uncertain; therefore the impacts plan should take into account locations

of the smooth tarplant and avoid 90 percent of the occupied portions at minimum. If 90 percent avoidance cannot be achieved, a DBESP analysis is required.

5.2 RECOMMENDATIONS

As outlined in Section 5.1, TRC recommends 90 percent avoidance of occupied habitat for known observations of the smooth tarplant within Criteria Area 4. If 90 percent avoidance cannot be achieved, a DBESP analysis is required.

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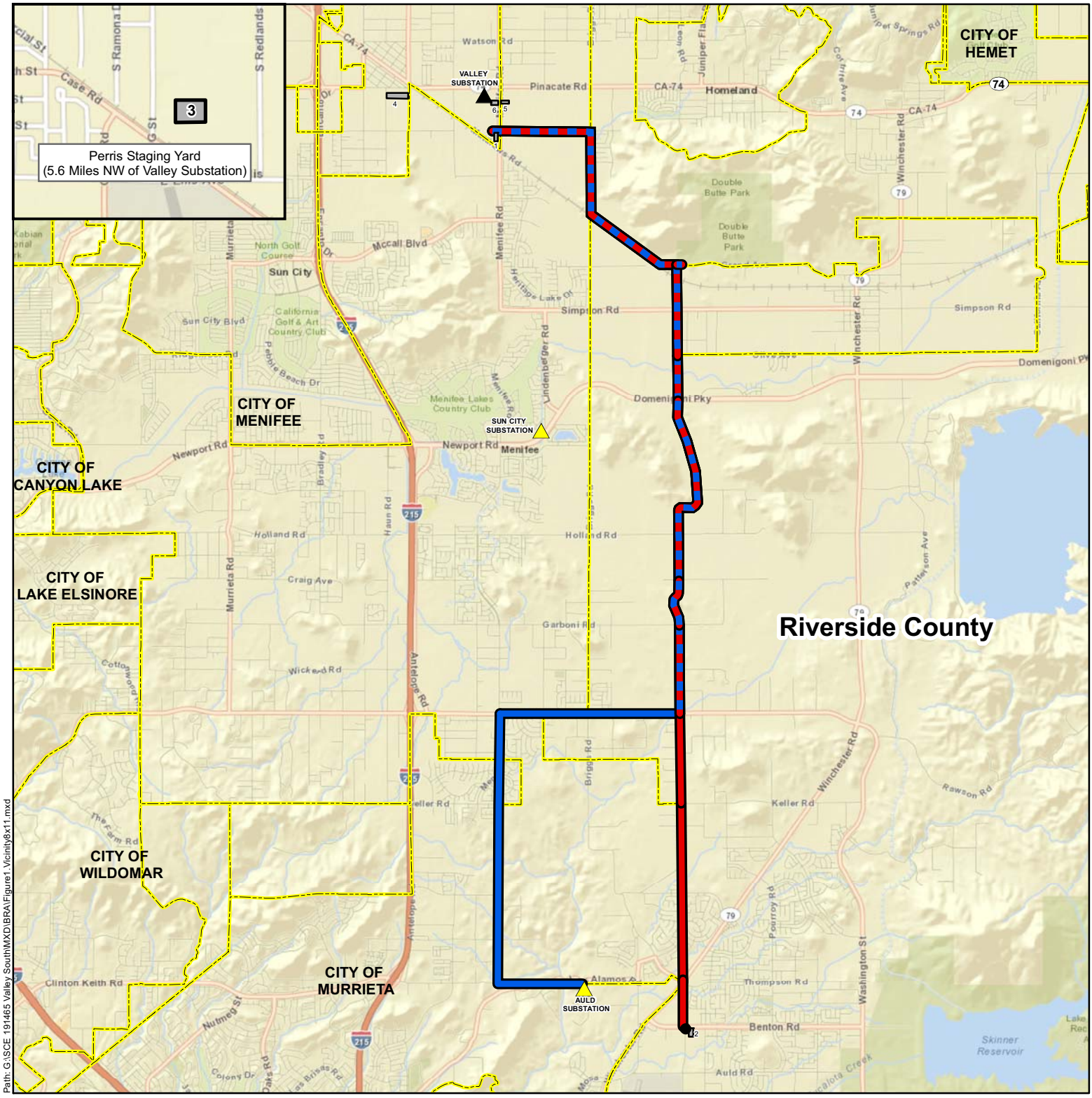
FIGURES

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 1

Southern California Edison

VICINITY MAP



Path: G:\SCE 191465 Valley South\MXD\BRA\Figure1.Vicinity8x11.mxd

Project Components

- Proposed 115 kV Subtransmission Line
- Alternative 115 kV Subtransmission Line
- Common to Both
- Staging Yards

Existing Facilities

- 115 kV Substation
- 500 kV Substation
- Terminal TSP

0 80
Miles

1:95,000

Sources:
SCE, 2012;
Basemap ESRI, 2012

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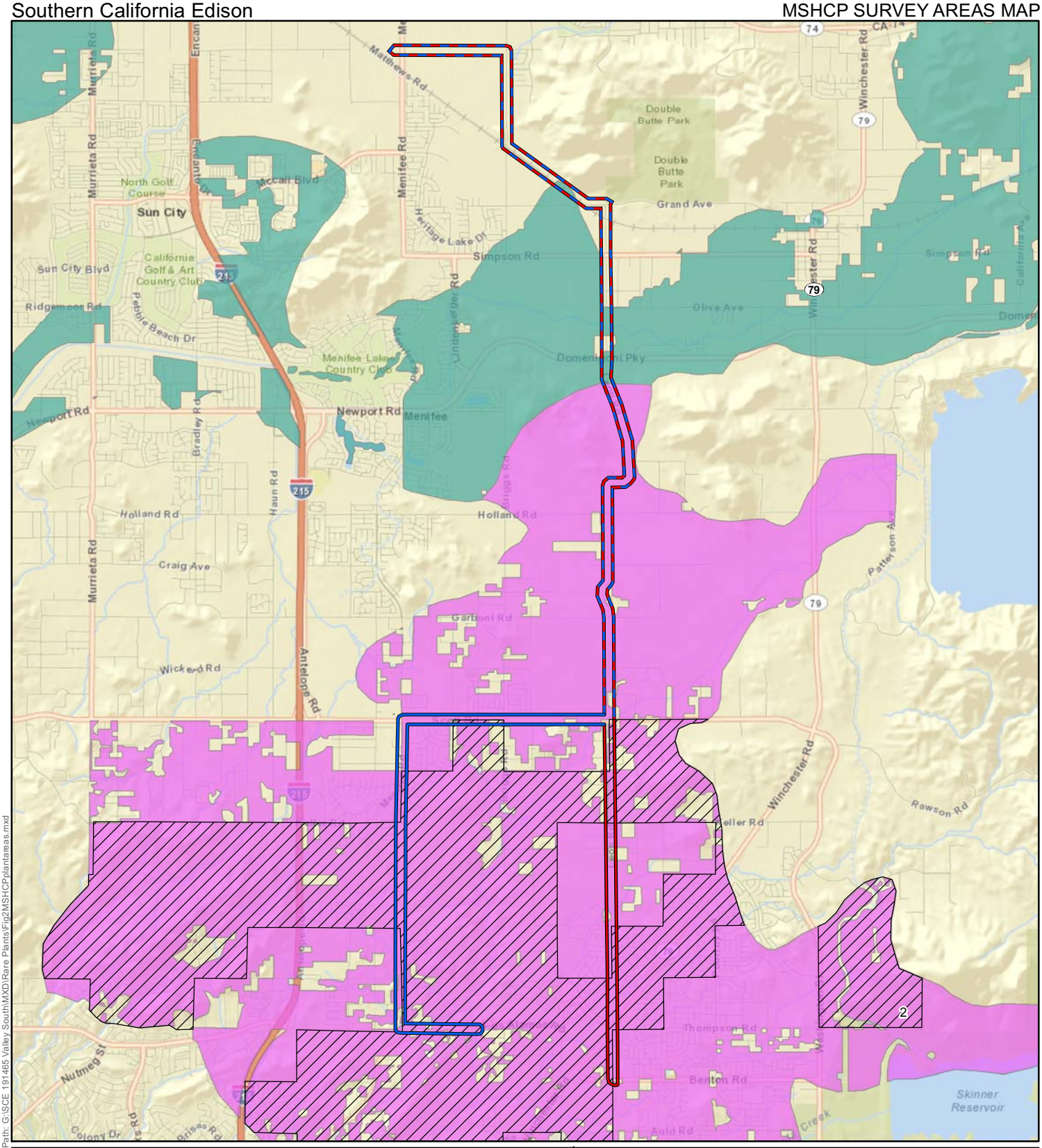
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 2

Southern California Edison

MSHCP SURVEY AREAS MAP



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Plant Criteria Survey Area 4

Narrow Endemic Plants Survey Area 3

Narrow Endemic Plants Survey Area 4

Proposed 115 kV Subtransmission Line Survey Area

Alternative 115 kV Subtransmission Line Survey Area

Survey Area Common to Both

0 1

Miles

1:82,000

Sources:
SCE, 2012;
US Department of Agriculture;
Natural Resources Conservation Service;
Basemap ESRI 2012

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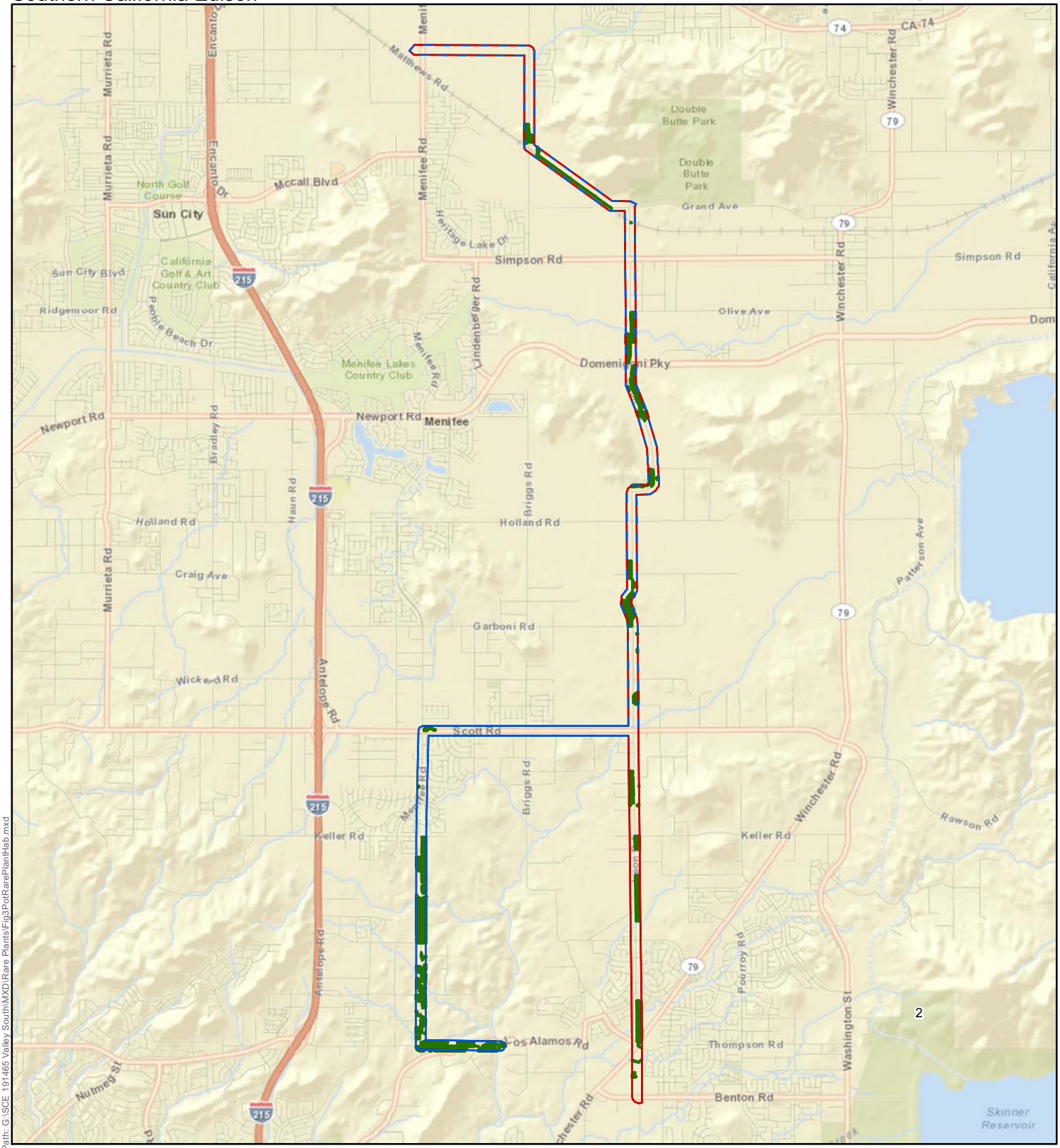
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 3

Southern California Edison

RARE PLANTS HABITAT MAP



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Potential Habitat for Rare Plants

Proposed 115 kV Subtransmission Line Survey Area

Alternative 115 kV Subtransmission Line Survey Area

Survey Area Common to Both

0 1

Miles

1:82,000

Sources:
TRC Surveys, 2102;
SCE, 2012; ESRI 2012

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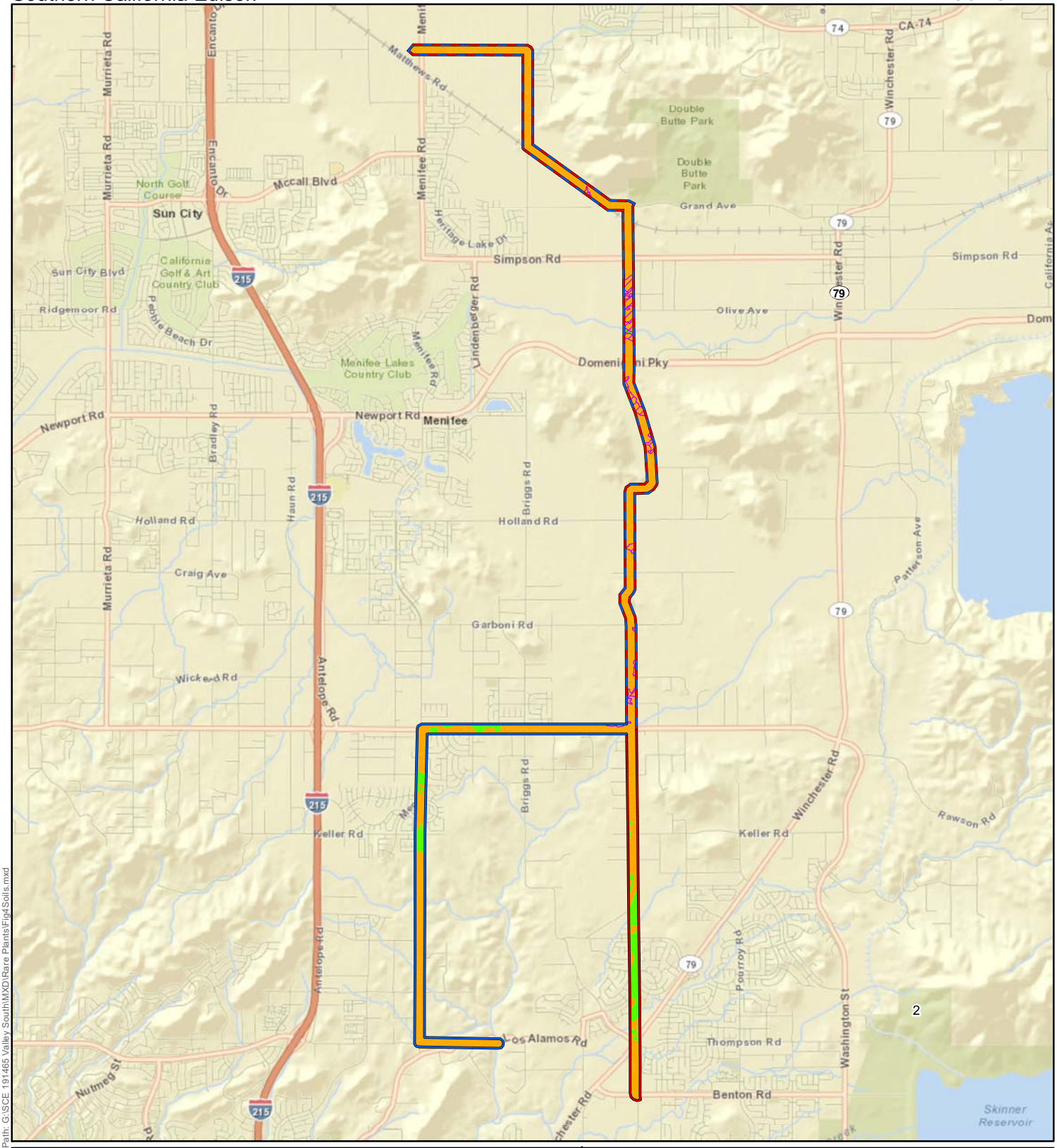
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 4

Southern California Edison

SOILS MAP



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- Loamy, Sandy, Rocky Soils
- Clay
- Saline-Alkali

- Proposed 115 kV Subtransmission Line Survey Area
- Alternative 115 kV Subtransmission Line Survey Area
- Survey Area Common to Both

0 1
Miles

1:82,000

Sources:
SCE, 2012;
US Department of Agriculture;
Natural Resources Conservation Service;
Basemap ESRI 2012

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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

Path: G:\SCE 191465 Valley South\MXD\Rare Plants\Fig5Vegetation.mxd

Vegetation Communities

- Agriculture (18000)
- Cen. Coast Arroyo Willow Riparian Forest (61230)
- Chamise Chaparral (37200)
- Coastal Sage - Chaparral Scrub (37G00)
- Diegan Coastal Sage Scrub (32500)
- Diegan Coastal Sage Scrub: Inland Form (32520)
- Disturbed / Developed (12000)*
- Disturbed Habitat (Ruderal) (11300)
- Disturbed Wetland (11200)
- Eucalyptus (79100)
- Mulefat Scrub (63310)
- Non-native Grassland (42200)
- Open Water (64140)
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- San Diego Mesa Claypan Vernal Pool (44322)
- Southern Willow Scrub (63320)
- Valley Freshwater Marsh (52410)

Sheet (1 of 18)

0 18

Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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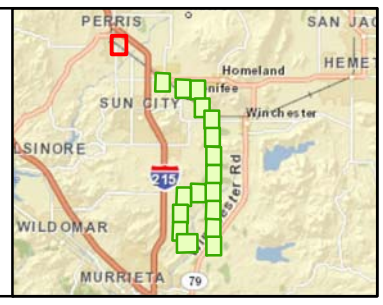

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SOUTHERN CALIFORNIA EDISON
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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

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0 18

Miles

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Sources:
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Basemap ESRI, 2012

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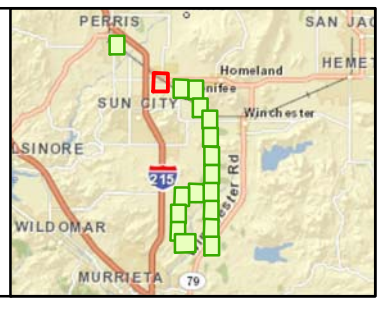

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SOUTHERN CALIFORNIA EDISON
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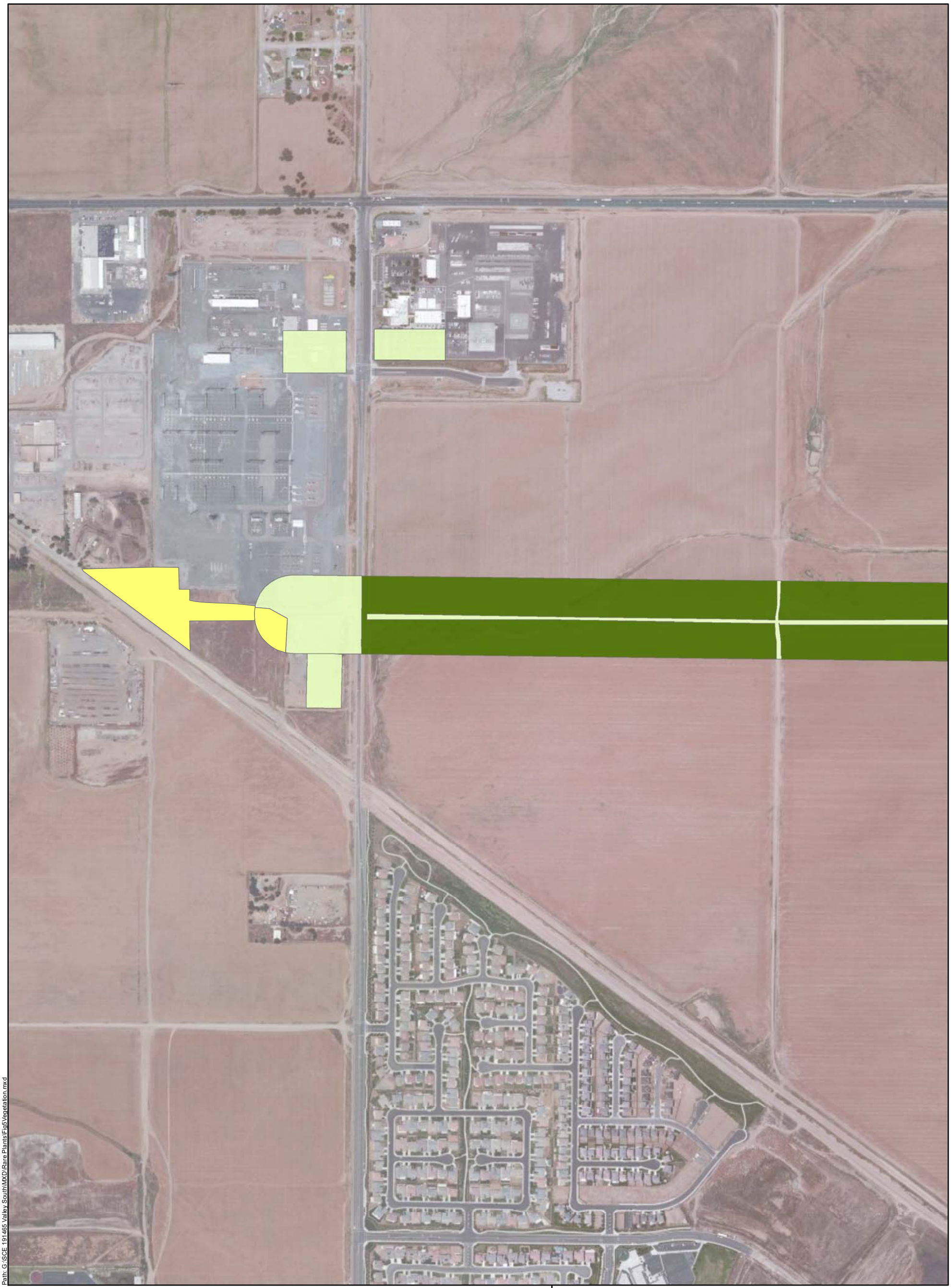
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison VEGETATION AND OTHER LAND COVER TYPES MAP



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Sheet (3 of 18)

0 18

Miles

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Sources:
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Basemap ESRI, 2012

Date: 7/16/2013

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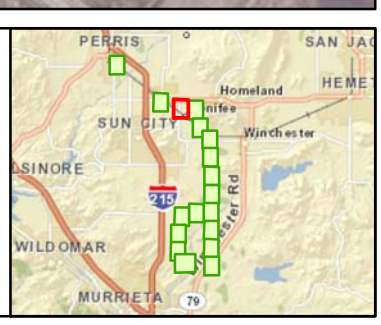

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SOUTHERN CALIFORNIA EDISON
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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

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Sheet (4 of 18)

0 18

Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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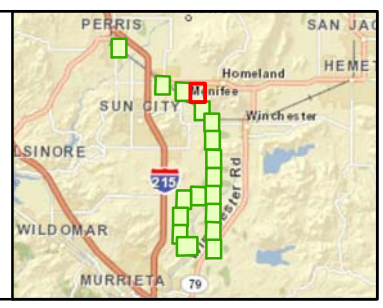

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SOUTHERN CALIFORNIA EDISON
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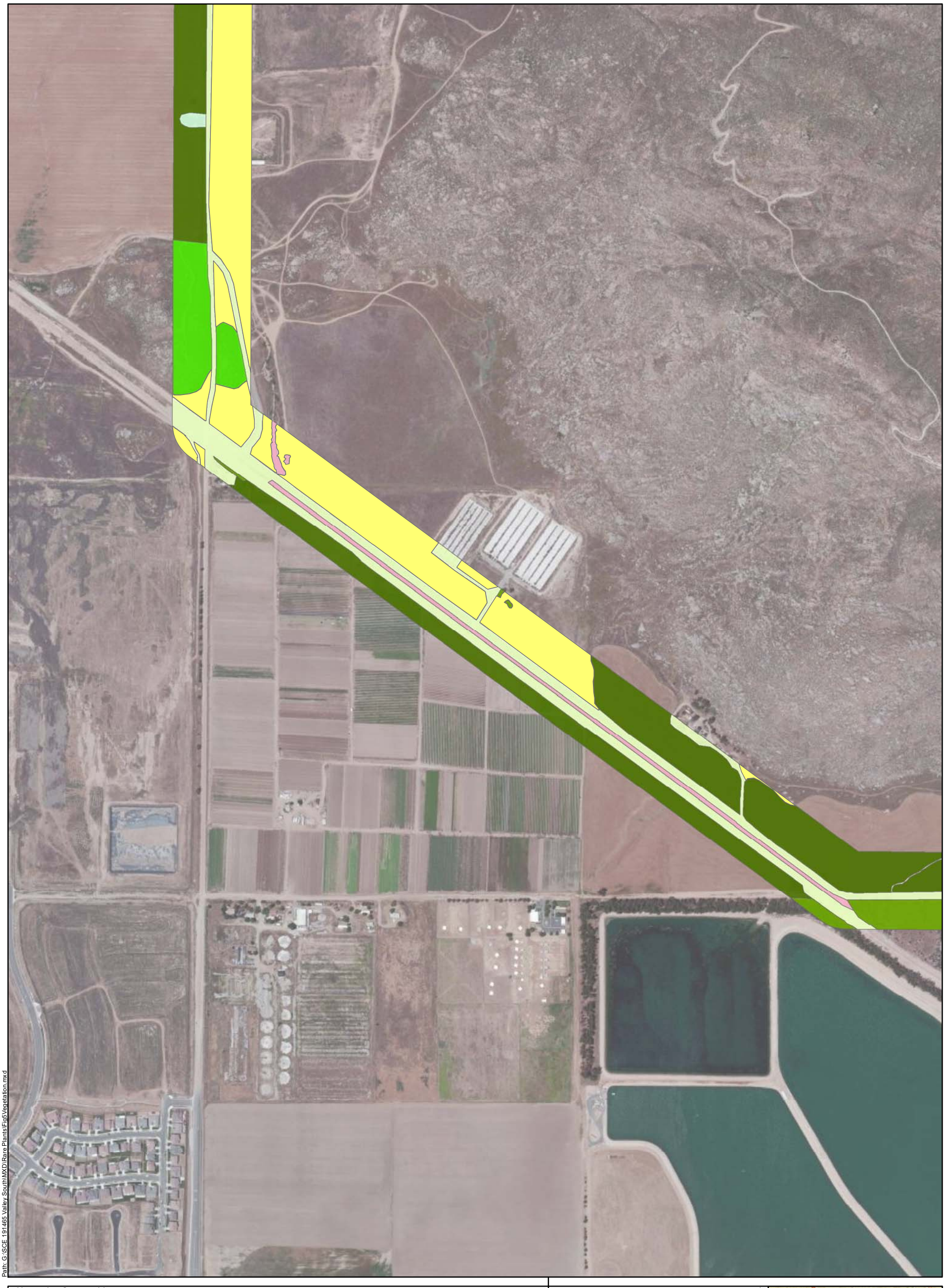
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Sheet (5 of 18)

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Sources:
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Basemap ESRI, 2012

Date: 7/16/2013

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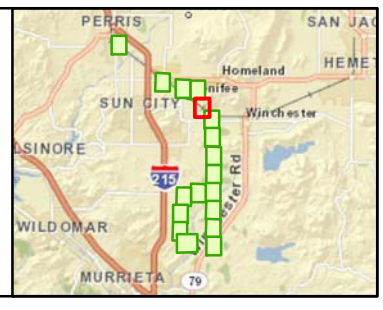

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SOUTHERN CALIFORNIA EDISON
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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

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Sheet (6 of 18)

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Miles

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Basemap ESRI, 2012

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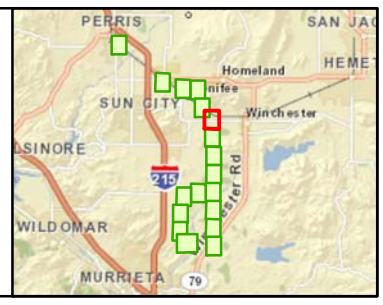

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SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

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Sheet (7 of 18)

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Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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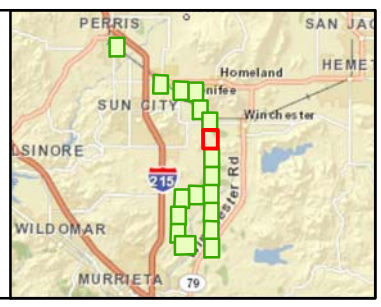

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SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

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Sheet (8 of 18)

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Miles

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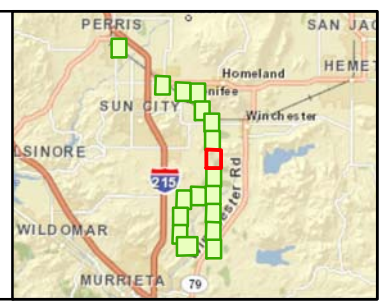

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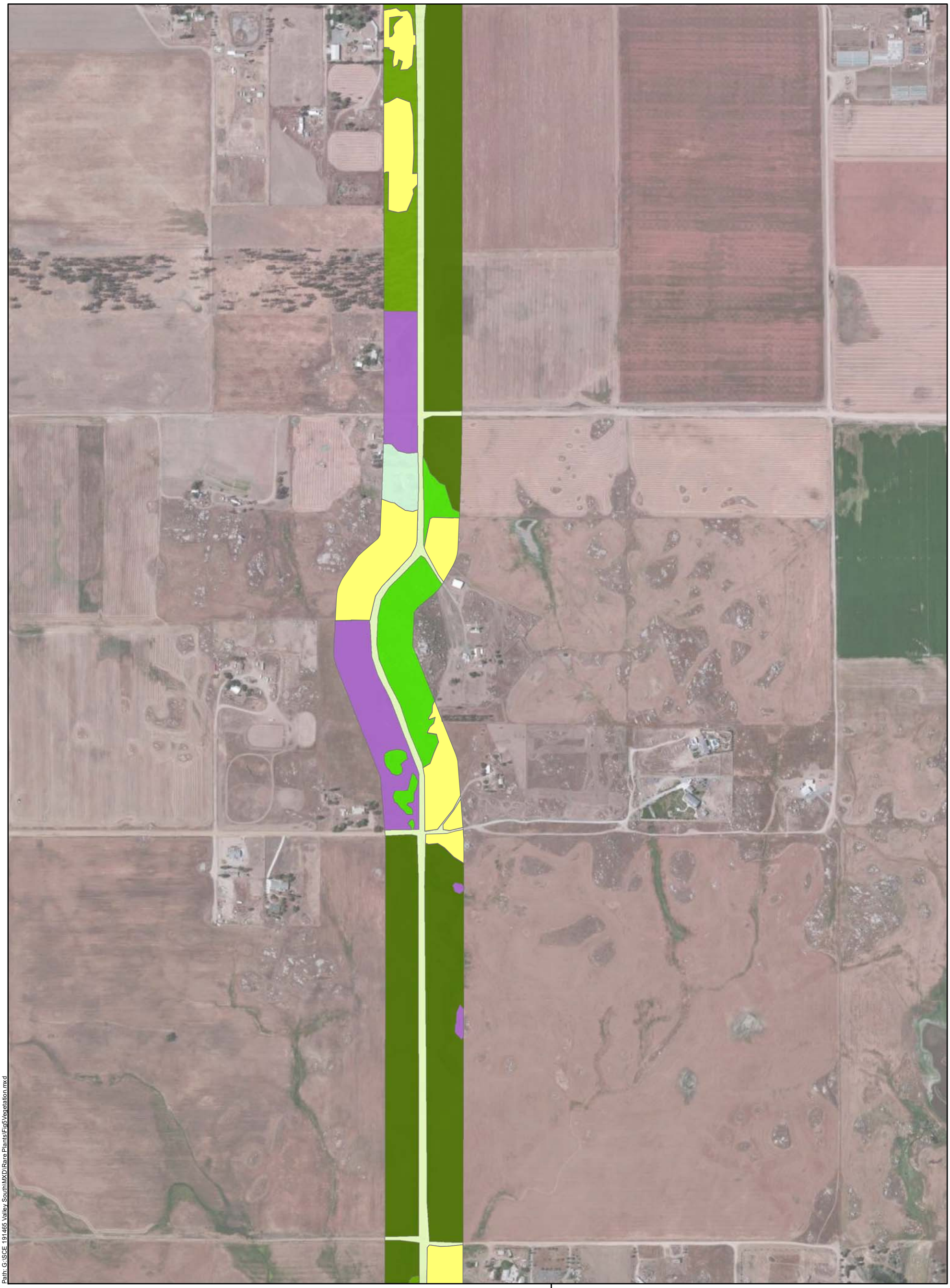
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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0 18

Miles

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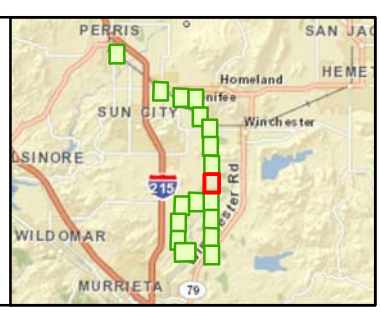

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SOUTHERN CALIFORNIA EDISON
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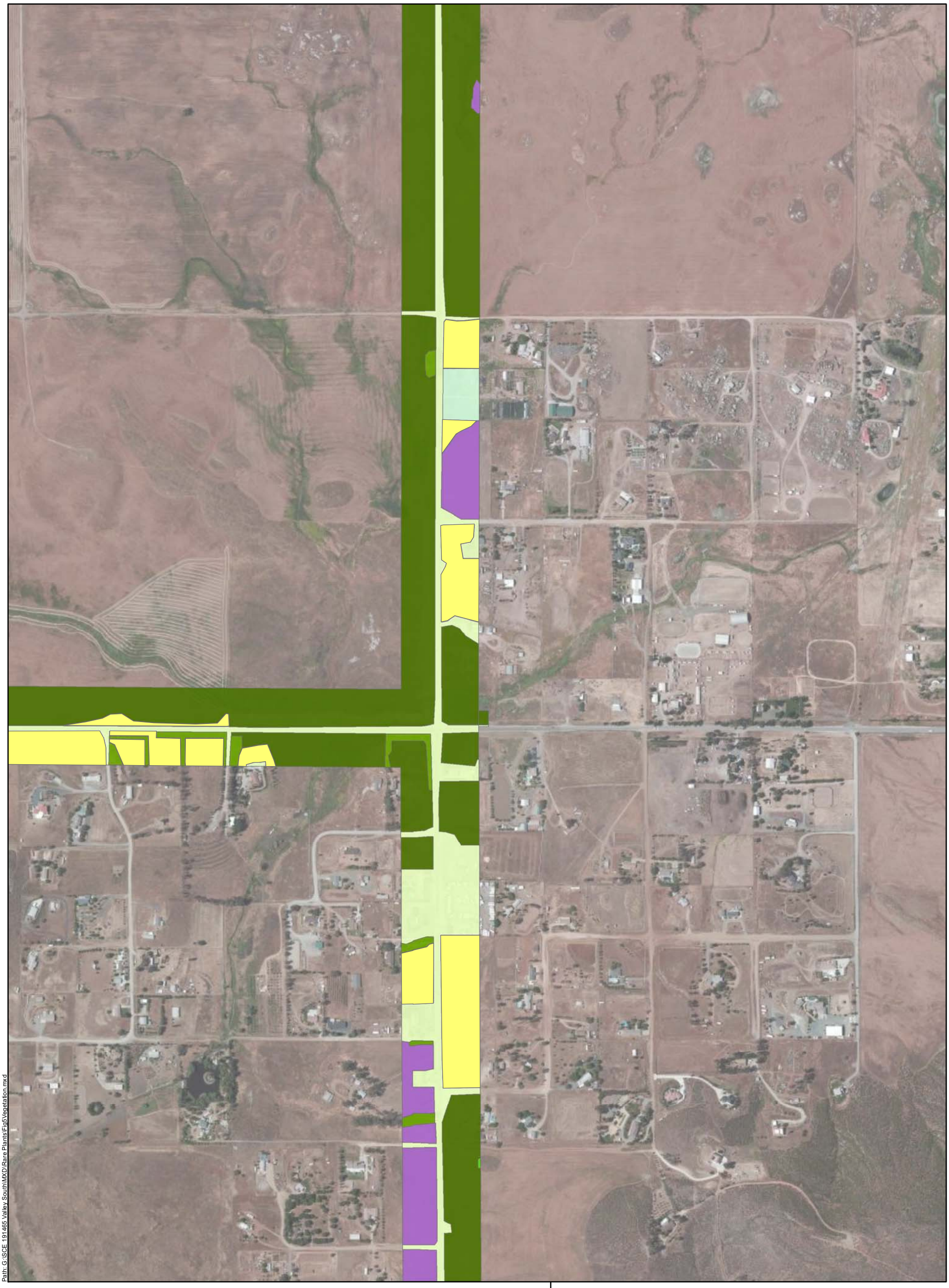
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Miles

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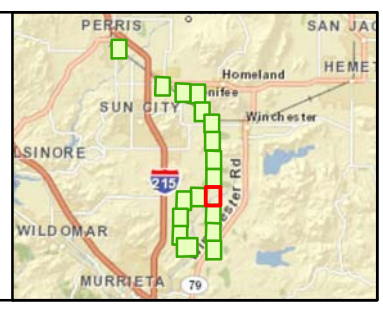

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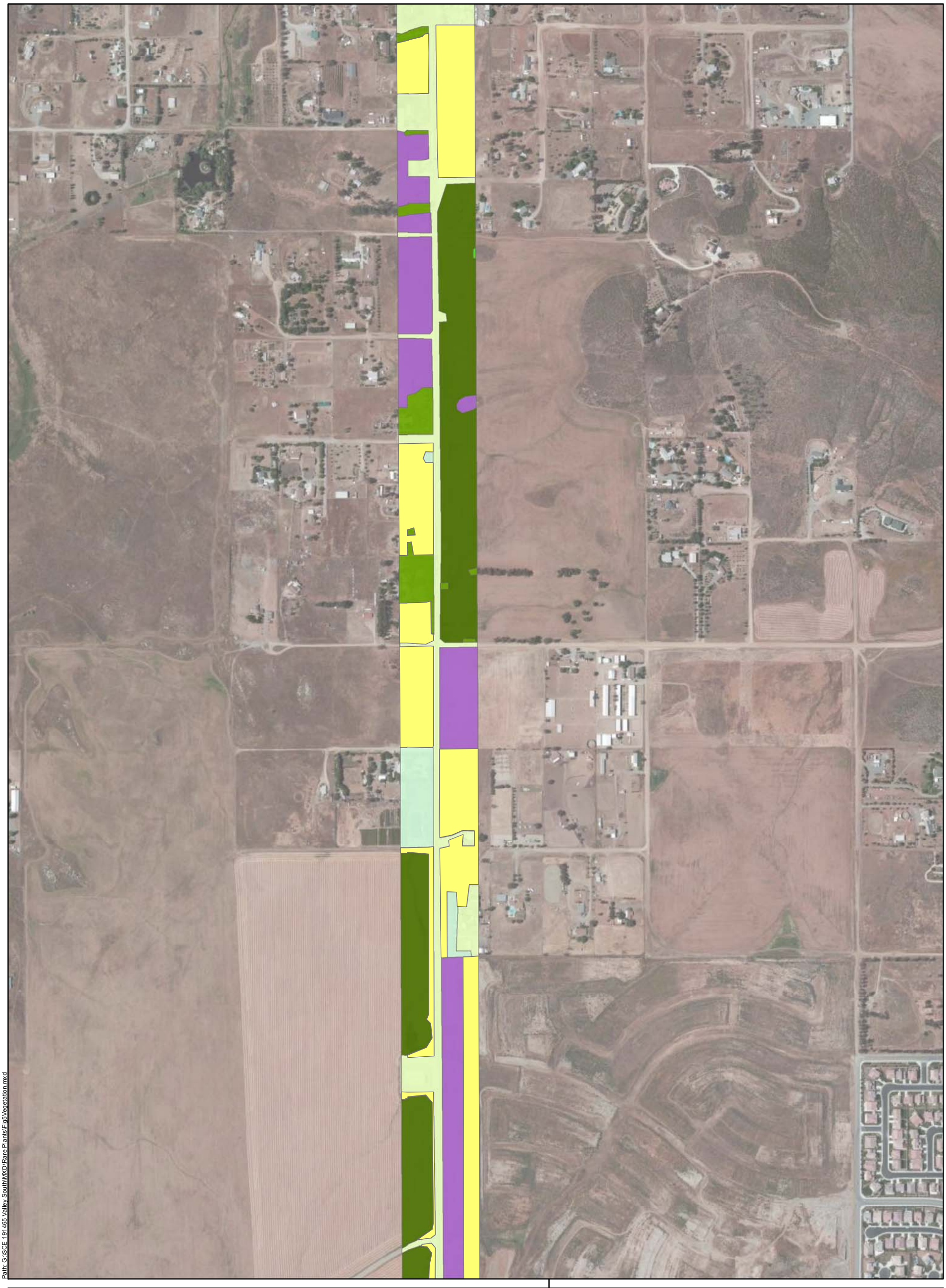
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Miles

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Sources:
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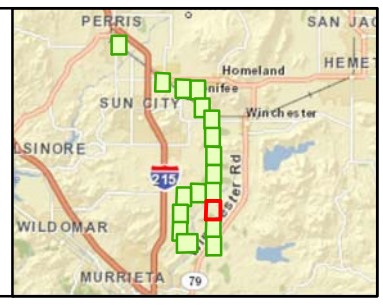

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SOUTHERN CALIFORNIA EDISON
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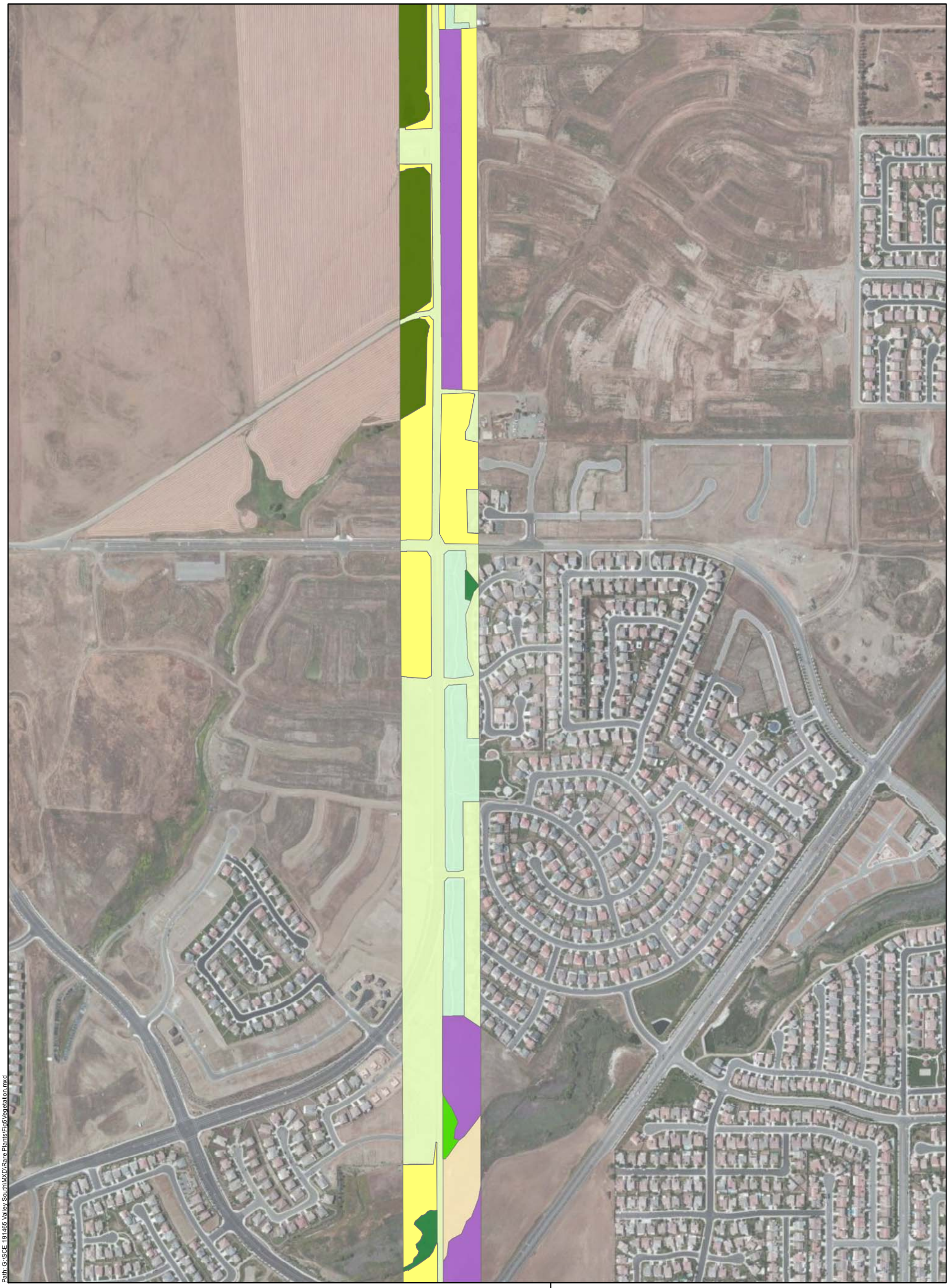
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Vegetation Communities

- Agriculture (18000)
- Cen. Coast Arroyo Willow Riparian Forest (61230)
- Chamise Chaparral (37200)
- Coastal Sage - Chaparral Scrub (37G00)
- Diegan Coastal Sage Scrub (32500)
- Diegan Coastal Sage Scrub: Inland Form (32520)
- Disturbed / Developed (12000)*
- Disturbed Habitat (Ruderal) (11300)
- Disturbed Wetland (11200)
- Eucalyptus (79100)
- Mulefat Scrub (63310)
- Non-native Grassland (42200)
- Open Water (64140)
- Ornamental/Planted Vegetation (12000)
- Ruderal / Disturbed Habitat (11300)
- S. Cottonwood - Willow Riparian Forest (61330)
- San Diego Mesa Claypan Vernal Pool (44322)
- Southern Willow Scrub (63320)
- Valley Freshwater Marsh (52410)

Sheet (12 of 18)

0 18

Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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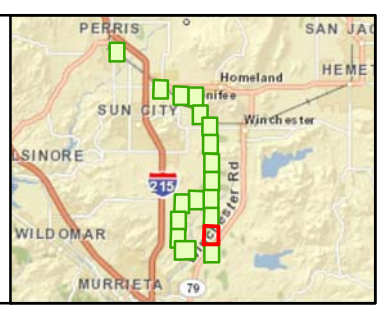

TRC

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

Path: G:\SCE 191465 Valley South\MXD\Rare Plants\Fig5Vegetation.mxd

Vegetation Communities

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- Cen. Coast Arroyo Willow Riparian Forest (61230)
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Sheet (13 of 18)

0 18

Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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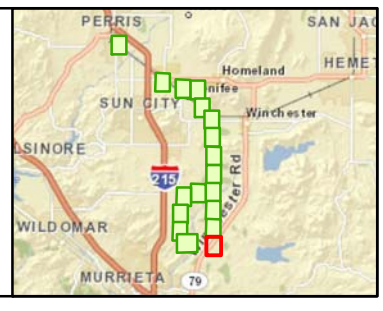

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SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Path: G:\SCE 191465 Valley South\MXD\Rare Plants\Fig5Vegetation.mxd

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Sheet (14 of 18)

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Miles
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Sources:
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Basemap ESRI, 2012

Date: 7/16/2013

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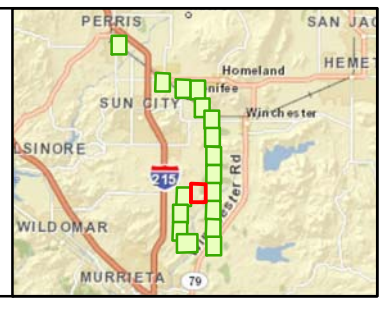

TRC

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP

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Sheet (15 of 18)

0 18

Miles

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Sources:
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Basemap ESRI, 2012

Date: 7/16/2013

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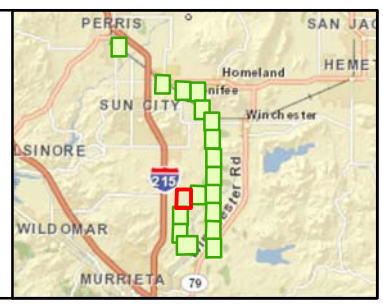

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SOUTHERN CALIFORNIA EDISON
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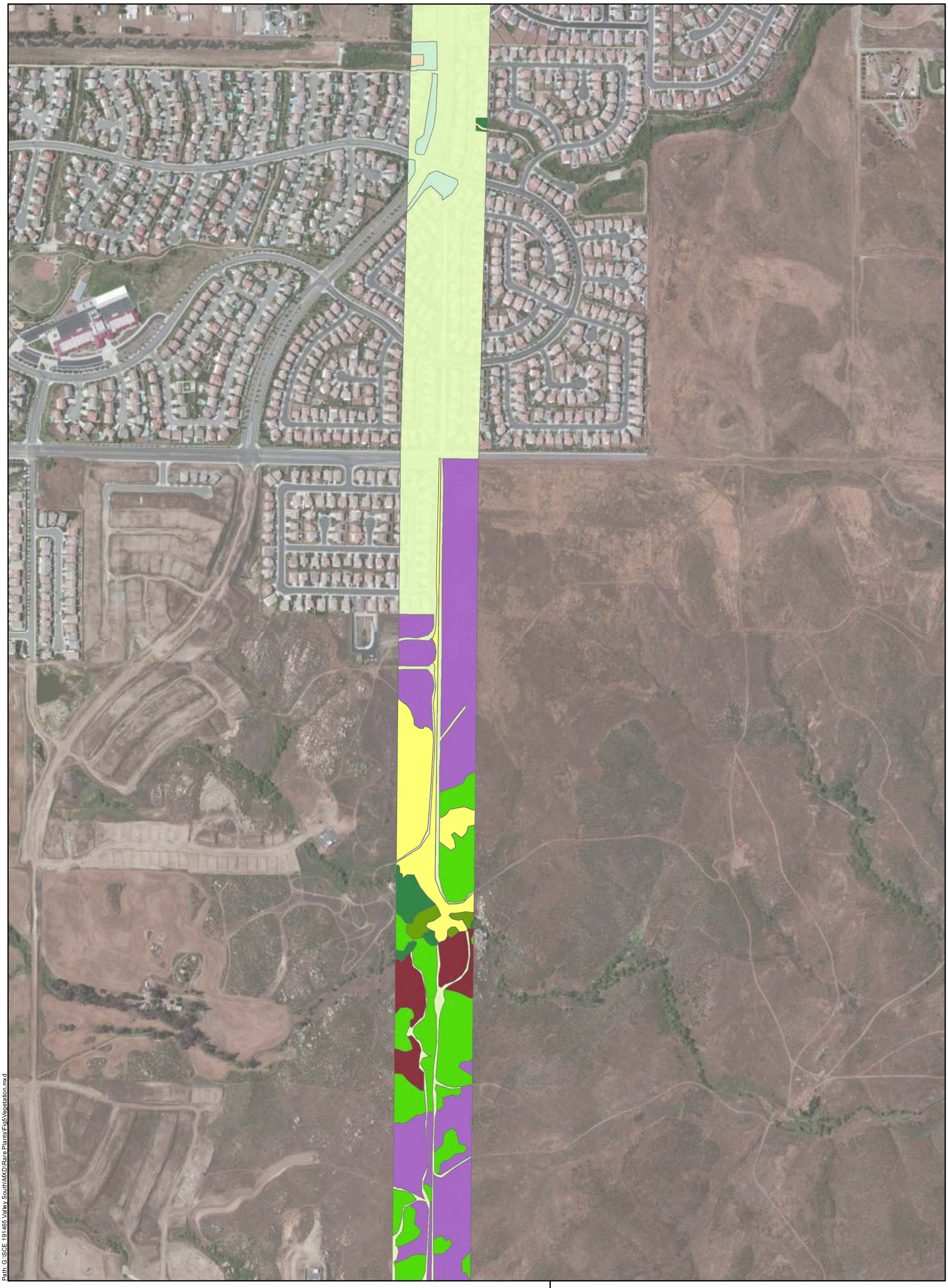

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Sheet (16 of 18)

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Miles
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Sources:
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Basemap ESRI, 2012

Date: 7/16/2013

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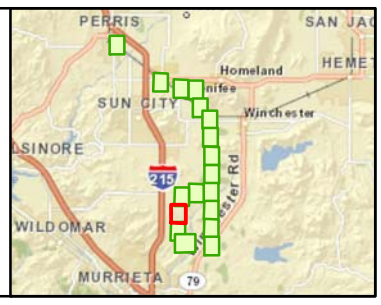

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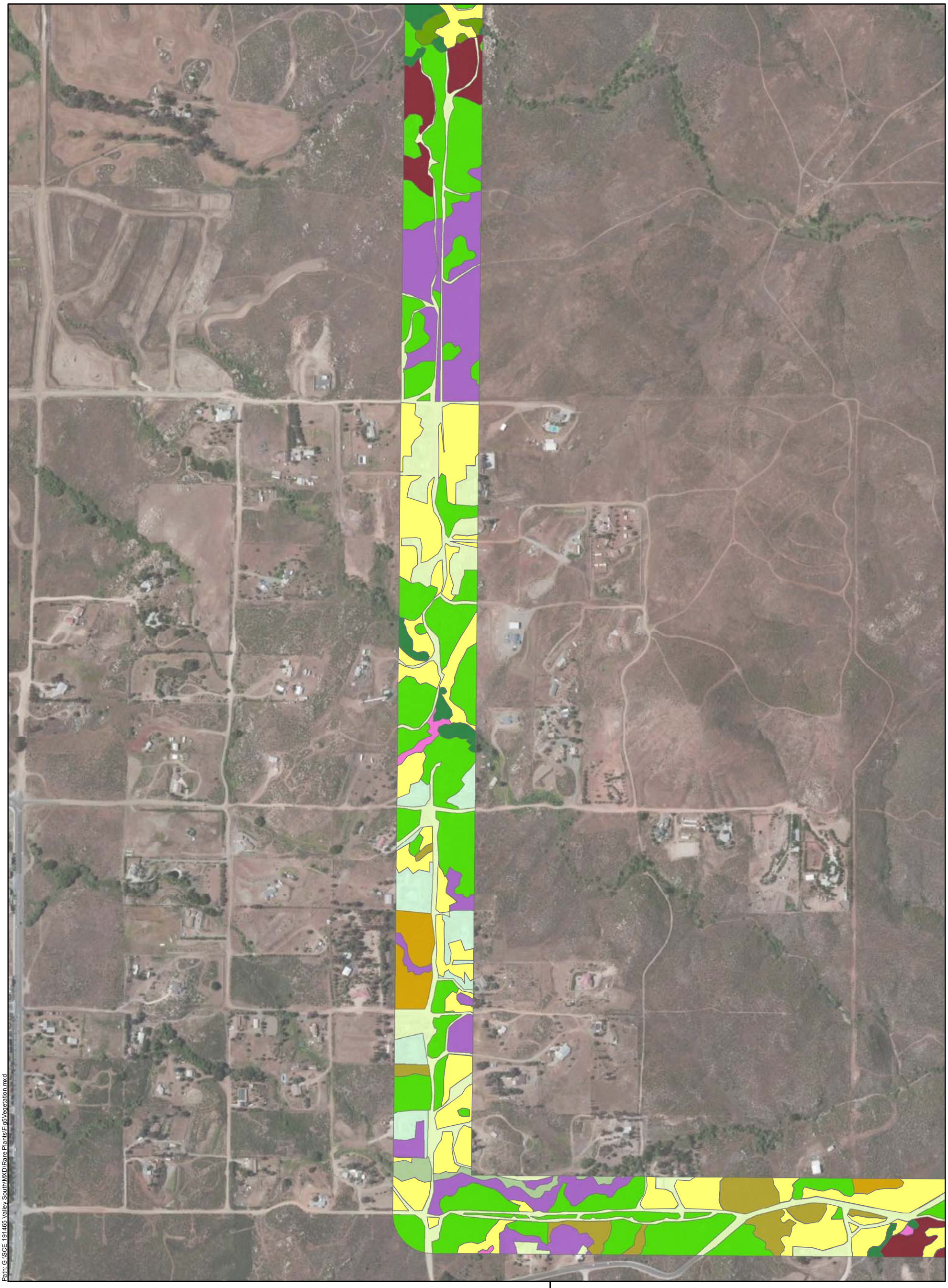
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Sheet (17 of 18)

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Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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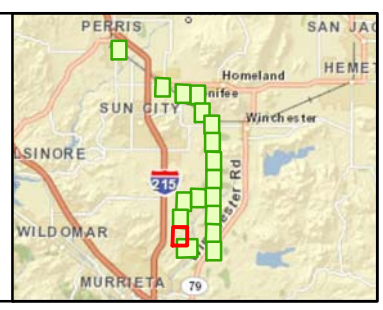

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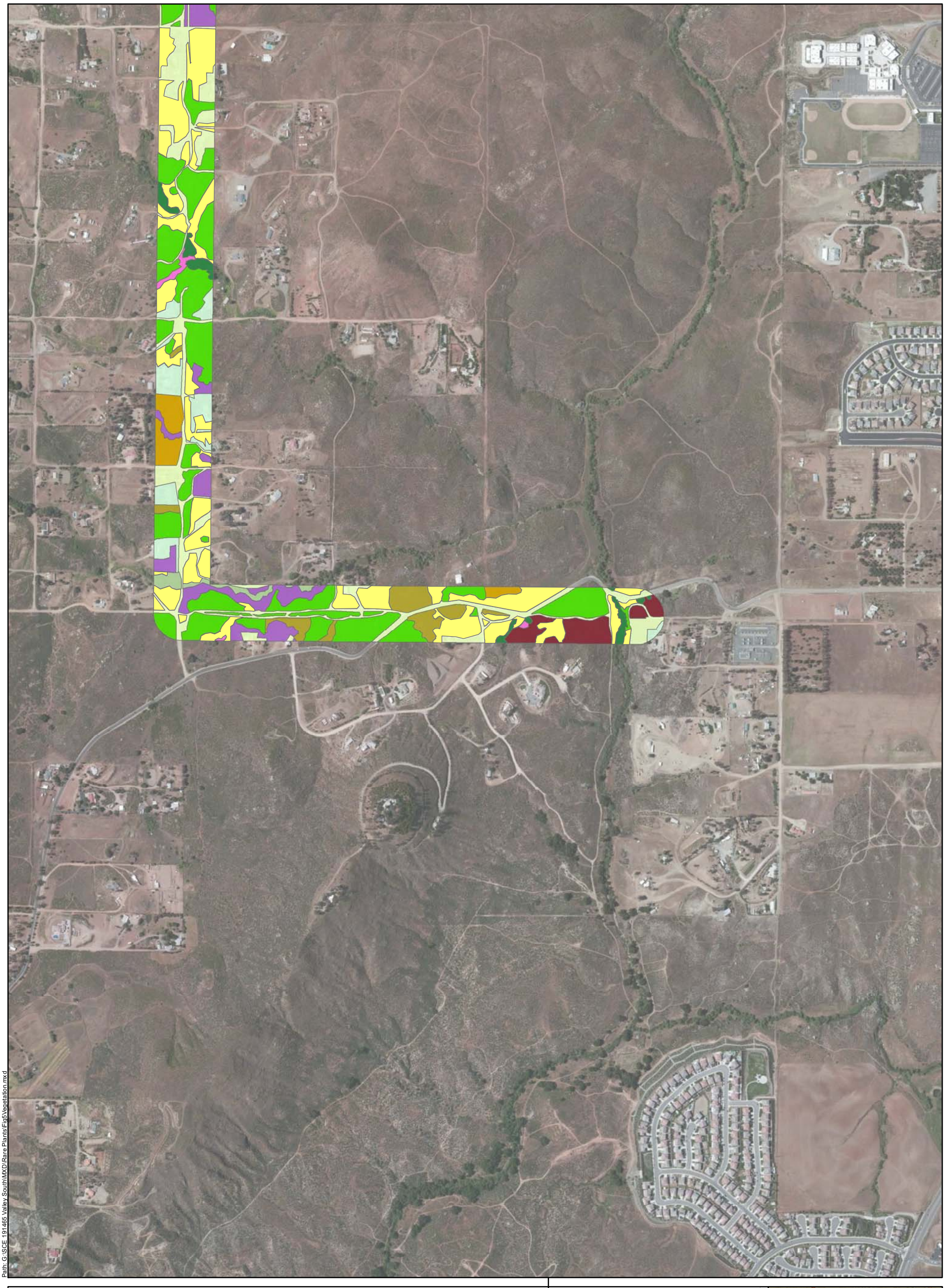
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 5**

Southern California Edison

VEGETATION AND OTHER LAND COVER TYPES MAP



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Sheet (18 of 18)

0 18

Miles

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Sources:
SCE, 2012; TRC, 2012
Basemap ESRI, 2012

Date: 7/16/2013

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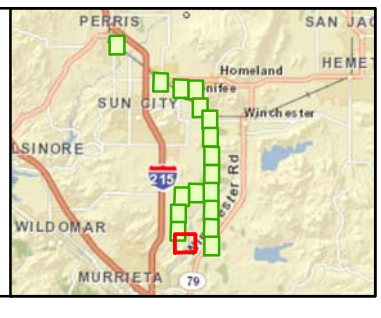

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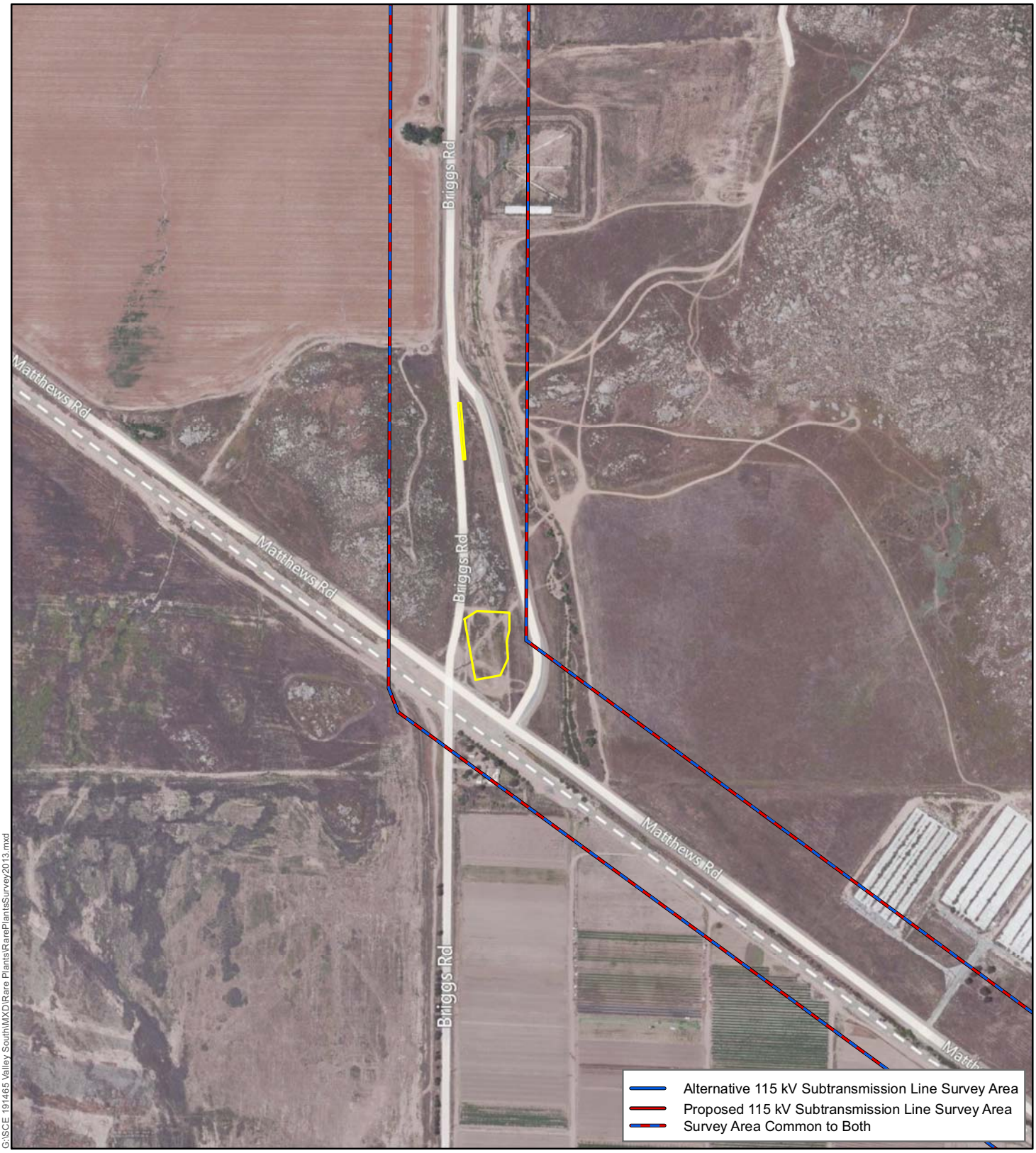
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company



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- *Chorizanthe parryi*
- *Chorizanthe polygonoides longispina*
- *Convolvulus simulans*
- *Hemizonia paniculata*
- *Hemizonia pungens laevis*

- *Chorizanthe polygonoides longispina*
- *Convolvulus simulans*
- *Hemizonia paniculata*
- *Hemizonia pungens laevis*
- *Lepidium virginicum robinsonii*
- *Microseris douglasii platycarpha*

0 100 200 300 400
Feet

Sources:
TRC, 2013
Microsoft Corp., 2012

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Sheet 1 of 13

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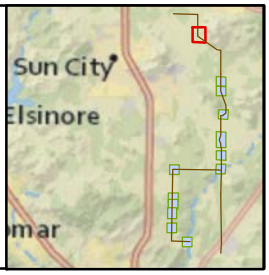

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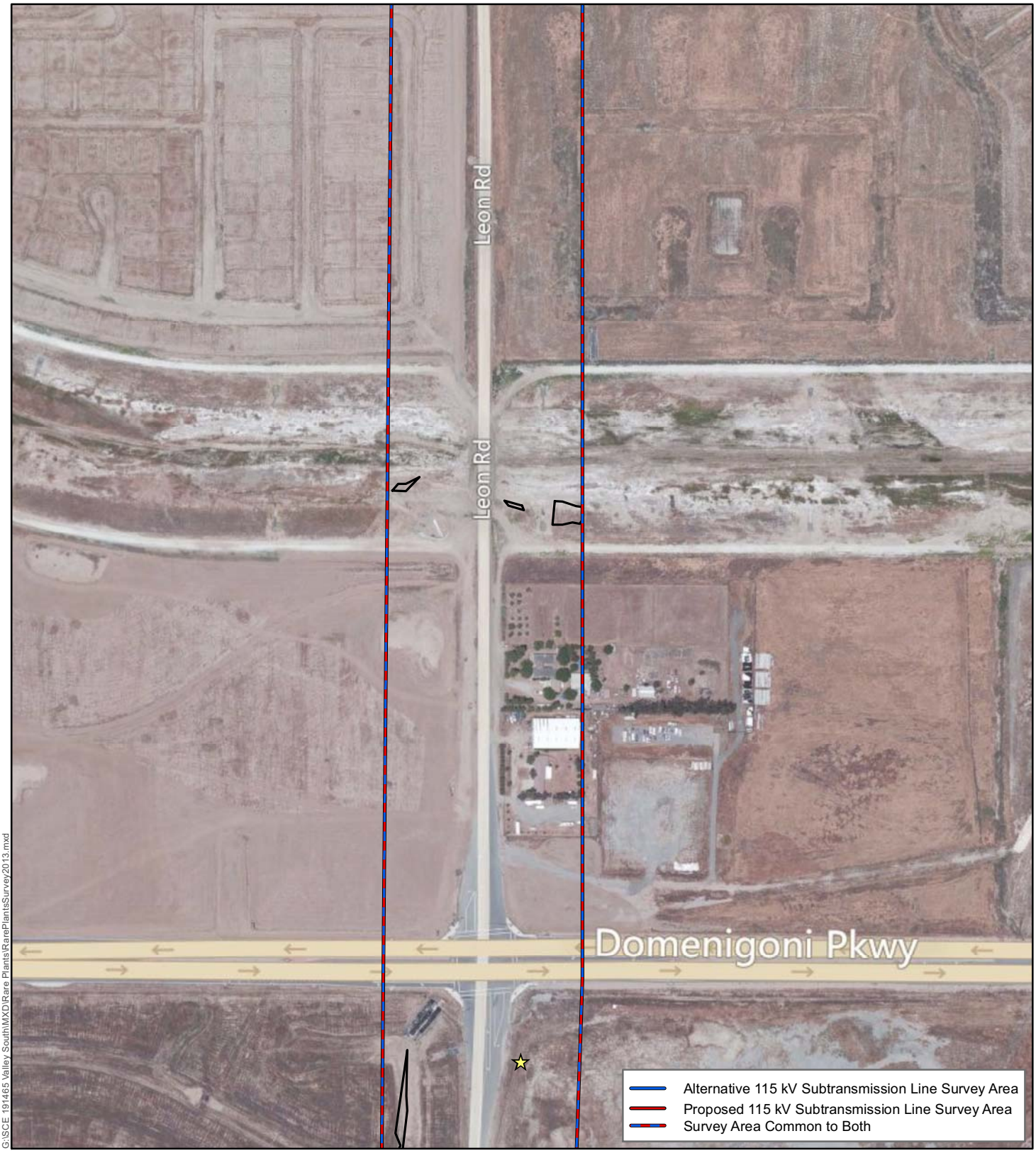
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company



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- *Chorizanthe parryi*
- *Chorizanthe polygonoides longispina*
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Feet

Sources:
TRC, 2013
Microsoft Corp., 2012

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Sheet 2 of 13

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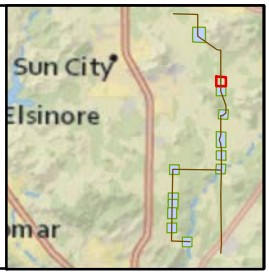

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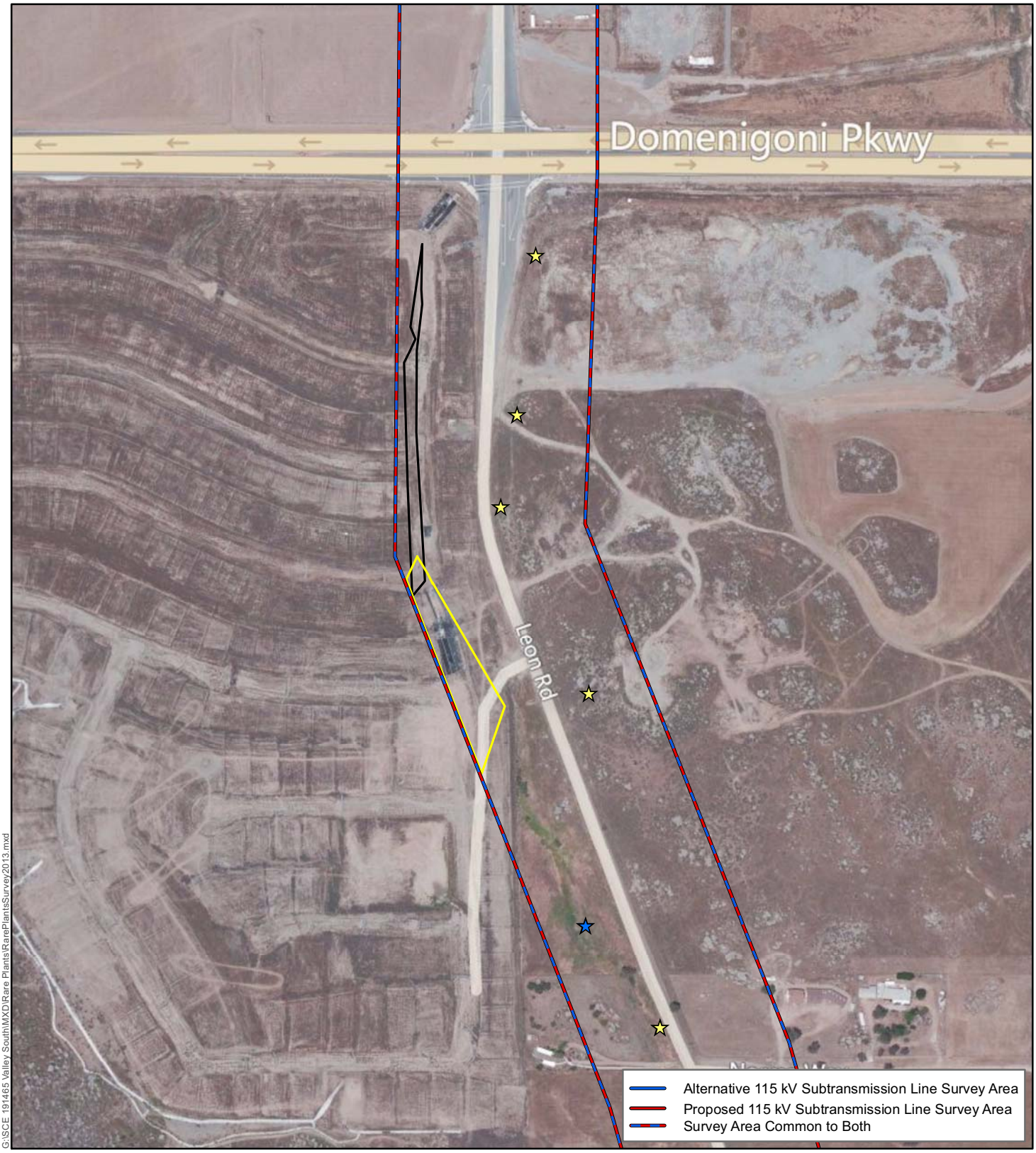
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company



Chorizanthe parryi
Chorizanthe polygonoides longispina
Convolvulus simulans
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Lepidium virginicum robinsonii
Microseris douglasii platycarpha

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Feet

Sources:
TRC, 2013
Microsoft Corp., 2012

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7/17/2013

Sheet 3 of 13

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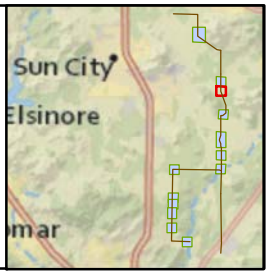

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SOUTHERN CALIFORNIA EDISON
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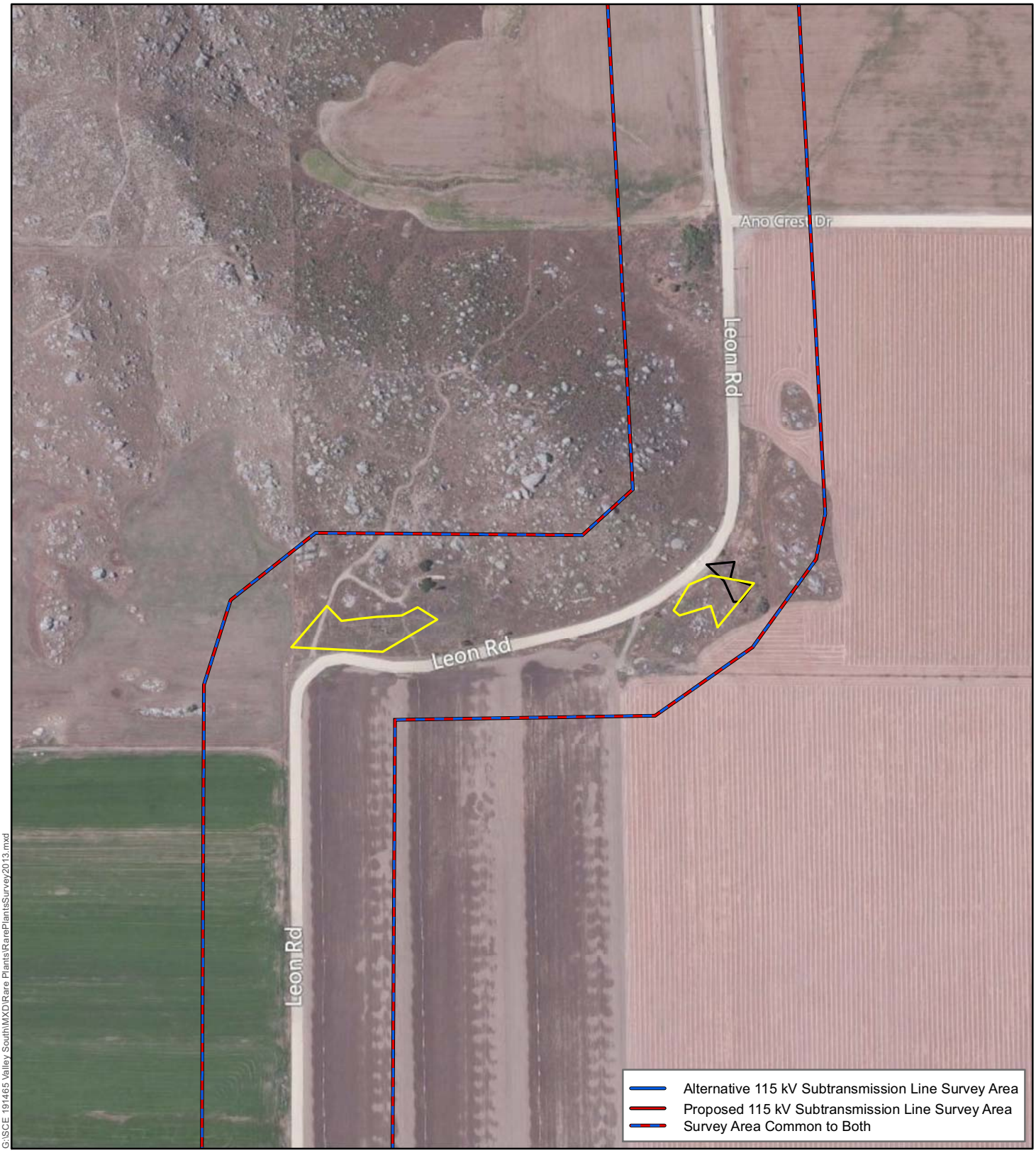

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Feet

Sources:
TRC, 2013
Microsoft Corp., 2012

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7/17/2013

Sheet 4 of 13

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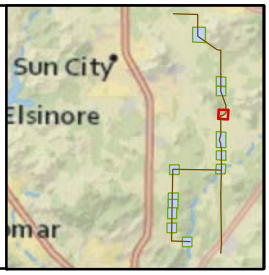

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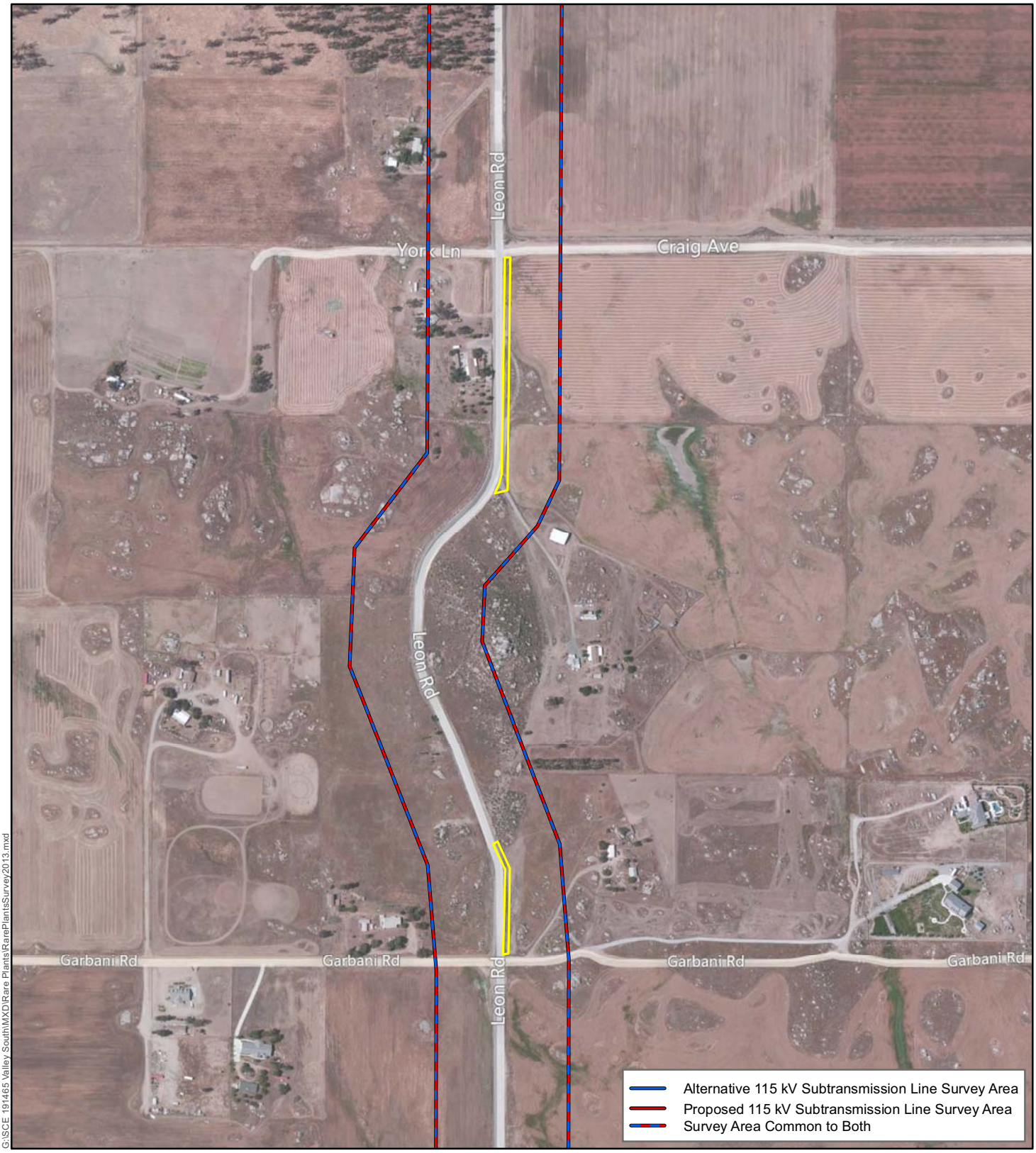

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Sheet 5 of 13

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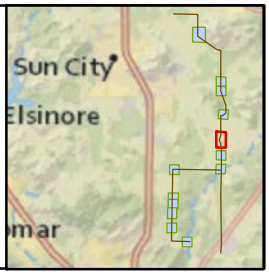

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Sheet 6 of 13

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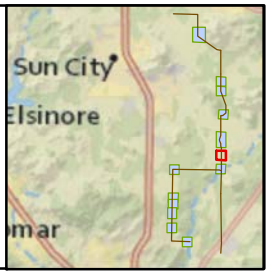

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Sheet 7 of 13

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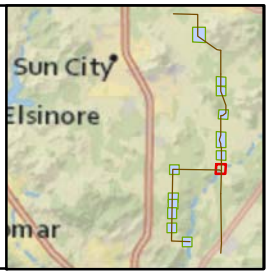

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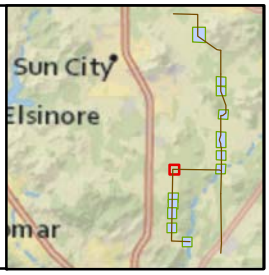

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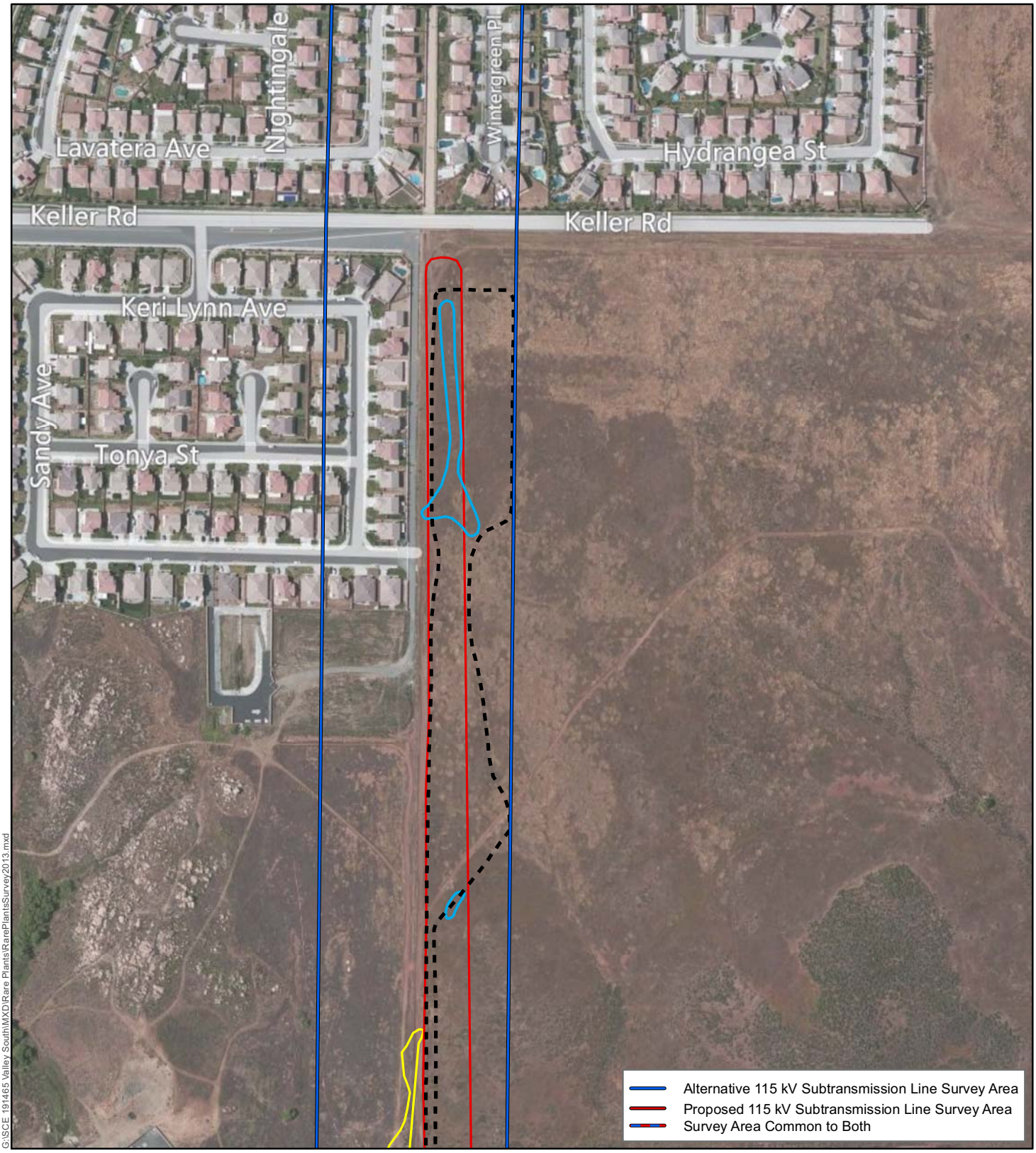

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- *Chorizanthe polygonoides longispina*
- *Convolvulus simulans*
- *Hemizonia paniculata*
- *Hemizonia pungens laevis*
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- *Hemizonia paniculata*
- *Hemizonia pungens laevis*
- *Lepidium virginicum robinsonii*
- *Microseris douglasii platycarpha*

0 100 200 300 400
Feet

Sources:
TRC, 2013
Microsoft Corp., 2012

N

7/17/2013

Sheet 9 of 13

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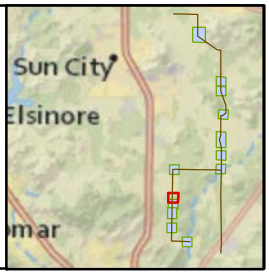

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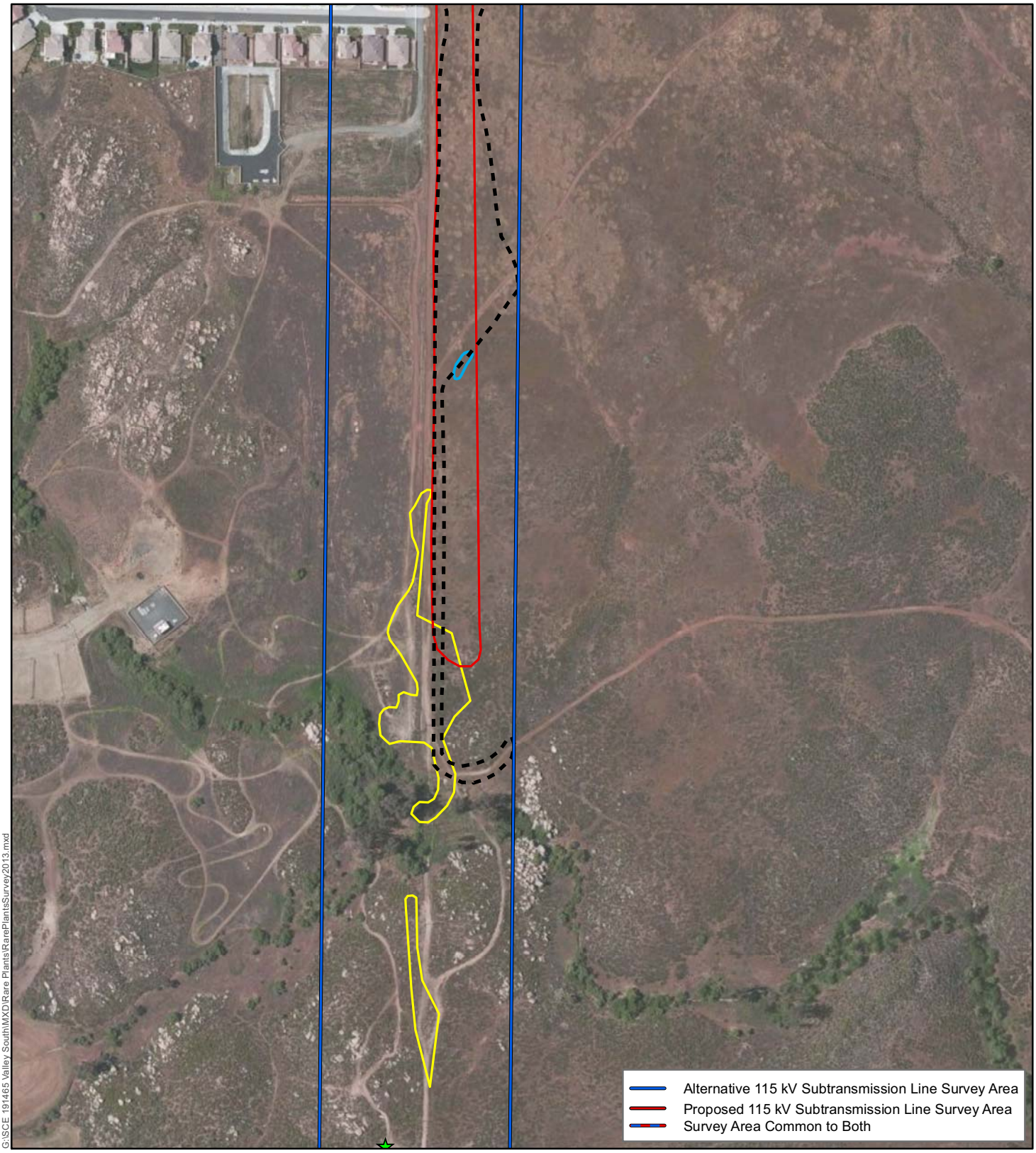

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Sources:
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7/17/2013

Sheet 10 of 13

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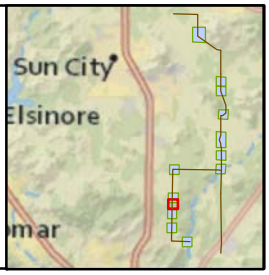

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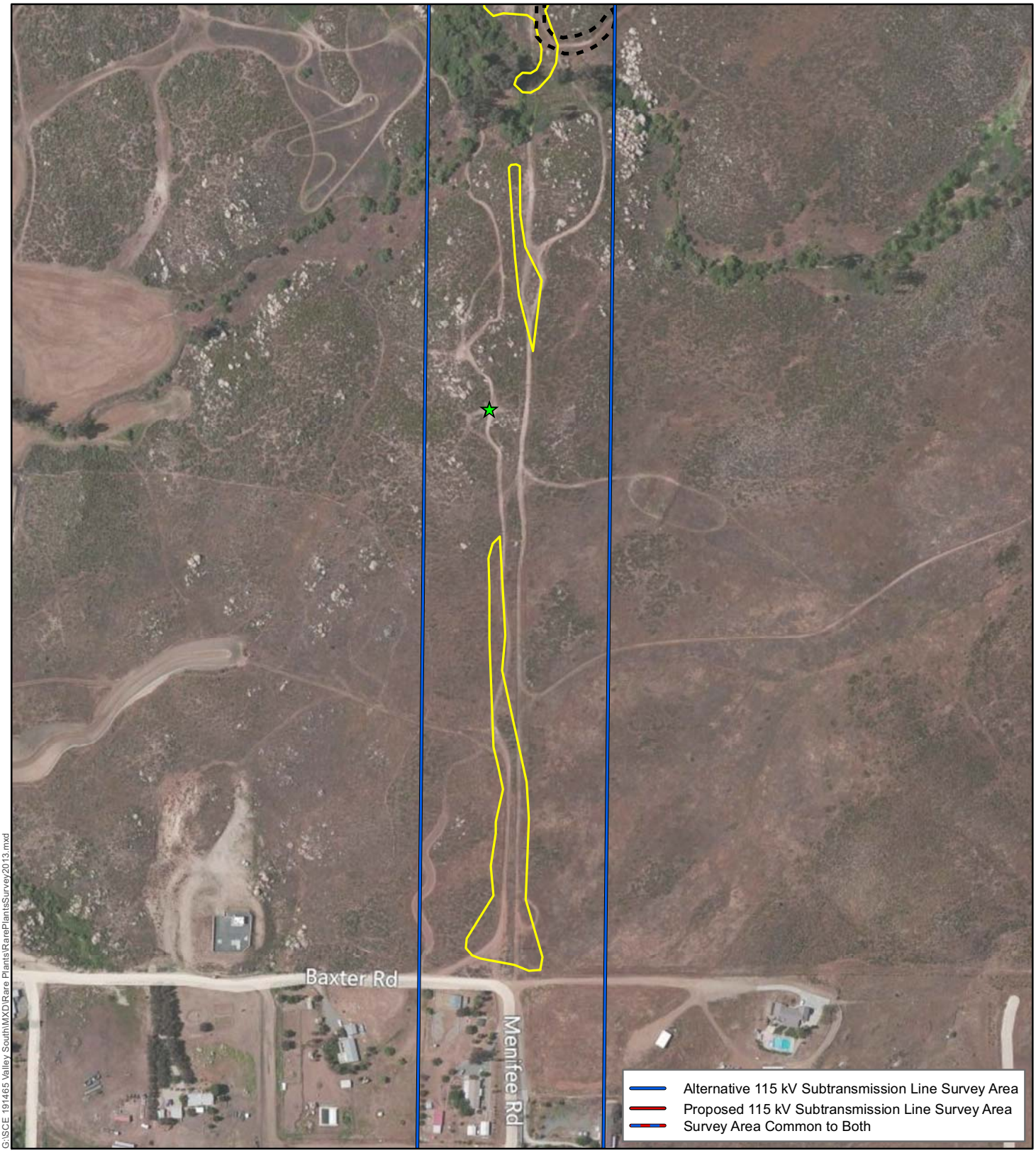

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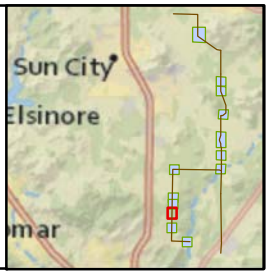

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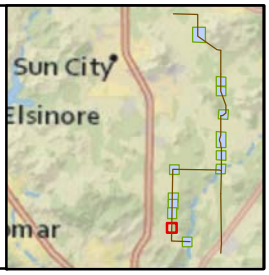

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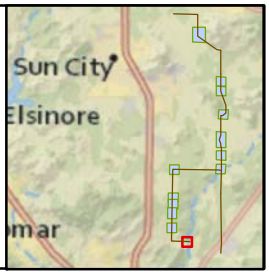

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APPENDICES

APPENDIX A

CNDDB AND CNPS RARE PLANTS

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
	Plants					
Brand's star phacelia	*Phacelia stellaris*	Federal: FC, SSC State: None CNPS: 1B.1 MSHCP: NE	Coastal dunes and coastal scrub. Occurs between 1 and 400 m.	Annual herb	March to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
California bearddtongue	*Penstemon californicus*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Chapparral, Lower montane coniferous forest, pinyon and juniper woodland. Prefers sandy soils. Occurs between 1,170 and 2,300 m.	Perennial herb	May to August	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
California orcutt grass	*Orcuttia californica* var. *californica*	Federal: FE State: SE CNPS: 1B.2 MSHCP: NE	Vernal pools. Occurs between 15 and 660 m.	Annual herb	April to August	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Chaparral, coastal scrub, desert dunes/sandy soils. Occurs between 80 and 1,600 m.	Annual herb	January to September	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	Federal: None State: None CNPS: 1B.1 MSHCP:CA	Marshes, swamps (coastal salt), playas and vernal pools. Occurs between 1 and 1,220 m.	Annual herb	February to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Davidson's saltscale	*Atriplex serenana* var. *davidsonii*	Federal: None State: None CNPS: 1B.2 MSHCP: CA	Coastal bluff scrub, coastal scrub. Prefers alkaline soils. Occurs between 10 and 200 m.	Annual herb	April to October	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Hammitt's clay-cress	*Sibaropsis hammittii*	Federal: None State: None CNPS: 1B.2 MSHCP: NE	Prefers clay substrate. Chaparral (openings), valley and foothill grasslands. Occurs between 720 and 1,065 m.	Annual herb	March to April	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Intermediate mariposa lily	*Calochortus weedii* var. *intermedius*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Rocky and calcareous substrate. Chaparral, coastal scrub, valley and foothill grassland. Occurs between 105 and 855 m.	Perennial bulbiferous herb	May to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Jaeger's milk-vetch	*Astragalus pachypus* var. *jaegeri*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Prefers sandy or rocky substrates. Occurs between 365 and 915 m.	Perennial shrub	December to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Johnston's rock cress	*Arabis johnstonii*	Federal: None State: None CNPS: 1B.2 MSHCP: NE	Often on eroded clay. Chaparral and lower montane coniferous forest. Occurs between 1,350 and 2,150 m.	Perennial herb	February to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Little mousetail	*Myosurus minimus* ssp. *apus*	Federal: None State: None CNPS: 3.1 MSHCP: CA	Valley and foothill grassland, vernal pools (alkaline). Occurs between 20 and 640 m.	Annual herb	March to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Little purple monkey flower	*Mimulus purpureus*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Meadows and seeps, pebble (Pavement) plain, upper montane coniferous forest. Occurs between 1,900 and 2,300 m.	Annual herb	May to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Long-spined spineflower	*Chorizanthe polygonoides* var. *longispina*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland. Often prefers clay soils. Occurs between 30 and 1,530 m.	Annual herb	April to July	**Present**. Long-spined spine flower was observed within Diegan coastal sage scrub and NNG in shallow clay soil lenses. The largest population of long-spined spine flower was observed southeast of the Menifee and Keller Road intersection.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Mesa horkelia	*Horkelia cuneata* ssp. *puberula*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Chaparral, cismontane woodland, coastal scrub. Prefers sandy or gravelly soil. Occurs between 70 and 810 m.	Perennial herb	February to September	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Mojave tarplant	*Deinandra mohavensis*	Federal: None State: None CNPS: 1B.3 MSHCP: None	Chaparral, coastal scrub and riparian scrub. Prefers mesic substrate. Occurs between 640 and 1,600 m.	Annual herb	June to January	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Mud nama	*Nama stenocarpum*	Federal: None State: None CNPS: 2.2 MSHCP: CA	Marshes and swamps (lake margins, riverbanks). Occurs between 5 and 500 m.	Annual / Perennial herb	January to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Munz's onion	*Allium munzii*	Federal: FE State: ST CNPS: 1B.1 MSHCP: None	Mesic and clay soils. Chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodland, valley and foothill grassland. Occurs between 297 and 1,070 m.	Perennial bulbiferous herb	March to May	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Nevin's barberry	*Berberis nevinii*	Federal: FE State: SE CNPS: 1B.1 MSHCP: CA	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Prefers sandy or rocky soils. Occurs between 295 and 825 m.	Perennial evergreen shrub	March to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Orcutt's brodiaea	*Brodiaea orcuttii*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools. Prefers clay soils, sometimes serpentine. Occurs between 30 and 1,692 m.	Perennial herb	May to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Parish's brittlescale	*Atriplex parishii*	Federal: None State: None CNPS: 1B.1 MSHCP: CA	Chenopod scrub, playas, vernal pools. Prefers alkaline soils. Occurs between 25 and 1,900 meters.	Annual herb	June to October	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Parry's spineflower	*Chorizanthe parryi*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Prefers sandy or rocky, openings. Occurs between 275 and 1,220 m.	Annual herb	April to June	**Present.** Parry's spine flower was observed within openings within CSS habitats and was generally associated with granitic soils. Observations were often associated with biotic crusts located below granite outcroppings and consistent with undisturbed soils.
Plummer's mariposa lily	*Calochortus plummerae*	Federal: None State: None CNPS: 1B.2 MSHCP: NE	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Prefers granitic or rocky substrate. Occurs between 100 and 1,700 m.	Perennial bulbiferous herb	May to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Prostrate vernal pool navarretia	*Navarretia prostrata*	Federal: None State :None CNPS:1B.1 MSHCP: CA	Coastal scrub, meadows and seeps, valley and foothill grassland (alkaline), vernal pools. Prefers mesic soils. Occurs between 15 and 1,210 m.	Annual herb	April to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Rainbow manzanita	*Arctostaphylos rainbowensis*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Chaparral. Occurs between 225 and 640 m.	Perennial evergreen shrub	January to February	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Robinson's pepper-grass	*Lepidium virginicum* var. *robinsonii*	Federal :None State: None CNPS: 1B.2 MSHCP: None	Chaparral and coastal scrub. Occurs between 1 and 885 m.	Annual herb	January to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Round-leaved filaree	*Erodium macrophyllum*	Federal: None State: None CNPS: 1B.1 MSHCP: None	Cismontane woodland, valley and foothill grassland. Occurs between 13 and 1,200 m.	Annual herb	March to May	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Salt spring checkered bloom	*Sidalcea neomexicana*	Federal: None State: None CNPS: 2.2 MSHCP: None	Chaparral, coastal scrub, lower montane coniferous forest, mojavean desert scrub, playas. Prefers alkaline and mesic soils. Occurs between 15 and 1,530 m.	Perennial herb	March to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
San Diego ambrosia	*Ambrosia pumila*	Federal :None State: None CNPS: 1B.2 MSCP: NE	Chaparral, coastal scrub, valley and foothill grassland, vernal pools. Often located in disturbed areas. Occurs between 20 and 415 m.	Perennial rhizomatous herb	April to October	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
San Diego button-celery	*Eryngium aristulatum* var. *parishii*	Federal: FE State: SE CNPS: 1B.1 MSCP: CS	Coastal scrub, valley and foothill grassland and vernal pools. Prefers mesic soils. Occurs between 20 and 620 m.	Annual / Perennial herb	April to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
San Jacinto Mountains bedstraw	*Galium angustifolium*	Federal: None State: None CNPS: 1B.1 MSHCP: NE	Lower montane coniferous forest. Occurs between 1,350 and 2,100 m.	Annual herb	June to August	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
San Jacinto Valley crownscale	*Atriplex coronata var. notatior*	Federal: FE State: None CNPS: 1B.1 MSHCP: CA	Playas, valley and foothill grassland and vernal pools. Prefers alkaline substrate. Occurs between 139 and 500 m	Annual herb	April to August	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
San Miguel savory	*Satureja chandleri*	Federal: None State: None CNPS: 1B.2 MSHCP: NE	Chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Prefers rocky, gabbroic or metavolcanic soils. Occurs between 120 and 1,075 m.	Perennial shrub	March to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Santa Lucia dwarf rush	*Juncus luciensis*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools. Occurs between 300 and 2,040 m.	Annual herb	April to July	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
slender-horned spineflower	*Dodecahema leptoceras*	Federal: FE State: SE CNPS: 1B.1 MSHCP: NE	Chaparral, cismontane woodland, coastal scrub (alluvial fan). Prefers sandy soil. Occurs between 200 and 760 m.	Annual herb	April to May (uncommonly in March)	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Smooth tarplant	*Centromadia pungens*	Federal: None State: None CNPS: 1B.1 MSCP: CA	Chenopod scrub, meadows and seeps, playas, riparian woodland and valley and foothill grassland. Prefers alkaline soils. Occurs between 0 and 640 m.	Annual herb	April to September	**Present.** Species was observed in 6 locations throughout the Project survey area. The smooth tarplant was generally associated with or near seasonally mesic sites located in loamy soils
South coast saltscale	*Artiplex pacifica*	Federal: None State: None CNPS: 1B.2 MSHCP: None	Coastal bluff scrub, coastal dunes, coastal scrub, playas. Occurs between 0 and 140 m.		March to August	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Spreading navarretia	*Navarretia fossalis*	Federal: FT State: None CNPS: 1B.1 MSHCP: NE	Chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, vernal pools. Occurs between 30 and 1,300 m.		March to May	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Thread-leaved brodiaea	*Brodiaea filifolia*	Federal: FT State: SE CNPS: 1B.1 MSHCP: CA	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools. Prefers clay substrate. Occurs between 25 and 1,219 m.	Perennial bulbiferous herb	March to June	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
Vail Lake ceanothus	*Ceanothus ophiochilus*	Federal: FT State: SE CNPS: 1B.1 MSCP: CA	Chaparral habitat. Prefers gabbroic or pyroxenite-rich outcrops. Only three occurrences are known of and occur near Vail Lake. Occurs between 580 and 1,065 m.	Perennial evergreen shrub	February to March	**Unlikely to occur.** Species was not detected during focused rare plant surveys.
White rabbit-tobacco	*Pseudognaphalium leucocephalum*	Federal: None State: None CNPS: 2.2 MSHCP: None	Chaparral, cismontane woodland, coastal scrub, riparian woodland. Prefers sandy or gravelly. Occurs between 0 and 2,100 m.	Perennial herb	July to December	**Unlikely to occur.** Species was not detected during focused rare plant surveys..
Wright's trichocoronis	*Trichocoronis wrightii*	Federal: None State: None CNPS: 2.1 MSHCP: NE	Meadows and seeps, marshes and swamps, riparian forest and vernal pools. Prefers alkaline soils. Occurs between 5 and 435 m.	Annual herb	May to September	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	GROWTH FORM	FLOWERING/ PHENOLOGY	POTENTIAL FOR OCCURRENCE
Yucapia onion	*Allium marvinii*	Federal: None State: None CNPS: 1B.1 MSHCP: NE	Chaparral. Prefers clay substrate and openings. Occurs between 760 and 1,065 m.	Perennial bulbiferous herb	April to May	**Unlikely to occur.** Species was not detected during focused rare plant surveys.

SPECIES LISTING CODES

Legend

Federal (U.S. Fish and Wildlife Service)

FE Federally listed, endangered: species in danger of extinction throughout a significant portion of its range
FT Federally listed, threatened: species likely to become endangered within the foreseeable future
FPE Federally proposed, endangered
FPT Federally proposed, threatened
FPD Federally proposed, delisting

State (California Department of Fish and Game)

SE State listed, endangered: species in danger of extinction throughout a significant portion of its range
ST State listed, threatened: species likely to become endangered within the foreseeable future
FP Fully protected: additional protection to those animals that are rare or possibly facing extinction
SSC Species of Special Concern: administrative designation for vertebrate species that appears vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats

CNPS (California Native Plant Society)

1A Presumed extinct in California
1B Rare, threatened, or endangered in California and elsewhere
2 Rare, threatened, or endangered in California, but more common elsewhere
3 Need More Information - A Review List
4 Limited Distribution - A Watch List
.1 Seriously threatened in California
.2 Fairly threatened in California
.3 Not very threatened in California

Western Riverside County MSHCP

CA Criteria Area Plant
NE Narrow Endemic Plant

APPENDIX B

VASCULAR PLANT SPECIES DOCUMENTED WITHIN PROJECT SURVEY AREA

APPENDIX B

Vascular Plant Species Documented Within Project Survey Area

Family and Species	Growth Form	Origin[1]	Voucher[2]
Pteridaceae			
Cheilanthes newberryi (D.C. Eat.) Domin.	perennial	N	
Pellaea andromedifolia (Kaulf.) Fée	perennial	N	X
Pityrogramma triangularis (Kaulfuss) Maxon	perennial	N	
Adoxaceae			
Sambucus mexicana Presl. ex DC.	shrub/tree	N	
Aizoaceae			
Glinus lotoides L.	annual	I	
Amaranthaceae			
Amaranthus albus L.	annual	I	
Amaranthus retroflexus L. ?	annual	I	
Anacardiaceae			
Rhus aromatica Ait.	shrub	N	X
Toxicodendron diversilobum (Torr. & Gray) Greene	shrub/liana	N	
Apiaceae			
Apiastrum angustifolium Nutt.	annual	N	
Apium graveolens L.	perennial	I	
Bowlesia incana Ruiz & Pavon	annual	N	
Conium maculatum L.	annual	I	
Daucus pusillus Michx.	annual	N	
Asclepiadaceae			
Asclepias eriocarpa Benth.	perennial	N	
Asteraceae			
Acourtia microcephala DC.	perennial	N	
Ambrosia psilostachya DC.	perennial	N	
Anthemis cotula L.	annual	I	
Artemisia californica Less.	shrub	N	
Artemisia douglasiana Bess.	perennial	N	
Baccharis salicifolia (Ruiz & Pavón) Pers.	shrub	N	X
Baccharis salicina Torr. & Gray	shrub	N	X
Bebbia juncea (Benth.) Greene	shrub	N	
Brickellia desertorum Coville	shrub	N	
Carduus pycnocephalus L.	annual	I	
Centaurea melitensis L.	annual	I	
Centaurea solstitialis L.	annual	I	
Conyza canadensis (L.) Cronq.	annual	I	
Cotula australis (Sieber) Hook. f.	annual	I	
Cotula coronopifolia L.	perennial	I	
Ericameria palmeri (Gray) Hall var. pachylepis (Hall) Nesom	shrub	N	
Erigeron foliosus Nutt.	perennial	N	
Eriophyllum confertiflorum (DC.) Gray	subshrub	N	
Eriophyllum multicaule (DC.) Gray	annual	N	X
Filago californica Nutt.	annual	N	

Appendix B, continued

Filago gallica L.	annual	I	
Gnaphalium californicum DC.	biennial	N	
Gnaphalium palustre Nutt.	annual	N	
Gutierrezia californica (DC.) T. & G.	subshrub	N	
Hazardia squarrosa (Hook. & Arn.) Greene	shrub	N	
Helianthus annuus L.	annual	I	
Helianthus gracilentus Gray	perennial	N	X
Hemizonia fasciculata (DC.) Torr. & Gray	annual	N	
Hemizonia kelloggii Greene	annual	N	X
Hemizonia paniculata Gray	annual	N	X
Hemizonia pungens ssp. laevis Keck	annual	N	X
Heterotheca grandiflora Nutt.	biennial	N	
Hypochaeris glabra L.	annual	I	
Iva axillaris Pursh	perennial	N	X
Lactuca serriola L.	annual	I	
Lasthenia coronaria (Nutt.) Ornd.	annual	N	X
Lasthenia gracilis (DC.) Greene	annual	N	X
Lessingia filaginifolia (H. & A.) M.A. Lane	perennial	N	
Malacothrix saxatilis (Nutt.) T. & G.	perennial	N	
Matricaria discoidea DC.	annual	I	X
Microseris douglasii ssp. platycarpha (Gray) Chambers	annual	N	X
Microseris heterocarpa (Nutt.) Chamb.	annual	N	X
Microseris lindleyi (DC.) Gray	annual	N	X
Osmadenia tenella Nutt.	Annual	N	
Pulicaria paludosa Link	perennial	I	X
Silybum marianum (L.) Gaertn.	biennial	I	
Sonchus asper (L.) Hill	annual	I	
Sonchus oleraceus L.	annual	I	
Stephanomeria exigua Nutt.	annual	N	
Stephanomeria virgata Benth.	annual	N	
Stylocline gnaphaloides Nutt.	annual	N	
Tetradymia comosa Gray	shrub	N	X
Xanthium strumarium L.	annual	N	
Boraginaceae			
Amsinckia intermedia Fisch. & C.A. Mey.	annual	N	
Amsinckia retrorsa Suksd.	annual	N	X
Cryptantha corollata?		N	
Cryptantha intermedia (Gray) Greene	annual	N	X
Heliotropium curassavicum L.	perennial	N	
Pectocarya linearis (R. & P.) DC.	annual	N	X
Pectocarya penicillata (H. & A.) A. DC.	annual	N	X
Plagiobothrys canescens Benth.	annual	N	
Plagiobothrys collinus var. californicus (Gray) Higgins	annual	N	X
Plagiobothrys collinus (Phil.) Jtn. var. fulvescens (I.M. Johnston) Higgins	annual	N	X
Plagiobothrys leptocladus (Greene) Johnst.	annual	N	X
Plagiobothrys tenellus (Nutt.) Gray	annual	N	
Brassicaceae			
Athysanus pusillus (Hook.) Greene	annual	N	X

Appendix B, continued

Brassica	annual		X
Brassica geniculata (Desf.) Ball	ann/perenn	I	
Capsella bursa-pastoris (L.) Medik.	annual	I	X
Coronopus didymus (L.) Sm.	annual	I	
Descurainia pinnata (Walt.) Britt.	annual	N	
Lepidium chalepensis ?	annual		X
Lepidium lasiocarpum T. & G.	annual	N	X
Lepidium nitidum Nutt.	annual	N	X
Lepidium virginicum L. var. robinsonii (Thell.) C. Hitchc.	annual	N	X
Raphanus sativus L.	annual	I	
Sisymbrium irio L.	annual	I	
Tropidocarpum gracile Hook.	annual	N	X
Cactaceae			
Cylindropuntia californica (Torr. & A. Gray) F. M. Knuth	succ. shrub	N	
Caryophyllaceae			
Cerastium glomeratum Thuill.	annual	I	X
Herniaria cinerea DC.	annual	I	
Loeflingia squarrosa Nutt.	annual	N	
Spergularia	annual	I	
Spergularia marina (L.) Griseb.	annual	N	
Stellaria media (L.) Villars	annual	I	X
Stellaria nitens Nutt.	annual	N	X
Chenopodiaceae			
Atriplex argentea Nutt.	annual	N	
Atriplex semibaccata R. Br.	perennial	I	
Atriplex serenana A. Nels. var. serenana	annual	N	X
Atriplex suberecta I. Verd.	annual	I	
Bassia hyssopifolia (Pall.) Kuntze	annual	I	
Chenopodium berlandieri Moq.	annual	N	
Chenopodium californicum (S. Wats.) S. Wats.	perennial	N	X
Chenopodium murale L.	perennial	I	
Salsola tragus L.	annual	I	
Convolvulaceae			
Calystegia macrostegia (Greene) Brummitt	perenn. vine	N	
Convolvulus arvensis L.	perenn. vine	I	
Convolvulus simulans L.M. Perry	annual	N	X
Cressa truxillensis Kunth	perennial	N	
Cuscuta californica Hook. & Arn.	annual vine	N	
Crassulaceae			
Crassula connata (R. & P.) Berger	annual	N	
Dudleya lanceolata (Nutt.) Britt. & Rose	perennial	N	
Cucurbitaceae			
Cucurbita foetidissima Kunth	perenn. vine	N	
Marah macrocarpus (Greene) Greene	perenn. vine	N	
Euphorbiaceae			
Croton californicus Muell.-Arg.	perennial	N	
Croton setiger Hook.	annual	N	
Euphorbia albomarginata T. & G.	perennial	N	
Euphorbia maculata L. ?	annual	I	

Appendix B, continued

Euphorbia polycarpa Benth.	perennial	N	X
Ricinus communis L.	shrub (weak)	I	
Fabaceae			
Astragalus pomonensis M. E. Jones	perennial	N	X
Lotus purshianus (Benth.) Clem. & Clem.	annual	N	
Lotus scoparius (Nutt.) Ottley var. brevialatus Ottley	subshrub	N	
Lotus strigosus (Nutt.) Greene	annual	N	
Lupinus bicolor Lindl.	annual	N	
Lupinus succulentus Koch	annual	N	X
Lupinus truncatus H. & A.	annual	N	
Medicago polymorpha L.	annual	I	
Melilotus indicus (L.) All.	annual	I	X
Parkinsonia aculeata L.	tree	I	
Trifolium depauperatum Desv.	annual		X
Vicia villosa Roth	annual vine	I	
Fagaceae			
Quercus agrifolia Nee var. agrifolia	tree	N	
Frankeniaceae			
Frankenia salina (Molina) I.M. Johnston	subshrub	N	X
Geraniaceae			
Erodium botrys (Cav.) Bertol.	annual	I	X
Erodium cicutarium (L.) L'Her. ex Ait.	annual	I	
Erodium moschatum (L.) L'Her. ex Ait.	annual	I	
Hydrophyllaceae			
Eriodictyon crassifolium Benth.	shrub	N	
Eucrypta chrysanthemifolia (Benth.) Greene	annual	N	
Nemophila menziesii H. & A. ssp. integrifolia (Parish) Munz	annual	N	X
Phacelia cicutaria Greene var. hispida (Gray) J.T. Howell	annual	N	
Phacelia distans Benth.	annual	N	X
Phacelia minor (Harv.) Thell.	annual	N	X
Phacelia ramosissima Dougl. ex Lehm.	perennial	N	
Lamiaceae			
Lamium amplexicaule L.	annual	I	X
Lavandula		I	
Marrubium vulgare L.	perennial	I	
Salvia apiana Jeps.	shrub	N	
Salvia columbariae Benth.	annual	N	X
Salvia mellifera Greene	shrub	N	
Stachys		N	
Trichostema lanceolatum Benth.	annual	N	
Malvaceae			
Malacothamnus fasciculatus (Nutt.) Greene	shrub	N	
Malva parviflora L.	annual	I	
Malvella leprosa (Ort.) Krapov.	perennial	N	
Nyctaginaceae			
Mirabilis laevis (Benth.) Curran	perennial	N	
Onagraceae			
Camissonia hirtella?	annual	N	
Camissonia bistorta (Nutt. ex T. & G.) Raven	annual	N	

Appendix B, continued

Camissonia strigulosa (Fisch. & Mey.) Raven	annual	N	X
Clarkia purpurea (Curt.) A. Nels. & Macbr.	annual	N	
Epilobium brachycarpum C. Presl	annual	N	
Epilobium canum (Greene) Raven	perennial	N	
Oenothera elata Kunth	biennial	N	
Papaveraceae			
Platystemon californicus Benth.	annual	N	X
Plantaginaceae			
Plantago erecta Morris	annual	N	X
Plantago major L.	perennial	I	
Polemoniaceae			
Eriastrum sapphirinum (Eastw.) Mason	annual	N	X
Gilia angelensis V. Grant	annual	N	X
Linanthus dianthiflorus (Benth.) Greene	annual	N	X
Navarretia atractyloides (Benth.) H. & A.	annual	N	
Polygonaceae			
Chorizanthe coriacea Goodm.	annual	N	X
Chorizanthe fimbriata Nutt.	annual	N	
Chorizanthe parryi S. Wats. var. parryi	annual	N	X
Chorizanthe polygonoides var. longispina (Goodman) Munz	annual	N	X
Eriogonum fasciculatum Benth. var. foliolosum (Nutt.) S. Stokes ex Abrams	shrub	N	
Eriogonum fasciculatum Benth. var. polifolium (A. DC.) T. & G.	shrub	N	
Eriogonum gracile Benth.	annual	N	
Polygonum argyrocoleon Kunze	annual	I	
Polygonum aviculare L.	annual	I	
Pterostegia drymarioides F. & M.	annual	N	X
Rumex crispus L.	perennial	I	
Rumex salicifolius Weinm.	perennial	N	
Portulacaceae			
Calandrinia ciliata (R. & P.) DC.	annual	N	X
Claytonia parviflora Dougl. ex Hook.	annual	N	X
Portulaca oleracea L.	succ. annual	I	
Primulaceae			
Anagallis arvensis L.	annual	I	
Ranunculaceae			
Clematis pauciflora Nutt.	liana	N	X
Delphinium parryi Gray	perennial	N	
Rhamnaceae			
Rhamnus crocea Nutt.	shrub	N	X
Rosaceae			
Adenostoma fasciculatum H. & A.	shrub	N	
Rosa	shrub	I	
Rubiaceae			
Galium angustifolium Nutt. ex Gray	perennial	N	
Galium aparine L.	annual	I	
Salicaceae			
Populus fremontii S. Wats.	tree	N	
Salix exigua Nutt.	shrub	N	X

Appendix B, continued

Salix gooddingii Ball.	tree	N	
Salix laevigata Bebb	tree	N	X
Salix lasiolepis Benth.	shrub	N	
Saururaceae			
Anemopsis californica (Nutt.) H. & A.	perennial	N	
Scrophulariaceae			
Antirrhinum nuttallianum Benth.	perennial	N	
Castilleja exserta (Heller) Chuang & Heckard	annual	N	
Keckiella antirrhinoides (Benth.) Straw	shrub	N	
Mimulus aurantiacus Curtis var. puniceus (Nutt.) D. Thompson	shrub	N	
Mimulus pilosus (Benth.) S. Wats.	annual	N	
Penstemon spectabilis Thurb. ex Gray	perennial	N	X
Scrophularia californica Cham. & Schldl.	perennial	N	X
Veronica peregrina L.	annual	N	X
Solanaceae			
Datura wrightii Regel	perennial	N	X
Nicotiana glauca Grah.	shrub	I	
Solanum douglasii Dunal	perennial	N	
Solanum umbelliferum Eschsch.	perennial	N	
Tamaricaceae			
Tamarix ramosissima Ledeb.	shrub	I	
Urticaceae			
Hesperocnide tenella Torr.	annual	N	X
Urtica dioica L.	perennial	N	
Urtica urens L.	annual	I	X
Zygophyllaceae			
Tribulus terrestris L.	annual	I	
Cyperaceae			
Bolboschoenus maritimus (L.) Palla ssp. paludosus (A. Nels.) Koyama	perennial	N	
Cyperus eragrostis Lam. ?	perennial	N	
Juncaceae			
Juncus bufonius L.	annual	N	X
Liliaceae			
Calochortus splendens Dougl. ex Benth.	perennial	N	
Dichelostemma capitatum (Benth.) Alph. Wood	perennial	N	
Poaceae			
Avena barbata Brot.	annual	I	
Avena fatua L.	annual	I	
Bromus catharticus Vahl	perennial	I	
Bromus diandrus Roth	annual	I	
Bromus hordeaceus L.	annual	I	
Bromus rubens L.	annual	I	
Bromus tectorum L.	annual	I	
Crypsis schoenoides (L.) Lam.	annual	I	
Cynodon dactylon (L.) Pers.	perennial	I	
Deschampsia danthonioides (Trin.) Munro ex Benth.	annual	N	X
Distichlis spicata (L.) Greene	perennial	N	
Echinochloa crus-galli (L.) P. Beauv.	annual	I	

Appendix B, continued

Festuca microstachys Nutt. var. pauciflora Scribn. ex Beal	annual	N	X
Festuca myuros L.	annual	I	
Festuca octoflora Walt.	annual	N	X
Hordeum marinum Huds.	annual	I	
Hordeum murinum L.	annual	I	
Lamarckia aurea (L.) Moench	annual	I	
Leptochloa uninervia (Presl.) Hitchc. & Chase	annual	I	
Lolium perenne L.	annual	I	
Melica imperfecta Trin.	perennial	N	X
Phalaris minor Retz.	annual	I	
Poa secunda Presl.	perennial	N	
Polypogon monspeliensis (L.) Desf.	annual	I	
Schismus barbatus (L.) Thell.	annual	I	
Stipa coronata Thurb.	perennial	N	
Typhaceae			
Typha	perennial	N	

[1]N = Native; I = Introduced

[2] Voucher specimen collected and housed at University of California Riverside Herbarium

APPENDIX C

SOIL TYPES

Map Code	Name and Slope	Soil Type	Farmland Status
AuC	Auld clay, 2 to 8 percent slopes	Consociation	Prime farmland if irrigated
AuD	Auld clay, 8 to 15 percent slopes	Consociation	Not prime farmland
AyF	Auld cobbly clay, 8 to 50 percent slopes	Consociation	Not prime farmland
BfC	Bosanko clay, 2 to 8 percent slopes	Consociation	Farmland of statewide importance
BkC2	Buchenau silt loam, 2 to 8 percent slopes, eroded	Consociation	Farmland of statewide importance
BxC2	Buren loam, deep, 2 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated
CaC2	Cajalco fine sandy loam, 2 to 8 percent slopes, eroded	Consociation	Farmland of statewide importance
CaD2	Cajalco fine sandy loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland
CaF2	Cajalco fine sandy loam, 15 to 35 percent slopes, erode d	Consociation	Not prime farmland
CbD2	Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded	Complex	Not prime farmland
CbF2	Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded	Complex	Not prime farmland
Ce	Chino silt loam, drained	Consociation	Prime farmland if irrigated and drained
Cf	Chino silt loam, drained, saline-alkali	Consociation	Farmland of statewide importance
ChC	Cieneba sandy loam, 5 to 8 percent slopes	Consociation	Not prime farmland
ChD2	Cieneba sandy loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded	Consociation	Not prime farmland
CkD2	Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded	Complex	Not prime farmland

Map Code	Name and Slope	Soil Type	Farmland Status
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, erod ed	Complex	Not prime farmland
Ds2	Domino fine sandy loam, eroded	Consociation	Farmland of statewide importance
Dt	Domino fine sandy loam, saline-alkali	Consociation	Farmland of statewide importance
Du	Domino silt loam	Consociation	Farmland of statewide importance
Dv	Domino silt loam, saline-alkali	Consociation	Farmland of statewide importance
Dw	Domino silt loam, strongly saline-alkali	Consociation	Not prime farmland
EcC2	Escondido fine sandy loam, 2 to 8 percent slopes, erode d	Consociation	Farmland of statewide importance
EcD2	Escondido fine sandy loam, 8 to 15 percent slopes, erod ed	Consociation	Not prime farmland
EcE2	Escondido fine sandy loam, 15 to 25 percent slopes, ero ded	Consociation	Not prime farmland
EfF2	Escondido rocky fine sandy loam, 8 to 50 percent slopes , eroded	Complex	Not prime farmland
EnA	Exeter sandy loam, 0 to 2 percent slopes	Consociation	Farmland of statewide importance
EnC2	Exeter sandy loam, 2 to 8 percent slopes, eroded	Consociation	Farmland of statewide importance
EoB	Exeter sandy loam, slightly saline-alkali, 0 to 5 perce nt slopes	Consociation	Farmland of statewide importance
EpA	Exeter sandy loam, deep, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
EwB	Exeter very fine sandy loam, 0 to 5 percent slopes	Consociation	Farmland of statewide importance
FaD2	Fallbrook sandy loam, 8 to 15 percent slopes, eroded	Consociation	Farmland of statewide importance
FfC2	Fallbrook fine sandy loam, 2 to 8 percent slopes, erode d	Consociation	Farmland of statewide importance

Map Code	Name and Slope	Soil Type	Farmland Status
FkD2	Fallbrook fine sandy loam, shallow, 8 to 15 percent slo pes, eroded	Consociation	Not prime farmland
FwE2	Friant fine sandy loam, 5 to 25 percent slopes, eroded	Consociation	Not prime farmland
FyE2	Friant rocky fine sandy loam, 8 to 25 percent slopes, e roded	Complex	Not prime farmland
GaA	Garretson very fine sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
GaC	Garretson very fine sandy loam, 2 to 8 percent slopes	Consociation	Prime farmland if irrigated
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	Consociation	Prime farmland if irrigated and drained
GvB	Grangeville fine sandy loam, saline-alkali, 0 to 5 perc ent slopes	Consociation	Farmland of statewide importance
GyA	Greenfield sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
GyC2	Greenfield sandy loam, 2 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated
GyD2	Greenfield sandy loam, 8 to 15 percent slopes, eroded	Consociation	Farmland of statewide importance
HcA	Hanford coarse sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	Consociation	Prime farmland if irrigated
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, erod ed	Consociation	Farmland of statewide importance
HgA	Hanford fine sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
HnC	Honcut sandy loam, 2 to 8 percent slopes	Consociation	Prime farmland if irrigated

Map Code	Name and Slope	Soil Type	Farmland Status
HuC2	Honcut loam, 2 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated
LaC	Las Posas loam, 2 to 8 percent slopes	Consociation	Farmland of statewide importance
LaC2	Las Posas loam, 5 to 8 percent slopes, eroded	Consociation	Farmland of statewide importance
LaD2	Las Posas loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland
LaE3	Las Posas loam, 8 to 25 percent slopes, severely eroded	Consociation	Not prime farmland
LkF3	Las Posas rocky loam, 15 to 50 percent slopes, severely eroded	Complex	Not prime farmland
LoF2	Lodo gravelly loam, 15 to 50 percent slopes, eroded	Consociation	Not prime farmland
LpE2	Lodo rocky loam, 8 to 25 percent slopes, eroded	Complex	Not prime farmland
LpF2	Lodo rocky loam, 25 to 50 percent slopes, eroded	Consociation	Not prime farmland
MmB	Monserate sandy loam, 0 to 5 percent slopes	Consociation	Farmland of statewide importance
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	Consociation	Farmland of statewide importance
MmD2	Monserate sandy loam, 8 to 15 percent slopes, eroded	Consociation	Farmland of statewide importance
MnD2	Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded	Consociation	Not prime farmland
PaA	Pachappa fine sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
PaC2	Pachappa fine sandy loam, 2 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated
PoC	Porterville clay, 0 to 8 percent slopes	Consociation	Prime farmland if irrigated
PsC	Porterville clay, moderately deep, 2 to 8 percent slope s	Consociation	Farmland of statewide importance

Map Code	Name and Slope	Soil Type	Farmland Status
PtB	Porterville clay, moderately deep, slightly saline-alka li, 0 to 5 percent slopes	Consociation	Farmland of statewide importance
PvD2	Porterville gravelly clay, moderately deep, 2 to 15 per cent slopes, eroded	Consociation	Farmland of statewide importance
RaA	Ramona sandy loam, 0 to 2 percent slopes	Consociation	Prime farmland if irrigated
RaB2	Ramona sandy loam, 2 to 5 percent slopes, eroded	Consociation	Prime farmland if irrigated
RaB3	Ramona sandy loam, 0 to 5 percent slopes, severely erod ed	Consociation	Prime farmland if irrigated
RaC2	Ramona sandy loam, 5 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated
RtF	Rockland	Consociation	Not prime farmland
VaE3	Vallecitos loam, 8 to 25 percent slopes, severely erode d	Consociation	Not prime farmland
VeC2	Vallecitos loam, thick solum variant, 2 to 8 percent sl opes, eroded	Consociation	Prime farmland if irrigated
VeD2	Vallecitos loam, thick solum variant, 8 to 15 percent s lopes, eroded	Consociation	Not prime farmland
VsC	Vista coarse sandy loam, 2 to 8 percent slopes	Consociation	Farmland of statewide importance
VsD2	Vista coarse sandy loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland
VtF2	Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded	Complex	Not prime farmland
Wg	Willows silty clay, saline-alkali	Consociation	Farmland of statewide importance
WxD2	Wyman fine sandy loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland
WyC2	Wyman loam, 2 to 8 percent slopes, eroded	Consociation	Prime farmland if irrigated

Map Code	Name and Slope	Soil Type	Farmland Status
YbC	Yokohl loam, 2 to 8 percent slopes	Consociation	Not prime farmland
YbD2	Yokohl loam, 8 to 15 percent slopes, eroded	Consociation	Not prime farmland

Wet Season Fairy Shrimp Survey Report for the Valley South 115 kV Subtransmission Line Project Riverside County, California

July 2013

Prepared for: TRC Solutions, Inc.
123 Technology Drive West
Irvine, CA 92618
Contact: Mr. John Lovio
Tel: (858) 505-8881
JLovio@trcsolutions.com

Prepared by: Cardno TEC
514 Via De La Valle, Suite 308
Solana Beach, CA 92075
Contact: Mr. Richard Stolpe
Tel: (858) 509-3157
Richard.Stolpe@cardnotec.com

WET SEASON FAIRY SHRIMP SURVEY REPORT FOR THE VALLEY SOUTH 115 KV SUBTRANSMISSION LINE PROJECT RIVERSIDE COUNTY, CALIFORNIA

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APPENDICES

1.0 INTRODUCTION

Cardno TEC was contracted by TRC Solutions, Inc. (TRC) to conduct United States Fish and Wildlife Service (USFWS) protocol surveys for listed vernal pool branchiopods within the Valley South Subtransmission Project Area (project area) during the 2012-2013 wet and dry seasons. This Wet Season Fairy Shrimp Survey Report describes the activities performed by Cardno TEC and provides the results of the 2012-2013 wet season fairy shrimp surveys in the project area.

2.0 PROJECT AREA

The project area includes all lands within a 500-foot (152-meter [m]) wide survey corridor and a 150-foot (46-m) impact corridor (most of which is nested within the 500-foot survey corridor, except for several locations where outlying staging yards and pull and tension sites occur beyond the 500 feet) along a proposed 18-mile (29-kilometer) electrical subtransmission line corridor in the vicinity of the cities of Murrieta, Menifee, and Winchester, within Riverside County, California (Figure 1). The project area is approximately 1,118 acres (452 hectares) in size.

For the purpose of these fairy shrimp surveys (both wet and dry season), the survey area includes only those lands within the project area that are publicly accessible. Private inaccessible lands (e.g. behind property fence lines) that occur within the project area were not surveyed.

3.0 BACKGROUND

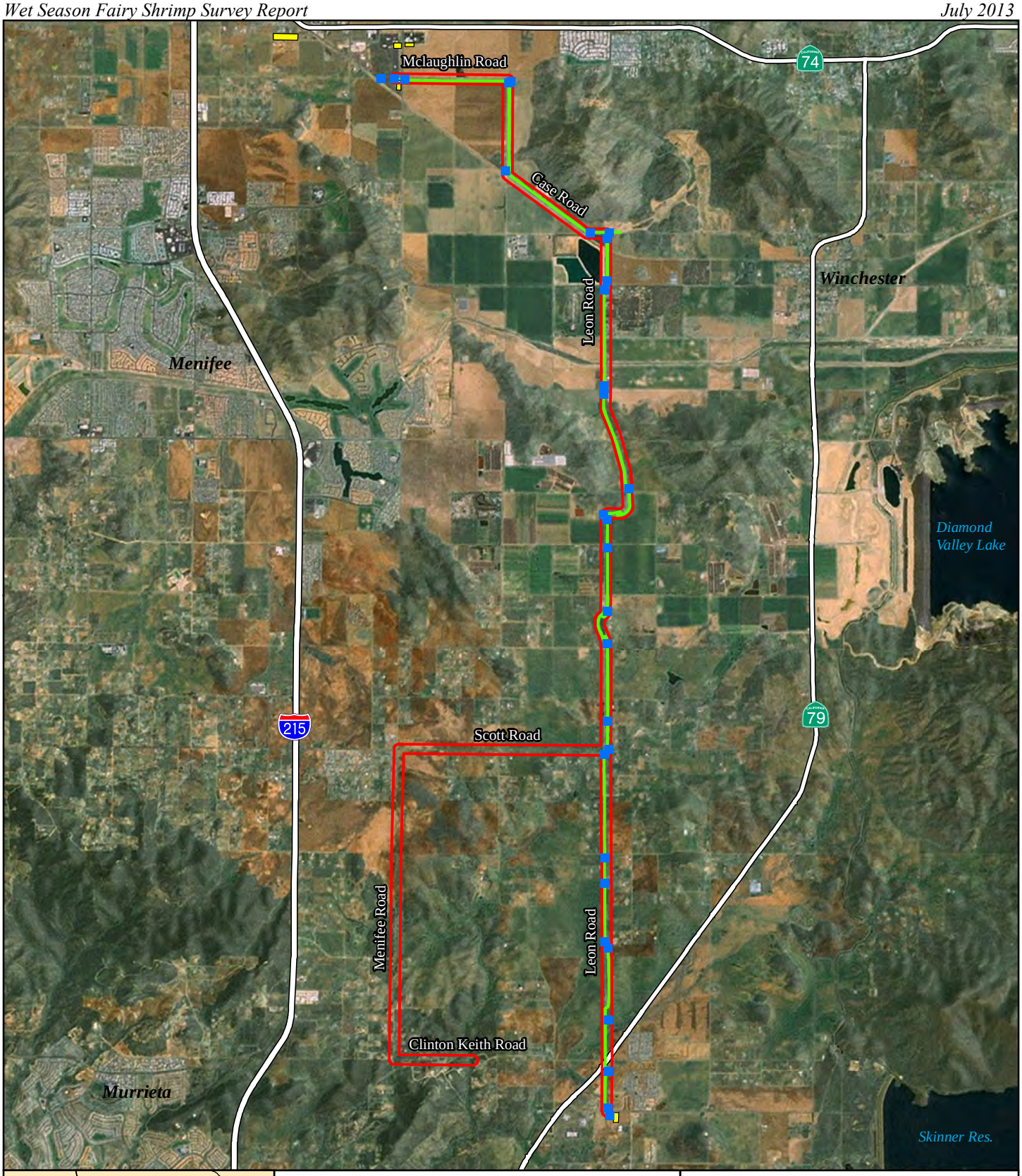
Potential vernal pool branchiopod habitat within most of the project area has not been previously delineated. Similarly, no previous fairy shrimp surveys have been conducted in the project area as part of this project. According to the California Natural Diversity Database (CNDDB), Riverside fairy shrimp (*Streptocephalus woottoni*) and vernal pool fairy shrimp (*Branchinecta lynchi*) are the only federally-listed fairy shrimp species known to occur in the vicinity of the project area (CNDDB 2013) (Appendix A). California does not list any branchiopod species under the California Endangered Species Act.

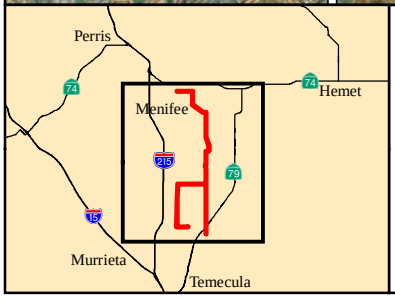
The closest occurrence of Riverside fairy shrimp to the project area was reported in 2002, northeast of the intersection of Scott Road and Menifee Road, within the project area (Figure 2). The closest occurrence of vernal pool fairy shrimp to the project area was reported in 2005, approximately 4 miles (6.4 kilometers) east-northeast of the project area (Figure 2). Figure 2 shows the locations of all other reported occurrences of Riverside and vernal pool fairy shrimp in the vicinity of the project area (CNDDB 2013). Federally-listed fairy shrimp species known to occur within or near the project area are provided in Table 1.

Table 1. Listed Fairy Shrimp Species Known to Occur Within or Near the Project Area

Scientific Name	*Common Name*	*Federal Status*
Branchinecta lynchi	Vernal Pool Fairy Shrimp	Threatened
Streptocephalus woottoni	Riverside Fairy Shrimp	Endangered

Source: CNDDB 2012



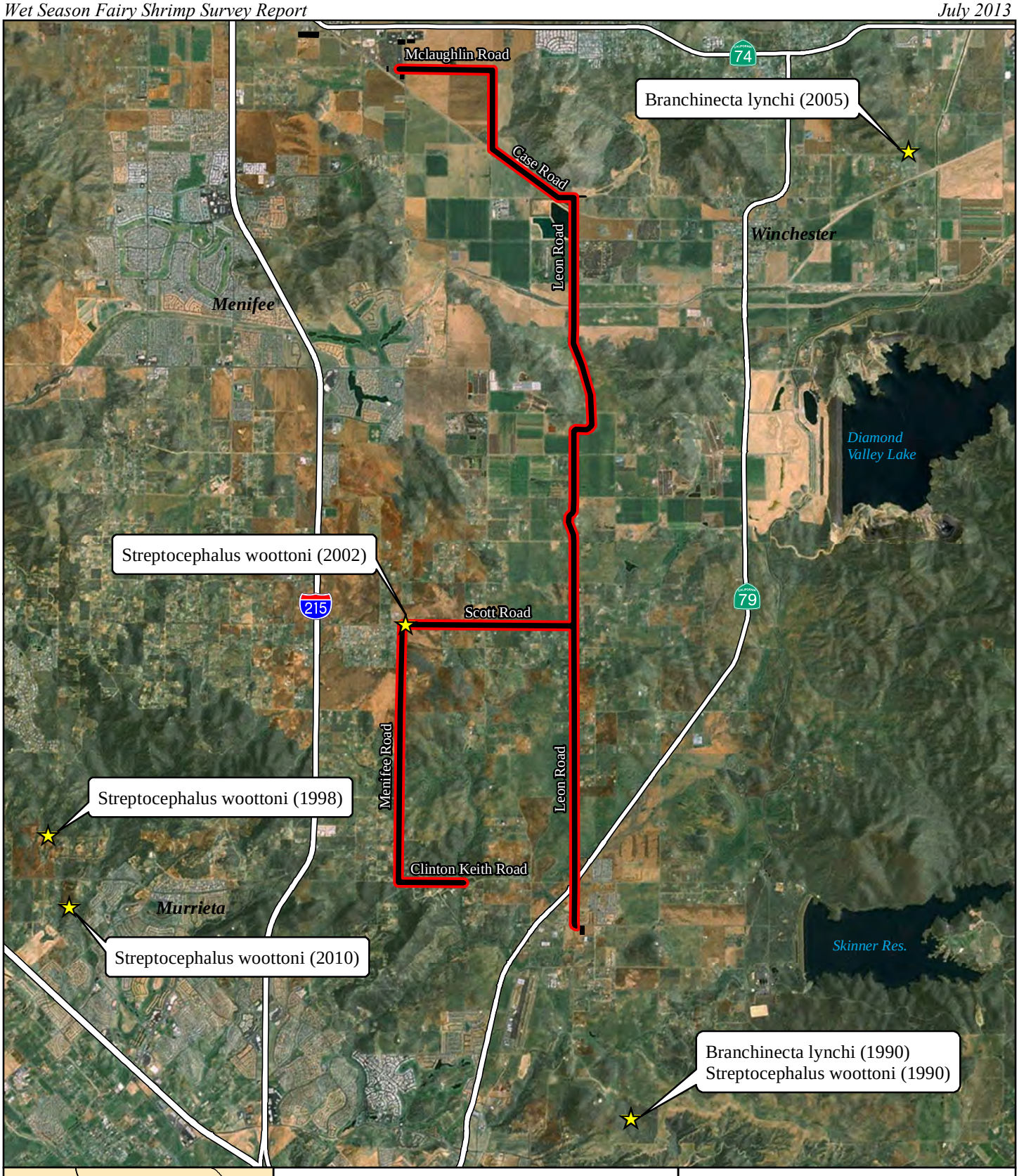


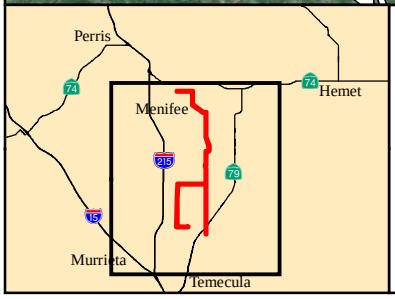
Legend

- Alternatives 1 and 2 Buffer (250')
- Road Pavement Edge Buffer (150')
- Potential Staging Area
- Pull Tension Site

Figure 1
Project Area and Project Features

0 1 2 Miles
0 1 2 Kilometers





Legend

- Alternatives 1 and 2 Buffer (250')
- Electrical Subtransmission Line Corridor
- CNDDB

Figure 2
CNDDB Results in the Vicinity of the Project Area

0 1 2 Miles
0 1 2 Kilometers

Source: CNDDB 2013

4.0 SURVEY METHODS

4.1 WET SEASON SURVEY PROTOCOL

Wet season fairy shrimp surveys were conducted according to the *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (USFWS 1996). Surveys were conducted by USFWS permitted fairy shrimp and vernal pool biologists Richard Stolpe (Permit TE-25864A-0) and Clint Scheuerman (Permit TE-44855A-0). For the purposes of this survey, all basins observed to be ponding ≥3 centimeters (cm) (1.2 inches [in]) of water were assumed to be potential fairy shrimp habitat. These basins were documented and mapped in the field using a Trimble Nomad® global positioning system (GPS) unit with a sub-meter level accuracy Hemisphere® receiver. Potential vernal basins were re-visited for the duration of the wet season until they were confirmed or dismissed as potential fairy shrimp habitat per the definitions and protocol survey guidelines (able to pond ≥3 cm [1.2 in] of water) (USFWS 1996). A total of 69 potential vernal basins were identified and delineated by GPS within the project area.

4.2 2012-2013 WET SEASON RAINFALL DATA

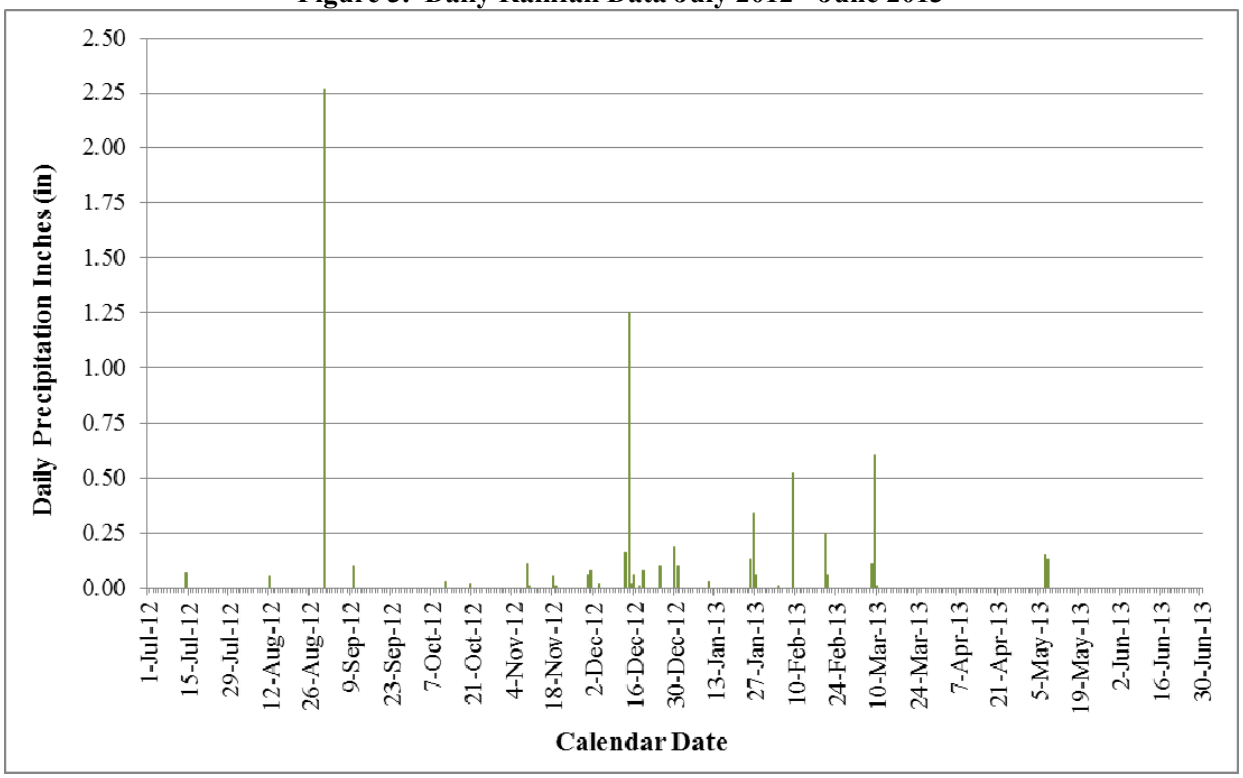
Wet season sampling occurred during winter of 2012 and spring of 2013 following significant rainfall events. Surveys were initiated on 27 December 2012 (Table 2). Daily rainfall data for the project area between 1 July 2012 and 30 June 2013 are shown in Figure 3. Rainfall totals in the vicinity of the project area for the 2012-2013 rainfall season were 64 percent of historical annual average (Figure 4). During the wet season, all basins were surveyed approximately once every two weeks and/or after significant rain events until basins were no longer inundated or until they were inundated for more than 120 days [Note: no basins in the project area were inundated for more than 120 days]. Surveys of individual basins that had dried out were reinitiated if they refilled to 3 cm (1.2 in) or more. No significant rainfall has occurred in the project area since 8 March (0.60 in [1.5 cm]), and given historical trends for rainfall at this location, the protocol wet-season survey is considered complete as of the end of March 2013.

Table 2. Ponded Basin Survey Log and Fairy Shrimp Presence

Basin ID	*Dec. 27*	*Jan. 4*	*Jan. 18*	*Jan. 30*	*Feb. 13*	*Feb. 26*	*Mar. 13*	*Mar. 28*
1	-	5	0	6	4	3	5.5	0
2	-	3	0	0	0	0	0	0
3	-	6	0	7	0	0	0	0
4	-	4	0	4.5	7	1	6	0
5	-	6	0	6	5	7	0	0
6	5	7	0	9	7.5	0	6	0
7	14	14	0	12	13	6	6.5	0
8	-	4	0	8	0	0	2	0
9	-	4	0	3	0	0	0	0
10	-	3	0	3	1	0	0	0
11	-	5	0	2	0	0	0	0
12	5	5	0	4	4	2	2.5	0
13	-	4	0	3.5	1	0	2	0
14	8	8	2.5	6	10	6	8	0
15	-	3	0	2	0	0	1	0
16	-	3	0	1	0	0	0	0
17	-	4	0	2	0	-	0	0
18	9	7	0	9	6	3	5	0
19	5	3	0	2.5	0.5	0	0	0
20	8	3	0	4.5	3	0	0	0
21	6	4	0	0	0	0	0	0
22	-	4	0	4	5	6	7	0
23	-	5	0	6	8	6	5	0
24	-	7	0	9	8	7	9	0
25	7	8	0	8	4	4	7	0
26	-	3	0	3	0	0	1	0
27	-	3	0	3	0	0	0	0
28	25	20	45	45	28	19	38	6
29	-	3	0	9	7	4	8	0
30	-	6	1.5	9	8	5	5	0
31	-	3	0	0	0	0	0	0
32	-	3	0	7	0	4	7	0
33	-	8	0	7	6	4	6	0
34	-	3	0	3	3.5	3	0	0
35	-	-	0	0	0	0	0	0
36	-	8	0	11	15	12	9	0
37	-	7	0	19	8	14	11	0
38	-	3	0	0	0	0	5	0
39	-	3	0	0	0	0	7	0
40	-	4	0	9	7	0	3	0
41	-	5	0	4	0	0	0	0
42	8	3	0	0	0	0	0	0
43	-	7	0	14	6	10	18	0
44	-	8	0	7	0	0	8	0
45	-	6	0	4	0	0	6	0
46	-	15	0	9	3	4	13	0
47	-	3	0	7	0	0	0	0
48	9	3	0	5	5	0	0	0
49	9	14	0	8	3.5	7	15	0
50	-	9	0	5	6	3	8	0
51	-	8	0	6	0	0	0	0
52	1	-	0	0	0	0	0	0
53	4	-	0	0	0	0	0	0
54	2	-	0	0.5	0	0	0	0
55	3	-	0	1	0	0	0	0
56	4	-	0	0	0	0	0	0
57	4	-	0	0	0	0	0	0
58	3	-	0	1	-	-	-	0
59	3	-	-	6	0	4	5.5	0
60	3	-	-	3.5	0	0	1	0
61	-	-	-	3	0	1	2	0
62	-	-	-	11	5	4	3	0
63	-	-	-	9.5	1	3	0	0
64	-	-	-	-	4.5	3	2	0
65	-	-	-	-	6	9	8	0
66	-	-	-	-	-	-	14	0
67	-	-	-	-	-	-	3	0
68	-	-	-	-	-	-	6	0
69	-	-	-	-	-	-	6	0
Scott & Menifee Rd.	0	0	0	0	0	0	0	0

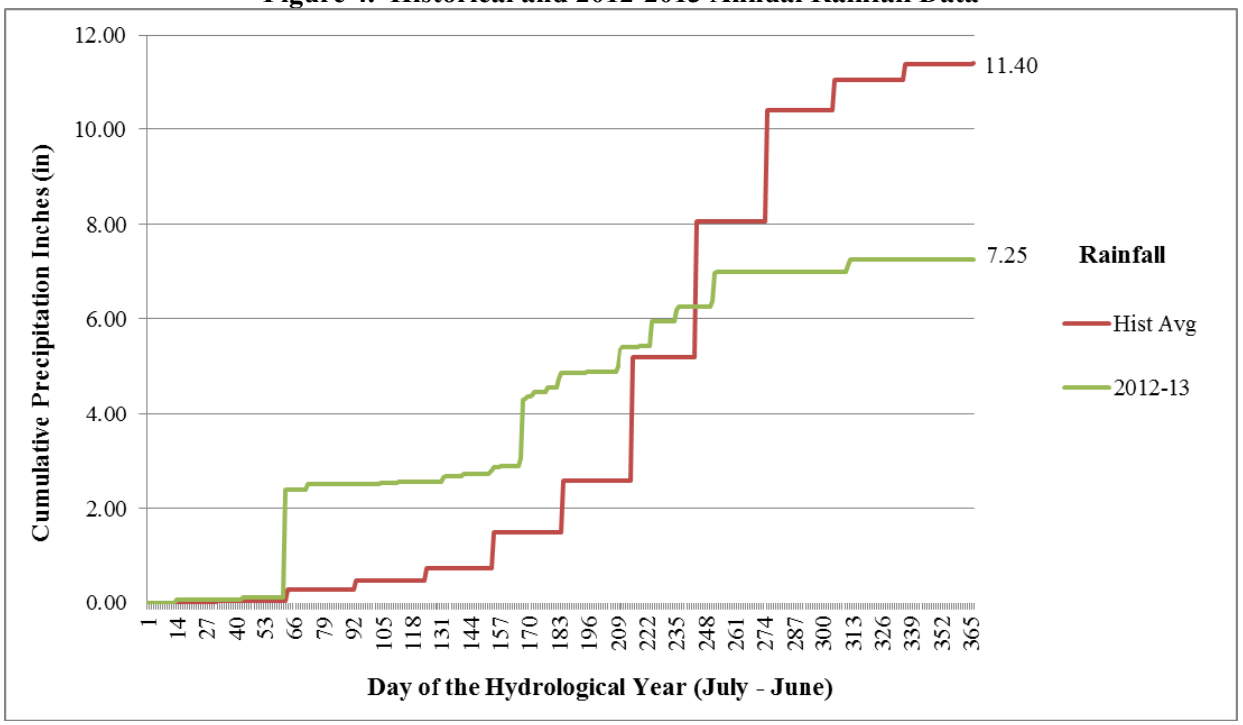
Note: Fairy shrimp population estimates by color: 1-99; 100-999; 1,000-9,999; >10,000. Numbers in columns indicate the depth of ponding in basins in centimeters at the time of survey. All fairy shrimp observed during wet season surveys were the non-listed versatile fairy shrimp.

Figure 3. Daily Rainfall Data July 2012 - June 2013



Source: Intellicast (2013) and Wunderground (2013).

Figure 4. Historical and 2012-2013 Annual Rainfall Data



Source: Intellicast (2013) and Wunderground (2013).

4.3 WET SEASON SAMPLING

During each site visit, basin bottoms, edges, and vertical water columns were sampled using an aquarium net with mesh size no larger than 0.125 (1/8) in (0.318 cm). A total of 69 basins were sampled during wet season surveys. Specimens collected from each pool numbered less than the maximum of 20 specimens and/or less than 10 percent of the estimated population per survey protocol guidelines (USFWS 1996). Only sexually mature individuals were collected for laboratory identification.

Fairy shrimp specimens collected were identified to the species level in a lab using a dissecting microscope. In the event that a federally-listed fairy shrimp were recovered from any of the basins during the wet season sampling, the fairy shrimp survey for that basin would have been considered complete under the survey protocol guidelines (USFWS 1996).

5.0 RESULTS

No federally-listed fairy shrimp were observed in any of the basins during wet season sampling.

In general, the quality of basins within the project area is very low. All basins are highly disturbed by activities associated with being located within or adjacent to paved and unpaved roads. All basins show signs of disturbance by tire ruts, grading, or dumping (litter and large discarded items such as mattresses and electronics). There were no state- or federally-listed vernal pool indicator floral species observed in any of the basins.

Twelve basins contained fairy shrimp: all were identified as the non-listed "versatile" or "Lindahl" fairy shrimp (*Branchinecta lindahli*). Six of the twelve basins were observed to host estimated populations greater than 1,000 individuals. One of those six basins was observed on multiple occasions to host an estimated population greater than 10,000 individuals. A list of the 69 vernal basins identified within the project area is provided in Table 2. Complete wet season survey results and accompanying maps are provided in Appendix B. As a result of the variation in timing and amount of precipitation during rain events, some basins were identified and added to the survey as additional rainfall exposed their presence. Therefore, some basins were visited more times than others. Photographs of all surveyed basins are provided in Appendix C.

In addition to regular sampling of basins in the project area, the location of reported Riverside fairy shrimp cysts observed in 2002 at the corner of Scott Road and Menifee Road (CNDDB 2013) was inspected during every site visit. It appears that this area likely undergoes regular disking of the soil and is highly disturbed. No ponding was observed in this area, and it appears that this area no longer has vernal pool characteristics that would support Riverside fairy shrimp. This location will also be analyzed during dry season surveys.

6.0 DISCUSSION

No federally-listed fairy shrimp species were observed in the surveyed portions of the project area during 2012-2013 wet season surveys. Precipitation during the 2012-2013 rainfall season was below average. Wetter years have the potential to reveal additional ponded basins, eliminate others from this list, and/or affect the hatching (e.g. timing, location, population) of fairy shrimp. The exceedingly low quality and high degree of disturbance of the basins within the survey area, coupled with the results of 2012-2013 wet season surveys, make the presence of listed fairy shrimp species unlikely. Dry season sampling will be conducted in each of the basins listed in Table 2 to confirm the wet season sampling results.

7.0 REFERENCES

CNDDB. 2013. California Natural Diversity Database Query Search. California Department of Fish and Game. Available at: https://nrm.dfg.ca.gov/cnddb/view/query.aspx.

Intellicast. 2013. Intellicast Weather. Search parameters: historical monthly averages for "Menifee CA.". Available at: http://www.intellicast.com/Local/History.aspx?location=USCA0692. Accessed: 13 June.

USFWS. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods. 19 April.

Wunderground. 2013. Weather Underground. Search parameters: daily weather data for "Menifee" and "Romoland" CA. from July 1, 2012 to June 30, 2013. Results shown for Riverside airport KRIV. Available at: http://www.wunderground.com/history/airport/KRIV/2012/7/1/MonthlyHistory.html. Accessed: 13 June.

APPENDIX A

CNDDB Reports in the Vicinity of the Project Area

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 64110
EO Index: 64205
Key Quad: Winchester (3311761)
Element Code: ICBRA03030
Occurrence Number: 396
Occurrence Last Updated: 2006-03-01

Scientific Name: *Branchinecta lynchi*
Common Name: vernal pool fairy shrimp

Listing Status: **Federal:** Threatened
State: None
Rare Plant Rank:
Other Lists: IUCN_VU-Vulnerable

CNDDB Element Ranks: **Global:** G3
State: S2S3

General Habitat:

ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro Habitat:

INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Last Date Observed: 2005-01-25
Occurrence Type: Natural/Native occurrence
Last Survey Date: 2005-01-25
Occurrence Rank: Good
Owner/Manager: PVT
Trend: Unknown
Presence: Presumed Extant

Location:

JUST WEST OF CALIFORNIA AVENUE, 1 MILE NORTH OF SIMPSON ROAD, 3.25 MILES SE OF HOMELAND

Detailed Location:

Ecological:

HABITAT CONSISTS OF A GRASSLAND VERNAL POOL, ALSO CONTAINING NAVARRETIA FOSSALIS, MYOSURUS MINIMUS, AND BRANCHINECTA LINDAHLI. SHEEP GRAZING OBSERVED DURING MAY 2005.

Threats:

THREATENED BY ADJACENT DEVELOPMENT THAT MAY IMPACT THE HYDROLOGY OF THE POOL.

General:

4 ADULTS OBSERVED ON 25 JAN 2005.

PLSS: T05S, R02W, Sec. 23 (S)
Accuracy: 80 meters
Area (acres): 0
UTM: Zone-11 N3731425 E495192
Latitude/Longitude: 33.72282 / -117.05189
Elevation (feet): 1,500

County Summary:

Riverside

Quad Summary:

Winchester (3311761)

Sources:

ALL05F0006 ALLEN, L. (CH2M HILL) - FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI 2005-09-18

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 47233
EO Index: 57829
Key Quad: Romoland (3311762)
Element Code: ICBRA07010
Occurrence Number: 24
Occurrence Last Updated: 2004-11-01

Scientific Name: *Streptocephalus woottoni*
Common Name: Riverside fairy shrimp

Listing Status: **Federal:** Endangered
State: None
Rare Plant Rank:
Other Lists: IUCN_EN-Endangered

CNDDB Element Ranks: **Global:** G1
State: S1

General Habitat:

ENDEMIC TO W RIV, ORA & SDG COUNTIES IN AREAS OF TECTONIC SWALES/EARTH SLUMP BASINS IN GRASSLAND & COASTAL SAGE SCRUB.

Micro Habitat:

INHABIT SEASONALLY ASTATIC POOLS FILLED BY WINTER/SPRING RAINS. HATCH IN WARM WATER LATER IN THE SEASON.

Last Date Observed: 2002-06-08
Occurrence Type: Natural/Native occurrence
Last Survey Date: 2002-06-08
Occurrence Rank: Good
Owner/Manager: PVT
Trend: Unknown
Presence: Presumed Extant

Location:

IMMEDIATELY NORTHEAST OF INTERSECTION OF MENIFEE AND SCOTT ROADS, 1.2 AIR MILES SOUTH OF BELL MOUNTAIN, NEAR MENIFEE.

Detailed Location:

IN A VERNAL POOL IN AN AGRICULTURAL FIELD.

Ecological:

BASIN IS DOMINATED BY EPILOBIUM PYGMAEUS, ELEOCHARIS GENICULATA, POLYGONUM ARENARIUM, NAVARRETIA FOSSALIS. OTHER ASSOCIATES INCLUDE LYTHRUM HYSSOPIFOLIUM, CRYPSIS SCHOENOIDES.

Threats:

DISTURBED BY TILLING ASSOCIATED WITH FARMING. POSSIBLY THREATENED BY FUTURE DEVELOPMENT OF SITE.

General:

SEVERAL S. WOOTTONI CYSTS TAKEN FROM DRY SEASON SOIL SAMPLES; 4 FROM SAMPLE 2.1, 1 FROM SAMPLE 3.2, AND 1 FROM SAMPLE 8.1. ECOLOGICAL AND THREAT INFORMATION TAKEN FROM DATA FOR OCCURRENCE 31 OF ORCUTTIA CALIFORNICA.

PLSS: T06S, R03W, Sec. 13 (S)
Accuracy: specific area
Area (acres): 1
UTM: Zone-11 N3722453 E485799
Latitude/Longitude: 33.64182 / -117.15314
Elevation (feet): 1,485

County Summary:	Quad Summary:
Riverside	Romoland (3311762)

Sources:

HEL02R0001 HELIX ENVIRONMENTAL PLANNING, INC. - 2002 ANNUAL REPORT, USFWS PROTOCOL LEVEL, DRY SEASON SURVEY FOR SAN DIEGO AND RIVERSIDE FAIRY SHRIMP (BRANCHINECTA SANDIEGONENSIS AND STREPTOCEPHALUS WOOTTONI). 2002-06-20

APPENDIX B

Wet Season Survey Results

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
1	33.591100	-117.118579	18.4	6.9	3.8	dirt road rut	1	12/27/2012	5	N/A	dry	none	N/A
							2	1/4/2013	3	2	5	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
2	33.597712	-117.118260	15.7	5.7	3.7	dirt road rut	1	12/27/2012	5	N/A	dry	none	N/A
							2	1/4/2013	3	2	3	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
3	33.597772	-117.118293	7.9	3.4	3.0	dirt road rut	1	12/27/2012	6	N/A	dry	none	N/A
							2	1/4/2013	3	2	6	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	14	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
4	33.597772	-117.118219	67.4	17.5	9.2	dirt road rut	1	12/27/2012	7	N/A	dry	none	N/A
							2	1/4/2013	3	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	4.5	none	N/A
							5	2/13/2013	20	15	7	none	N/A
							6	2/26/2013	22	19	1	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
5	33.597634	-117.117896	20.7	6.5	4.6	dirt road rut	1	12/27/2012	8	N/A	dry	none	N/A
							2	1/4/2013	4	2	6	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	14	5	none	N/A
							6	2/26/2013	22	16	7	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
6	33.615174	-117.118793	66.1	19.0	5.1	dirt road rut	1	12/27/2012	8	5	5	none	N/A
							2	1/4/2013	4	2	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	9	none	N/A
							5	2/13/2013	20	14	8	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
7	33.619680	-117.118996	48.3	20.7	4.5	dirt road rut	1	12/27/2012	12	5	14	none	N/A
							2	1/4/2013	4	1	14	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	12	none	N/A
							5	2/13/2013	20	12	13	none	N/A
							6	2/26/2013	22	12	6	none	N/A
							7	3/13/2013	29	15	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
8	33.619680	-117.118842	4.7	2.9	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	4	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	8	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
9	33.619734	-117.118905	5.1	2.7	2.5	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	5	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
10	33.619779	-117.118947	9.5	3.9	3.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	6	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	16	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
11	33.626831	-117.119038	65.4	15.8	7.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	7	3	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
12	33.638119	-117.119136	20.8	5.7	4.6	dirt road rut	1	12/27/2012	12	7	5	none	N/A
							2	1/4/2013	7	3	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	14	4	none	N/A
							6	2/26/2013	22	15	2	none	N/A
							7	3/13/2013	29	16	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
13	33.638969	-117.119146	16.8	9.0	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	7	3	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3.5	none	N/A
							5	2/13/2013	20	15	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
14	33.641958	-117.119193	83.4	22.7	5.2	dirt road rut	1	12/27/2012	12	8	8	none	N/A
							2	1/4/2013	8	3	8	VFS (3M, 4F)	100s
							3	1/18/2013	12	10	3	none	N/A
							4	1/30/2013	19	12	6	juveniles not collected	100s
							5	2/13/2013	20	13	10	VFS (7M, 1F)	100s
							6	2/26/2013	22	15	6	VFS (1M, 1F)	10s
							7	3/13/2013	29	22	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
15	33.641849	-117.119283	11.3	4.1	4.0	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	8	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
16	33.641822	-117.119203	5.2	3.4	2.1	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	9	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
17	33.641771	-117.119190	2.6	2.0	1.8	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	9	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
18	33.641699	-117.119252	31.3	10.9	8.6	dirt road rut	1	12/27/2012	12	6	9	none	N/A
							2	1/4/2013	9	4	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	16	3	none	N/A
							7	3/13/2013	29	22	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
19	33.641506	-117.119221	12.7	6.5	4.8	road rut, partially on asphalt	1	12/27/2012	12	6	5	none	N/A
							2	1/4/2013	9	4	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	12	3	none	N/A
							5	2/13/2013	20	17	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
20	33.641543	-117.119058	6.5	3.2	3.1	road rut, partially on asphalt	1	12/27/2012	12	9	8	none	N/A
							2	1/4/2013	10	4	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	4	none	N/A
							5	2/13/2013	20	16	3	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
21	33.642241	-117.119191	4.7	3.0	2.0	dirt road rut	1	12/27/2012	12	7	6	none	N/A
							2	1/4/2013	11	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
22	33.648904	-117.119324	19.6	7.0	5.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	11	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	19	6	none	N/A
							7	3/13/2013	29	21	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
23	33.648904	-117.119401	24.5	10.5	6.6	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	11	4	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	6	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	15	6	none	N/A
							7	3/13/2013	29	19	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
24	33.664914	-117.119400	22.0	11.9	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	12	5	7	VFS (1M, 4F)	100s
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	8	juveniles not collected	1,000s
							5	2/13/2013	20	14	8	none	N/A
							6	2/26/2013	22	14	7	none	N/A
							7	3/13/2013	29	19	9	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
25	33.665033	-117.119408	22.2	9.9	3.3	dirt road rut	1	12/27/2012	15	6	7	VFS (7M, 4F)	100s
							2	1/4/2013	13	4	8	VFS (4M, 5F)	100s
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	8	none	N/A
							5	2/13/2013	20	15	4	none	N/A
							6	2/26/2013	22	15	4	none	N/A
							7	3/13/2013	29	19	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
26	33.670179	-117.119468	25.0	12.8	2.3	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
27	33.670342	-117.119342	8.3	5.1	2.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
28	33.694669	-117.120111	1,439.6	51.2	47.3	large basin in disturbed field	1	12/27/2012	11	6	25	VFS (2M, 1F)	100s
							2	1/4/2013	13	5	20	none	N/A
							3	1/18/2013	12	6	40	VFS (11M, 8F)	1,000s
							4	1/30/2013	19	12	40	VFS (4M, 2F)	1,000s
							5	2/13/2013	20	14	28	VFS (9M, 6F)	1,000s
							6	2/26/2013	22	16	19	VFS (12M, 2F)	10,000s
							7	3/13/2013	29	20	38	VFS (1M, 2F)	100,000s
							8	3/28/2013	25	22	6	none	N/A
29	33.699541	-117.119573	31.8	12.2	11.7	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	6	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	9	none	N/A
							5	2/13/2013	20	15	7	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	20	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
30	33.700257	-117.119747	69.0	30.5	3.8	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	6	6	none	N/A
							3	1/18/2013	12	8	4	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	16	5	VFS (1M)	1 individual, identified in-field
							7	3/13/2013	29	20	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
31	33.701908	-117.119776	35.2	12.0	3.9	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
32	33.712167	-117.119699	7.3	3.5	2.8	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	14	4	none	N/A
							7	3/13/2013	29	19	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
33	33.715943	-117.125766	77.3	19.7	14.9	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	15	6	8	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	15	6	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	21	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
34	33.721704	-117.134659	18.1	7.4	3.4	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	15	6	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	3	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
35	33.722029	-117.135747	2.3	2.9	1.1	dirt road rut	1	12/27/2012	15	9	4	none	N/A
							2	1/4/2013	12	N/A	dry	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
36	33.722001	-117.135582	137.1	26.9	14.3	dirt road rut	1	12/27/2012	10	6	1	*Branchinecta* sp. (14M, 6F)	100s, unidentifiable juveniles
							2	1/4/2013	15	5	8	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	11	juveniles not collected	1,000s
							5	2/13/2013	20	14	15	none	N/A
							6	2/26/2013	22	16	12	VFS (5M, 3F)	100s
							7	3/13/2013	29	20	9	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
37	33.722257	-117.136434	74.6	12.8	8.0	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	19	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	16	14	none	N/A
							7	3/13/2013	29	21	11	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
38	33.722257	-117.136726	41.6	10.4	8.6	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	5	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A
39	33.722410	-117.136903	73.9	19.0	14.7	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	3	none	N/A
							3	1/18/2013	14	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	7	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A
40	33.735982	-117.136613	12.0	4.9	3.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	17	6	4	none	N/A
							3	1/18/2013	14	N/A	dry	none	N/A
							4	1/30/2013	19	15	9	none	N/A
							5	2/13/2013	20	16	7	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
41	33.735537	-117.145274	9.8	4.1	3.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	17	5	5	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
42	33.597901	-117.154551	14.2	5.4	3.3	dirt road rut	1	12/27/2012	16	9	8	none	N/A
							2	1/4/2013	17	5	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
43	33.597808	-117.152245	61.8	17.0	4.4	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	7	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	14	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	16	10	none	N/A
							7	3/13/2013	29	22	18	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
44	33.597921	-117.152301	42.0	9.7	5.2	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	8	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
45	33.597879	-117.152193	9.6	3.9	3.3	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	4	6	VFS (3M, 2F))	100s
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	22	6	VFS (4M, 1F)	100s
							8	3/28/2013	25	N/A	dry	none	N/A
46	33.597911	-117.152059	95.0	20.0	6.5	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	5	15	VFS (2M, 7F)	100s
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	9	none	N/A
							5	2/13/2013	20	17	3	none	N/A
							6	2/26/2013	22	17	4	none	N/A
							7	3/13/2013	29	21	13	VFS (4M, 3F)	100s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
47	33.597933	-117.151062	11.2	4.5	3.0	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	5	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
48	33.597997	-117.148320	7.8	3.4	3.1	dirt road rut	1	12/27/2012	16	12	9	none	N/A
							2	1/4/2013	17	6	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	5	none	N/A
							5	2/13/2013	20	15	5	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
49	33.598198	-117.141776	44.7	15.1	5.8	multiple dirt road ruts	1	12/27/2012	16	12	9	none	N/A
							2	1/4/2013	17	5	14	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	8	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	7	none	N/A
							7	3/13/2013	29	21	15	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
50	33.597961	-117.150508	29.0	10.0	4.0	multiple dirt road ruts	1	12/27/2012	17	N/A	dry	none	N/A
							2	1/4/2013	17	6	9	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	5	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	23	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
51	33.611970	-117.154129	62.8	17.6	6.3	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	8	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
52	33.615104	-117.118652	7.0	5.1	1.6	dirt road rut	1	12/27/2012	16	12	3	none	N/A
							2	1/4/2013	17	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
53	33.615296	-117.118663	3.3	4.1	0.9	dirt road rut	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
54	33.641718	-117.119063	11.4	12.3	1.0	roadside swale	1	12/27/2012	16	12	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
55	33.641688	-117.119348	5.7	3.6	1.9	dirt road rut	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	16	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
56	33.670610	-117.119328	25.8	16.6	1.8	roadside swale, partially on asphalt	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
57	33.598002	-117.148817	8.4	3.9	2.6	dirt road rut	1	12/27/2012	16	10	4	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
58	33.597046	-117.141671	12.3	8.4	1.9	dirt road rut	1	12/27/2012	16	10	4	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
59	33.637994	-117.119169	25.5	8.2	3.6	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	18	4	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
60	33.642013	-117.119053	35.6	14.4	2.4	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
61	33.663392	-117.119030	78.1	13.1	8.1	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	19	1	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

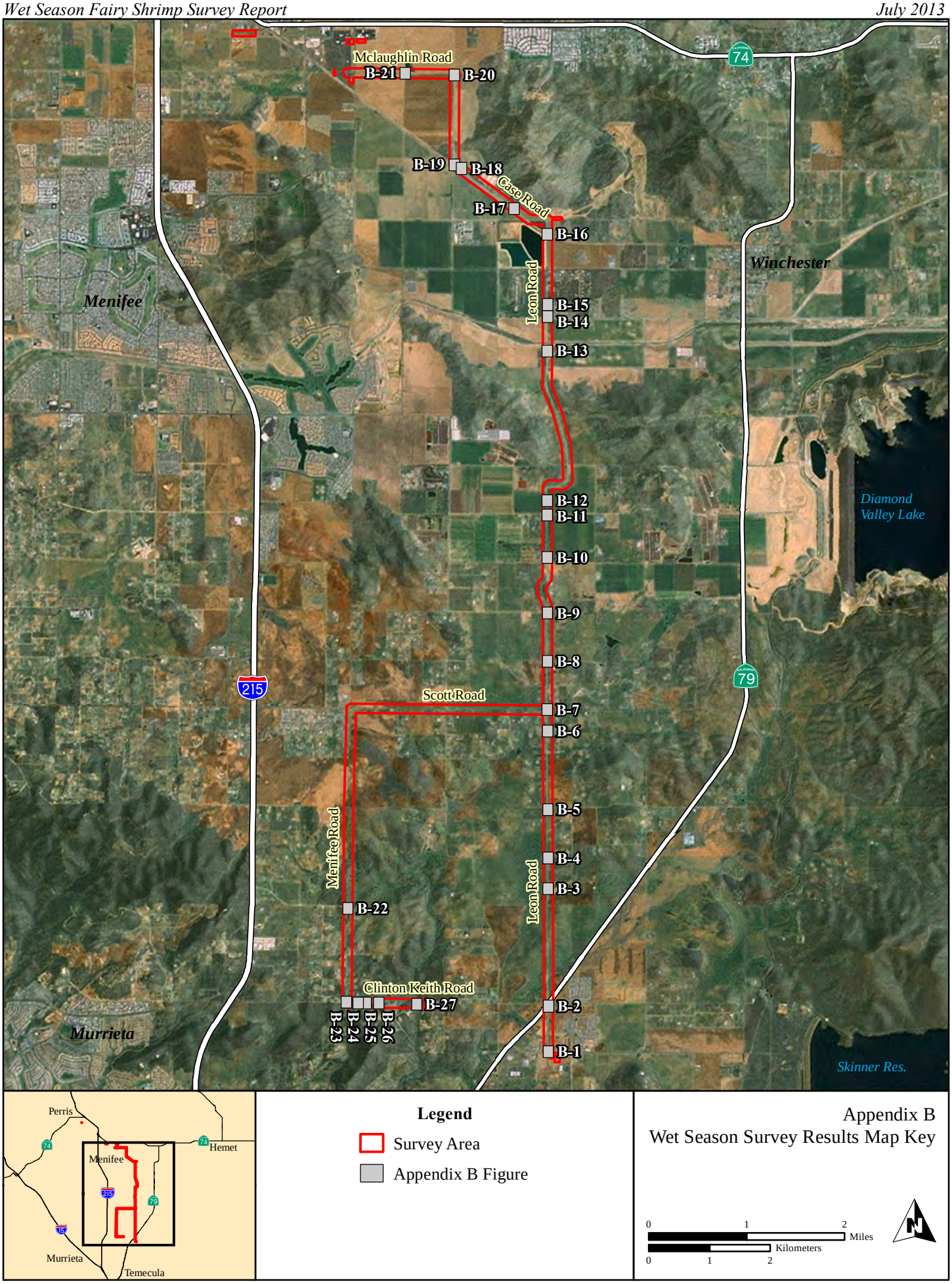
Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
62	33.672404	-117.119453	37.8	29.5	2.0	dirt road swale	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	11	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	20	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
63	33.673049	-117.119464	119.1	61.1	2.4	dirt road swale	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	16	1	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
64	33.695271	-117.119895	16.1	7.6	2.6	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	17	3	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
65	33.722414	-117.136471	22.4	12.8	2.3	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	16	6	none	N/A
							6	2/26/2013	22	18	9	none	N/A
							7	3/13/2013	29	21	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
66	33.664757	-117.119216	71.9	57.5	1.6	irrigation ditch	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	14	VFS (6M, 0F)	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
67	33.670437	-117.119467	3.9	2.5	2.2	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
68	33.720112	-117.132908	124.5	41.7	4.5	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
69	33.597848	-117.152277	7.6	11.4	1.2	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Note: VFS = versatile fairy shrimp *(Branchinecta lindahli)*, M = Male, F = Female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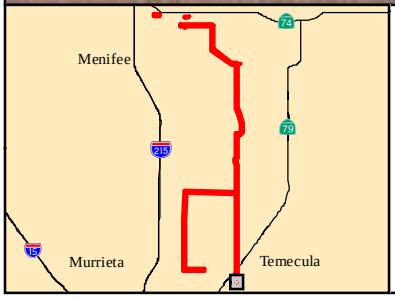
B-21
B-20
B-19
B-18
Case Road
B-17
B-16
Winchester
Menifee
Leon Road
B-15
B-14
B-13
B-12
B-11
Diamond Valley Lake
B-10
B-9
B-8
215
79
Scott Road
B-7
B-6
B-5
Menifee Road
B-4
B-3
Leon Road
B-22
Clinton Keith Road
B-27
B-2
B-23
B-24
B-25
B-26
B-1
Murrieta
Skinner Res.
Perris
74
Hemet
Menifee
215
79
15
Murrieta
Temecula
Legend
Survey Area
Appendix B Figure
Appendix B
Wet Season Survey Results Map Key
0 1 2
Miles
Kilometers
0 1 2
N



Legend

Survey Area

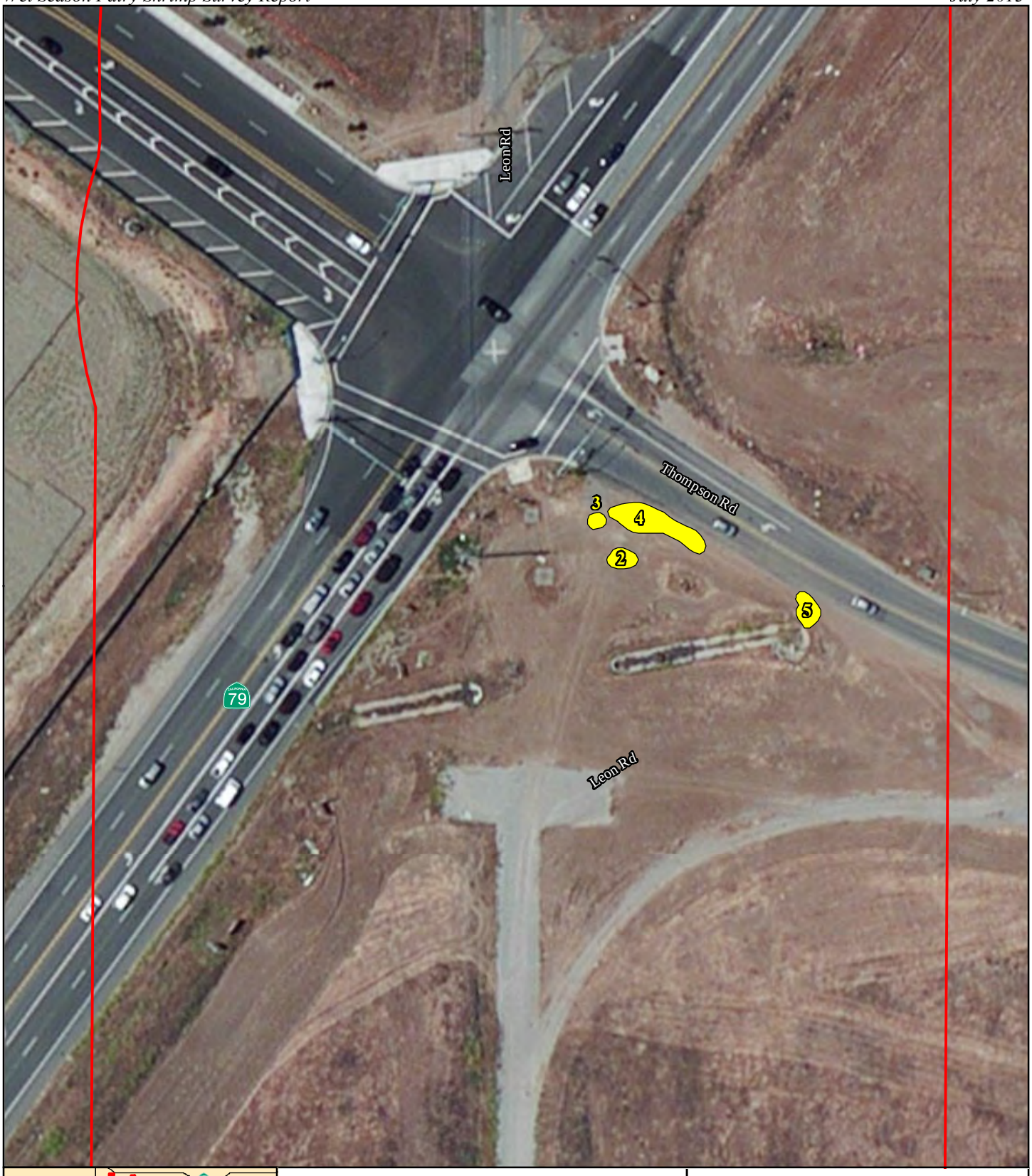
Ponded Basins

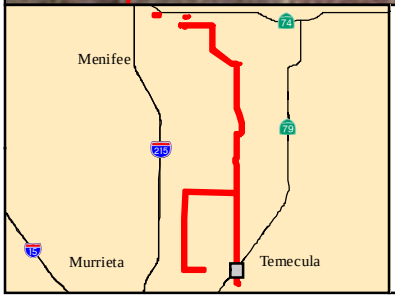
No Fairy Shrimp

Figure B-1
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

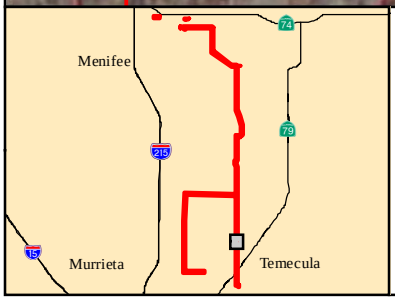
Ponded Basins

No Fairy Shrimp

Figure B-2
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



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Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-3
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

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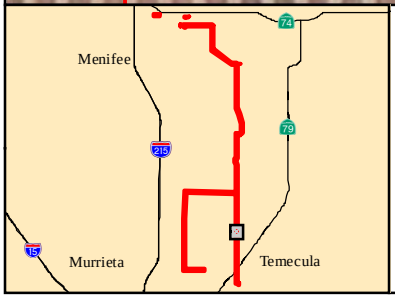

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Survey Area

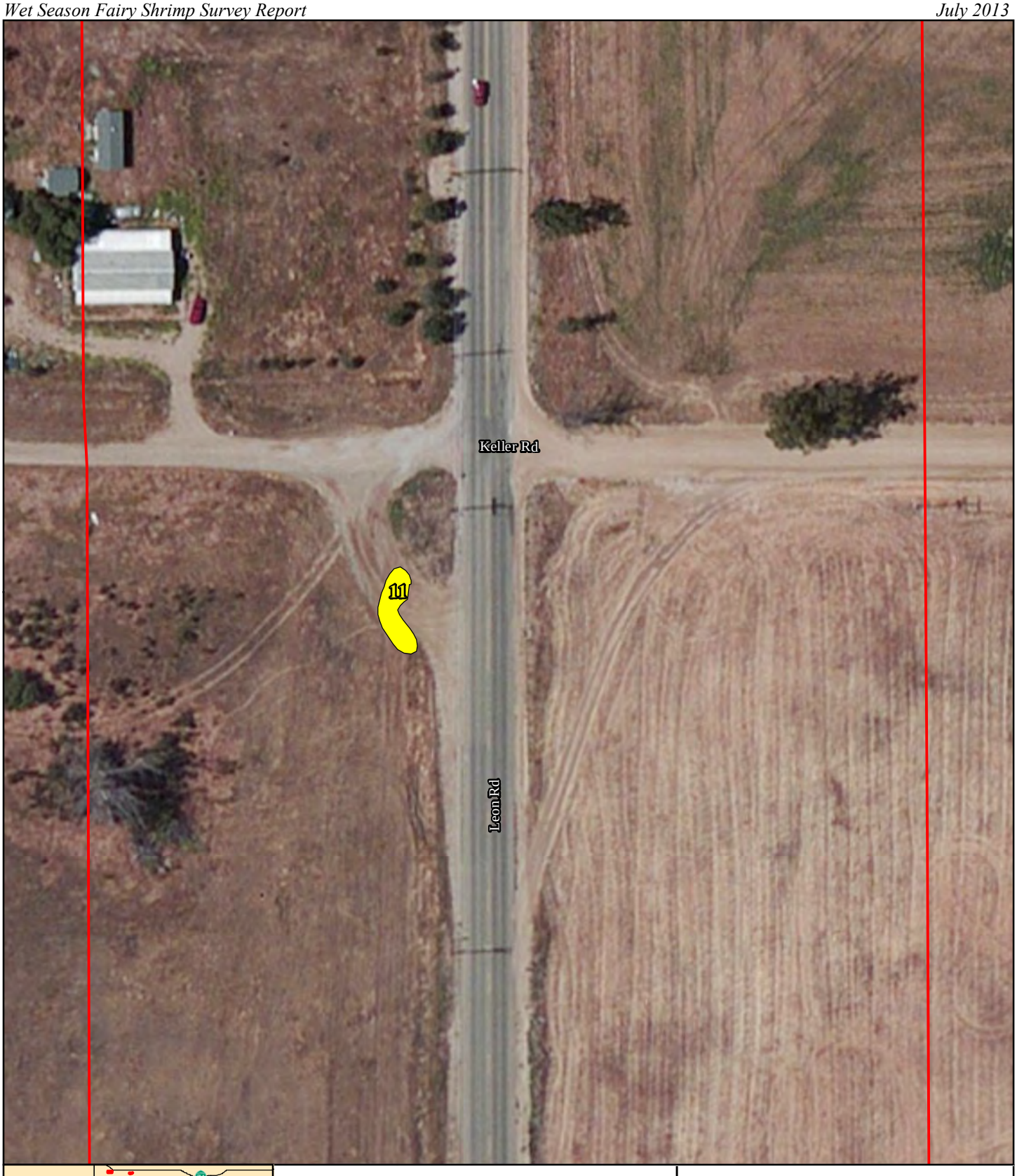
Ponded Basins

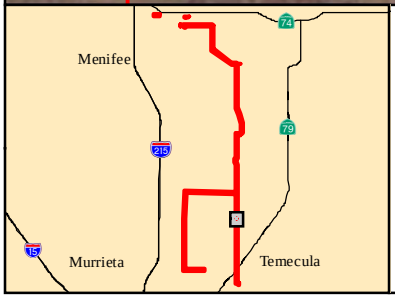
No Fairy Shrimp

Figure B-4
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

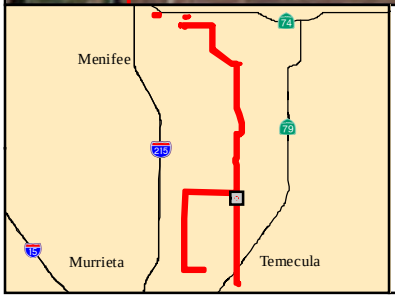
Ponded Basins

No Fairy Shrimp

Figure B-5
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

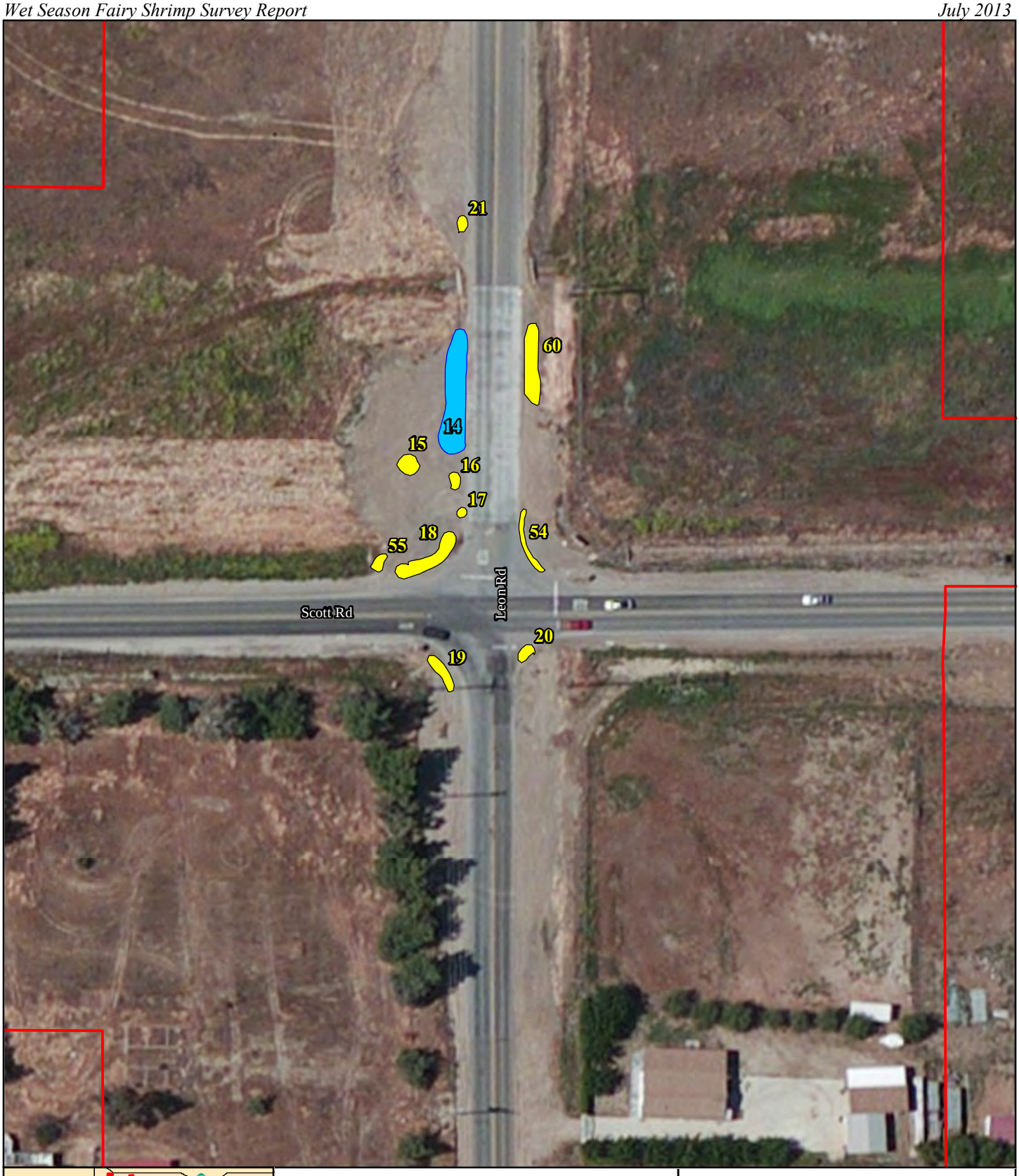
Ponded Basins

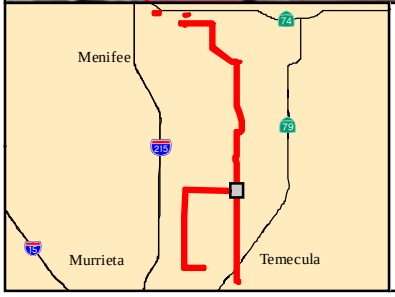
No Fairy Shrimp

Figure B-6
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

Ponded Basins

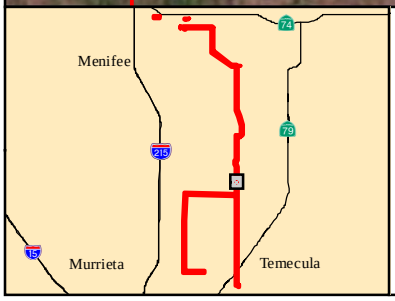
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-7
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

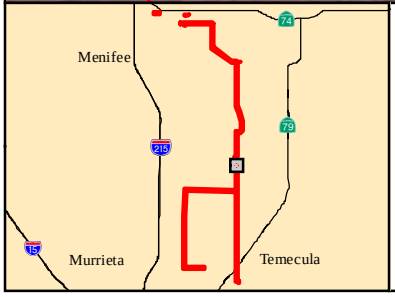
Ponded Basins

No Fairy Shrimp

Figure B-8
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

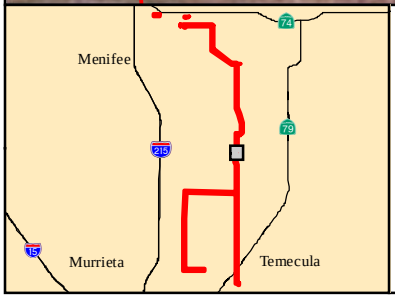
Ponded Basins

No Fairy Shrimp

Figure B-9
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

Ponded Basins

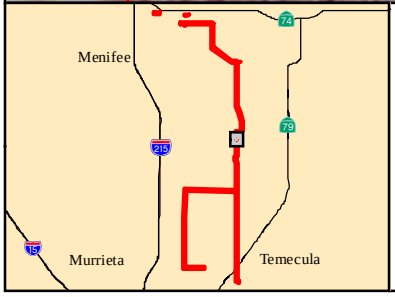
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-10
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

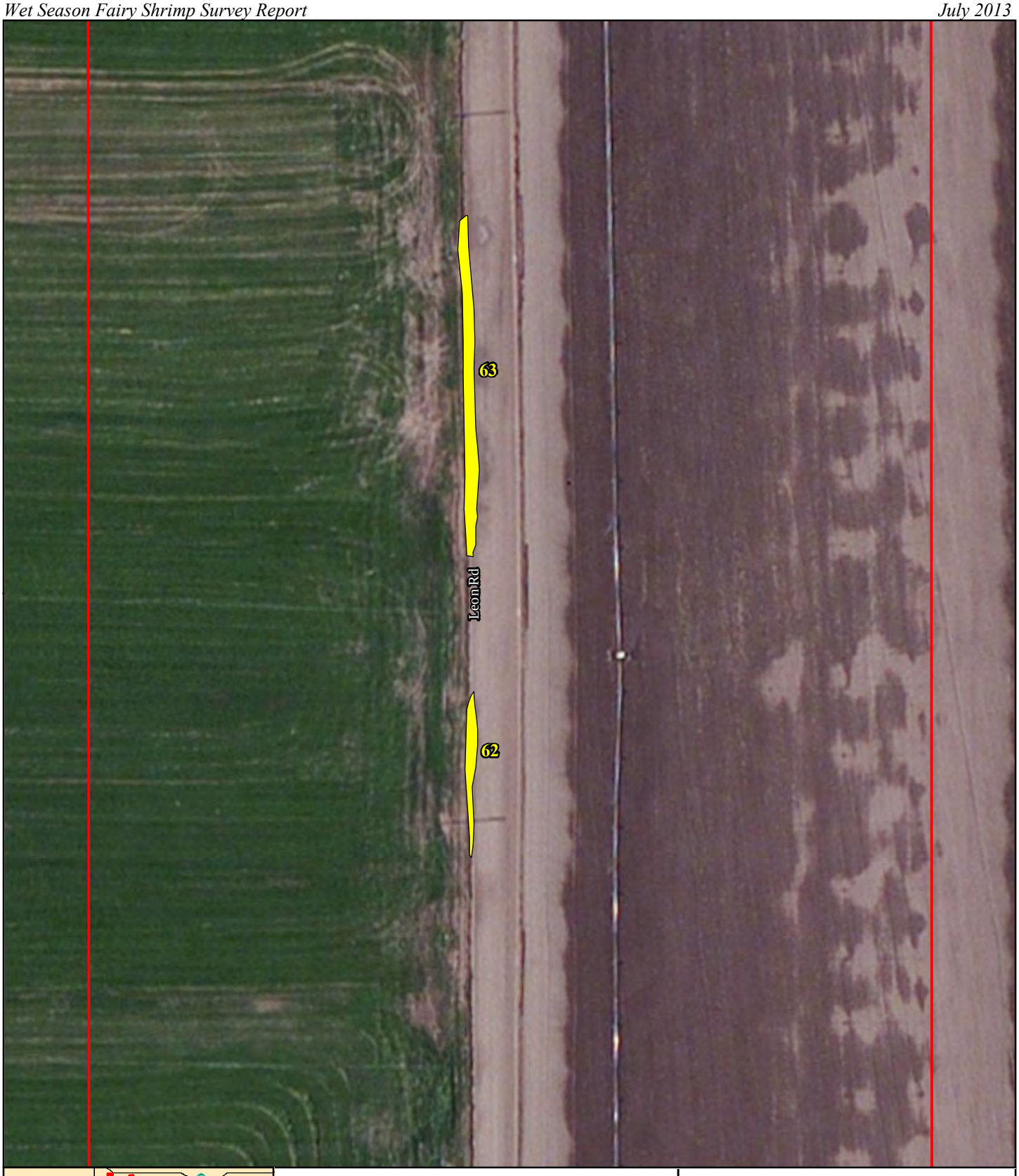
Ponded Basins

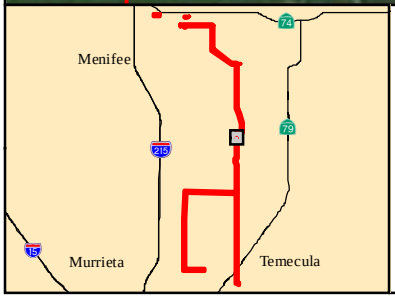
No Fairy Shrimp

Figure B-11
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

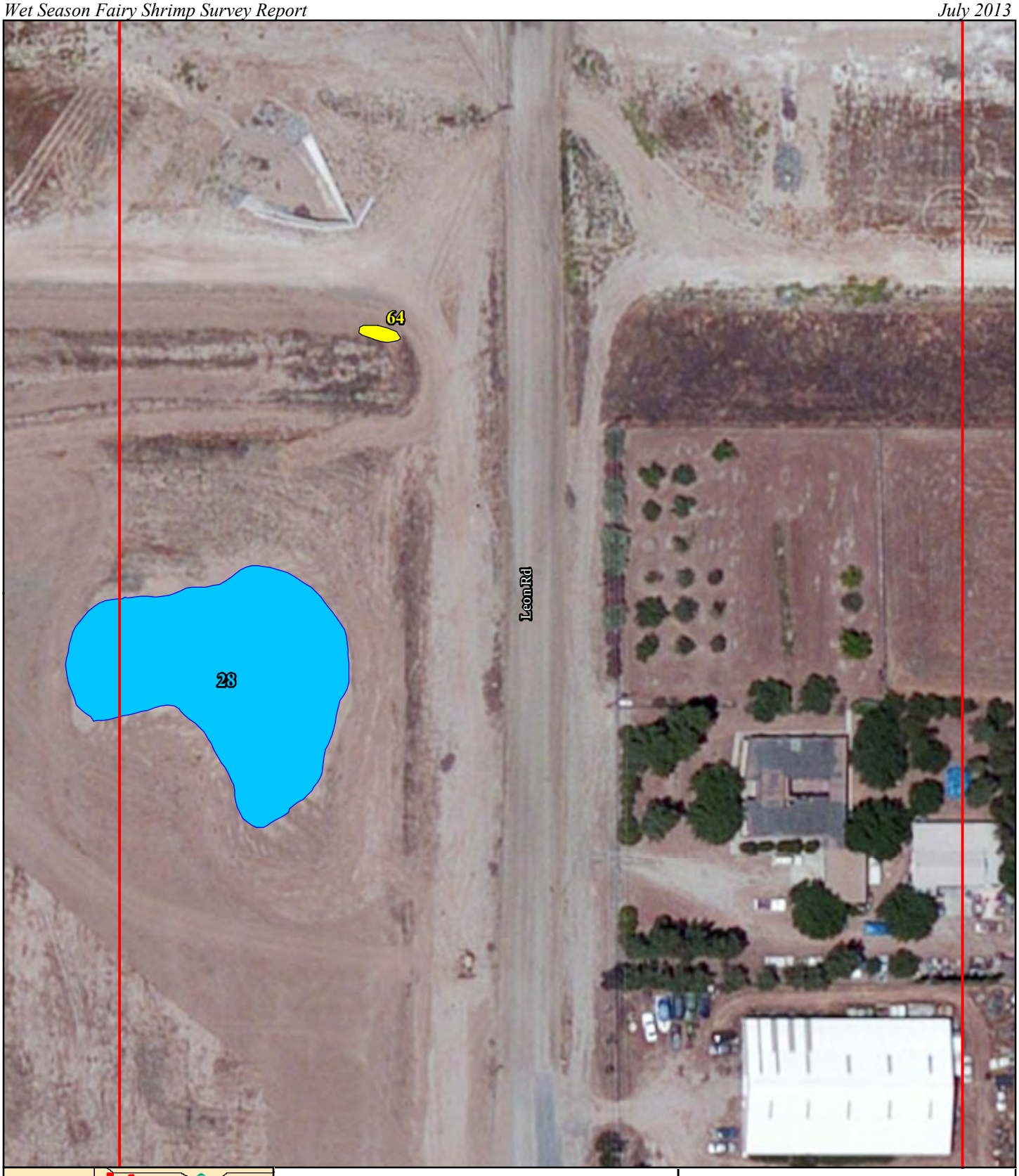
Ponded Basins

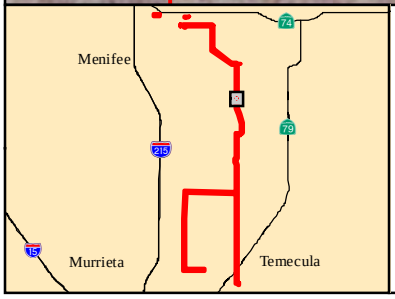
No Fairy Shrimp

Figure B-12
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

Ponded Basins

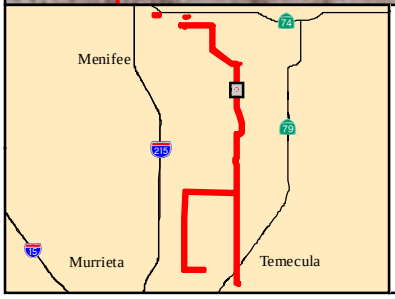
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-13
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

Ponded Basins

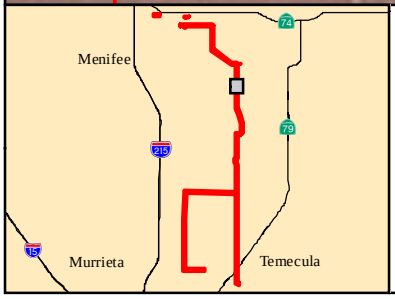
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-14
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

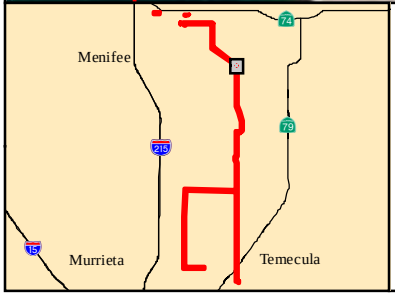
Ponded Basins

No Fairy Shrimp

Figure B-15
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

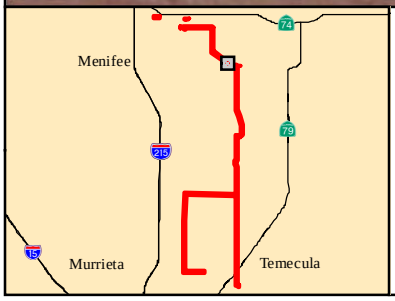
Ponded Basins

No Fairy Shrimp

Figure B-16
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

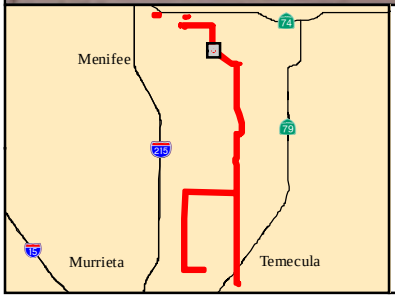
Ponded Basins

No Fairy Shrimp

Figure B-17
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

Ponded Basins

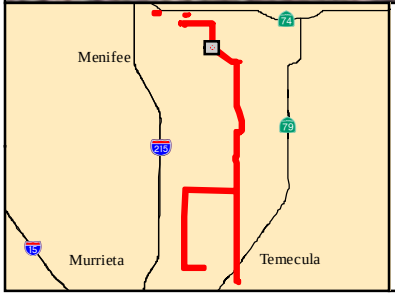
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-18
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

Ponded Basins

No Fairy Shrimp

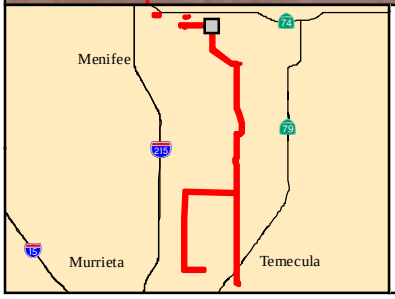
Versatile Fairy Shrimp

Juvenile Fairy Shrimp (Too Small to Identify)

Figure B-19
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

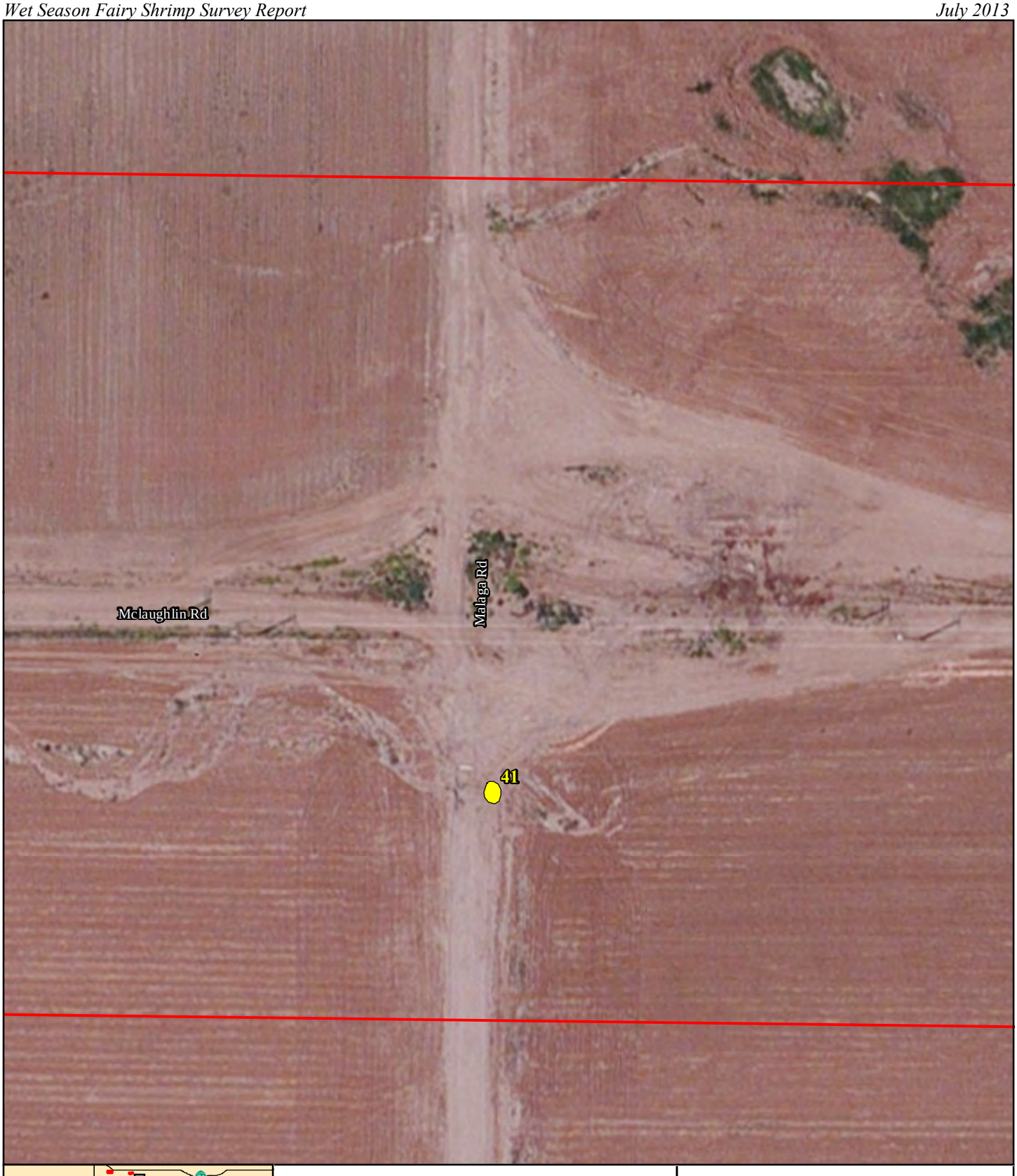
Ponded Basins

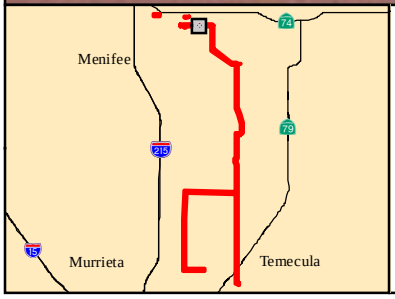
No Fairy Shrimp

Figure B-20
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

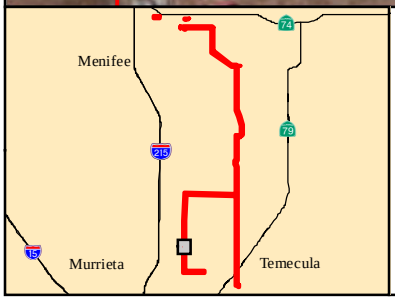
Ponded Basins

No Fairy Shrimp

Figure B-21
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

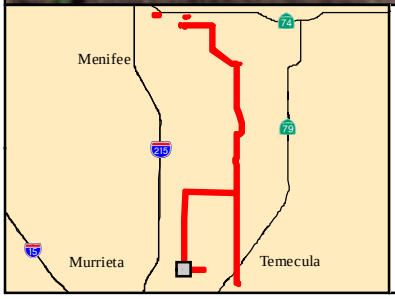
Ponded Basins

No Fairy Shrimp

Figure B-22
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

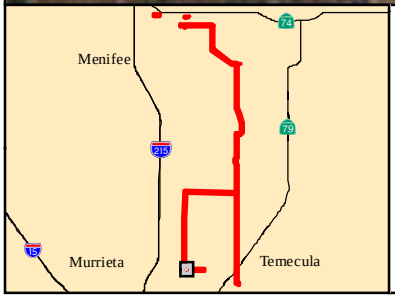
Ponded Basins

No Fairy Shrimp

Figure B-23
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

Ponded Basins

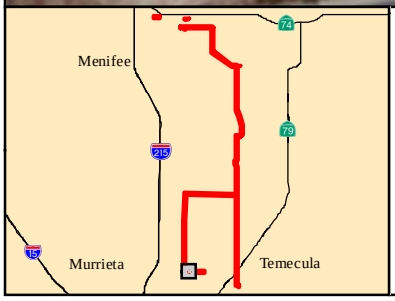
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-24
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

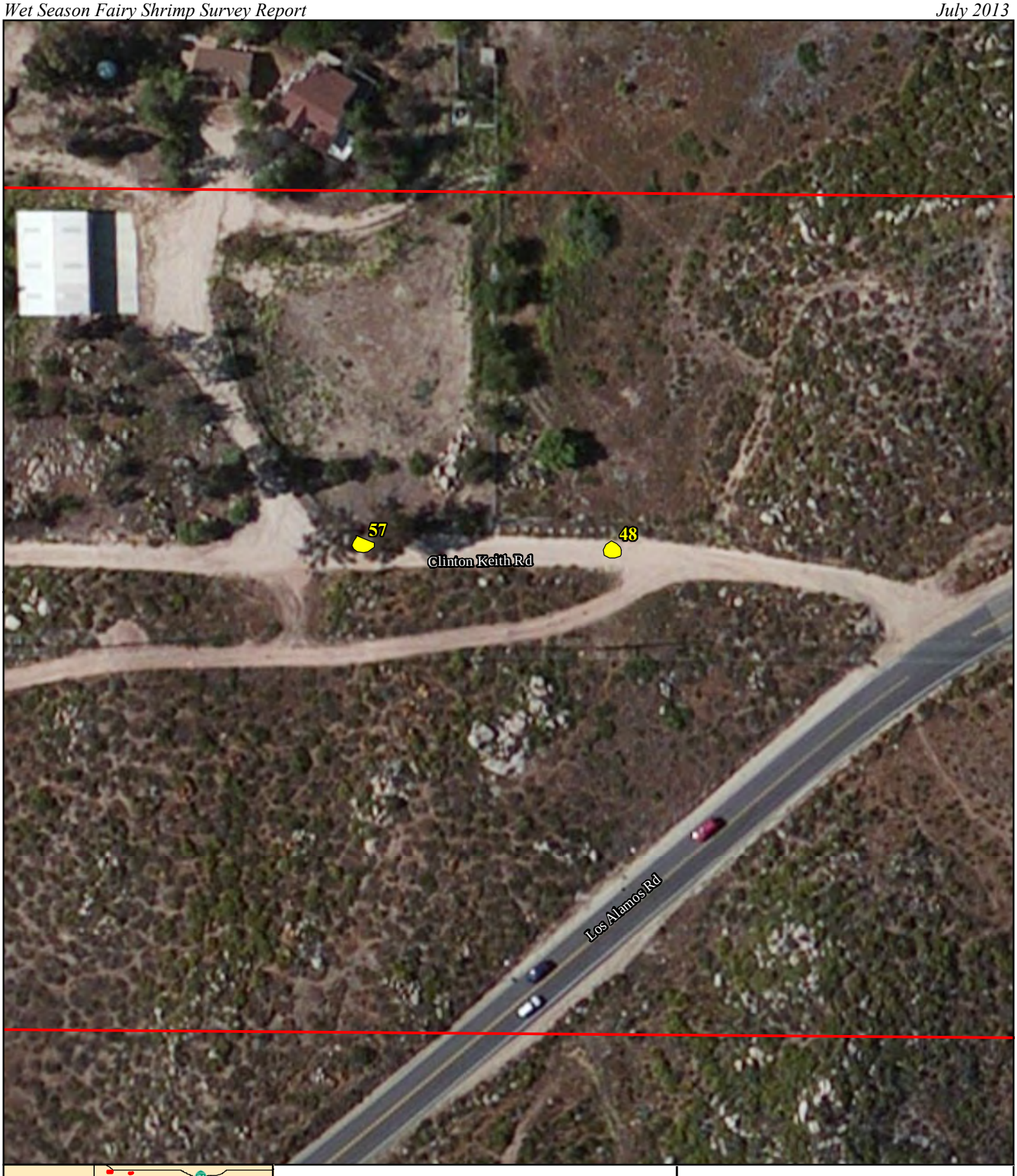
Ponded Basins

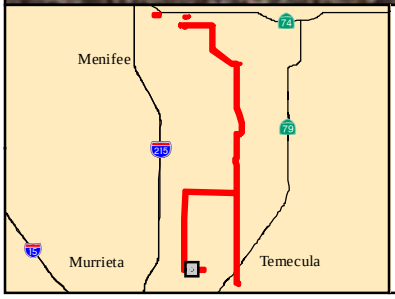
No Fairy Shrimp

Figure B-25
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-26
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N

Figure B-27
Wet Season Survey Results

APPENDIX C

Photographic Record

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 1

Basin 2

Basin 3

Basin 4

Basin 5

Basin 6

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 7

Basin 8

Basin 9

Basin 10

Basin 11

Basin 12

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 13

Basin 14

Basin 15

Basin 16

Basin 17

Basin 18

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 19

Basin 20

Basin 21

Basin 22

Basin 23

Basin 24

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 25

Basin 26

Basin 27

Basin 28

Basin 29

Basin 30

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 31

Basin 32

Basin 33

Basin 34

Basin 35

Basin 36

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 37

Basin 38

Basin 39

Basin 40

Basin 41

Basin 42

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 43

Basin 44

Basin 45

Basin 46

Basin 47

Basin 48

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 49

Basin 50

Basin 51

Basin 52

Basin 53

Basin 54

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 55

Basin 56

Basin 57

Basin 58

Basin 59

Basin 60

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 61

Basin 62

Basin 63

Basin 64

Basin 65

Basin 66

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 67

Basin 68

Basin 69

Corner of Scott and Menifee Roads

Final (Wet and Dry Season) Fairy Shrimp Survey Report
Valley South 115 kV Subtransmission Line Project
Riverside County, California

September 2013

Prepared for: TRC Solutions, Inc.
123 Technology Drive West
Irvine, CA 92618
Contact: Ms. Elisha Back
Tel: (949) 727-7390
EBack@trcsolutions.com

Prepared by: Cardno TEC
514 Via De La Valle, Suite 308
Solana Beach, CA 92075
Contact: Mr. Richard Stolpe
Tel: (858) 509-3157
Richard.Stolpe@cardnotec.com

FINAL (WET AND DRY SEASON) FAIRY SHRIMP SURVEY REPORT VALLEY SOUTH 115 KV SUBTRANSMISSION LINE PROJECT RIVERSIDE COUNTY, CALIFORNIA

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APPENDICES

1.0 INTRODUCTION

Cardno TEC was contracted by TRC Solutions, Inc. (TRC) to conduct United States Fish and Wildlife Service (USFWS) protocol surveys for listed vernal pool branchiopods within the Valley South Subtransmission Project Area (project area) during the 2012-2013 wet and dry seasons. This Final Fairy Shrimp Survey Report describes the activities performed by Cardno TEC and provides the results of the 2012-2013 wet and dry season fairy shrimp surveys in the project area. A Wet Season Fairy Shrimp Survey Report was completed and submitted to the USFWS in July 2013 (Cardno TEC 2013). This report incorporates everything from the initial wet season report and has been updated with the results of the dry season survey.

2.0 PROJECT AREA

The project area includes all lands within a 500-foot (152-meter [m]) wide survey corridor and a 150-foot (46-m) impact corridor (most of which is nested within the 500-foot survey corridor, except for several locations where outlying staging yards and pull and tension sites occur beyond the 500 feet) along a proposed 18-mile (29-kilometer) electrical subtransmission line corridor in the vicinity of the cities of Murrieta, Menifee, and Winchester, within Riverside County, California (Figure 1). The project area is approximately 1,118 acres (452 hectares) in size.

For the purpose of these fairy shrimp surveys (both wet and dry season), the survey area includes only those lands within the project area that are publicly accessible. Private inaccessible lands (e.g. behind property fence lines) that occur within the project area were not surveyed.

3.0 BACKGROUND

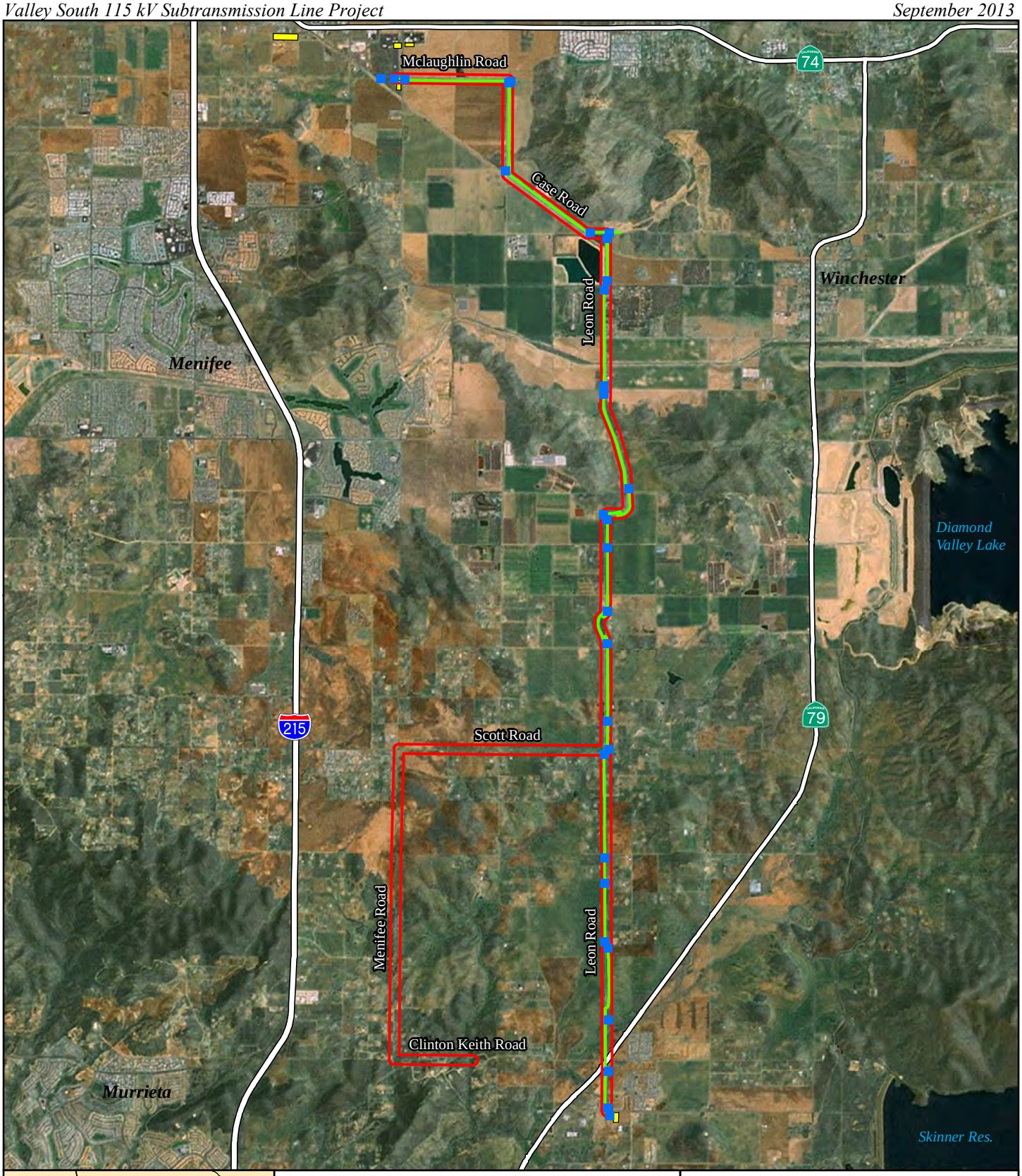
Potential vernal pool branchiopod habitat within most of the project area has not been previously delineated. Similarly, no previous fairy shrimp surveys have been conducted in the project area as part of this project. According to the California Natural Diversity Database (CNDDB), Riverside fairy shrimp (*Streptocephalus woottoni*) and Vernal Pool fairy shrimp (*Branchinecta lynchi*) are the only federally-listed fairy shrimp species known to occur in the vicinity of the project area (CNDDB 2013) (Appendix A). California does not list any branchiopod species under the California Endangered Species Act.

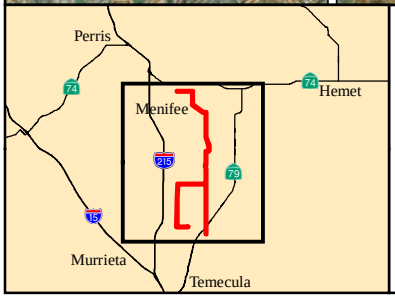
The closest occurrence of Riverside fairy shrimp to the project area was reported in 2002, northeast of the intersection of Scott Road and Menifee Road, within the project area (Figure 2). The closest occurrence of Vernal Pool fairy shrimp to the project area was reported in 2005, approximately 4 miles (6.4 kilometers) east-northeast of the project area (Figure 2). Figure 2 shows the locations of all other reported occurrences of Riverside and Vernal Pool fairy shrimp in the vicinity of the project area (CNDDB 2013). Federally-listed fairy shrimp species known to occur within or near the project area are provided in Table 1.

Table 1. Listed Fairy Shrimp Species Known to Occur Within or Near the Project Area

Scientific Name	*Common Name*	*Federal Status*
Branchinecta lynchi	Vernal Pool fairy shrimp	Threatened
Streptocephalus woottoni	Riverside fairy shrimp	Endangered

Source: CNDDB 2012



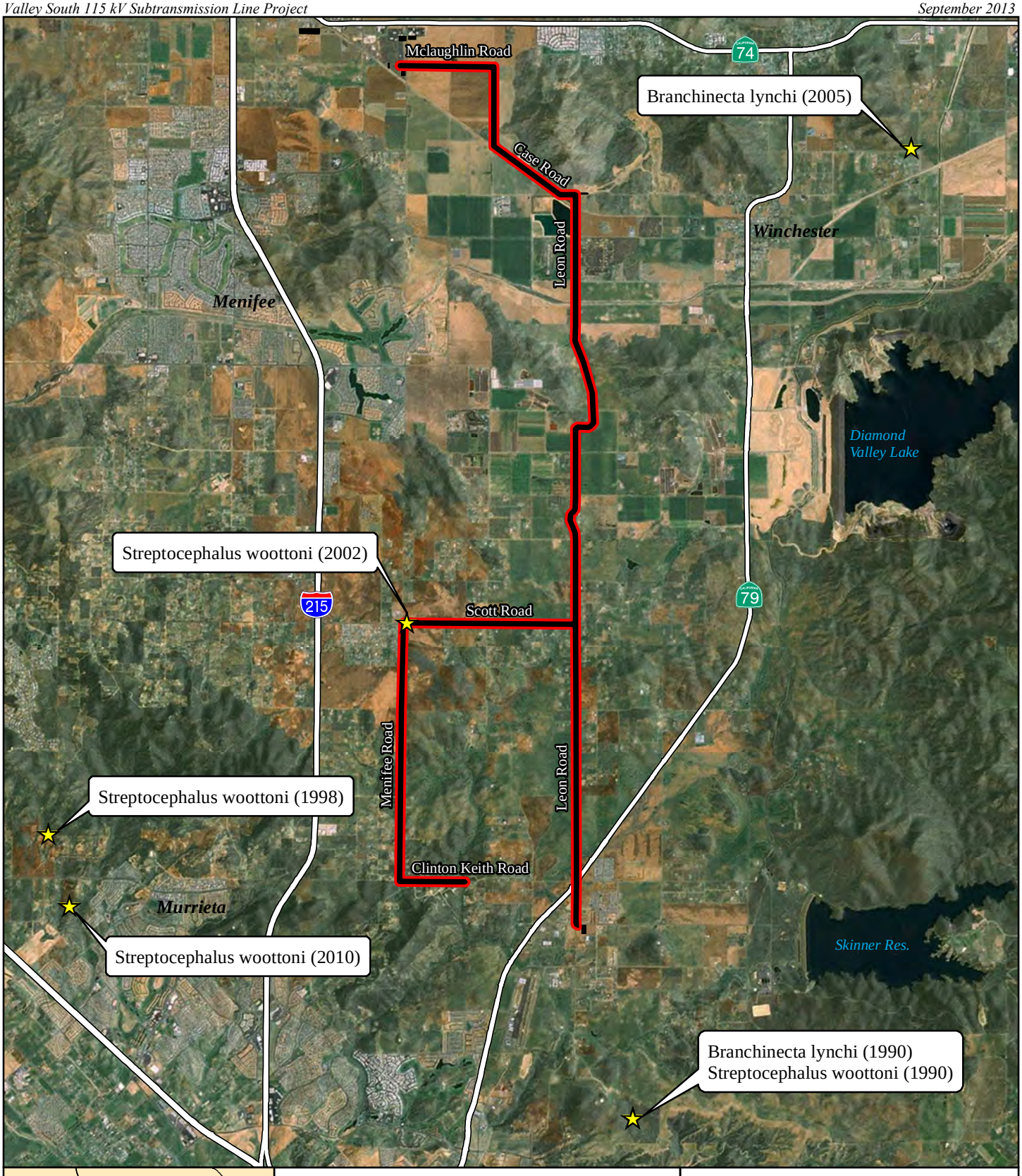


Legend

- Alternatives 1 and 2 Buffer (250')
- Road Pavement Edge Buffer (150')
- Potential Staging Area
- Pull Tension Site

Figure 1
Project Area and Project Features

0 1 2 Miles
0 1 2 Kilometers



Legend

- Alternatives 1 and 2 Buffer (250')
- Electrical Subtransmission Line Corridor
- CNDDB

Figure 2
CNDDB Results in the Vicinity of the Project Area

0 1 2 Miles
0 1 2 Kilometers

Source: CNDDB 2013

4.0 SURVEY METHODS

4.1 WET SEASON SURVEY PROTOCOL

Wet season fairy shrimp surveys were conducted according to the *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (USFWS 1996). Surveys were conducted by USFWS permitted fairy shrimp and vernal pool biologists Richard Stolpe (Permit TE-25864A-0) and Clint Scheuerman (Permit TE-44855A-0). For the purposes of this survey, all basins observed to be ponding ≥3 centimeters (cm) (1.2 inches [in]) of water were assumed to be potential fairy shrimp habitat. These basins were documented and mapped in the field using a Trimble Nomad® global positioning system (GPS) unit with a sub-meter level accuracy Hemisphere® receiver. Potential vernal basins were re-visited for the duration of the wet season until they were confirmed or dismissed as potential fairy shrimp habitat per the definitions and protocol survey guidelines (able to pond ≥3 cm [1.2 in] of water) (USFWS 1996). A total of 69 potential vernal basins were identified and delineated by GPS within the project area.

4.2 2012-2013 WET SEASON RAINFALL DATA

Wet season sampling occurred during the winter of 2012 and spring of 2013 following significant rainfall events. Surveys were initiated on 27 December 2012 (Table 2). Table 2 shows the water depth (in cm) and observed fairy shrimp (approximate) population in each basin for every survey site visit during the wet season. Basin water depth is shown as a numerical value and population is shown as a color along a defined color ramp in which darker colors represent higher population (see note below the Table 2).

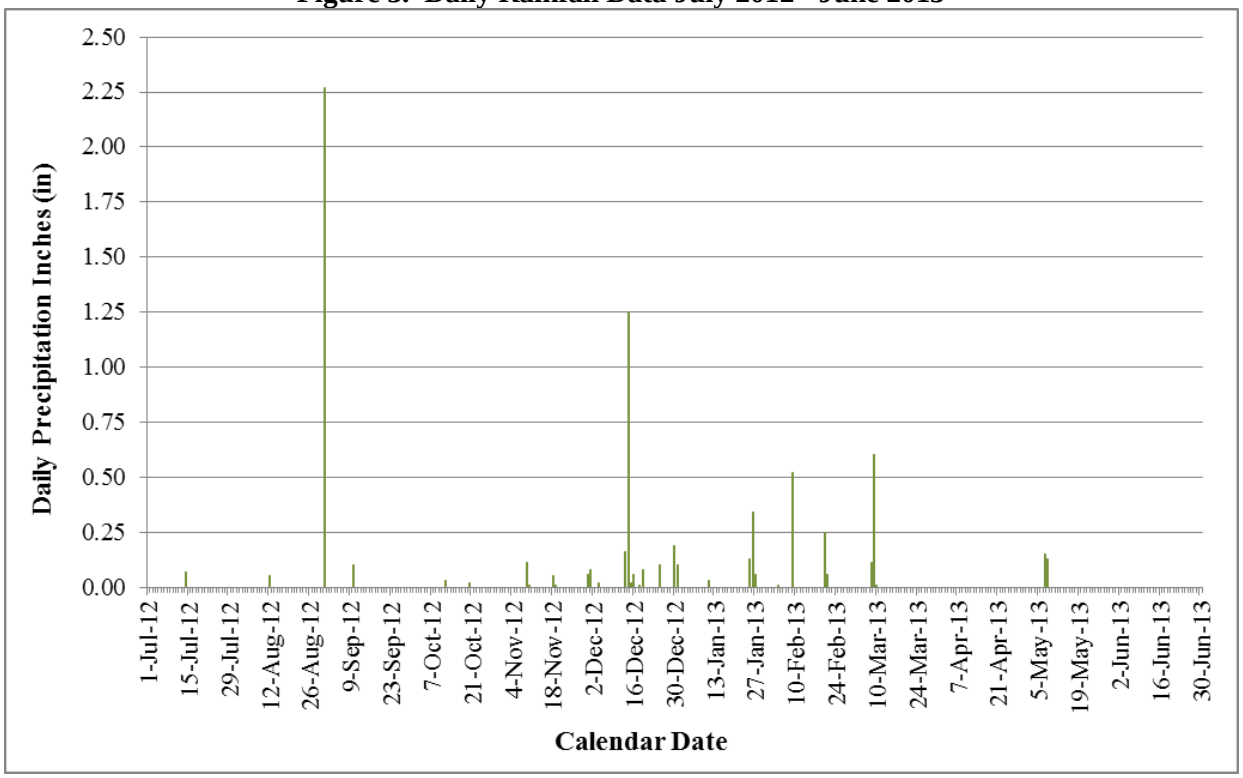
Daily rainfall data for the project area between 1 July 2012 and 30 June 2013 are shown in Figure 3. Rainfall totals in the vicinity of the project area for the 2012-2013 rainfall season were 64 percent of historical annual average (Figure 4). During the wet season, all basins were surveyed approximately once every two weeks and/or after significant rain events until basins were no longer inundated or until they were inundated for more than 120 days [Note: no basins in the project area were inundated for more than 120 days]. Surveys of individual basins that had dried out were reinitiated if they refilled to 3 cm (1.2 in) or more. As no significant rainfall occurred in the project area since 8 March (0.60 in [1.5 cm]), and given the historical trends for rainfall at this location, the protocol wet-season survey was considered complete as of the end of March 2013.

Table 2. Ponded Basin Survey Log and Fairy Shrimp Presence

Basin ID	*Dec. 27*	*Jan. 4*	*Jan. 18*	*Jan. 30*	*Feb. 13*	*Feb. 26*	*Mar. 13*	*Mar. 28*
1	-	5	0	6	4	3	5.5	0
2	-	3	0	0	0	0	0	0
3	-	6	0	7	0	0	0	0
4	-	4	0	4.5	7	1	6	0
5	-	6	0	6	5	7	0	0
6	5	7	0	9	7.5	0	6	0
7	14	14	0	12	13	6	6.5	0
8	-	4	0	8	0	0	2	0
9	-	4	0	3	0	0	0	0
10	-	3	0	3	1	0	0	0
11	-	5	0	2	0	0	0	0
12	5	5	0	4	4	2	2.5	0
13	-	4	0	3.5	1	0	2	0
14	8	8	2.5	6	10	6	8	0
15	-	3	0	2	0	0	1	0
16	-	3	0	1	0	0	0	0
17	-	4	0	2	0	-	0	0
18	9	7	0	9	6	3	5	0
19	5	3	0	2.5	0.5	0	0	0
20	8	3	0	4.5	3	0	0	0
21	6	4	0	0	0	0	0	0
22	-	4	0	4	5	6	7	0
23	-	5	0	6	8	6	5	0
24	-	7	0	9	8	7	9	0
25	7	8	0	8	4	4	7	0
26	-	3	0	3	0	0	1	0
27	-	3	0	3	0	0	0	0
28	25	20	45	45	28	19	38	6
29	-	3	0	9	7	4	8	0
30	-	6	1.5	9	8	5	5	0
31	-	3	0	0	0	0	0	0
32	-	3	0	7	0	4	7	0
33	-	8	0	7	6	4	6	0
34	-	3	0	3	3.5	3	0	0
35	-	-	0	0	0	0	0	0
36	-	8	0	11	15	12	9	0
37	-	7	0	19	8	14	11	0
38	-	3	0	0	0	0	5	0
39	-	3	0	0	0	0	7	0
40	-	4	0	9	7	0	3	0
41	-	5	0	4	0	0	0	0
42	8	3	0	0	0	0	0	0
43	-	7	0	14	6	10	18	0
44	-	8	0	7	0	0	8	0
45	-	6	0	4	0	0	6	0
46	-	15	0	9	3	4	13	0
47	-	3	0	7	0	0	0	0
48	9	3	0	5	5	0	0	0
49	9	14	0	8	3.5	7	15	0
50	-	9	0	5	6	3	8	0
51	-	8	0	6	0	0	0	0
52	1	-	0	0	0	0	0	0
53	4	-	0	0	0	0	0	0
54	2	-	0	0.5	0	0	0	0
55	3	-	0	1	0	0	0	0
56	4	-	0	0	0	0	0	0
57	4	-	0	0	0	0	0	0
58	3	-	0	1	-	-	-	0
59	3	-	-	6	0	4	5.5	0
60	3	-	-	3.5	0	0	1	0
61	-	-	-	3	0	1	2	0
62	-	-	-	11	5	4	3	0
63	-	-	-	9.5	1	3	0	0
64	-	-	-	-	4.5	3	2	0
65	-	-	-	-	6	9	8	0
66	-	-	-	-	-	-	14	0
67	-	-	-	-	-	-	3	0
68	-	-	-	-	-	-	6	0
69	-	-	-	-	-	-	6	0
Scott & Menifee Rd.	0	0	0	0	0	0	0	0

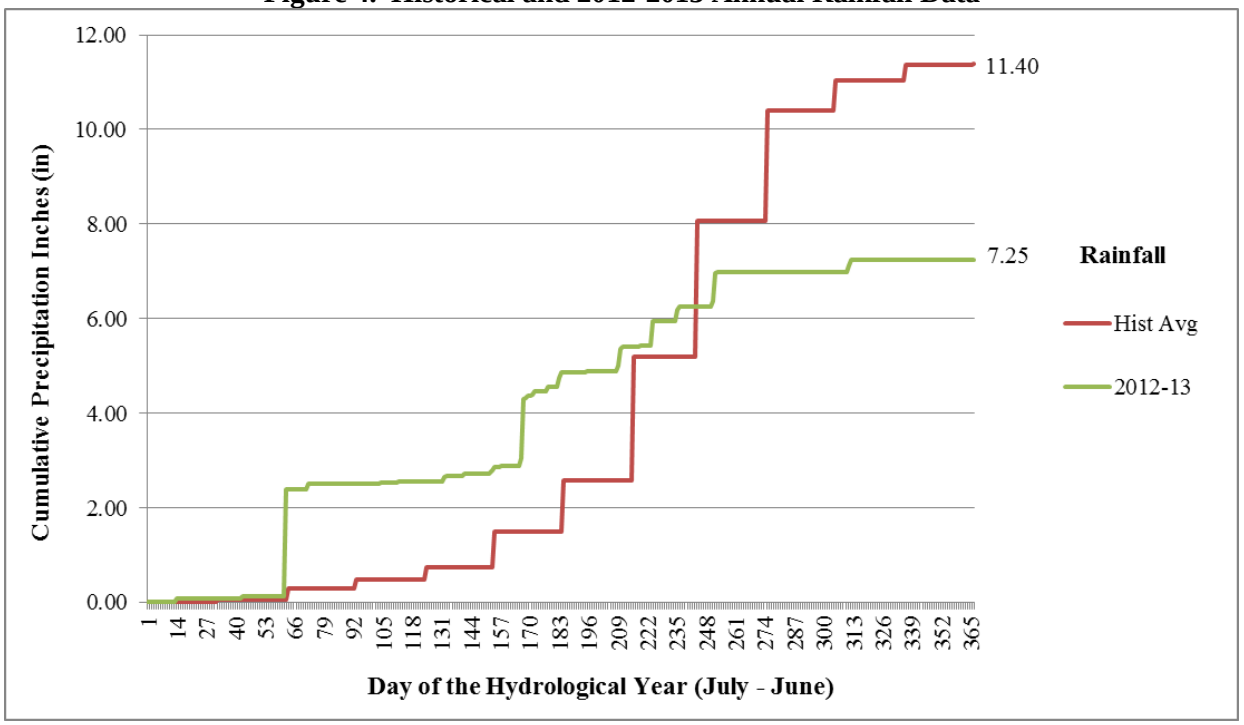
Note: Fairy shrimp population estimates by color: 1-99; 100-999; 1,000-9,999; >10,000. Numbers in columns indicate the depth of ponding in basins in centimeters at the time of survey. All fairy shrimp observed during wet season surveys were the non-listed versatile fairy shrimp.

Figure 3. Daily Rainfall Data July 2012 - June 2013



Source: Intellicast (2013) and Wunderground (2013).

Figure 4. Historical and 2012-2013 Annual Rainfall Data



Source: Intellicast (2013) and Wunderground (2013).

4.3 WET SEASON SAMPLING

During each site visit, basin bottoms, edges, and vertical water columns were sampled using an aquarium net with mesh size no larger than 0.125 (1/8) in (0.318 cm). A total of 69 basins were sampled during wet season surveys. Specimens collected from each basin numbered less than the maximum of 20 specimens and/or less than 10 percent of the estimated population per survey protocol guidelines (USFWS 1996). Only sexually mature individuals were collected for laboratory identification.

Fairy shrimp specimens collected were identified to the species level in a lab using a dissecting microscope. In the event that a federally-listed fairy shrimp were recovered from any of the basins during the wet season sampling, the fairy shrimp survey for that basin would have been considered complete under the survey protocol guidelines (USFWS 1996).

4.4 DRY SEASON SURVEY PROTOCOL

On 6 June 2013, Cardno TEC biologist, Richard Stolpe (Permit TE-25864A-0), collected soil samples from a total of 70 basins as part of the dry season survey. Soil samples were processed in accordance with the survey protocol guidelines (USFWS 1996). Soil samples were collected when the previously identified ponded basins in the project area were completely dry. A hand trowel was used to collect a maximum of one liter volume sample per basin consisting of the top 0.4 to 1.2 inches (1 to 3 cm) of basin sediment. Whenever possible, soil samples were collected as intact pieces and the trowel was used to pry up intact chunks of sediment. Loosening the soil by raking or shoveling was avoided as such methods can damage cysts.

Ten soil samples were collected from each basin, but no more than one liter of soil was taken from any basin. If a basin had a diameter of less than three meters, the number of samples was decreased and the total soil sample taken from that basin did not exceed 0.5 liters in volume. Samples were collected in the following manner: one from the edge of the basin, at least four from equidistant points along the longest transect of the basin, at least four from equidistant points along the widest transect of the basin and, when necessary, at least two samples from the deepest part of the basin.

Each soil sample was labeled, stored, and analyzed individually. Each label included information necessary to identify the specific collection location for each sample. The soil samples were placed in separate bags. Any soil sample with residual moisture was adequately ventilated and allowed to air dry thoroughly before it was stored. The stored samples were kept out of direct sunlight in order to avoid excessive heating.

All 69 ponded basins that were sampled during wet season surveys were also sampled during dry season surveys. In addition, the location of reported Riverside fairy shrimp cysts observed in 2002 near the corner of Scott Road and Menifee Road (CNDDB 2013) was sampled during dry season surveys (refer to Figure 2). It appears that this area likely undergoes regular disking of the soil and is highly disturbed. No ponding was observed in this area during the wet season.

4.5 DRY SEASON CYST CULTURING

Soil samples were placed in discrete plastic containers, numbered, and hydrated with approximately two liters of distilled water. Containers were placed in an environment approximating the conditions at the locations where the samples were recovered. Containers were placed in ambient sunlight/shade and air temperature conditions (ranging from approximately low-60s to low-90s in degrees Fahrenheit [°F]), with basin water temperatures ranging from approximately mid-60s to mid-80s in degrees Fahrenheit [°F], and fed with crumbled aquarium fish food flakes. The soil samples were fully inundated with water and

allowed to completely dry out for three complete cycles to increase the likelihood of cysts hatching, if present. The soils sample cultures were continually monitored between 3 July and 4 September.

If and where they occurred, adult shrimp were removed from the containers as they matured, and identified to species. If a federally-listed fairy shrimp was recovered from any of the basins during the dry season sampling, the fairy shrimp survey for that basin would have been considered complete under survey protocol guidelines (USFWS 1996).

5.0 RESULTS

5.1 WET SEASON RESULTS

No federally-listed fairy shrimp were observed in any of the basins during wet season sampling.

In general, the quality of basins within the project area is very low. All 69 basins are highly disturbed by activities associated with being located within or adjacent to paved and unpaved roads. All basins show signs of disturbance by tire ruts, grading, or dumping (litter and large discarded items such as mattresses and electronics). There were no state- or federally-listed vernal pool indicator floral species observed in any of the basins.

Twelve basins contained fairy shrimp: all were identified as the non-listed versatile fairy shrimp (VFS) (*Branchinecta lindahli*). Six of the twelve basins were observed to host estimated populations greater than 1,000 individuals. One of those six basins was observed on multiple occasions to host an estimated population greater than 10,000 individuals. Complete wet season survey results, basin information, and accompanying maps are provided in Appendix B. As a result of the variation in timing and amount of precipitation during rain events, some basins were identified and added to the survey as additional rainfall exposed their presence. Therefore, some basins were visited more times than others. Photographs of all surveyed basins are provided in Appendix C.

In addition to regular sampling of basins in the project area, the location of reported Riverside fairy shrimp cysts observed in 2002 at the corner of Scott Road and Menifee Road (CNDDB 2013) was inspected during every site visit. As previously noted, it appears that this area likely undergoes regular disking of the soil and is highly disturbed. No ponding was observed in this area, and it appears that this area no longer has vernal pool characteristics that would support Riverside fairy shrimp. This location was also analyzed during dry season surveys.

5.2 DRY SEASON RESULTS

No federally listed fairy shrimp species were detected during dry season sampling. Non-listed VFS were observed in 14 of the ponded basin soil samples. Table 3 provides the results of the dry season surveys alongside the wet season results.

Table 3. Complete Wet and Dry Season Survey Results

Basin ID	*Fairy Shrimp Species*		*Basin ID*	*Fairy Shrimp Species*	
	Wet Season	*Dry Season*		*Wet Season*	*Dry Season*
1	-	-	*36*	VFS	VFS
2	-	-	*37*	-	-
3	-	-	*38*	VFS	-
4	-	-	*39*	VFS	VFS
5	-	-	*40*	-	-
6	-	-	*41*	-	-
7	-	-	*42*	-	-
8	-	-	*43*	-	-
9	-	-	*44*	-	VFS
10	-	-	*45*	VFS	VFS
11	-	-	*46*	VFS	VFS
12	-	-	*47*	-	-
13	-	-	*48*	-	-
14	VFS	VFS	*49*	-	VFS
15	-	VFS	*50*	-	-
16	-	VFS	*51*	-	-
17	-	-	*52*	VFS	-
18	-	-	*53*	-	-
19	-	-	*54*	-	-
20	-	-	*55*	-	-
21	-	-	*56*	-	-
22	-	-	*57*	-	-
23	-	-	*58*	-	-
24	VFS	-	*59*	-	-
25	VFS	VFS	*60*	-	-
26	-	-	*61*	-	-
27	-	-	*62*	-	-
28	VFS	VFS	*63*	-	-
29	-	-	*64*	-	-
30	VFS	-	*65*	-	VFS
31	-	-	*66*	VFS	-
32	-	-	*67*	-	-
33	-	-	*68*	-	-
34	-	-	*69*	-	VFS
35	-	-	*Scott & Menifee Rd.*	-	VFS

6.0 DISCUSSION

No federally-listed fairy shrimp species were observed in the surveyed portions of the project area during 2012-2013 wet and dry season surveys. Precipitation during the 2012-2013 rainfall season was below average. Wetter years have the potential to reveal additional ponded basins, eliminate others from this list, and/or affect the hatching (e.g. timing, location, population) of fairy shrimp. The exceedingly low quality and high degree of disturbance of the basins within the survey area, coupled with the results of 2012-2013 wet and dry season surveys, make the presence of listed fairy shrimp species in the project area unlikely. This final report fulfills the requirements of a complete USFWS protocol fairy shrimp survey for the Valley South 115 kV Subtransmission Line project area.

7.0 REFERENCES

Cardno TEC. 2013. Wet Season Fairy Shrimp Survey Report for the Valley South 115 kV Subtransmission Line Project, Riverside County, California. Prepared for: TRC Solutions, Inc. July.

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Intellicast. 2013. Intellicast Weather. Search parameters: historical monthly averages for "Menifee CA.". Available at: http://www.intellicast.com/Local/History.aspx?location=USCA0692. Accessed: 13 June.

USFWS. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods. 19 April.

Wunderground. 2013. Weather Underground. Search parameters: daily weather data for "Menifee" and "Romoland" CA. from July 1, 2012 to June 30, 2013. Results shown for Riverside airport KRIV. Available at: http://www.wunderground.com/history/airport/KRIV/2012/7/1/MonthlyHistory.html. Accessed: 13 June.

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APPENDIX A

CNDDB Reports in the Vicinity of the Project Area

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 64110
EO Index: 64205
Key Quad: Winchester (3311761)
Element Code: ICBRA03030
Occurrence Number: 396
Occurrence Last Updated: 2006-03-01

Scientific Name: *Branchinecta lynchi*
Common Name: vernal pool fairy shrimp

Listing Status: **Federal:** Threatened
State: None
Rare Plant Rank:
Other Lists: IUCN_VU-Vulnerable

CNDDB Element Ranks: **Global:** G3
State: S2S3

General Habitat:

ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro Habitat:

INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Last Date Observed: 2005-01-25
Occurrence Type: Natural/Native occurrence
Last Survey Date: 2005-01-25
Occurrence Rank: Good
Owner/Manager: PVT
Trend: Unknown
Presence: Presumed Extant

Location:

JUST WEST OF CALIFORNIA AVENUE, 1 MILE NORTH OF SIMPSON ROAD, 3.25 MILES SE OF HOMELAND

Detailed Location:

Ecological:

HABITAT CONSISTS OF A GRASSLAND VERNAL POOL, ALSO CONTAINING NAVARRETIA FOSSALIS, MYOSURUS MINIMUS, AND BRANCHINECTA LINDAHLI. SHEEP GRAZING OBSERVED DURING MAY 2005.

Threats:

THREATENED BY ADJACENT DEVELOPMENT THAT MAY IMPACT THE HYDROLOGY OF THE POOL.

General:

4 ADULTS OBSERVED ON 25 JAN 2005.

PLSS: T05S, R02W, Sec. 23 (S)
Accuracy: 80 meters
Area (acres): 0
UTM: Zone-11 N3731425 E495192
Latitude/Longitude: 33.72282 / -117.05189
Elevation (feet): 1,500

County Summary:

Riverside

Quad Summary:

Winchester (3311761)

Sources:

ALL05F0006 ALLEN, L. (CH2M HILL) - FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI 2005-09-18

Occurrence Report

California Department of Fish and Wildlife

California Natural Diversity Database

Map Index Number: 47233
EO Index: 57829
Key Quad: Romoland (3311762)
Element Code: ICBRA07010
Occurrence Number: 24
Occurrence Last Updated: 2004-11-01

Scientific Name: *Streptocephalus woottoni*
Common Name: Riverside fairy shrimp

Listing Status: **Federal:** Endangered
State: None
Rare Plant Rank:
Other Lists: IUCN_EN-Endangered

CNDDB Element Ranks: **Global:** G1
State: S1

General Habitat:

ENDEMIC TO W RIV, ORA & SDG COUNTIES IN AREAS OF TECTONIC SWALES/EARTH SLUMP BASINS IN GRASSLAND & COASTAL SAGE SCRUB.

Micro Habitat:

INHABIT SEASONALLY ASTATIC POOLS FILLED BY WINTER/SPRING RAINS. HATCH IN WARM WATER LATER IN THE SEASON.

Last Date Observed: 2002-06-08
Occurrence Type: Natural/Native occurrence
Last Survey Date: 2002-06-08
Occurrence Rank: Good
Owner/Manager: PVT
Trend: Unknown
Presence: Presumed Extant

Location:

IMMEDIATELY NORTHEAST OF INTERSECTION OF MENIFEE AND SCOTT ROADS, 1.2 AIR MILES SOUTH OF BELL MOUNTAIN, NEAR MENIFEE.

Detailed Location:

IN A VERNAL POOL IN AN AGRICULTURAL FIELD.

Ecological:

BASIN IS DOMINATED BY EPILOBIUM PYGMAEUS, ELEOCHARIS GENICULATA, POLYGONUM ARENARIUM, NAVARRETIA FOSSALIS. OTHER ASSOCIATES INCLUDE LYTHRUM HYSSOPIFOLIUM, CRYPSIS SCHOENOIDES.

Threats:

DISTURBED BY TILLING ASSOCIATED WITH FARMING. POSSIBLY THREATENED BY FUTURE DEVELOPMENT OF SITE.

General:

SEVERAL S. WOOTTONI CYSTS TAKEN FROM DRY SEASON SOIL SAMPLES; 4 FROM SAMPLE 2.1, 1 FROM SAMPLE 3.2, AND 1 FROM SAMPLE 8.1. ECOLOGICAL AND THREAT INFORMATION TAKEN FROM DATA FOR OCCURRENCE 31 OF ORCUTTIA CALIFORNICA.

PLSS: T06S, R03W, Sec. 13 (S)
Accuracy: specific area
Area (acres): 1
UTM: Zone-11 N3722453 E485799
Latitude/Longitude: 33.64182 / -117.15314
Elevation (feet): 1,485

County Summary:	Quad Summary:
Riverside	Romoland (3311762)

Sources:

HEL02R0001 HELIX ENVIRONMENTAL PLANNING, INC. - 2002 ANNUAL REPORT, USFWS PROTOCOL LEVEL, DRY SEASON SURVEY FOR SAN DIEGO AND RIVERSIDE FAIRY SHRIMP (BRANCHINECTA SANDIEGONENSIS AND STREPTOCEPHALUS WOOTTONI). 2002-06-20

APPENDIX B

Wet Season Survey Results

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
1	33.591100	-117.118579	18.4	6.9	3.8	dirt road rut	1	12/27/2012	5	N/A	dry	none	N/A
							2	1/4/2013	3	2	5	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
2	33.597712	-117.118260	15.7	5.7	3.7	dirt road rut	1	12/27/2012	5	N/A	dry	none	N/A
							2	1/4/2013	3	2	3	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
3	33.597772	-117.118293	7.9	3.4	3.0	dirt road rut	1	12/27/2012	6	N/A	dry	none	N/A
							2	1/4/2013	3	2	6	none	N/A
							3	1/18/2013	10	N/A	dry	none	N/A
							4	1/30/2013	19	14	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
4	33.597772	-117.118219	67.4	17.5	9.2	dirt road rut	1	12/27/2012	7	N/A	dry	none	N/A
							2	1/4/2013	3	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	4.5	none	N/A
							5	2/13/2013	20	15	7	none	N/A
							6	2/26/2013	22	19	1	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
5	33.597634	-117.117896	20.7	6.5	4.6	dirt road rut	1	12/27/2012	8	N/A	dry	none	N/A
							2	1/4/2013	4	2	6	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	14	5	none	N/A
							6	2/26/2013	22	16	7	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
6	33.615174	-117.118793	66.1	19.0	5.1	dirt road rut	1	12/27/2012	8	5	5	none	N/A
							2	1/4/2013	4	2	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	9	none	N/A
							5	2/13/2013	20	14	8	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
7	33.619680	-117.118996	48.3	20.7	4.5	dirt road rut	1	12/27/2012	12	5	14	none	N/A
							2	1/4/2013	4	1	14	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	12	none	N/A
							5	2/13/2013	20	12	13	none	N/A
							6	2/26/2013	22	12	6	none	N/A
							7	3/13/2013	29	15	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
8	33.619680	-117.118842	4.7	2.9	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	4	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	8	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
9	33.619734	-117.118905	5.1	2.7	2.5	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	5	2	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
10	33.619779	-117.118947	9.5	3.9	3.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	6	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	16	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
11	33.626831	-117.119038	65.4	15.8	7.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	7	3	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
12	33.638119	-117.119136	20.8	5.7	4.6	dirt road rut	1	12/27/2012	12	7	5	none	N/A
							2	1/4/2013	7	3	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	14	4	none	N/A
							6	2/26/2013	22	15	2	none	N/A
							7	3/13/2013	29	16	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
13	33.638969	-117.119146	16.8	9.0	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	7	3	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3.5	none	N/A
							5	2/13/2013	20	15	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
14	33.641958	-117.119193	83.4	22.7	5.2	dirt road rut	1	12/27/2012	12	8	8	none	N/A
							2	1/4/2013	8	3	8	VFS (3M, 4F)	100s
							3	1/18/2013	12	10	3	none	N/A
							4	1/30/2013	19	12	6	juveniles not collected	100s
							5	2/13/2013	20	13	10	VFS (7M, 1F)	100s
							6	2/26/2013	22	15	6	VFS (1M, 1F)	10s
							7	3/13/2013	29	22	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
15	33.641849	-117.119283	11.3	4.1	4.0	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	8	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
16	33.641822	-117.119203	5.2	3.4	2.1	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	9	3	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
17	33.641771	-117.119190	2.6	2.0	1.8	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	9	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	2	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
18	33.641699	-117.119252	31.3	10.9	8.6	dirt road rut	1	12/27/2012	12	6	9	none	N/A
							2	1/4/2013	9	4	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	16	3	none	N/A
							7	3/13/2013	29	22	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
19	33.641506	-117.119221	12.7	6.5	4.8	road rut, partially on asphalt	1	12/27/2012	12	6	5	none	N/A
							2	1/4/2013	9	4	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	12	3	none	N/A
							5	2/13/2013	20	17	1	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
20	33.641543	-117.119058	6.5	3.2	3.1	road rut, partially on asphalt	1	12/27/2012	12	9	8	none	N/A
							2	1/4/2013	10	4	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	4	none	N/A
							5	2/13/2013	20	16	3	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
21	33.642241	-117.119191	4.7	3.0	2.0	dirt road rut	1	12/27/2012	12	7	6	none	N/A
							2	1/4/2013	11	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
22	33.648904	-117.119324	19.6	7.0	5.2	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	11	4	4	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	19	6	none	N/A
							7	3/13/2013	29	21	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
23	33.648904	-117.119401	24.5	10.5	6.6	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	11	4	5	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	6	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	15	6	none	N/A
							7	3/13/2013	29	19	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
24	33.664914	-117.119400	22.0	11.9	2.3	dirt road rut	1	12/27/2012	12	N/A	dry	none	N/A
							2	1/4/2013	12	5	7	VFS (1M, 4F)	100s
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	8	juveniles not collected	1,000s
							5	2/13/2013	20	14	8	none	N/A
							6	2/26/2013	22	14	7	none	N/A
							7	3/13/2013	29	19	9	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
25	33.665033	-117.119408	22.2	9.9	3.3	dirt road rut	1	12/27/2012	15	6	7	VFS (7M, 4F)	100s
							2	1/4/2013	13	4	8	VFS (4M, 5F)	100s
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	8	none	N/A
							5	2/13/2013	20	15	4	none	N/A
							6	2/26/2013	22	15	4	none	N/A
							7	3/13/2013	29	19	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
26	33.670179	-117.119468	25.0	12.8	2.3	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
27	33.670342	-117.119342	8.3	5.1	2.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
28	33.694669	-117.120111	1,439.6	51.2	47.3	large basin in disturbed field	1	12/27/2012	11	6	25	VFS (2M, 1F)	100s
							2	1/4/2013	13	5	20	none	N/A
							3	1/18/2013	12	6	40	VFS (11M, 8F)	1,000s
							4	1/30/2013	19	12	40	VFS (4M, 2F)	1,000s
							5	2/13/2013	20	14	28	VFS (9M, 6F)	1,000s
							6	2/26/2013	22	16	19	VFS (12M, 2F)	10,000s
							7	3/13/2013	29	20	38	VFS (1M, 2F)	100,000s
							8	3/28/2013	25	22	6	none	N/A
29	33.699541	-117.119573	31.8	12.2	11.7	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	13	6	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	15	9	none	N/A
							5	2/13/2013	20	15	7	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	20	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
30	33.700257	-117.119747	69.0	30.5	3.8	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	6	6	none	N/A
							3	1/18/2013	12	8	4	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	16	5	VFS (1M)	1 individual, identified in-field
							7	3/13/2013	29	20	5	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
31	33.701908	-117.119776	35.2	12.0	3.9	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
32	33.712167	-117.119699	7.3	3.5	2.8	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	14	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	14	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	14	4	none	N/A
							7	3/13/2013	29	19	7	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
33	33.715943	-117.125766	77.3	19.7	14.9	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	15	6	8	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	15	6	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	21	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
34	33.721704	-117.134659	18.1	7.4	3.4	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	15	6	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	16	3	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
35	33.722029	-117.135747	2.3	2.9	1.1	dirt road rut	1	12/27/2012	15	9	4	none	N/A
							2	1/4/2013	12	N/A	dry	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
36	33.722001	-117.135582	137.1	26.9	14.3	dirt road rut	1	12/27/2012	10	6	1	*Branchinecta* sp. (14M, 6F)	100s, unidentifiable juveniles
							2	1/4/2013	15	5	8	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	11	11	juveniles not collected	1,000s
							5	2/13/2013	20	14	15	none	N/A
							6	2/26/2013	22	16	12	VFS (5M, 3F)	100s
							7	3/13/2013	29	20	9	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
37	33.722257	-117.136434	74.6	12.8	8.0	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	7	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	13	19	none	N/A
							5	2/13/2013	20	15	8	none	N/A
							6	2/26/2013	22	16	14	none	N/A
							7	3/13/2013	29	21	11	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
38	33.722257	-117.136726	41.6	10.4	8.6	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	3	none	N/A
							3	1/18/2013	12	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	5	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A
39	33.722410	-117.136903	73.9	19.0	14.7	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	16	5	3	none	N/A
							3	1/18/2013	14	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	7	juveniles not collected	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A
40	33.735982	-117.136613	12.0	4.9	3.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	17	6	4	none	N/A
							3	1/18/2013	14	N/A	dry	none	N/A
							4	1/30/2013	19	15	9	none	N/A
							5	2/13/2013	20	16	7	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
41	33.735537	-117.145274	9.8	4.1	3.1	dirt road rut	1	12/27/2012	15	N/A	dry	none	N/A
							2	1/4/2013	17	5	5	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
42	33.597901	-117.154551	14.2	5.4	3.3	dirt road rut	1	12/27/2012	16	9	8	none	N/A
							2	1/4/2013	17	5	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
43	33.597808	-117.152245	61.8	17.0	4.4	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	7	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	14	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	16	10	none	N/A
							7	3/13/2013	29	22	18	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
44	33.597921	-117.152301	42.0	9.7	5.2	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	8	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	20	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
45	33.597879	-117.152193	9.6	3.9	3.3	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	4	6	VFS (3M, 2F))	100s
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	22	6	VFS (4M, 1F)	100s
							8	3/28/2013	25	N/A	dry	none	N/A
46	33.597911	-117.152059	95.0	20.0	6.5	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	5	15	VFS (2M, 7F)	100s
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	9	none	N/A
							5	2/13/2013	20	17	3	none	N/A
							6	2/26/2013	22	17	4	none	N/A
							7	3/13/2013	29	21	13	VFS (4M, 3F)	100s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
47	33.597933	-117.151062	11.2	4.5	3.0	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	5	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	13	7	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
48	33.597997	-117.148320	7.8	3.4	3.1	dirt road rut	1	12/27/2012	16	12	9	none	N/A
							2	1/4/2013	17	6	3	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	5	none	N/A
							5	2/13/2013	20	15	5	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
49	33.598198	-117.141776	44.7	15.1	5.8	multiple dirt road ruts	1	12/27/2012	16	12	9	none	N/A
							2	1/4/2013	17	5	14	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	8	none	N/A
							5	2/13/2013	20	16	4	none	N/A
							6	2/26/2013	22	18	7	none	N/A
							7	3/13/2013	29	21	15	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
50	33.597961	-117.150508	29.0	10.0	4.0	multiple dirt road ruts	1	12/27/2012	17	N/A	dry	none	N/A
							2	1/4/2013	17	6	9	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	5	none	N/A
							5	2/13/2013	20	14	6	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	23	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
51	33.611970	-117.154129	62.8	17.6	6.3	multiple dirt road ruts	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	17	6	8	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
52	33.615104	-117.118652	7.0	5.1	1.6	dirt road rut	1	12/27/2012	16	12	3	none	N/A
							2	1/4/2013	17	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
53	33.615296	-117.118663	3.3	4.1	0.9	dirt road rut	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
54	33.641718	-117.119063	11.4	12.3	1.0	roadside swale	1	12/27/2012	16	12	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
55	33.641688	-117.119348	5.7	3.6	1.9	dirt road rut	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	16	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
56	33.670610	-117.119328	25.8	16.6	1.8	roadside swale, partially on asphalt	1	12/27/2012	16	11	3	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
57	33.598002	-117.148817	8.4	3.9	2.6	dirt road rut	1	12/27/2012	16	10	4	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
58	33.597046	-117.141671	12.3	8.4	1.9	dirt road rut	1	12/27/2012	16	10	4	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	15	1	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
59	33.637994	-117.119169	25.5	8.2	3.6	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	6	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	18	4	none	N/A
							7	3/13/2013	29	22	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
60	33.642013	-117.119053	35.6	14.4	2.4	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	4	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	1	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
61	33.663392	-117.119030	78.1	13.1	8.1	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	3	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	19	1	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

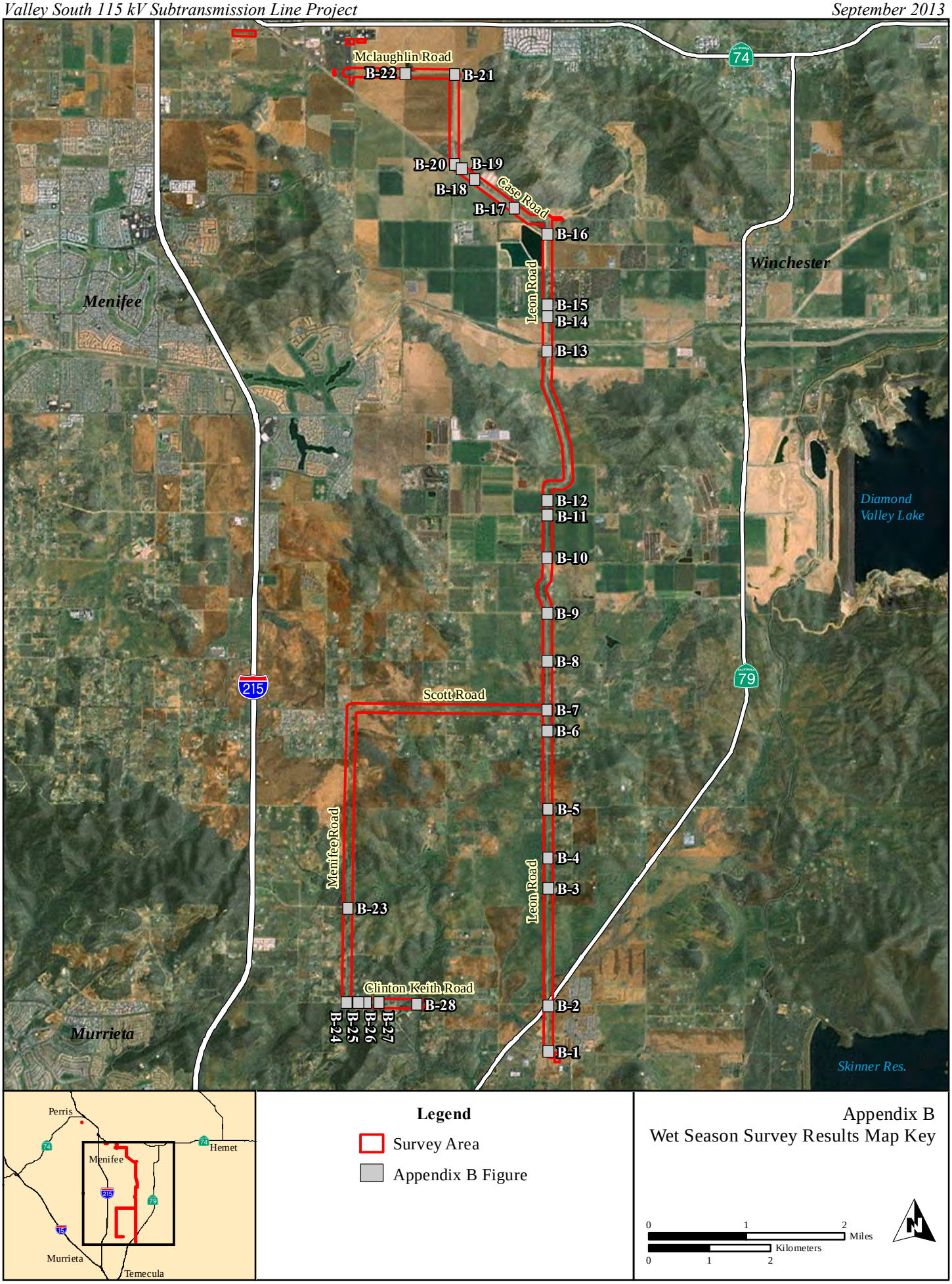
Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

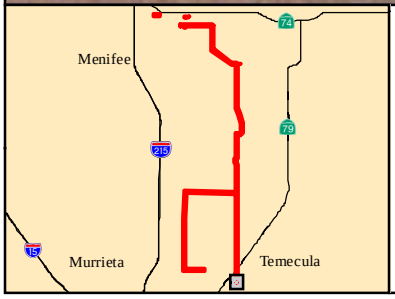
Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
62	33.672404	-117.119453	37.8	29.5	2.0	dirt road swale	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	14	11	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	16	4	none	N/A
							7	3/13/2013	29	20	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
63	33.673049	-117.119464	119.1	61.1	2.4	dirt road swale	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	12	9	none	N/A
							5	2/13/2013	20	16	1	none	N/A
							6	2/26/2013	22	18	3	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
64	33.695271	-117.119895	16.1	7.6	2.6	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	16	5	none	N/A
							6	2/26/2013	22	17	3	none	N/A
							7	3/13/2013	29	23	2	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
65	33.722414	-117.136471	22.4	12.8	2.3	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	16	6	none	N/A
							6	2/26/2013	22	18	9	none	N/A
							7	3/13/2013	29	21	8	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
66	33.664757	-117.119216	71.9	57.5	1.6	irrigation ditch	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	14	VFS (6M, 0F)	1,000s
							8	3/28/2013	25	N/A	dry	none	N/A

Appendix B. Valley South 115 kV Subtransmission Line Project Wet Season Fairy Shrimp Survey Results

Basin ID	Lat	Long	Area (m2)	Max Length (m)	Max Width (m)	Habitat Condition	Site Visit	Date	Air Temp (°C)	Water Temp (°C)	Depth (cm)	Shrimp Species in Sample	Estimated # in Basin
67	33.670437	-117.119467	3.9	2.5	2.2	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	3	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
68	33.720112	-117.132908	124.5	41.7	4.5	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	23	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
69	33.597848	-117.152277	7.6	11.4	1.2	dirt road rut	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	24	6	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A
Scott and Men-ifee Rd.	33.641708	-117.153619	N/A	N/A	N/A	disturbed field dominated by non-native grasses and forbs	1	12/27/2012	16	N/A	dry	none	N/A
							2	1/4/2013	18	N/A	dry	none	N/A
							3	1/18/2013	18	N/A	dry	none	N/A
							4	1/30/2013	19	N/A	dry	none	N/A
							5	2/13/2013	20	N/A	dry	none	N/A
							6	2/26/2013	22	N/A	dry	none	N/A
							7	3/13/2013	29	N/A	dry	none	N/A
							8	3/28/2013	25	N/A	dry	none	N/A

Note: VFS = versatile fairy shrimp *(Branchinecta lindahli)*, M = Male, F = Female


Mclaughlin Road
B-22
B-21
B-20
B-19
B-18
B-17
Case Road
B-16
Leon Road
B-15
B-14
B-13
B-12
B-11
B-10
B-9
B-8
Scott Road
B-7
B-6
B-5
B-4
B-3
Menifee Road
B-23
Leon Road
Clinton Keith Road
B-28
B-24
B-25
B-26
B-27
B-2
B-1
Menifee
Winchester
Murrieta
Diamond Valley Lake
Skinner Res.
74
215
79
Perris
Hemet
Menifee
Murrieta
Temecula
Legend
Survey Area
Appendix B Figure
Appendix B
Wet Season Survey Results Map Key
0 1 2 Miles
0 1 2 Kilometers
N



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Survey Area

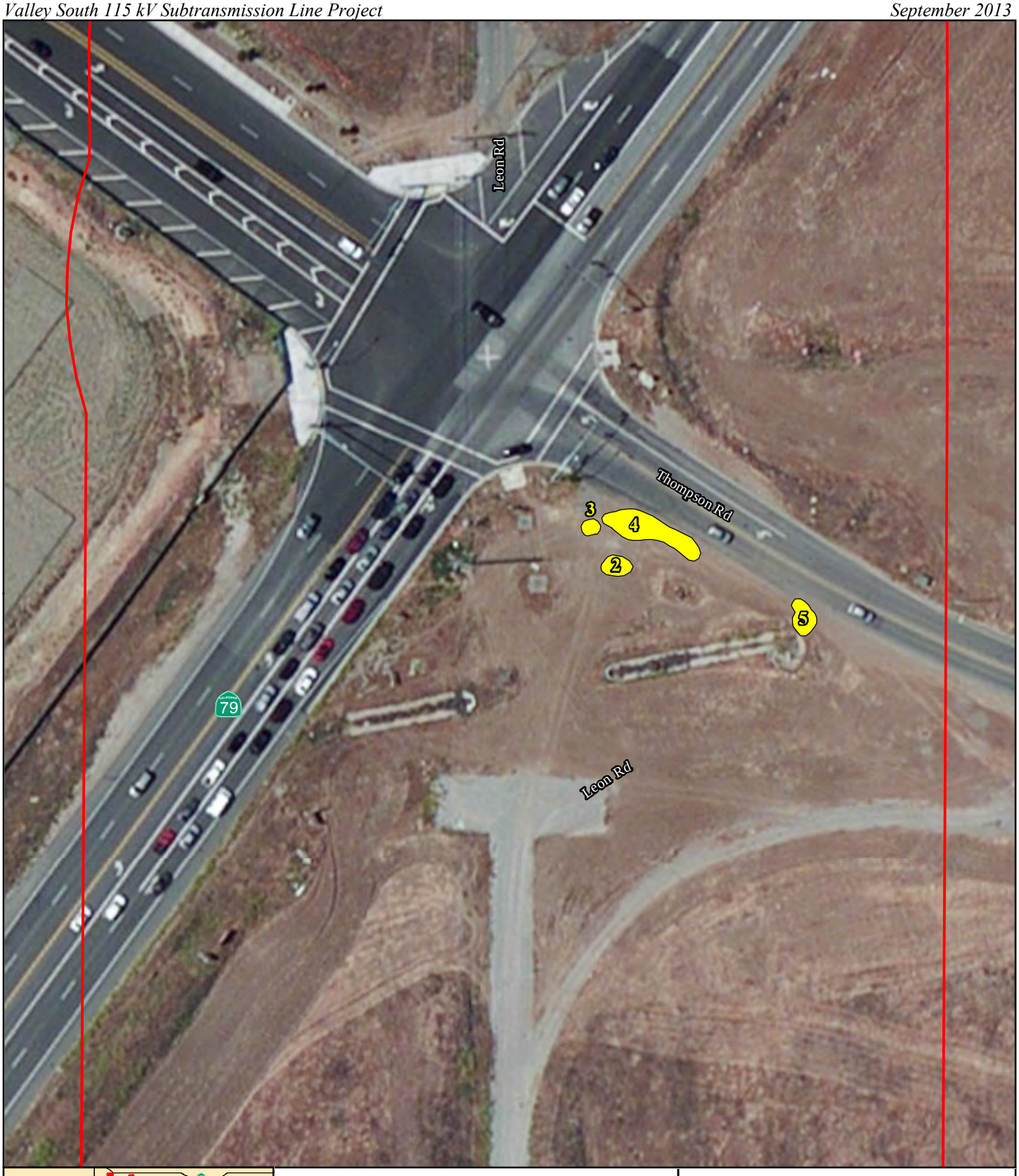
Ponded Basins

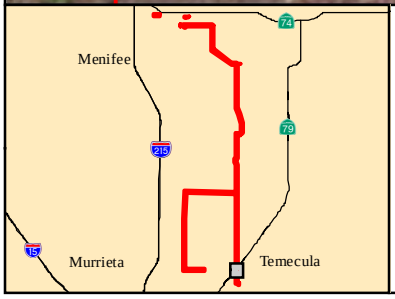
No Fairy Shrimp

Figure B-1
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





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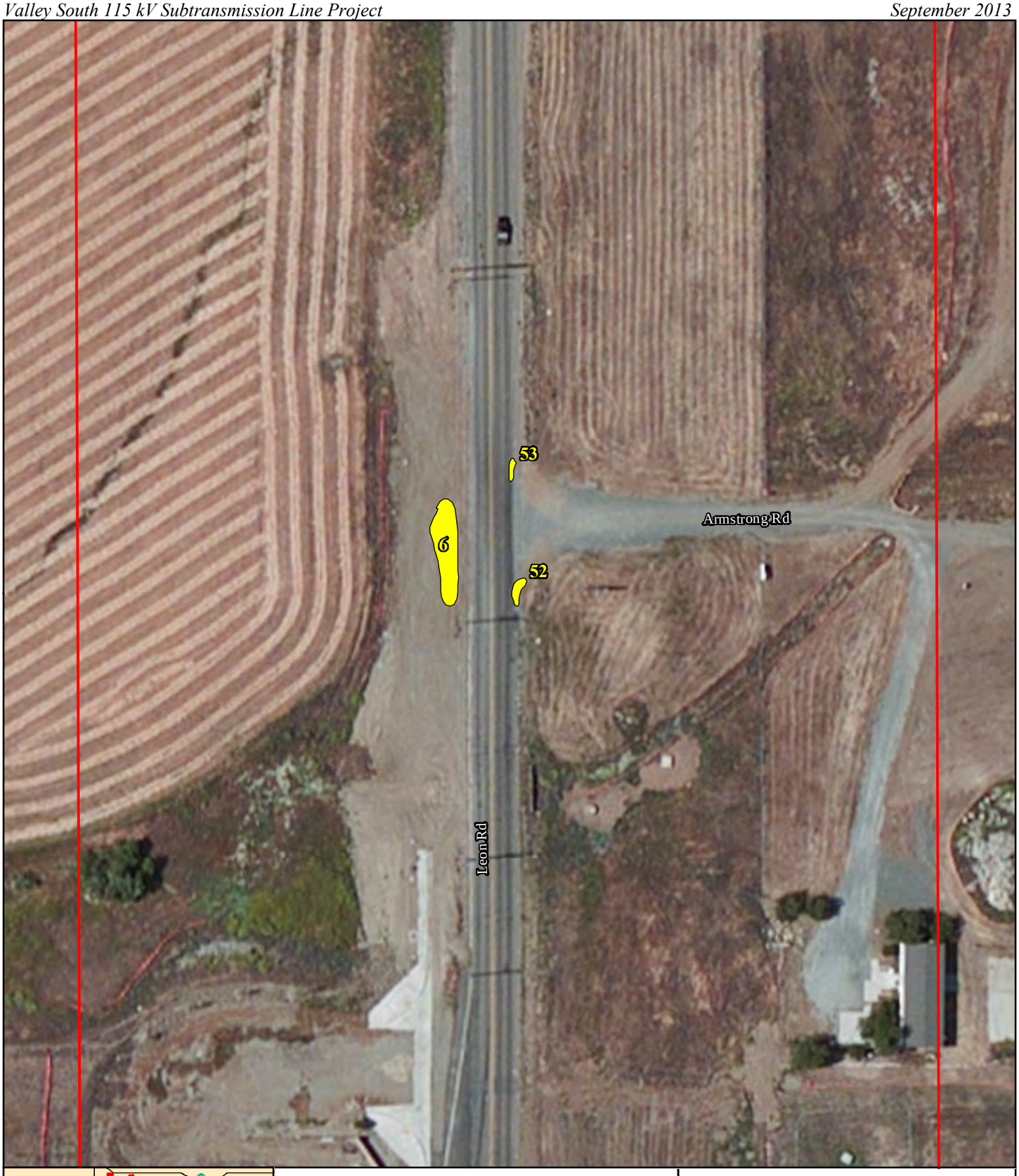
Survey Area

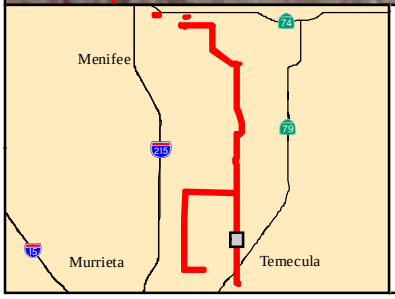
Ponded Basins

No Fairy Shrimp

Figure B-2
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters





Legend

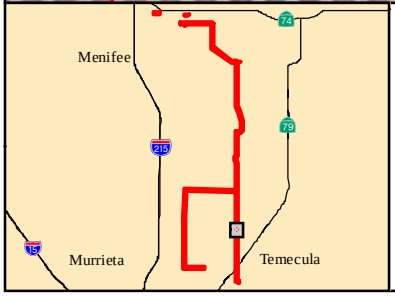
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-3
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

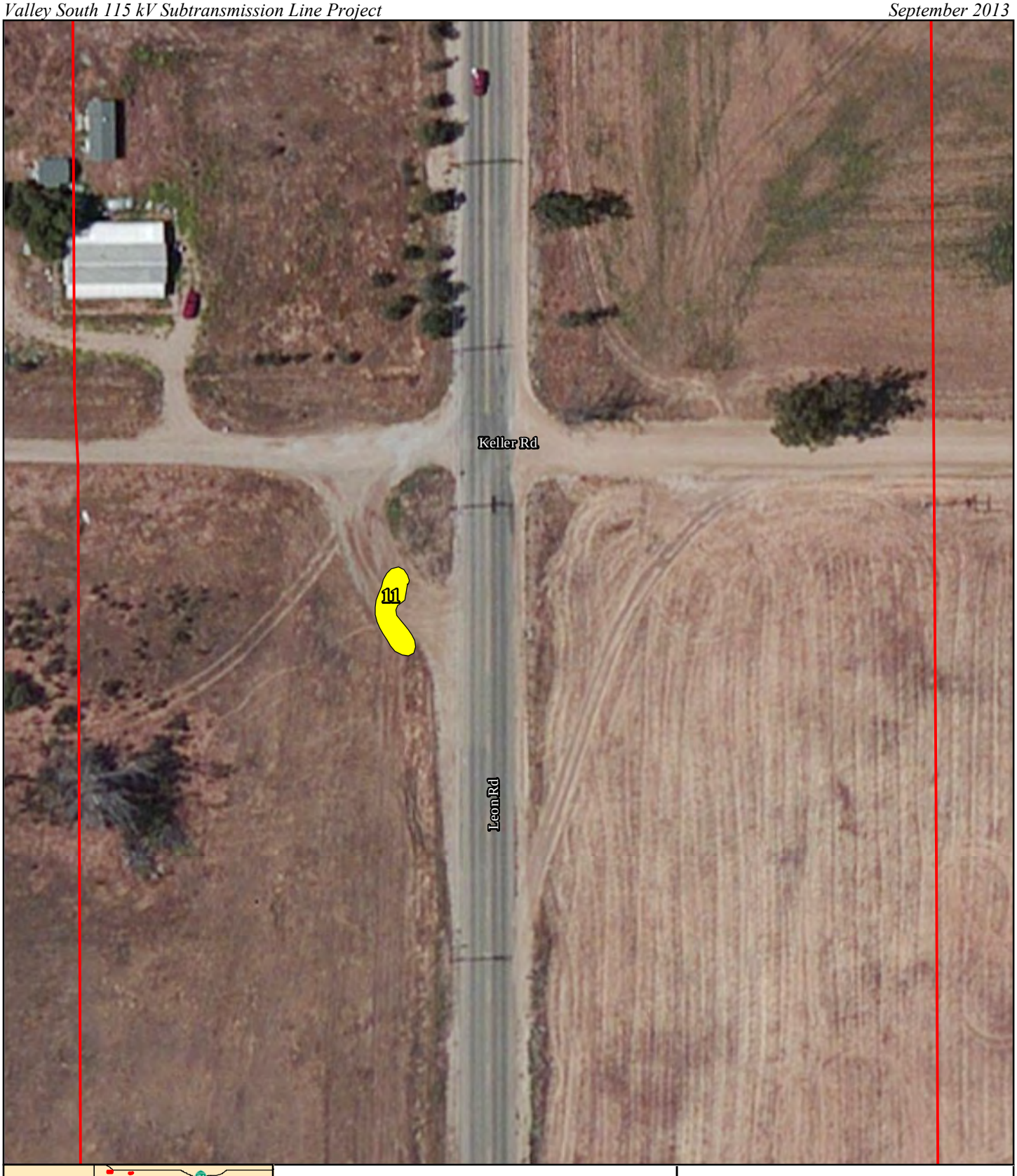
Ponded Basins

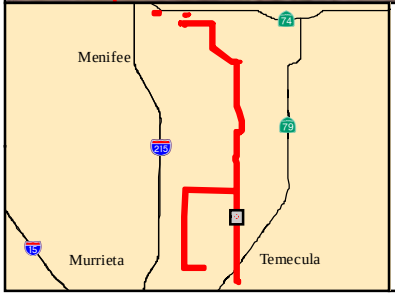
No Fairy Shrimp

Figure B-4
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

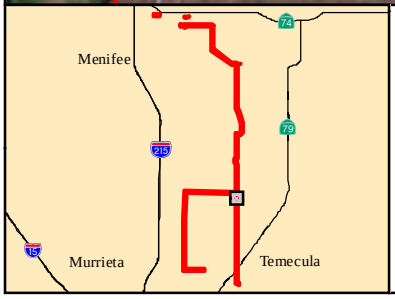
Ponded Basins

No Fairy Shrimp

Figure B-5
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

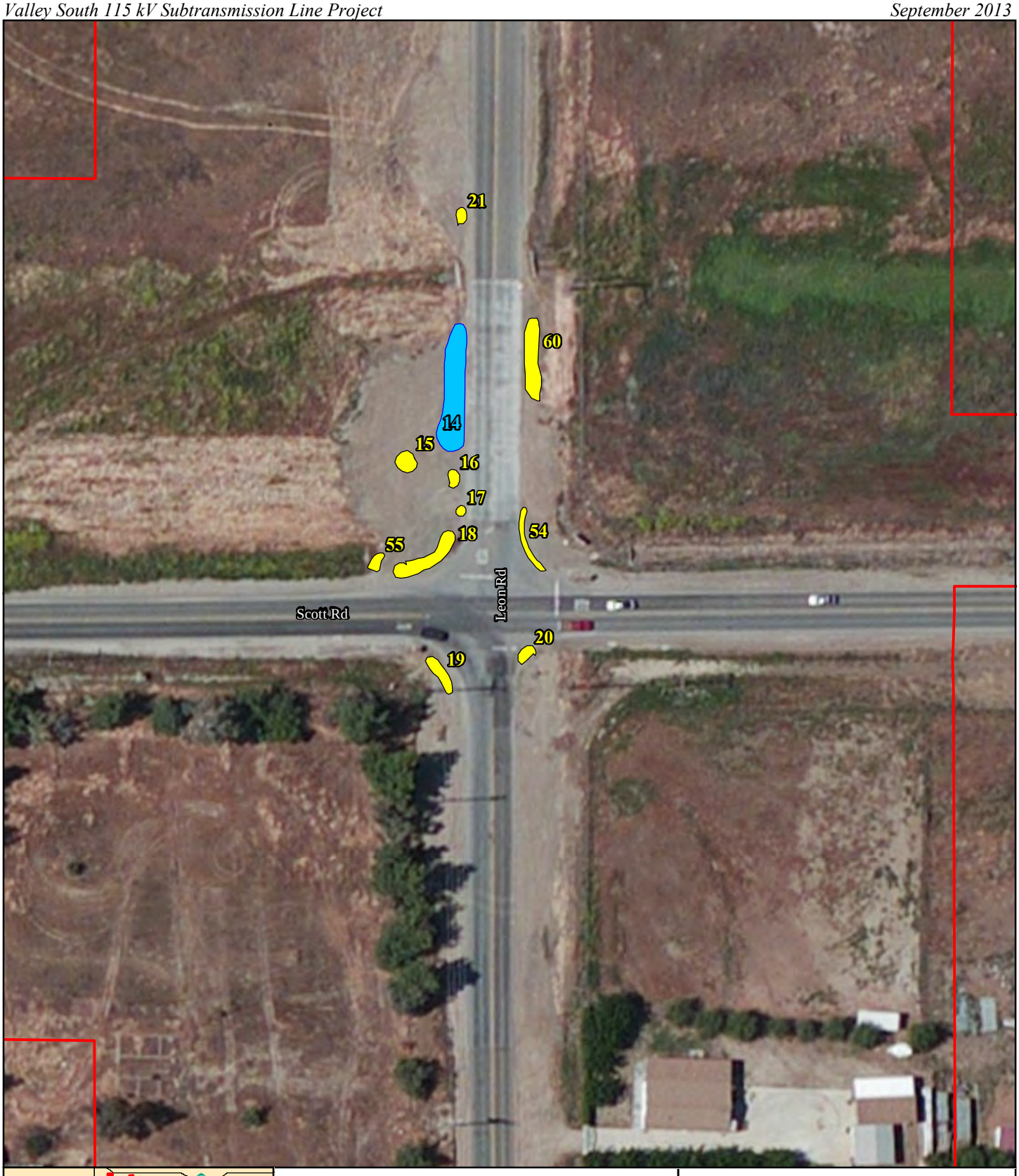
Ponded Basins

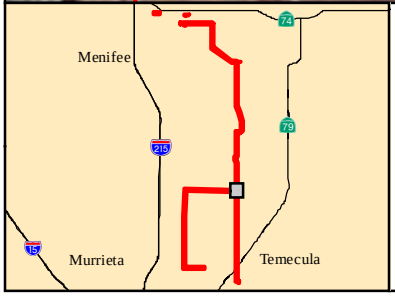
No Fairy Shrimp

Figure B-6
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

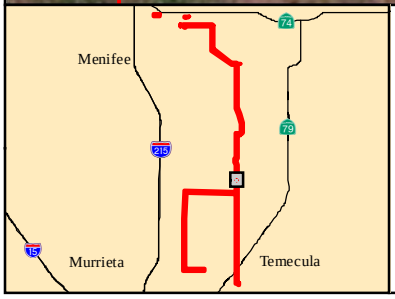
Ponded Basins

No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-7
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

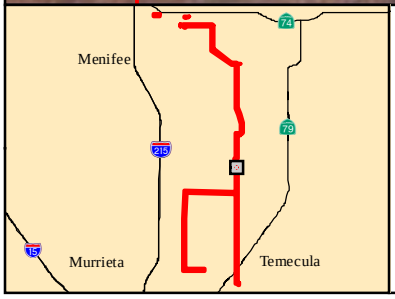
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-8
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

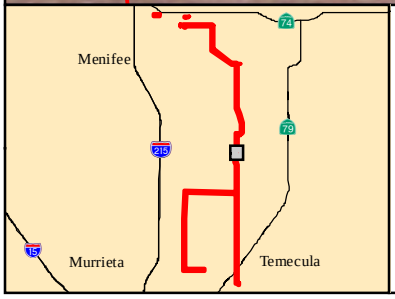
Ponded Basins

No Fairy Shrimp

Figure B-9
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

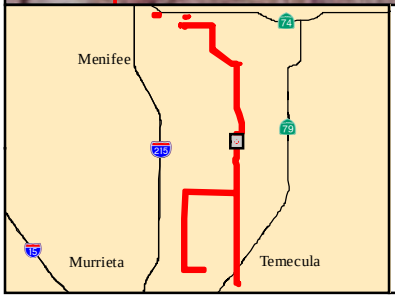
Ponded Basins

No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-10
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

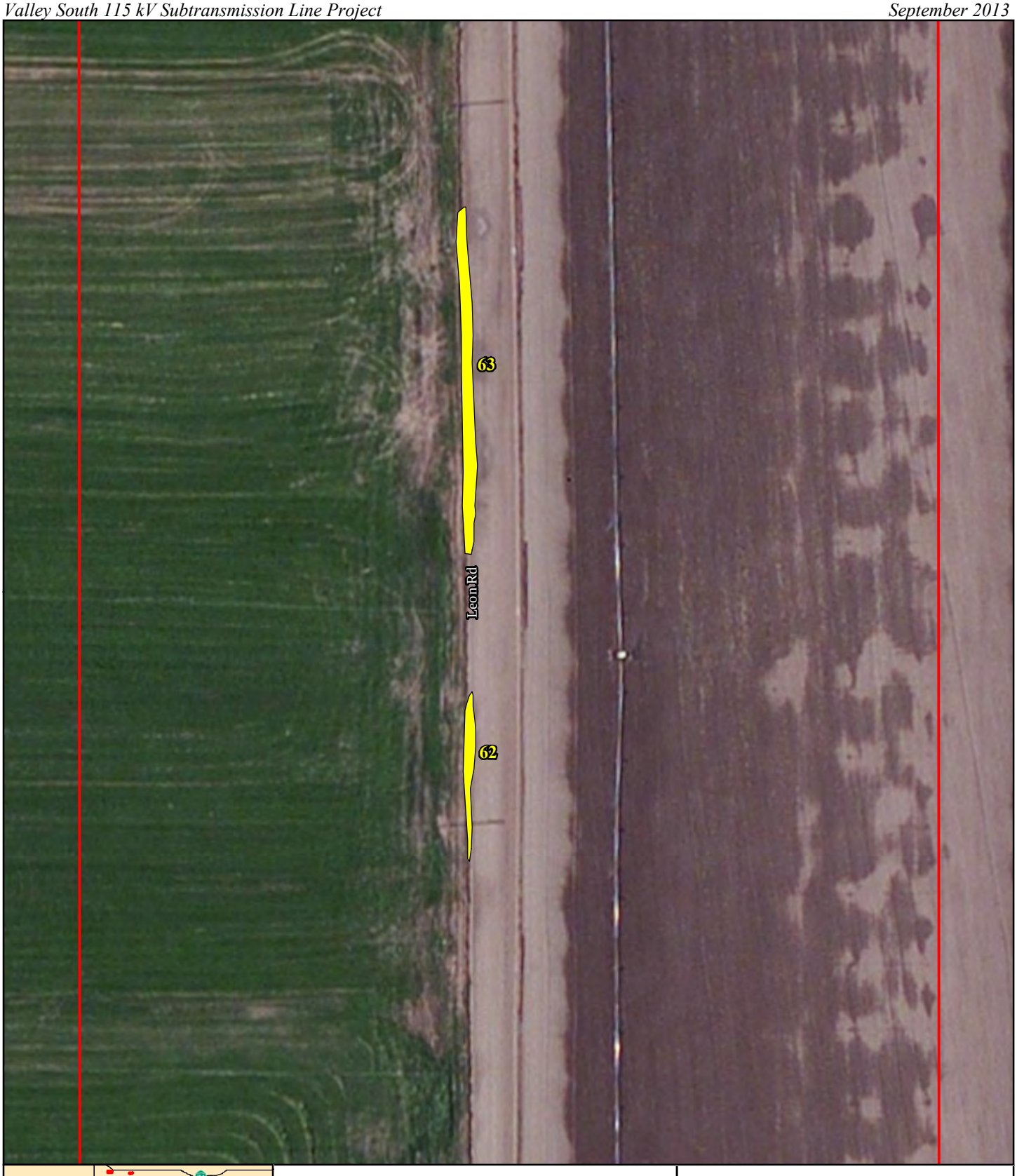
Survey Area

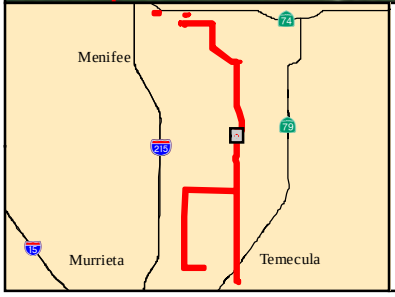
Ponded Basins

No Fairy Shrimp

Figure B-11
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters





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Survey Area

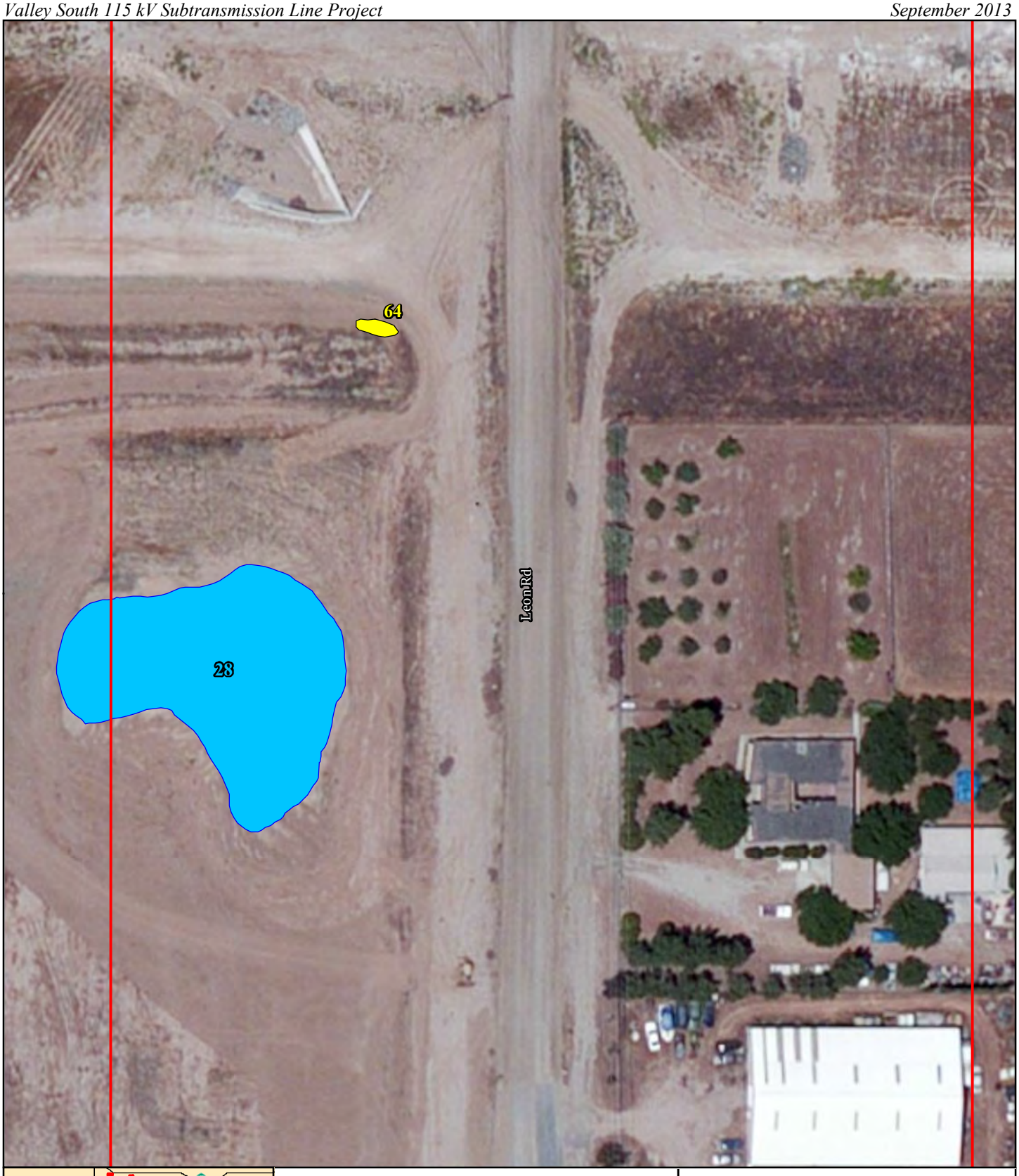
Ponded Basins

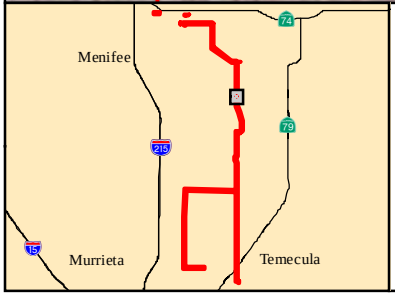
No Fairy Shrimp

Figure B-12
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

Survey Area

Ponded Basins

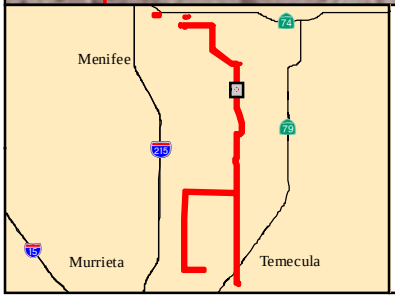
No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-13
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

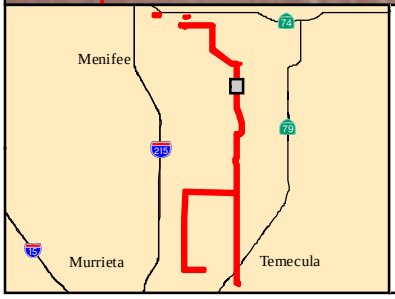
Ponded Basins

No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-14
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

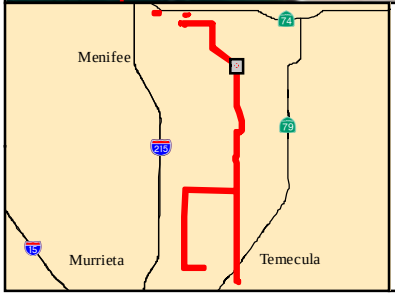
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-15
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

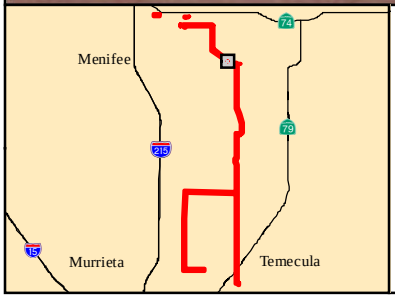
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-16
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

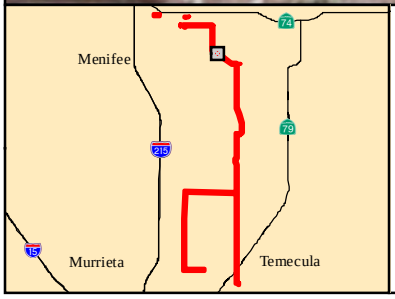
Ponded Basins

No Fairy Shrimp

Figure B-17
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

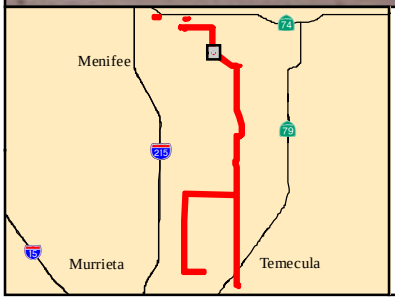
Ponded Basins

No Fairy Shrimp

Figure B-18
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N



Legend

Survey Area

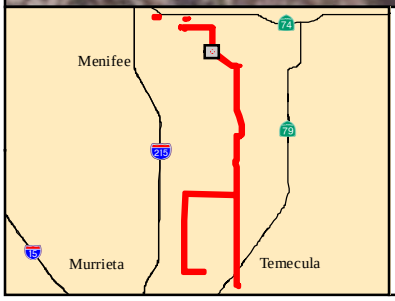
Ponded Basins

No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-19
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

Ponded Basins

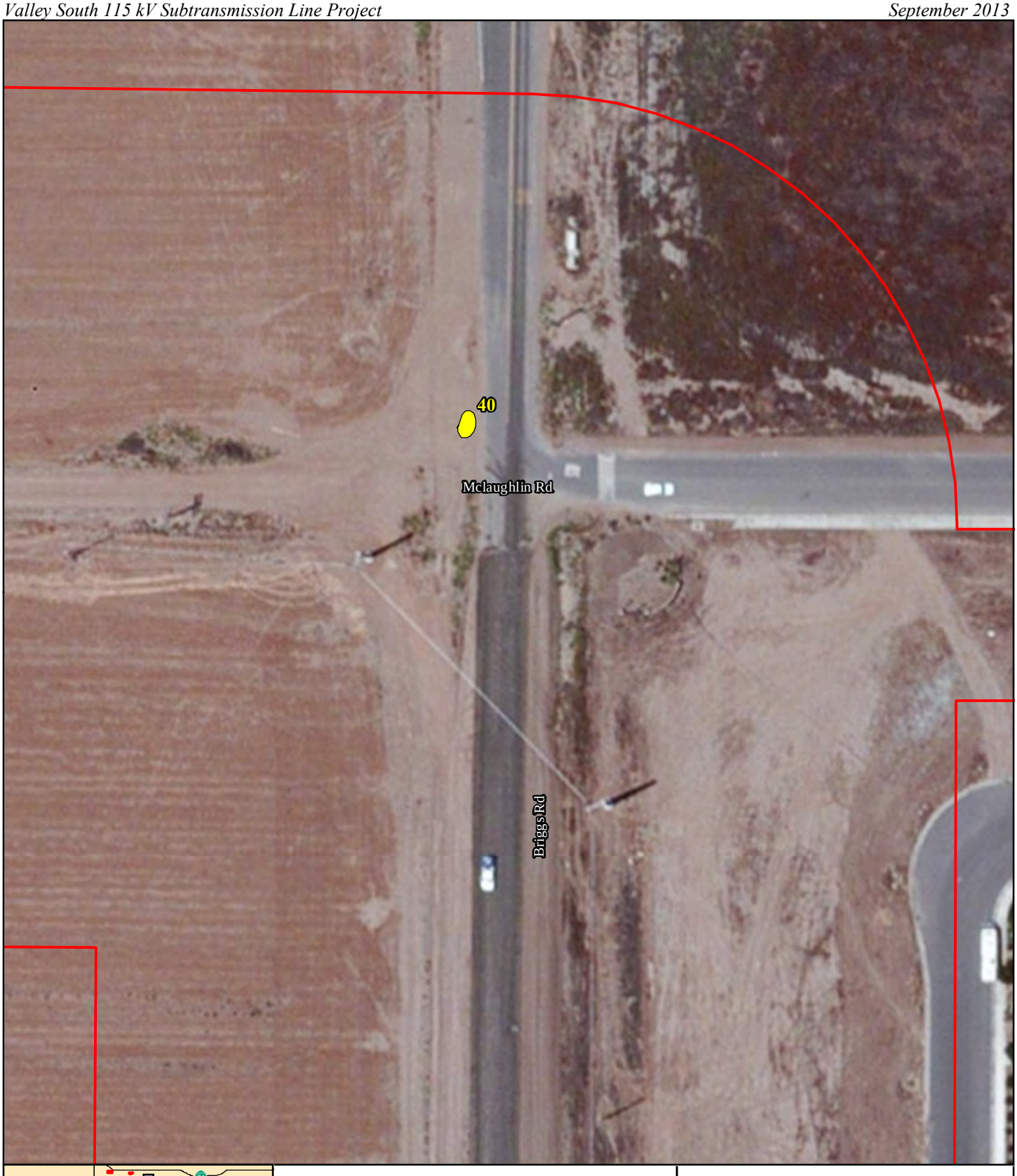
No Fairy Shrimp

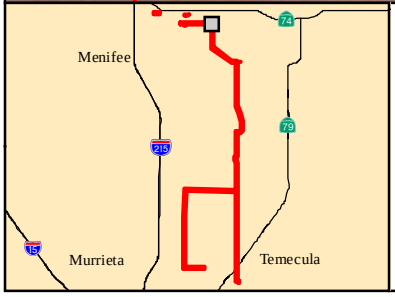
Versatile Fairy Shrimp

Juvenile Fairy Shrimp (Too Small to Identify)

Figure B-20
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters





Legend

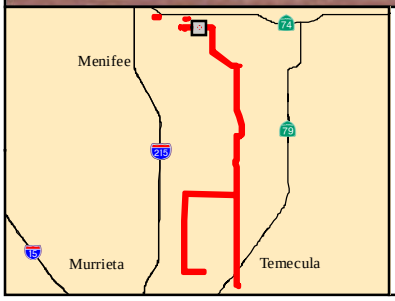
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-21
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

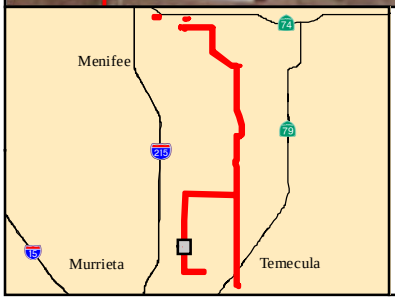
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-22
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-23
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N

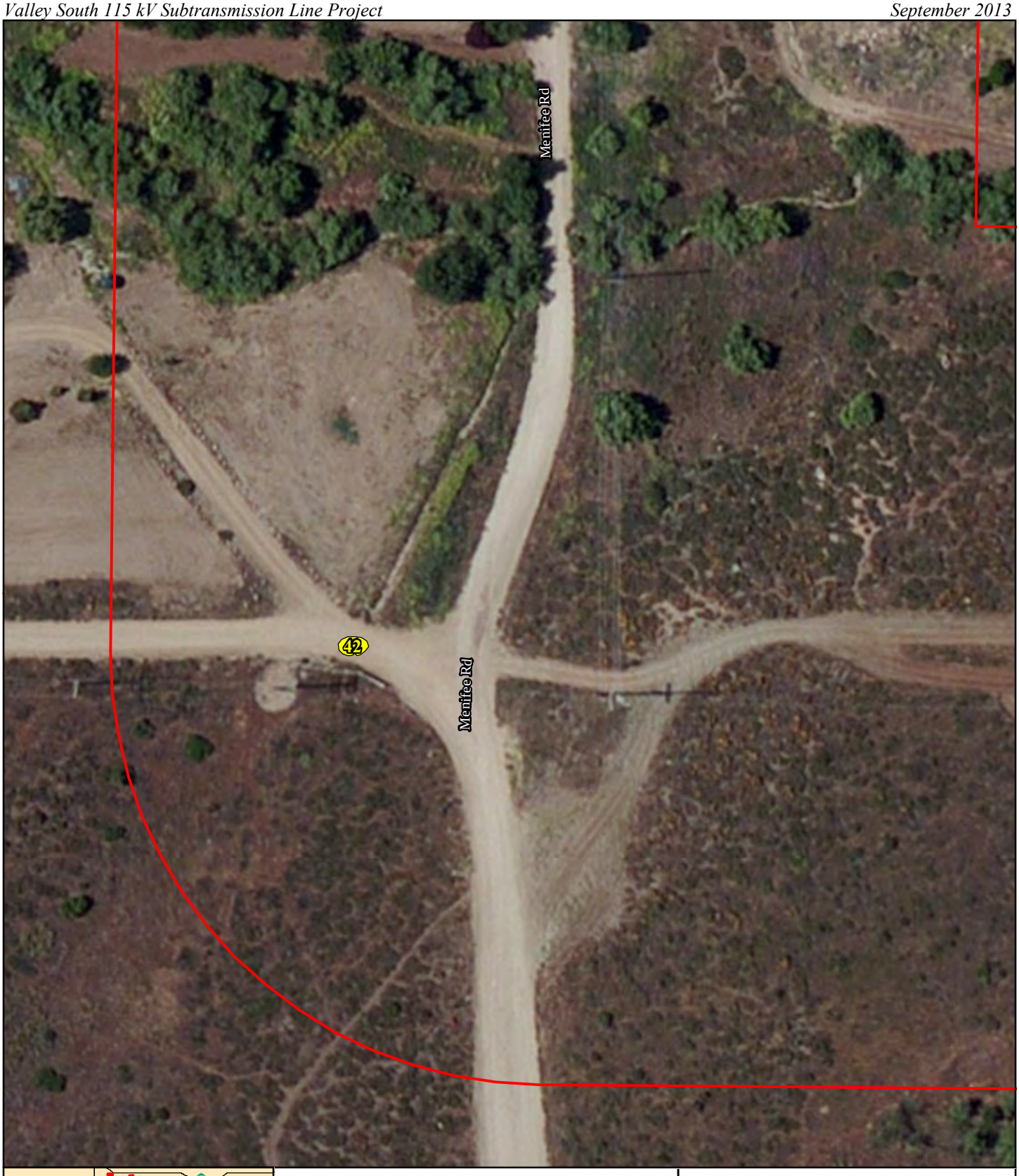
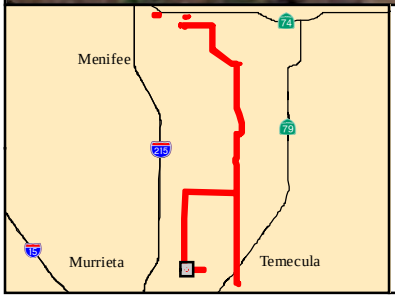


Figure B-24
Wet Season Survey Results



Legend

Survey Area

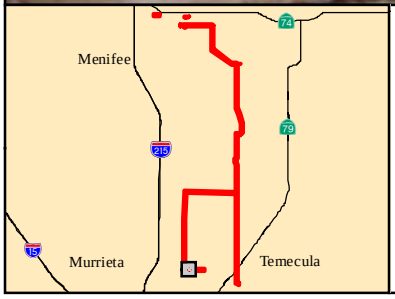
Ponded Basins

No Fairy Shrimp

Versatile Fairy Shrimp

Figure B-25
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

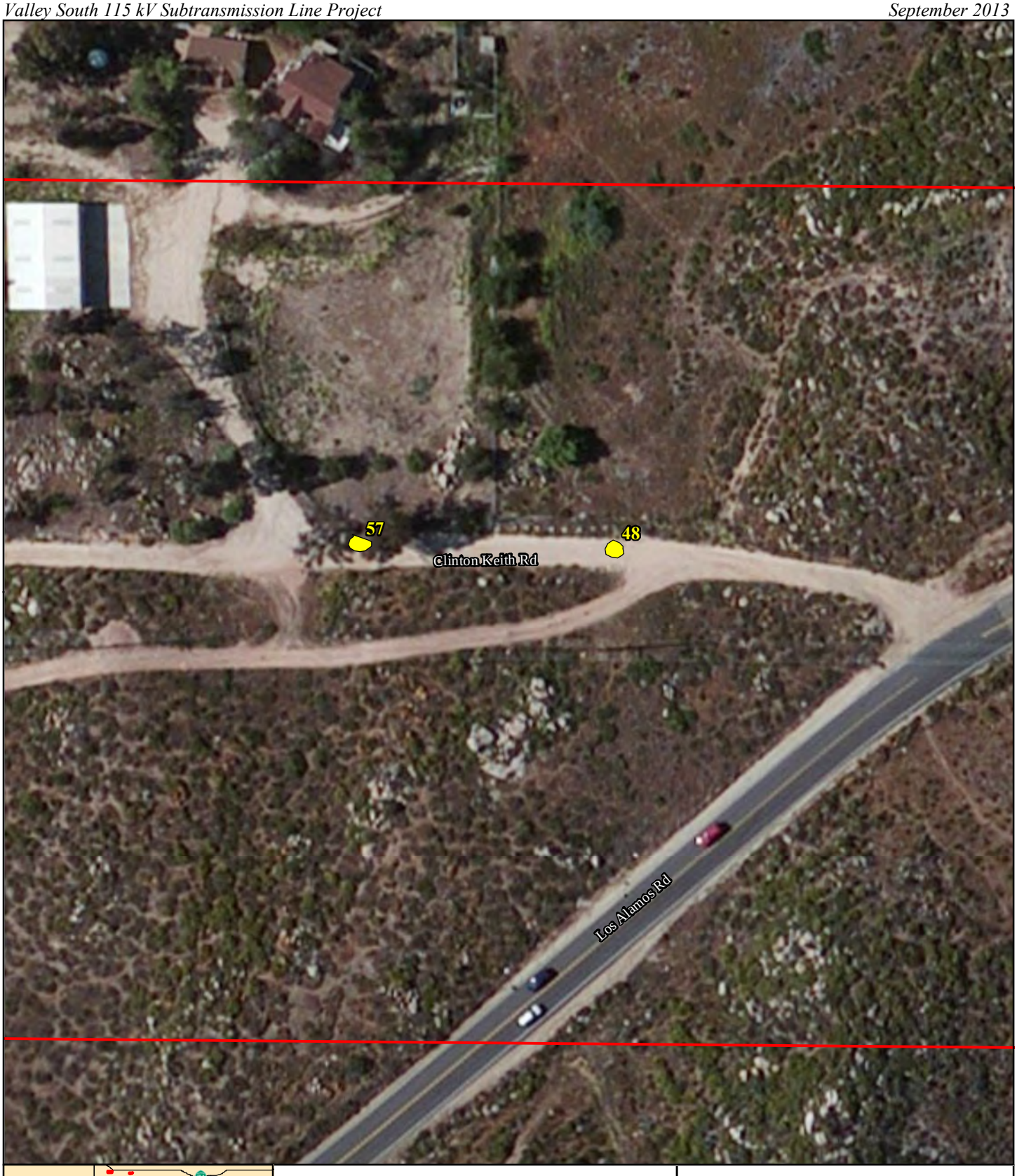
Ponded Basins

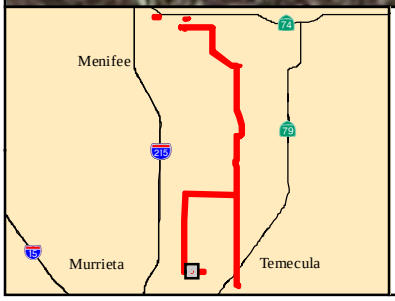
No Fairy Shrimp

Figure B-26
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

N





Legend

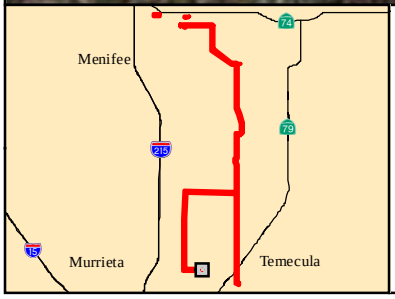
Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-27
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters



Legend

Survey Area

Ponded Basins

No Fairy Shrimp

Figure B-28
Wet Season Survey Results

0 50 100 Feet
0 10 20 Meters

APPENDIX C

Photographic Record

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 1 – looking south

Basin 2 – looking southeast

Basin 3 – looking southeast

Basin 4 – looking southeast

Basin 5 – looking southeast

Basin 6 – looking south

Appendix C. Photographic Record of Ponded Basins in Project Area

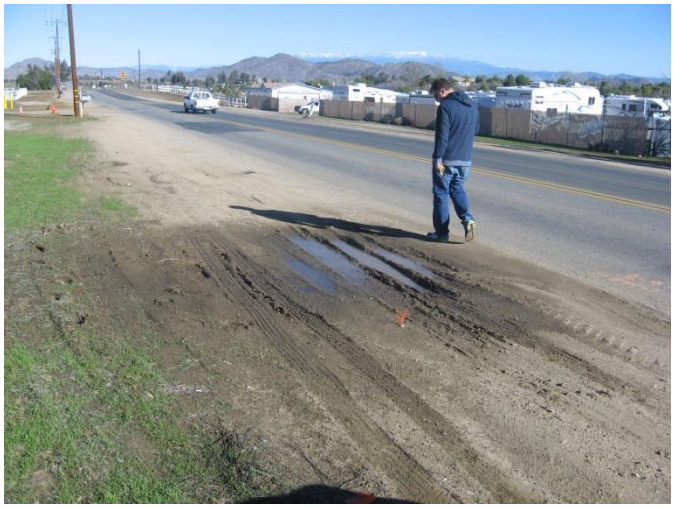
Basin 7 – looking west

Basin 8 – looking north

Basin 9 – looking southwest

Basin 10 – looking west

Basin 11 – looking south



Basin 12 – looking north

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 13 – looking south

Basin 14 – looking north

Basin 15 – looking west

Basin 16 – looking south

Basin 17 – looking south

Basin 18 – looking east

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 19 – looking north

Basin 20 – looking west

Basin 21 – looking north

Basin 22 – looking south

Basin 23 – looking southeast

Basin 24 – looking south

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 25 – looking south

Basin 26 – looking south

Basin 27 – looking south

Basin 28 – looking northwest

Basin 29 – looking northeast

Basin 30 – looking north

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 31 – looking south

Basin 32 – looking east

Basin 33 – looking northwest

Basin 34 – looking north

Basin 35 – looking southwest

Basin 36 – looking north

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 37 – looking west

Basin 38 – looking northwest

Basin 39 – looking northwest

Basin 40 – looking northeast

Basin 41 – looking south

Basin 42 – looking west

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 43 – looking east

Basin 44 – looking east

Basin 45 – looking southeast

Basin 46 – looking east

Basin 47 – looking east

Basin 48 – looking west

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 49 – looking south

Basin 50 – looking west

Basin 51 – looking south

Basin 52 – looking north

Basin 53 – looking north

Basin 54 – looking south

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 55 – looking west

Basin 56 – looking northeast

Basin 57 – looking east

Basin 58* – looking west (determined outside survey area)

Basin 59 – looking south

Basin 60 – looking north

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 61 – looking west

Basin 62 – looking north

Basin 63 – looking north

Basin 64 – looking northwest

Basin 65 – looking northwest

Basin 66 – looking south

Appendix C. Photographic Record of Ponded Basins in Project Area

Basin 67 – looking southwest

Basin 68 – looking southeast

Basin 69 – looking east

Corner of Scott and Menifee Roads – looking east

Quino Checkerspot Survey Report

Southern California Edison
Valley South 115kV Subtransmission Line Project
Riverside, California

USGS Bachelor Mountain, Murrieta, Romoland, and Winchester Quadrangles

July, 2013

Prepared For:

Southern California Edison
1218 S. Fifth Ave
Monrovia, CA 91016

Prepared By:

TRC Solutions, Inc.
123 Technology Drive West
Irvine, CA 92618

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Acronyms List

Acronym	Definition
DBESP	Determination of Biologically Equivalent or Superior Preservation
MSHCP	Western Riverside Multiple Species Habitat Conservation Plan
kV	kilovolt
Proposed Project	Valley South 115kV Subtransmission Line Project
Project survey area	500-foot buffer around Proposed and Alternative Projects
SCE	Southern California Edison
TRC	TRC Solutions, Inc.
TSP	Tubular Steel Pole
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

TRC Solutions, Inc. (TRC) was contracted by Southern California Edison (SCE) to conduct a habitat assessment and protocol survey for the federally endangered Quino checkerspot (*Euphydryas editha quino*) for the Valley South 115 kV Subtransmission Line Project (Proposed and Alternative Projects), which is located in and adjacent to the cities of Menifee, Murrieta, and Perris and the unincorporated communities of Winchester and French Valley, Riverside County, California (see Figure 1, Vicinity Map). The purpose of this survey was to determine presence and assess risk to the species from the Proposed and Alternative Projects.

1.1 PROJECT OVERVIEW

SCE is proposing the construction of the Proposed or Alternative Project to serve current and projected demand for electricity and maintain electric system reliability in portions of Murrieta, Menifee, and unincorporated communities within the southern portion of Riverside County. The following points briefly describe the components included in the Proposed Project:

- Modification of SCE's existing Valley 500/115 kilovolt (kV) Substation which would include equipping an existing 115 kV line position and providing protection equipment as required.
- Construction of a new 115 kV Subtransmission Line originating at SCE's existing Valley 500/115 kV Substation and terminating at a Tubular Steel Pole (TSP) which is located south of the intersection of Leon and Benton Roads, hereinafter referred to as "Terminal TSP." The Terminal TSP is the common point of the three-point existing 115 kV subtransmission line Valley-Auld-Triton; thus the project would create the Valley-Auld No. 2 and Valley-Triton 115 kV subtransmission lines. The new 115 kV Subtransmission Line would be approximately 12 miles in length.
- Installation of communication equipment at Triton and Valley Substations to support the new 115 kV Subtransmission Line.

Displayed in Figure 1 are the Proposed Valley South 115 kV Subtransmission Line Project (Proposed Project) and Alternative 115 kV Subtransmission Line Project (Alternative Project). The area within which biological surveys were conducted is defined by a 250-foot buffer surrounding the Proposed and Alternative Projects (500-foot total width). The area confined strictly within this buffer, referred to here as the Project survey area, is approximately 1,064 acres. Subsequent addition of outlying staging and work areas increased the Project survey area to approximately 1,100 acres.

1.2 PROJECT SETTING

The Proposed and Alternative Projects occur within the predominantly rural and natural landscape comprising the interior valleys, rolling hills, and rugged peaks between the Santa Ana and San Jacinto Mountain ranges of western Riverside County. The Proposed and Alternative Project alignments primarily follow existing roadways that pass through relatively gradual terrain of the Perris, Domenigoni, Paloma, and French Valleys, as well as portions of the northeast Sedco Hills.

The southern portion of the Project survey area is drained by the Warm Springs Creek watershed and the northern portion by Salt Creek (Domenigoni Channel). Portions of the valleys have no drainage outlets to the ocean.

The location of the Proposed and Alternative Projects on the east side of coastal mountains, in combination with relatively low elevation range of 1,300 to 2,600 feet above sea level, imposes arid conditions that are reflected in the vegetation. Xeric scrub vegetation dominates the steeper terrain, whereas the valley bottoms support mostly herbaceous types, such as grassland. Much of the steep terrain is extremely rocky, with many large granitic outcrops. Drainages and basins support willow-dominated riparian growth and/or marsh.

Historic human land uses in this area have consisted primarily of extensive agricultural conversion of the valley bottoms to dry grain and irrigated crops, as well as livestock grazing. Human dwellings are sparse and widely separated, but typically associated with non-native tree and shrub plantings. Human-caused modifications to the landscape include artificial water reservoirs and large tracts of non-native trees. Although relatively steep terrain within the Project survey area supports a high percentage of native scrub vegetation, much of it shows evidence of past disturbance, such as through grazing or fire. The topography and/or vegetation of nearly every drainage bear some evidence of past disturbance from crop cultivation, vegetation removal, channelization, or grazing. Much of the current riparian vegetation appears to be re-established growth following earlier disturbance. Vegetation on several drainages adjacent to recent suburban development have been actively enhanced or restored.

Dense suburban and commercial development with associated landscaping and water control features constitute the most recent addition to the landscape of the Project survey area. Dense development accounts for 27 percent of the area mapped within the Project survey area. This human habitat occurs in discrete areas within the matrix of rural or undeveloped lands.

The Valley South 115 kV Subtransmission Line Project occurs within the Southwestern California region of the California Floristic Province, specifically in the South Coast subregion. The South Coast subregion extends along the Pacific Coast from Point Conception to Mexico. Twenty-two vegetation types, sub-types, and other land cover types were documented and mapped within the Project survey area. These are identified in Table 1: Vegetation Types within 250 feet of the Proposed and Alternative Projects. Vegetation is classified and mapped according to the system of Holland (1986), as modified by Oberbauer et al. (2008).

Table 1: Vegetation Types within 250 Feet of the Proposed and Alternative Projects

Acres	Description	Standard Classification[1]
4.55	Willow-cottonwood riparian	Southern Cottonwood - Willow Riparian Forest (61330)
2.24	Willow riparian	Central Coast Arroyo Willow Riparian Forest (61230)
0.41	Restored riparian forest (mixed)	Southern Cottonwood - Willow Riparian Forest (61330)
0.83	Semi-native willow riparian scrub	Southern Willow Scrub (63320)
4.17	Mulefat riparian scrub	Mulefat Scrub (63310)
9.08	Dense, tall coastal sage scrub	Diegan Coastal Sage Scrub: Inland Form (32520)[2]
60.29	Mature open coastal sage scrub	Coastal Sage Scrub (32500 / 32700)
3.81	Chamise chaparral	Chamise Chaparral (37200)
4.53	Tall, dense coastal sage scrub-chaparral	Coastal Sage - Chaparral Scrub (37G00)
0.73	Burned coastal sage scrub-chaparral	Coastal Sage - Chaparral Scrub (37G00)
14.80	Low, sparse coastal sage scrub	Coastal Sage Scrub (32500 / 32700)
257.35	Ruderal	Disturbed Habitat (11300)[2]
92.40	Dense non-native grassland	Non-native Grassland (42200)
4.93	Semi-native grassland	Non-native Grassland (42200)
260.35	Unvegetated / developed	Urban / Developed (12000)[2]
30.17	Ornamental / planted veg	Urban / Developed (12000)[2]
22.05	Eucalyptus	Eucalyptus Woodland (79100)[2]
3.84	Freshwater marsh	Valley Freshwater Marsh (52410)
1.33	Disturbed ephemeral wet basin	San Diego Mesa Claypan Vernal Pool (44322)[2]
277.84	Agriculture	Agriculture (18000)[2]
4.12	Disturbed flood control channel	Disturbed Wetland (11200)[2]
3.77	Open water	Fresh water (64140)[2]
1063.6 TOTAL ACREAGE		

[1] *Framework classification according to Holland 1986.*

[2] *Vegetation types not addressed in Holland 1986, so classified according to Oberbauer et al. 2008.*

The southern portions of the Proposed and Alternative Projects occur near several historical Quino checkerspot locations registered with the California Natural Diversity Database. Known extant populations occur around Lake Skinner, about three miles east of the Proposed Project. The majority of the Alternative Project is surrounded by Critical Habitat designated for the species by the U.S. Fish and Wildlife (USFWS).

1.3 REGULATORY BACKGROUND

The Valley South Subtransmission Line Project occurs within the implementation area of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), developed pursuant to the state Natural Communities Conservation Planning Act of 1991. The Quino checkerspot is regarded as an adequately conserved "covered species" (MSHCP 2003), such that implementation of the conservation acreage targets and species-specific conservation objectives (MSHCP 2003, Table 9-2) is regarded as adequate for the long-term persistence of this species within the area. If 90 percent avoidance of current distribution cannot be achieved throughout the plan area, a Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis must be prepared outlining the proposed impacts to Quino checkerspot and prescribing mitigation to compensate for the impacts.

1.4 QUINO CHECKERSPOT BIOLOGY AND STATUS

The Quino checkerspot was listed as endangered under the federal Endangered Species Act in 1997. The Quino checkerspot is one of several sub-species of the Edith's checkerspot (*Euphydryas editha*) distributed throughout the western United States (Mattoni et al. 1997). It is a medium-sized butterfly that is geographically confined to a few inland areas of southern California between central Riverside County and the Mexican border. This butterfly, formerly widespread throughout the lowlands and low mountains of southern California, has become restricted to a highly fragmented range by historical land conversions to agriculture, grazing, and residential development. Remaining populations occur in highly separated, remote areas supporting suitable low, open woody or herbaceous vegetation with one or more required larval host plant species. Many formerly occupied areas of currently suitable habitat remain unoccupied by this species, presumably due to historical extirpation (Mattoni et al. 1997).

The population structure of the Quino checkerspot across the landscape appears to be naturally disjunct, based on the discontinuous distribution of suitable micro-habitat, including the presence of larval host plants. These conditions often occur in extremely localized dispersions, so local populations may occur on as small an area as one to two thousand square meters (one quarter to one half acre) with wide separations among populations. The ability of this species to re-colonize extirpated areas is apparently poor.

The flight period of adult Quino checkerspots is restricted to a short period in late winter and early spring, generally between late February and early April (Murphy and White 1984). Most populations occur at relatively low elevations (below 2,000 feet above sea level) and depend on locally abundant annual growth of dot seed plantain (*Plantago erecta*) as a single food source for developing larvae. Adults obtain nectar from a wider variety of plant species. Higher elevation populations (up to 5,000 feet) rely on other species in the plantain and figwort families for larval

feeding. The available larval host plant species in the area of the Project survey area is *Plantago erecta.*

The Quino checkerspot is unusual in passing its long period of dormancy as larvae rather than eggs, perhaps giving the species the advantage of rapid response to greening of annual vegetation following winter rain.

Weather conditions during the species' flight period are extremely variable, but the Quino checkerspot is adapted to survive extreme events, from drought to cold spring storms. Recent studies have suggested that the refugia occupied by dormant Quino checkerspot larvae allow them to survive wildfire, at least in some cases.

2.0 METHODS

A habitat assessment and survey for the Quino checkerspot were conducted according to the most recent protocol provided by the USFWS (USFWS 2002). The work was conducted under authority of USFWS 10(a)(1)(A) recovery permit TE-065741-2 issued to TRC biologist John Lovio, who was present during all survey visits.

The Project survey area is defined as all potentially suitable habitat within the 1,064-acre survey buffer described above. The additional outlying staging and work areas were determined to not include potentially suitable Quino checkerspot habitat. An initial habitat assessment was conducted during detailed vegetation mapping of the entire Proposed Project survey area in the spring of 2012. Potentially suitable low, open woody or herbaceous vegetation, with and without documented occurrence of *Plantago erecta,* was identified, irrespective of standard vegetation type. This resulted in the identification of approximately 80 acres of potentially suitable habitat, based on gross structure, distributed over 42 discrete polygons. During the course of the actual survey, the effective survey area was refined and reduced by elimination of areas with overly dense woody cover and/or tall, dense herbaceous cover precluding the occurrence of larval host or nectar plants. The application of these criteria for inclusion in the survey resulted in the designation of a revised survey area comprising approximately 47.8 acres in 26 polygons throughout the greater Project survey area. Two of these polygons (numbers 3 and 38, as referenced below) of potentially suitable habitat were inaccessible behind private fences and were therefore not surveyed. Consequently, the actual surveyed area was 36.1 acres in 24 polygons.

The survey timing was determined by the period of prevailing suitable vegetation conditions between February and early April of 2013 and by observed activity of adult Quino checkerspots on reference sites throughout the region. Each habitat polygon was surveyed by observers on foot on each of five visits over a period of six consecutive weeks. Due to the large area of potential habitat identified by the initial habitat assessment and limited survey hours per day, the protocol survey of all suitable habitat polygons required twelve field visits. Survey effort per polygon was scaled to polygon size and relative habitat suitability, including presence of *Plantago erecta*. Polygons received cumulative survey efforts ranging from 30 to 305 minutes. In accordance with the USFWS survey protocol, survey was not conducted during conditions below 60 degrees Fahrenheit under clear sky or below 70 degrees under cloud cover. Dates,

conditions, polygons surveyed, and survey personnel are presented in Table 2: Survey Effort and Conditions.

Additional field data collected included lists of blooming potential nectar plant species and counts of other butterfly species detected.

Table 2: Survey Effort and Conditions

Date	Survey Hours	Weather Conditions	Polygons Surveyed	Observers*
3/05/13	10:30 – 16:00	66° to 66° F, clear, wind 3 to 10-15 mph, SW	2, 5, 7, 8, 9, 10, 11, 13	JL, AH
3/13/13	09:30 – 16:45	68° to 87° F, clear, wind 0 to 5-8 mph, NW	14, 16, 18, 20, 21, 22B, 24, 27, 28, 29N, 30, 32, 33, 42	JL, AH
3/14/13	09:00 – 13:45	58° to 95° F, clear, wind 0 to 2 mph, NW	13, 39, 40	JL, AH
3/15/13	09:45 – 15:15	70° to 85° F, 80% high clouds	2, 5, 7, 8, 9, 10, 11, 14, 16, 18, 20, 21, 22B	JL, AH, AB
3/19/13	10:45 – 12:30	63° to 76° F, overcast to high thin haze, wind 0-3 mph, W to 10-15 mph, W	2, 9	JL
3/21/13	10:15 – 16:30	58° to 79° F, 80% high thin clouds to clear, wind 3 to 15 mph, SW	13, 24, 27, 28, 29N, 30, 32, 33, 39, 40, 42	JL, AH
3/22/13	10:45 – 14:45	63° to 84° F, clear, wind 1 to 3 mph, SW	5, 7, 8, 10, 11, 14, 16, 18, 20, 21, 22B	JL, AH
3/26/13	11:00 – 16:15	76° to 76° F, mostly clear, wind 3 to 10-15 mph, SW	10, 11, 13, 24, 27, 28, 29N, 30, 32, 33, 39, 40, 42	JL, ML
3/28/13	10:15 – 16:15	67° to 81° F, high thin clouds to clear, wind 3 to 10 mph, S	2, 5, 7, 8, 9, 14, 16, 18, 20, 21, 22B, 24, 27, 28, 29N, 30, 32, 33, 42	JL, AB
4/01/13	11:30 – 14:30	62° to 72° F, 90 to 70% clouds	13, 32, 39, 40	JL
4/03/13	14:00 – 15:45	88° to 88° F, clear, wind 5 to 10 mph, SSW	24, 27, 28, 29N, 30, 33, 42	JL
4/11/13	10:00 – 15:15	70° to 86° F, high thin haze to clear, wind 5 to 10 mph, SW	2, 5, 7, 8, 9, 10, 11, 14, 16, 18, 20, 21, 22B, 39, 40	JL

** JL= John Lovio, AH = Alicia Hill, AB = Anna Bryant, ML = Mike Landers*

3.0 RESULTS AND DISCUSSION

3.1 SURVEY EFFORT AND SEASONAL CONDITIONS

A total of 56.25 hours of survey time was dedicated to the 2013 Quino checkerspot survey. The survey polygons are depicted on Figure 2, Potential Quino Checkerspot Habitat Map.

The period of January through February 2013 received record low rainfall accompanied by low temperatures during the latter part of the period, resulting in the adult Quino checkerspot flight season being essentially restricted to March and early April. Herbaceous vegetation in general responded to early seasonal rains (late 2012) with normal germination, but many plants experienced stunted growth due to lack of sustaining rain throughout the remainder of the rainy season. *Plantago erecta,* in particular, was stunted in growth throughout the early spring period. Additionally, cold late winter temperatures apparently delayed blooming of many annual species well into March.

Plantago erecta stand locations documented in the course of this survey are shown in Figure 2. This larval host species was restricted to the southern portions of the Alternative Project route (habitat polygons 13, 32, 24, 22B, 21, 9, 10, 11, and 2).

3.2 QUINO CHECKERSPOT HABITAT

The Quino checkerspot survey area included polygons of three basic vegetation types, as described in the sections below.

3.2.1 Semi-native Grassland

Semi-native grassland is largely restricted to polygon 13; located east of Menifee Road and south of Keller Road (refer to Figure 2). This extensive terrace is underlain by heavy red clay soil that remained dry and cracked throughout the 2013 rainy season. The predominant grass cover is composed of non-native annual species, but the grassland includes many areas of very low, sparse grass cover and relatively high cover of mixed native and non-native forb species, including millions of *Plantago erecta* plants in clumped dispersion within openings. The southern portion of polygon 13 includes some broad, shallow swale topography that supports dense non-native grassland that is not suitable for Quino checkerspot.

3.2.2 Disturbed Herbaceous Vegetation

Two small areas of very sparse, ruderal herbaceous vegetation, confined to polygons 22B and 42, support small stands of *Plantago erecta.*

3.2.3 Coastal Sage Scrub Types

The majority of the collective area surveyed for Quino checkerspot in 2013 (21 of 24 polygons) consists of various compositions and structural types of coastal sage scrub or sage scrub mixed with chaparral elements.

Most suitable polygons support relatively open scrub (50 to 70 percent woody cover) dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) with lesser amounts of California sagebrush (*Artemisia californica*). Others support more dense scrub vegetation (70 to 90 percent woody cover), including elements of the inland Diegan coastal sage scrub form (Oberbauer et al. 2008) such as white sage (*Salvia apiana*), spiny red berry (*Rhamnus crocea*), and bush penstemon (*Keckiella antirrhinoides*) or chaparral such as chamise (*Adenostoma fasciculatum*). One disturbed site (polygon 39) supports only 10 to 20 percent shrub cover. Large boulders are present on most polygons. The critical criterion for inclusion of coastal sage scrub polygons in the survey was presence of openings of low, open, semi-native herbaceous cover with potential to support *Plantago erecta*, regardless of whether that species was detected.

3.3 SURVEY RESULTS

No Quino checkerspots were detected during the survey, despite widespread occurrence of suitable habitat. Ten polygons were documented to support stands of *Plantago erecta*: 2, 9, 10, 11, 13, 21, 22B, 24, 32, and 42. Figure 2 shows that all of these polygons occur along the north-south and southern east-west parts of the Alternative Project. This area coincides with designated Critical Habitat for the species and is near recent documented occurrences.

Blooming plant species with potential to provide nectar sources for adult Quino chekerspots are presented in Table 3: Plant Species Blooming During Survey Visits, by dates on which blooming was observed.

Numbers of butterfly species observed are presented by date in Table 4: Butterfly Species Documented During Survey by Date.

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Table 3: Plant Species Blooming During Survey Visits

Common Name	Scientific Name	Date of Survey (2013)									
		3-5	3-13	3-14	3-15	3-21	3-22	3-26	3-28	4-1	4-11
Fiddleneck	*Amsinckia intermedia*	X	X	X	X	X	X	X	X	X	X
Milkvetch	*Astragalus* sp.				X			X		X	X
Red maids	*Calandrinia*	X	X		X	X		X			
Sun cup	*Camissonia* sp.	X			X	X	X	X	X		
Indian paintbrush	*Castilleja* sp.						X		X		X
Spurge	*Chamaesyce* sp.		X		X		X	X			
Farewell to spring	*Clarkia* sp.										X
Morning glory	*Convolvulus* sp.									X	
Popcorn flower	*Cryptantha intermedia*	X		X	X	X		X	X	X	X
Larkspur	*Delphinium* sp.										X
Blue dicks	*Dichelostemma pulchra*			X	X	X	X	X		X	X
Yerba santa	*Eriodyction crassifolium*										X

Table 3 Continued: Plant Species Blooming During Survey Visits

Common Name	Scientific Name	Date of Survey (2013)									
		3-5	3-13	3-14	3-15	3-21	3-22	3-26	3-28	4-1	4-11
Wooly sunflower	*Eriophyllum multicaule*				X	X	X	X	X		X
Filaree	*Erodium* sp.	X	X		X	X	X	X	X	X	
California poppy	*Eschscholzia californica*		X					X			
Angel gilia	*Gilia angelensis*		X			X			X		
Bush penstemon	*Keckiella antirrhinoides*							X			
Goldfields	*Lasthenia californica*	X		X	X	X	X	X	X		X
Deerweed	*Lotus scoparius*			X		X	X				
Lupine	*Lupinus* sp.			X		X				X	
Bush monkeyflower	*Mimulus aurantiacus*			X		X		X			X
Wishbone bush	*Mirabilis californica*				X	X	X	X	X	X	X
Baby blue eyes	*Nemophila* sp.	X	X		X		X	X	X	X	
Phacelia	*Phacelia* spp.		X	X		X	X	X	X		X
Cream cups	*Platystemon californicus*		X		X		X		X		

Table 3 Continued: Plant Species Blooming During Survey Visits

Common Name	Scientific Name	Date of Survey (2013)									
		3-5	3-13	3-14	3-15	3-21	3-22	3-26	3-28	4-1	4-11
Spiny red berry	*Rhamnus crocea*						X	X			X
Skunk brush	*Rhus trilobata*						X				
Chia	*Salvia columbariae*		X	X	X	X	X	X	X		X
Black sage	*Salvia mellifera*						X	X	X	X	X
Nightshade	*Solanum* sp.				X				X		
Vetch	*Vicia* sp.					X		X			

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Table 4 Butterfly Species Documented During Survey By Date

Common Name	Scientific Name	Date of Survey (2013)										
		3-5	3-13	3-14	3-15	3-21	3-22	3-26	3-28	4-1	4-3	4-11
Anise swallowtail	*Papilio zelicaon*			1								
Western tiger swallowtail	*Papilio rutulus*				1	1						
Sara orangetip	*Anthocharis sara*		3	1	1	5			2			
Orange sulphur	*Colias eurytheme*		3			1						
Western green hairstreak	*Callophrys dumetorum*		2			5	4	3	1			
Western tailed blue	*Everes amyntula*		2			1		2				
Southern blue	*Glaucopsyche lygdamus*	2	2		2							1
Acmon blue	*Plebejus acmon*				1	1		1	1			
Unidentified blue									9			
Behr's metalmark	*Apodemia virgulti*		1		7	17	19	42	94	19	130	190
Variable checkerspot	*Euphydrias chalcedon*								2			4
American lady	*Vanessa virginiensis*		1									

Table 4 Continued: Butterfly Species Documented During Survey By Date

Common Name	Scientific Name	Date of Survey (2013)										
		3-13	3-14	3-15	3-21	3-22	3-26	3-28	4-1	4-3	4-11	
Painted lady	*Vanessa cardui*		1	3								
West Coast lady	*Vanessa annabella*		1							1		
Unidentified lady	*Vanessa* sp.	3	11	9	5	10	2		2	1		4
Red admiral	*Vanessa atalanta*								1			
Monarch	*Danaus plexippus*				1		1					
Funereal duskywing	*Erynnis funerealis*		10	10	15	9	10	14	19	4		3

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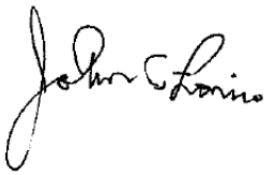
4.0 CONCLUSIONS AND RECOMMENDATIONS

Quino checkerspot were not found during the 2013 protocol surveys. The Project survey area and surroundings support suitable Quino checkerspot habitat, as defined above. Historical location records for the species within and in proximity to the Alternative Project coincide with prevalent suitable conditions documented by this survey. Among the suitable areas adjacent to the Alternative Project, the highest potential for occurrence is in the area of grassland and open coastal sage scrub on the east side of Menifee Road, between Keller Road and the crossing of the western tributary of Warm Springs Creek (polygon 13). This area supports an extensive area of low herbaceous vegetation and stands of *Plantago erecta* consisting of millions of individuals.

Impacts in coastal sage scrub and semi-native grassland should be minimized or avoided due to potential to support Quino checkerspot and documented occurrences of other special status plant and animal species. Significant stands of *Plantago erecta* should be identified prior to construction and avoided due to the potential of these areas to support occasional population expansions of Quino checkerspot from dispersal events (Murphy and White, 1984).

5.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached figures and appendices present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



John Lovio
Senior Biologist

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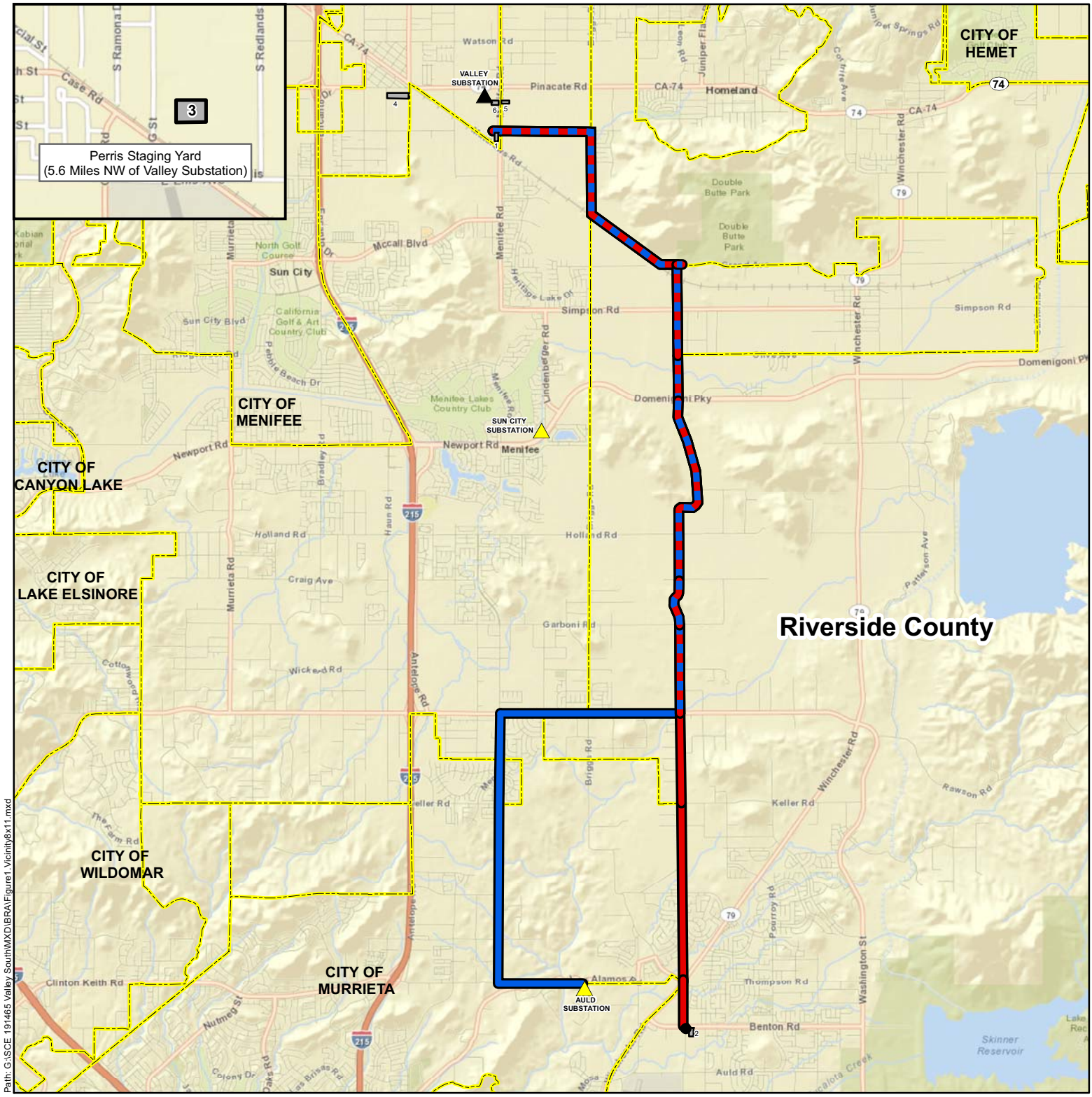
FIGURES

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT **FIGURE 1**

Southern California Edison VICINITY MAP



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Project Components

- Proposed 115 kV Subtransmission Line
- Alternative 115 kV Subtransmission Line
- Common to Both
- Staging Yards

Existing Facilities

- 115 kV Substation
- 500 kV Substation
- Terminal TSP

0 80
Miles

1:95,000

Sources:
SCE, 2012;
Basemap ESRI, 2012

3/20/2013

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TRC

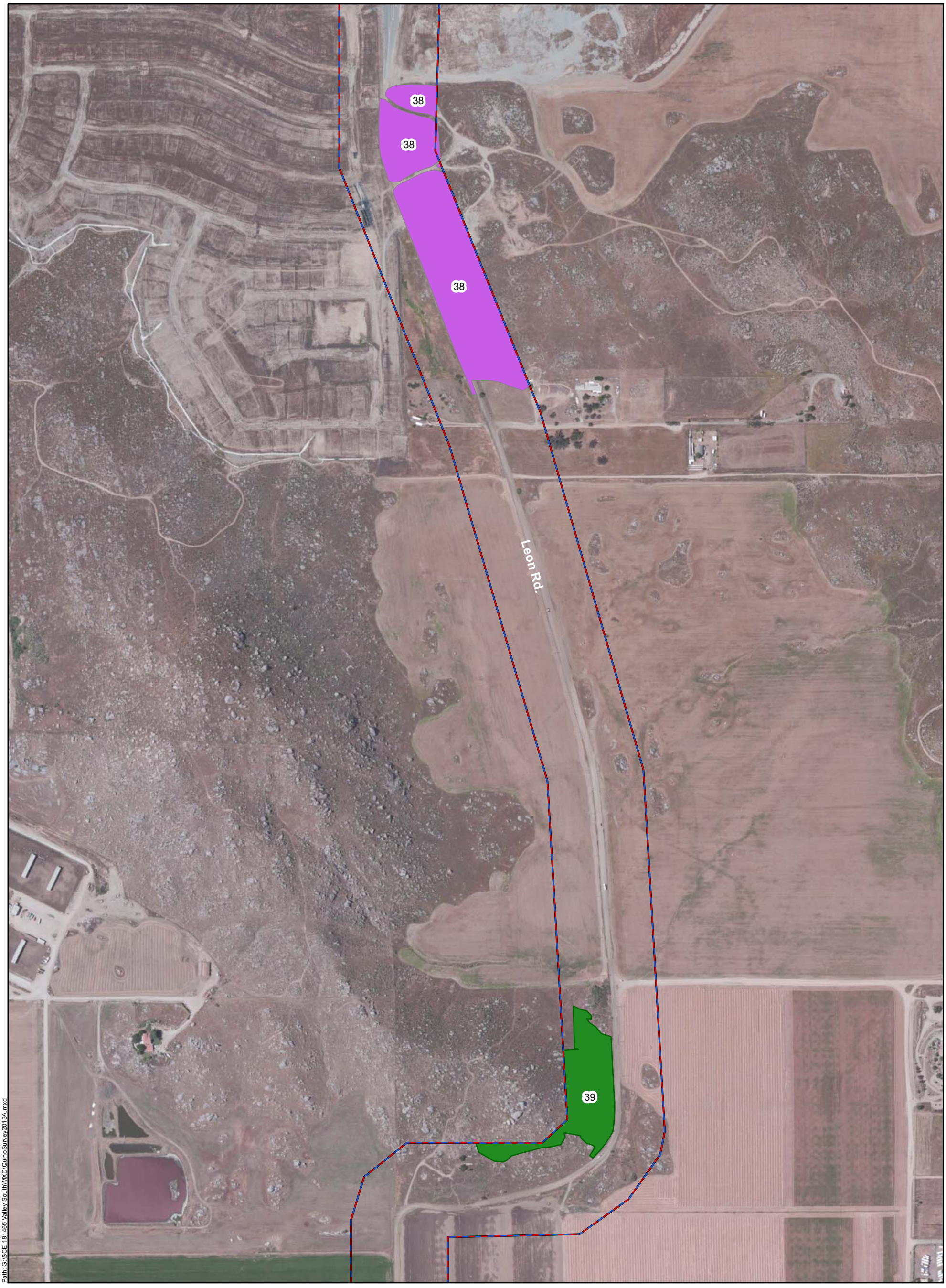
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 2

Southern California Edison

POTENTIAL QUINO CHECKERSPOT HABITAT MAP



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Fence line

Survey Area Common to Both

Alternative 115 kV Subtransmission Line Survey Area

Proposed 115 kV Subtransmission Line Survey Area

Potential Quino habitat (surveyed)

Potential Quino habitat (not surveyed)

Plantago erecta (larval host plant)

Note: Individual plant polygons are indicated by numbers corresponding to field notes.

Sheet 1 of 4

0 300 600 900

Feet

Sources:
SCE, 2012; TRC, 2013;
Basemap: ESRI 2012

5/7/2013

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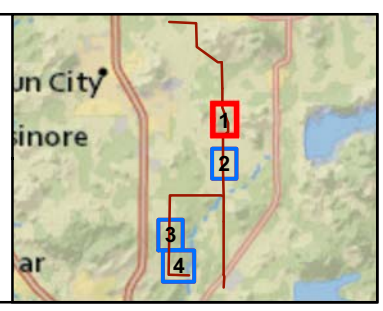

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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 2

Southern California Edison

POTENTIAL QUINO CHECKERSPOT HABITAT MAP

Fence line

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Alternative 115 kV Subtransmission Line Survey Area

Proposed 115 kV Subtransmission Line Survey Area

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Potential Quino habitat (not surveyed)

Plantago erecta (larval host plant)

Note: Individual plant polygons are indicated by numbers corresponding to field notes.

Sheet 2 of 4

0 300 600 900

Feet

Sources:
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Basemap: ESRI 2012

5/7/2013

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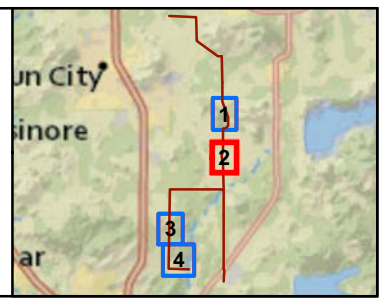

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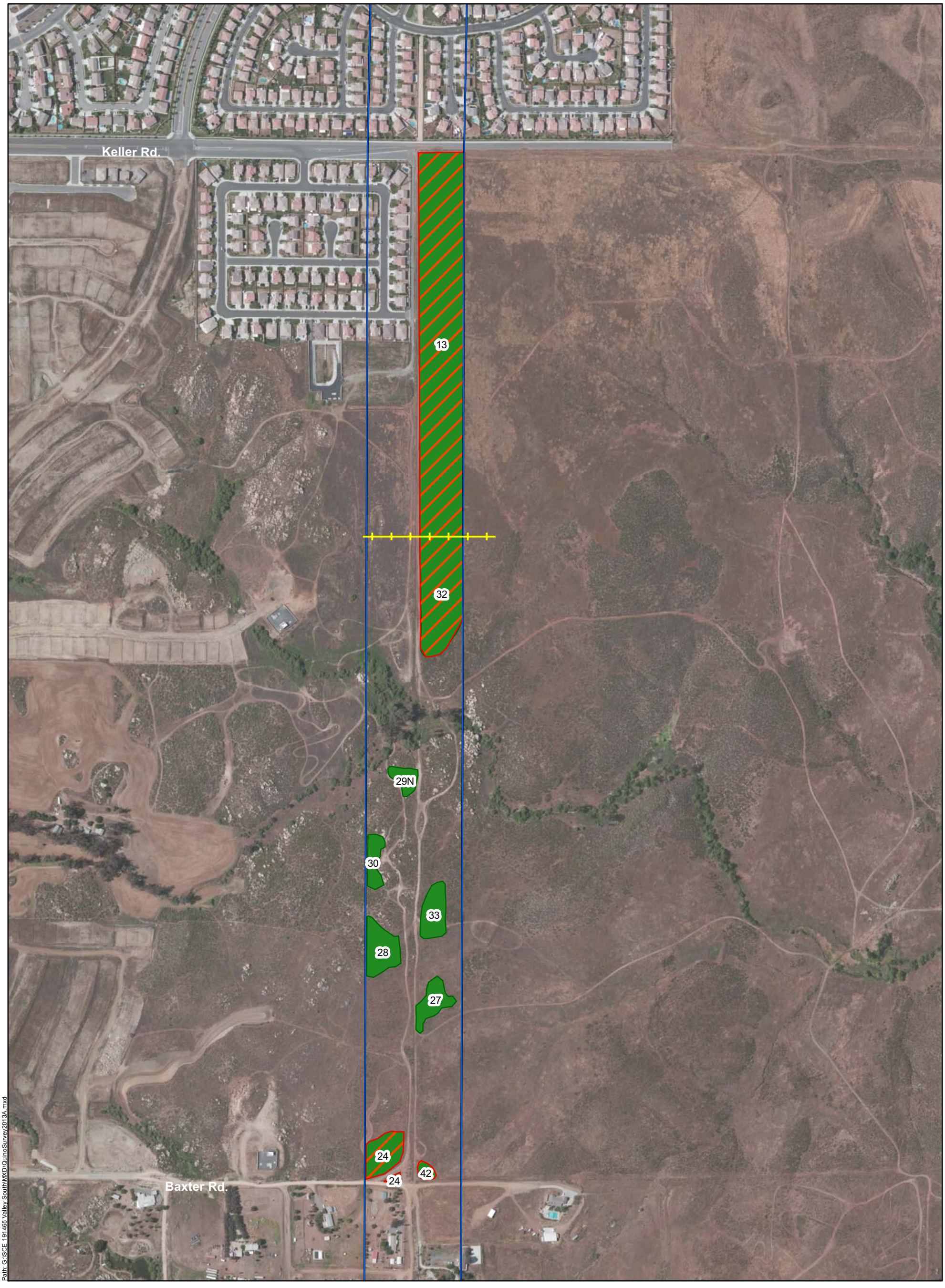
VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 2

Southern California Edison

POTENTIAL QUINO CHECKERSPOT HABITAT MAP



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Fence line

Survey Area Common to Both

Alternative 115 kV Subtransmission Line Survey Area

Proposed 115 kV Subtransmission Line Survey Area

Potential Quino habitat (surveyed)

Potential Quino habitat (not surveyed)

Plantago erecta (larval host plant)

Note: Individual plant polygons are indicated by numbers corresponding to field notes.

Sheet 3 of 4

0 300 600 900

Feet

Sources:
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Basemap: ESRI 2012

5/7/2013

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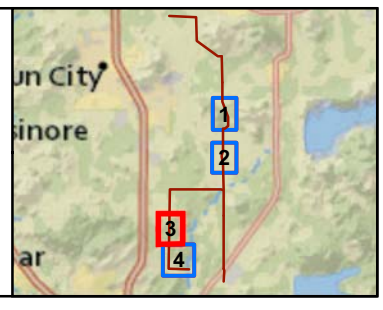

TRC

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VALLEY SOUTH 115 kV SUBTRANSMISSION LINE PROJECT

FIGURE 2

Southern California Edison

POTENTIAL QUINO CHECKERSPOT HABITAT MAP

Fence line

Survey Area Common to Both

Alternative 115 kV Subtransmission Line Survey Area

Proposed 115 kV Subtransmission Line Survey Area

Potential Quino habitat (surveyed)

Potential Quino habitat (not surveyed)

Plantago erecta (larval host plant)

Note: Individual plant polygons are indicated by numbers corresponding to field notes.

Sheet 4 of 4

0 300 600 900

Feet

Sources:
SCE, 2012; TRC, 2013;
Basemap: ESRI 2012

5/7/2013

DRAFT - Not for Public Review

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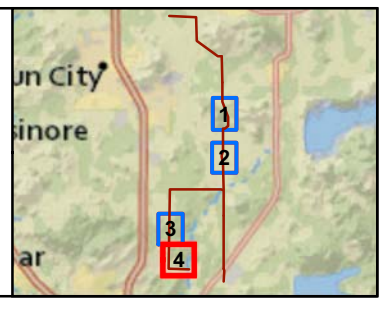

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