BOWMAN SOLAR PROJECT

JUNE 2014

Focused Rare Plant Survey

Goat Mountain United States Geological Survey 7.5-Minute Topographic Quadrangles San Bernardino Base and Meridian
Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16

Assessor Parcel Number
0630-351-01,-02,-03,-04,-05,-06,-07,-08,-09,-10,-11,-12,-13,-14,-15

Conditional Use Permit Number
P201400196

Owner
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TABLE OF CONTENTS

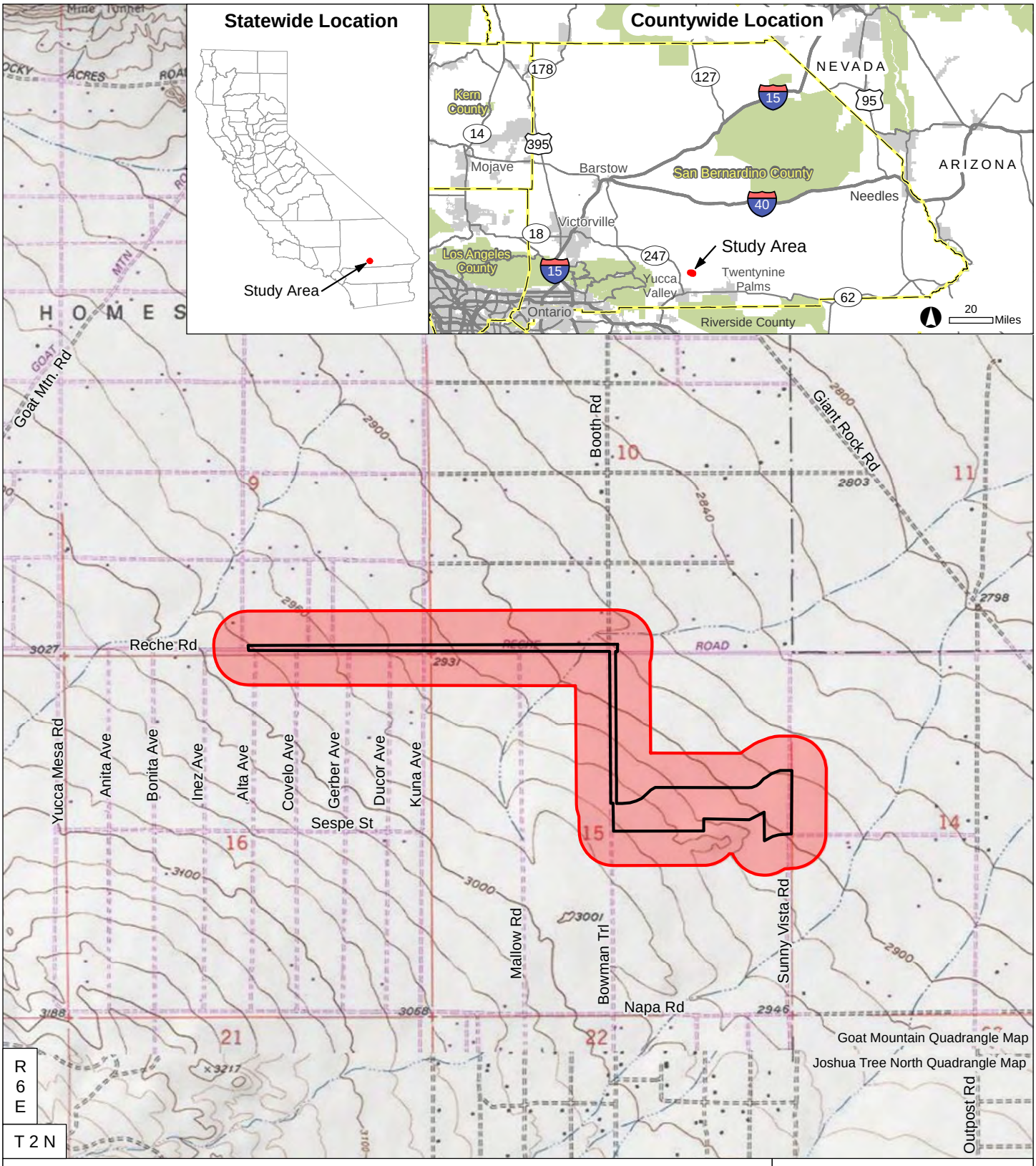
1.0 EXECUTIVE SUMMARY

sPower, LLC (sPower) is an independent solar power producer and developer of distributed solar assets for utilities that are both municipally and investor owned. sPower strives to be a leader in wholesale solar power generation and the process of developing, building, and operating Solar Generating Facilities (SGFs). sPower is proposing to develop the Bowman Solar Project east of Yucca Valley, California (hereafter referred to as the Project) (Figure 1). This report documents the findings of rare plant surveys for the Project. For the purposes of this report, the "study area" includes the Project's proposed ground disturbance footprint (Project Site) and a buffer (Figure 2).

Two vegetation communities/land cover types were observed within the study area: Creosote Bush Scrub and Developed/Disturbed Lands. The Project is not collocated with any USFWS-designated critical habitat for plants. While notable quantities of mature Joshua Trees (*Yucca brevifolia*) were detected within the Project Site, no federal or state listed plant species were observed there during field surveys. Given the extent of anthropogenic disturbance (e.g., abundance of trash, cleared lots, and on- and off-highway vehicle and pedestrian-related traffic) and negative survey results, the Project would not be expected to adversely affect rare, sensitive or special status plant species.

2.0 PROJECT AND PROPERTY DESCRIPTION

The proposed Project's purpose is energy generation. It is located on approximately 50 acres of previously disturbed land in the County of San Bernardino (Figure 1). The proposed Project will consist of a 3 Mega Watt Alternating Current Solar Photovoltaic (PV) generating facility. The proposed generation-tie (gen-tie) line will connect the facility to Southern California Edison's (SCE) existing distribution line located to the north of the Project. The proposed facility will utilize PV technology on either fixed-tilt or tracker mounting supports. For the purposes of this report, the "study area" includes the Project's proposed ground disturbance footprint (Project Site) and a buffer (Figure 2). The Project can be found on the Goat Mountain United States Geological Survey 7.5-Minute Topographic Quadrangle Map within the San Bernardino Base and Meridian – Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16 (USGS 1989). The majority of the study area is disturbed creosote bush scrub; the remainder includes developed lands.



Study Area
Project Site
County Boundary (inset)
Urban Area (inset)
Interstate or State Highway (inset)
Water Body (inset)
Park or National Forest (inset)

Data Sources:
- ESRI StreetMap North America 2010
- ESRI US Topo Maps accessed Apr 2014

Map Prepared: 4-4-14

The Study Area is located on the Goat Mountain USGS 7.5-minute quadrangle map; San Bernardino Base and Meridian, Township 2 North, Range 6 East, Sections 9, 10, 14, 15 and 16. Center coordinates are: Latitude 34.261802, Longitude -116.344193.

0 1,000 2,000 Feet

1 inch = 2,000 feet

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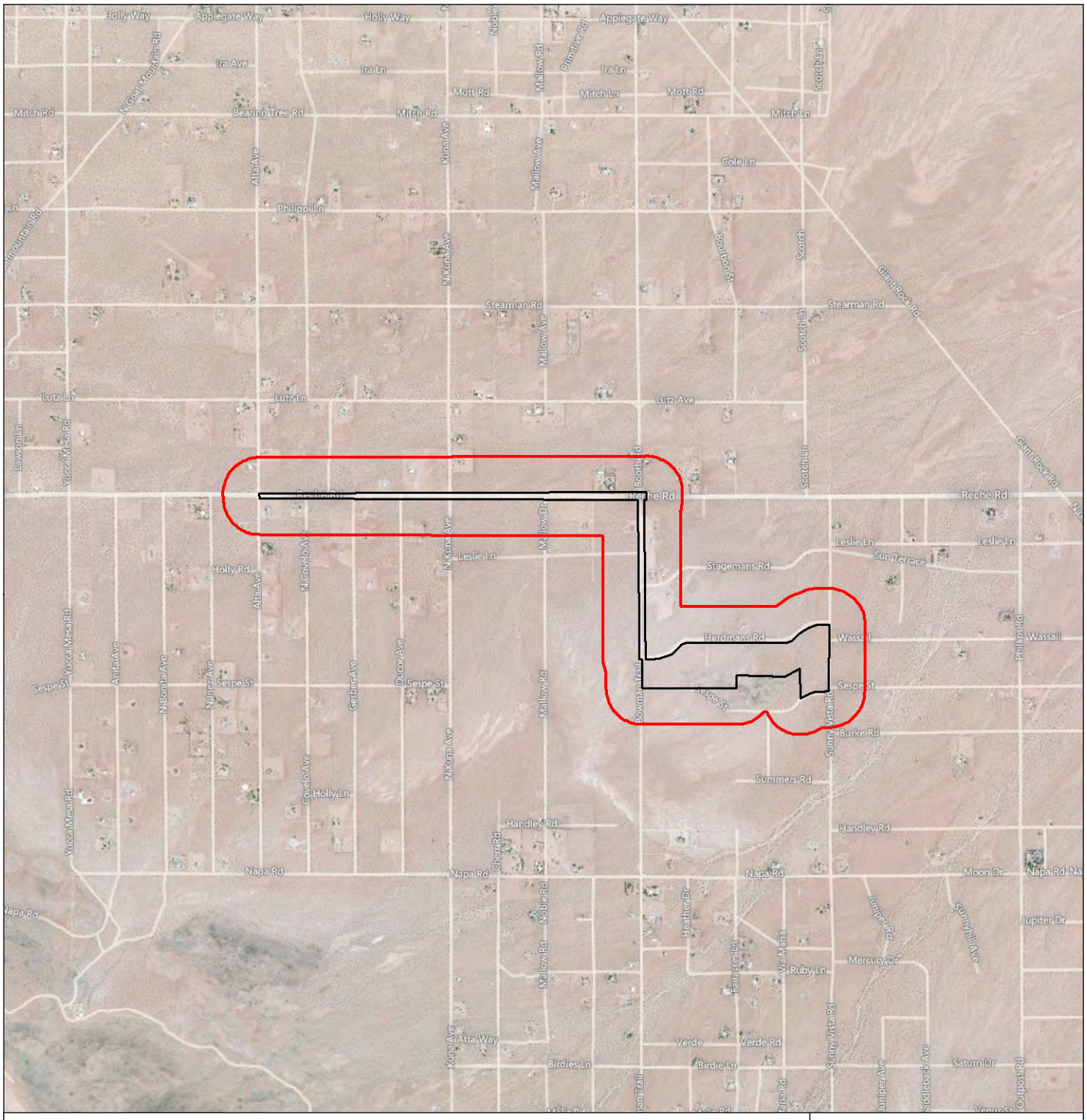
Figure 1. Regional Location



Study Area (319 acres which includes the Project Site)

Project Site (50 acres)

0 1,000 2,000 Feet

1 inch = 2,000 feet

Data Source:
- BingMaps accessed Apr 2014, image date range: May 2010

Map Prepared: 4-4-14

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Figure 2. Site Vicinity

3.0 FOCUSED STUDY/SPECIES OF CONCERN

Prior to beginning field surveys, botanical specialists were consulted and available information from resource management plans and relevant documents were reviewed to determine the locations and types of resources that have the potential to exist within and adjacent to the study area; resources were evaluated within several miles of the Project. The materials reviewed included, but were not limited to, the following:

- ✓ U.S. Fish and Wildlife Service (USFWS) Critical Habitat Mapper and File Data (USFWS 2014a);
- ✓ USFWS Carlsbad Field Office Species List for San Bernardino County (2014b);
- ✓ California Natural Diversity Database maintained by the California Department of Fish and Wildlife (CDFW 2014);
- ✓ California Native Plant Society (CNPS) Electronic Inventory (CNPS 2014);
- ✓ Biological Technical Report for the Bowman Solar Project (NOREAS 2014);
- ✓ Desert Tortoise Report for the Bowman Solar Project (NOREAS 2014a);
- ✓ U.S. Army Corps of Engineers (Corps) 16 May 2013 Tentative Tract 18036, U.S. Army Corps of Engineers Approved Jurisdictional Determination Form, SPL-2012-00461JD-BEM (Corps 2013); and
- ✓ Aerial Photographs (Microsoft Corporation 2014).

4.0 METHODS

To support the analysis detailed within Section 3.0 above, pedestrian-based field surveys were performed to assess general and dominant vegetation community types, community sizes, habitat types, and species present within communities. Community type descriptions were based on observed dominant vegetation composition and derived from the criteria and definitions of widely accepted vegetation classification systems (Holland 1986; Sawyer et al. 2009).

Plants were identified to the lowest taxonomic level sufficient to determine whether the plant species observed were non-native, native, or special-status. Plants of uncertain identity were subsequently identified from taxonomic keys (Baldwin et al. 2012). Scientific and common species names were recorded according to Baldwin et al. (2012).

Focused botanical surveys were conducted within the Project Site in March, May and June of 2014. Field survey methods were derived from the standardized guidelines issued by the U.S. Fish and Wildlife Service (USFWS 2000), California Department of Fish and Wildlife (CDFW 2000) and the California Native Plant Society (CNPS 2001). The field surveys were conducted to determine the presence/absence of special status[1] plant species within the Project Site and were conducted during the appropriate blooming period[2] for the majority of annual plant species within the region. A census of reference populations was performed prior to initiating surveys in March and again in May to ensure that survey timing was appropriate and to assess local variations in plant phenology. The field surveys of the Project Site were completed by walking parallel belt transects spaced approximately 30 ft apart. Where necessary, transect spacing was reduced or expanded to account for differences in terrain, vegetation density, and visibility.

[1] For the purposes of this analysis, "special-status plant species" refers to any species that has been afforded special protection by federal, state, or local resource agencies (e.g., U.S. Fish and Wildlife Service [USFWS], California Department of Fish and Wildlife [CDFW]) or resource conservation organizations (e.g., California Native Plant Society [CNPS]) and excludes Joshua Trees.

[2] Appropriate blooming periods were derived from the California Native plant Society's Inventory of Rare and Endangered Vascular Plants of California, 1994.

5.0 BOTANICAL SURVEY RESULTS

Weather conditions during the March, May and June 2014 surveys included clear skies, temperatures ranging from 56–98 °F, and winds ranging from 0 to 10mph.

5.1 Vegetation Communities and Land Cover Types

Two vegetation communities/land cover types were observed within the study area: Creosote Bush Scrub and Developed/Disturbed Lands (Figure 3). Vegetation communities/land cover types are described below.

Creosote Bush Scrub

Creosote bush scrub within the study area was substantially disturbed, and dominated by widely spaced creosote (*Larrea tridentata*) and white bursage (*Ambriosa dumosa*) with bare ground between them (Holland 1986). Many species of herbs and annuals may appear depending on sufficient winter rains. Soils in this community are well drained, alluvial, sandy, and sometime underlain by a hardpan that may be calcareous and/or covered with desert pavement (Sawyer et al. 2009). Other common perennial species present include white ratany (*Krameria bicolor*), jointfir (*Ephedra* sp.*),* pencil cholla (*Cylindropuntia ramosissima*), and wire-lettuce (*Stephanomeria pauciflora*). This habitat also included notable quantities of mature Joshua Trees (Yucca brevifolia).

Developed/Disturbed Lands

Developed or disturbed lands include locales that have been disked, cleared, or otherwise altered by human activities. This cover type within the study area includes on- and off-highway vehicle roads, an abundance of trash, and cleared lots. Common non-native plants species within this land cover type included saharan mustard (*Brassica tournefortii*), annual bur-sage (*Ambrosia acanthocarpa*), and bristly fiddleneck (*Amsinckia tessellata*).

5.2 Special-Status Plants

No federal or state listed plants were observed within the Project Site during the field surveys, and none have been documented within 5.5 miles (Figures 4, 5 and 6). The Project Site is heavily disturbed, with evidence of on- and off -highway vehicle use. It supports creosote bush scrub vegetation; dominated by widely spaced creosote (*Larrea tridentata*) and burrow weed (*Ambriosa dumosa*), with bare ground between them. The majority of the bare ground includes lands that have been disked, cleared, or otherwise altered by human activities. No special status plant species were observed during census efforts, and the Project Site does not include USFWS critical habitat for plants. Representative photographs of the study area are provided in Appendix A. All plant species observed during the surveys are listed in Appendix B.

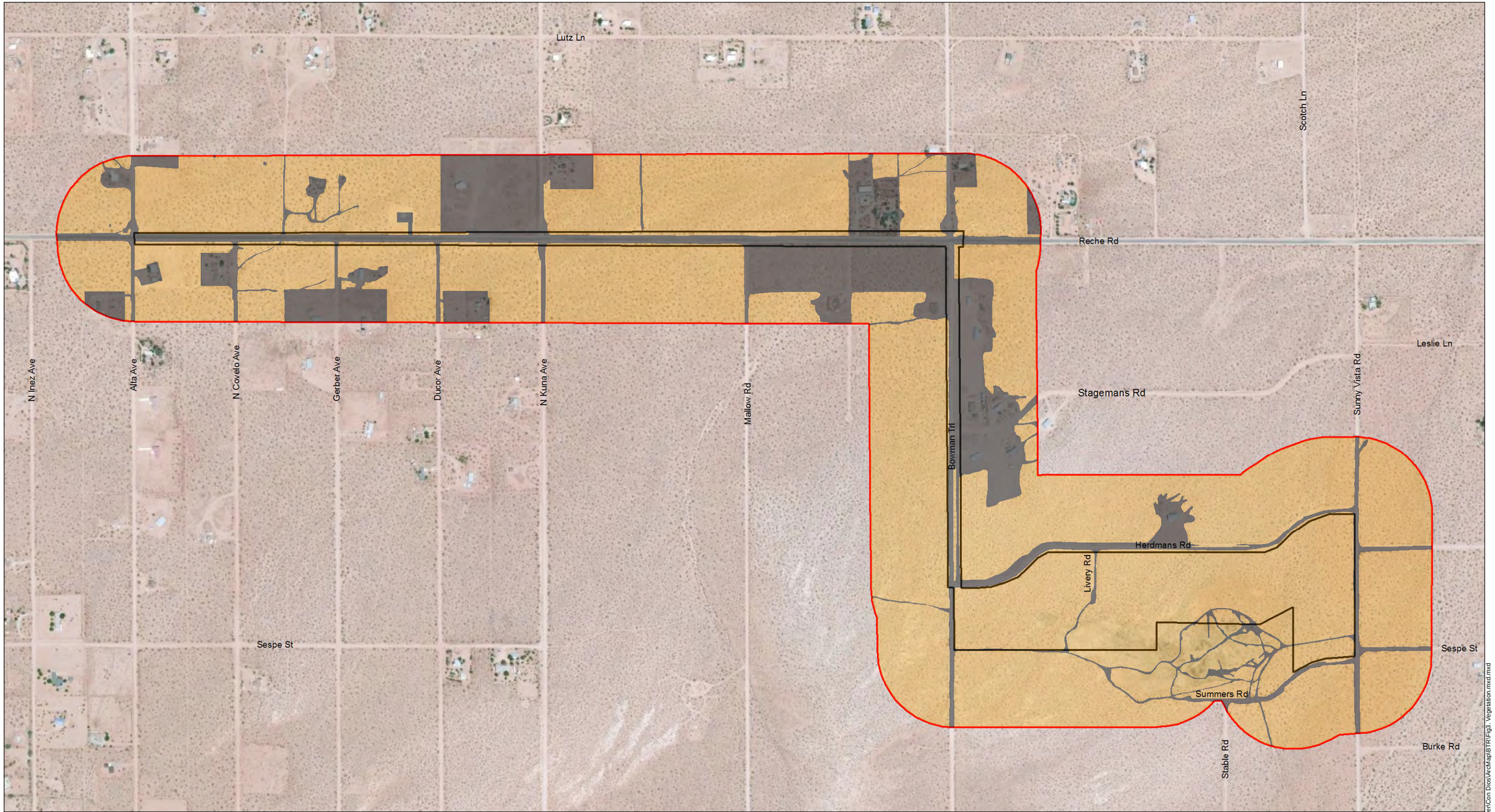

Figure 3. Vegetation Communities and Land Cover Types

Project Site

10-Mile Radius Around the Project Site

Special-Status Species Occurrences

Map Code	Common Name (Scientific Name)
	Plants
1	San Bernardino Milk-Vetch (*Astragalus bernardinus*)
2	Fremont Barberry (*Berberis fremontii*)
3	Pinyon Rockcress (*Boechera dispar*)
4	Purple-Nerve Cymopterus (*Cymopterus multinervatus*)
5	Parish's Daisy (*Erigeron parishii*)
6	Parish's Club-Cholla (*Grusonia parishii*)
7	Pioneertown Linanthus (*Linanthus bernardinus*)
8	Little San Bernardino Mtns. Linanthus (*Linanthus maculatus*)
9	Robison's Monardella (*Monardella robisonii*)
10	Latimer's Woodland-Gilia (*Saltugilia latimeri*)
11	Jackass-Clover (*Wislizenia refracta* ssp. *refracta)*
	Reptiles
12	Coast Horned Lizard (*Phrynosoma blainvillii*)
13	Desert Tortoise (*Gopherus agassizii*)
14	Mojave Fringe-Toed Lizard (*Uma scoparia*)
	Birds
15	Bendire's Thrasher (*Toxostoma bendirei*)
16	Burrowing Owl (*Athene cunicularia*)
17	Le Conte's Thrasher (*Toxostoma lecontei*)
	Mammals
18	Pallid San Diego Pocket Mouse (*Chaetodipus fallax pallidus*)

0 1 2 Miles

1:140,000

Data Sources:
- Bing accessed Apr 2014, imagery date: May 2010

Note: Resource specialists were consulted and readily available commercial data from resource management plans and other relevant documents were reviewed to determine the locations and types of resources that have the potential to exist in the region.

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Figure 4. Literature Review

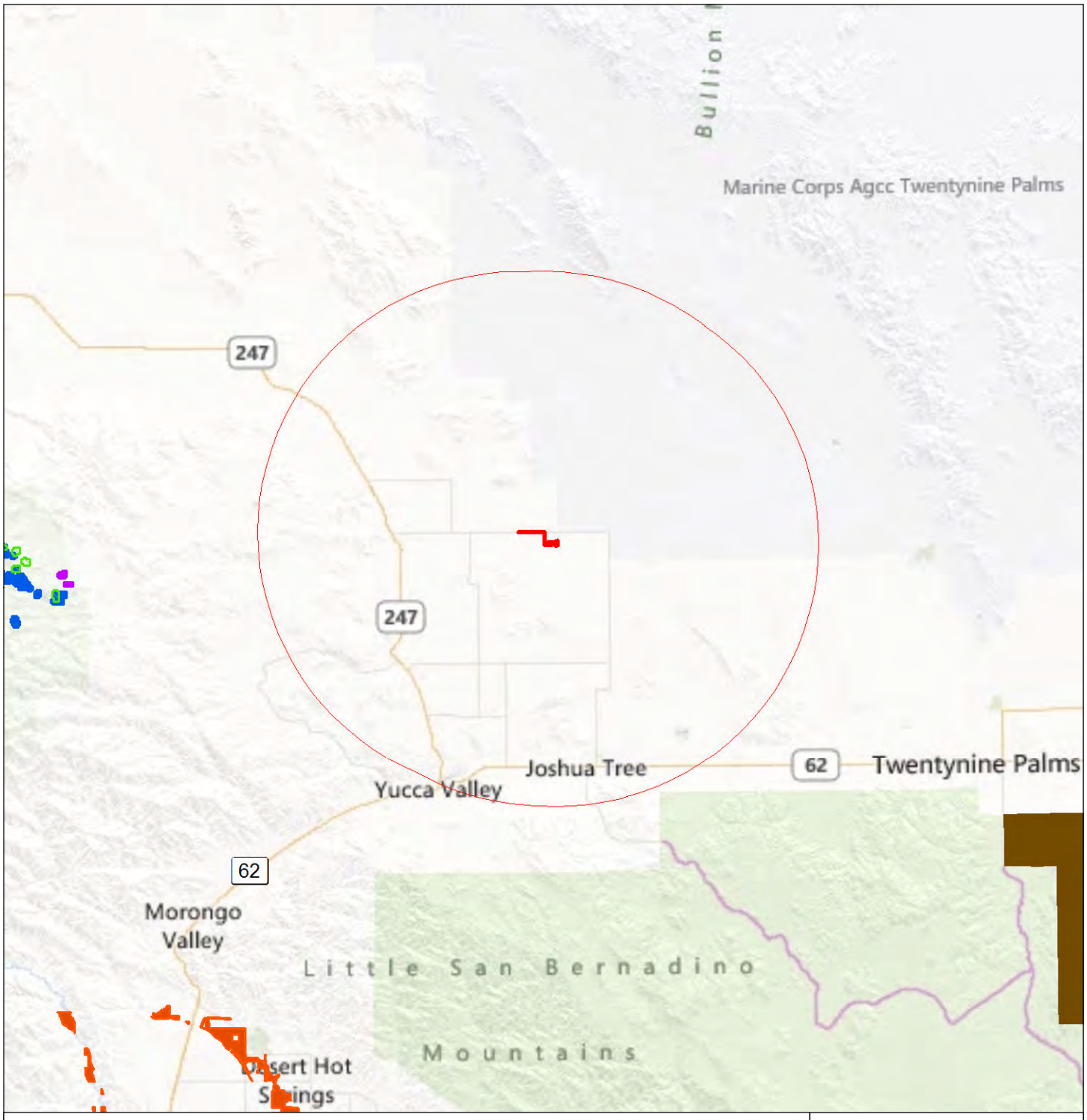

Figure 5. Critical Habitat

Study Area (319 acres which includes the Project Site)

Project Site (50 acres)

Little San Bernardino Mtns. Linanthus (*Linanthus maculatus*) Occurrence Number 38

0 0.5 1 1.5 Miles

1 inch = 1.5 miles

Data Sources:
- Bing accessed Jun 2014, image date range: May 2010
- CDFW California Natural Diversity Database, Mar 2014 data release

Map Prepared: 6-20-14

Prepared by:

NOREAS
Environmental Engineering and Science

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Figure 6. Reference Population Map

6.0 IMPACTS AND RECOMMENDATIONS

The majority of the Project Site consists of creosote bush scrub. Given the extent of anthropogenic disturbance any species currently using these lands are presumed to be acclimated to the disturbance regime present. No special status plants were detected within the Project Site, and the habitat quality on site is low. Therefore, the Project seems unlikely to affect federal or state listed plant species. Focused census efforts for special status plant species have been negative. For that reason, there is no presumption that the Project would result in the loss of individual special status plants, or that it would adversely affect local or regional populations of them.

7.0 PROPOSED MITIGATION MEASURES

The following measures are recommended as a means of avoiding and minimizing adverse impacts to protected resources that have the potential to occur within the Project Site and on adjacent lands:

- Adverse effects to regulated desert native plants (e.g., Joshua Trees) should be avoided to the maximum extent practical. If adverse impacts cannot be avoided, then sPower should census the resources within the Project Site and develop a plan in concert with the County of San Bernardino to offset unavoidable affects.

The services performed and documented in this report have been conducted in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representations are either expressed or implied and no warranty or guarantee is included or intended in this report. Opinions relating to presence, absence, or potential for occurrence of biological resources are based on limited data and actual conditions may vary from those encountered at the times and locations where the data were obtained despite due professional care.

8.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached figures present the data and information required for this resource assessment, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this investigation was performed by me or under my direct supervision. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the sPower or sPower's representative, and that I have no financial interest in the Project.

DATE: _____ SIGNED: _____
Lenny Malo

The following NOREAS employees performed the field work and/or participated in preparation of this report: Lenny Malo MS, Lincoln Hulse BS, Erin Serra BS, Ben Zamora BS, Onkar Singh BS, Mikaila Negrete MS, and Ken Hashagen BS.

9.0 REFERENCES

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APPENDIX A

PHOTOGRAPH LOG

APPENDIX A

PHOTOGRAPH LOG

	**Photograph: 1, facing north.**
	**Photograph: 2, facing north east.**

APPENDIX A

PHOTOGRAPH LOG

	**Photograph: 3, facing south.**
	**Photograph: 4, Little San Bernardino Mtns. Linanthus (*Linanthus maculatus*) at reference location.**

APPENDIX B

PLANT SPECIES OBSERVED WITHIN THE STUDY AREA

Scientific Name	Common Name
GYMNOSPERMS	
Ephedraceae (Mormon-tea family)	
Ephedra sp.	Jointfir
EUDICOTS	
Asteraceae (Aster family)	
Ambrosia acanthicarpa	Annual bur-sage
Ambrosia dumosa	White bursage
Ambrosia salsola	Burrobush
Baccharis brachyphylla	Shortleaf baccharis
Bahiopsis parishii	Parish's goldeneye
Chaenactis fremontii	Pincushion flower
Encelia frutescens	Button brittlebush
Malacothrix coulteri	Snake's head
Palafoxia arida var. arida	Desert palafox
Pectis papposa var. papposa (d)	Manybristle chinchweed
Porophyllum gracile	Slender poreleaf
Stephanomeria pauciflora	Wire-lettuce
Tetradymia stenolepis	Mojave cottonthorn
Xylorhiza tortifolia var. tortifolia	Mojave woodyaster
Boraginaceae (Borage family)	
Amsinckia tessellata var. tessellata	Bristly fiddleneck
Cryptantha circumscissa var. circumscissa	Cushion cryptantha
Cryptantha nevadensis var. nevadensis	Nevada cryptantha
Cryptantha pterocarya var. pterocarya	Wingnut cryptantha
Pectocarya penicillata	Sleeping combseed
Brassicaceae (Mustard family)	
*Brassica tournefortii **	Saharan mustard
Streptanthella longirostris	Longbeak streptanthella
Cactaceae (Cactus family)	
Cylindropuntia echinocarpa	Silver cholla
Cylindropuntia ramosissima	Pencil cholla
Echinocactus polycephalus var. polycephalus	Cottontop cactus
Euphorbiaceae (Spurge family)	
Chamaesyce albomarginata	Whitemargin sandmat
Croton californicus	California croton
Stillingia linearifolia	Queen's-root
Fabaceae (Pea family)	

Scientific Name	***Common Name***
Astragalus layneae	Widow's milkvetch
Parkinsonia aculeata *	Jerusalem thorn
Senna armata	Desert senna
Geraniaceae (Geranium family)	
Erodium cicutarium *	Redstem stork's bill
Lamiaceae (Mint family)	
Scutellaria mexicana	Mexican bladdersage
Loasaceae (Loasa family)	
Petalonyx thurberi subsp. thurberi	Death Valley sandpaper
Malvaceae (Mallow family)	
Sphaeralcea ambigua	Desert globemallow
Nyctaginaceae (Four o'clock family)	
Mirabilis laevis	Desert wishbone-bush
Onagraceae (Evening Primrose family)	
Eremothera boothii (d)	Booth's evening primrose
Papaveraceae (Poppy family)	
Eschscholzia minutiflora	Pygmy golden poppy
Polemoniaceae (Phlox family)	
Eriastrum sp.	Woollystar
Polygonaceae (Buckwheat family)	
Chorizanthe rigida (d)	Devil's spineflower
Eriogonum sp.	Buckwheat
Eriogonum fasciculatum var. polifolium	Eastern Mojave buckwheat
Eriogonum inflatum	Desert trumpet
Eriogonum nidularium	Birdnest buckwheat
Eriogonum trichopes (d)	Little desert trumpet
Solanaceae (Potato family)	
Datura wrightii	Sacred thorn-apple
Zygophyllaceae (Creosote-bush family)	
Larrea tridentata	Creosote bush
MONOCOTS	
Agavaceae (Century-plant family)	
Yucca brevifolia	Joshua tree
Poaceae (Grass family)	
Hilaria rigida	Big galleta
*Schismus arabicus**	Arabian schismus
Stipa sp.	Feather grass

Nomenclature follows the Jepson Manual, Second Edition (Baldwin et al 2011).
d = plant species that were identified with previous seasons material; no live plants of these species observed.
* = naturalized, non- native plant species.