CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel 916.286.0224
Fax 916.614.3424

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December 30, 2011

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Mike Monasmith
Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Data Response, Set 1B-2
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached electronic copies of Data Response, Set 1B-2, which provides the spring 2011 botanical survey of the project site in partial response to Data Request 63. Due to the holidays, hard copies will be sent out on Tuesday, January 3, 2012.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response, Set 1B-2

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

December 30, 2011

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 1B-2
(Response to Data Request 63)

Submitted to the

California Energy Commission

Submitted by

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

December 30, 2011

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Introduction

Attached is Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") supplemental response to the California Energy Commission (CEC) Staff's data request 63 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served these data requests on November 4, 2011. The Attachment submitted in response to the data request is numbered to match the data request number.

Biological Resources (63)

SPECIAL-STATUS PLANT SPECIES

BACKGROUND: Eight special-status plant species have been found on-site, some in very large numbers and densities throughout the project site; seven of these plants are identified by the California Native Plant Society as List 2 species and one is a List 1B species, Pahrump Valley buckwheat. An additional plant species, Nye milk-vetch (Astragalus nyensis), was previously not known to occur in California, was also found on-site. In addition to focused botanical surveys performed on-site, the applicant also performed off-site plant surveys in areas near Pahrump, Chicago, and Stewart valleys in California and Nevada although those results have not been provided to staff, to date. The applicant stated in Data Adequacy Supplement A (Response 7, page 15) that no significant impacts would occur to special-status plant species since avoidance measures would be implemented and that no further mitigation would be required, but did not identify which impact avoidance and minimization measures would be implemented.

In Data Adequacy Supplement B (Response B7, page 12), the applicant claimed impacts to special-status plant species would not be significant but includes a "general discussion of impact avoidance and minimization measures." The applicant also claims that the primary impact avoidance measure to special-status plant species is the project's use of taller solar power towers, which reduces the project's impact footprint (Response B5, page 7). Staff believes that since an adequate impact analysis of special-status plant species has not been provided by the applicant, in both a site-specific and regional context, it is premature to assume that impacts would not be significant. Staff needs all the field survey information in order to perform an analysis of the project's impacts to special-status plants and to determine if impacts may be significant and if additional mitigation is necessary.

DATA REQUEST

63. As indicated in the AFC, please provide staff a survey report including maps for fall 2010 botanical surveys for off-site botanical surveys performed near Pahrump, Nevada, Chicago, and Stewart valleys in California and Nevada.

Response: On December 5, 2011 the Applicant responded to this data request stating that an onsite botany report would be ready in mid-December. It has taken a little longer to complete the report than expected. It is provided here as Attachment DR63-1. The offsite botany report should be ready by January 13, 2012.

Attachment DR63-1A

Spring 2011 Botanical Resource Survey of the Hidden Hills Solar Electric Generating System Site

Prepared for

Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC

December 30, 2011

Prepared by

CH2MHILL®

John Carrier, Project Manager
Amy Hiss, Botany Lead
2485 Natomas Park Drive, Suite 600
Sacramento, California 95833

With data collected by:

Garcia and Associates
One Saunders Avenue
San Anselmo, California 94960
Contact: Ann Howald, Senior Botanist

Executive Summary

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on approximately 3,277 acres of privately owned land in Inyo County, California, adjacent to the Nevada border and north of Old Spanish Trail Highway.[1] The project site is approximately 18 miles south of Pahrump, Nevada, and approximately 45 miles west of Las Vegas, Nevada.

HHSEGS will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres and Solar Plant 2 will occupy approximately 1,510 acres. A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

The HHSEGS site is located in Inyo County, California, within the southern Pahrump Valley. This area is at the toe of an alluvial fan complex, or bajada, that extends southwest from the Spring Mountains about 13 miles to the northeast. The Pahrump Valley is part of a northwest-southeast-trending valley system that includes Sandy (Mesquite) Valley to the southeast and Stewart Valley to the northwest of Pahrump Valley. In the vicinity of the project site, drainage is generally to the west and northwest toward Pahrump Playa. The elevation of the Pahrump Valley floor ranges from 2,515 feet at Pahrump Dry Lake to about 2,655 feet in the southwestern part of the basin along Old Spanish Trail Highway. Topography within the HHSEGS site is gently sloping, with the highest elevations in the southeast corner and the lowest along the northwest boundary. Several ephemeral washes enter from the eastern boundary.

The spring 2011 botanical survey within the HHSEGS site and the 250-foot buffer included reconnaissance visits, reference site visits, and a protocol-level survey for special-status plants,[2] as defined herein, using the intuitive controlled method. In addition, non-native invasive plant species (weeds) were mapped and their abundance was estimated; and the vegetation was classified and mapped. Cacti are present in very low numbers, and no individuals of any species of *Yucca* are present within the study area, so these plants were not mapped.

Pre-field research was conducted to select special-status plant species with potential to be found within the study area. A list of special-status plants with known presence in the greater vicinity of the project area was developed through searches of plant databases, including the California Native Plant Society's (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2011), the California Natural Diversity Database (CNDDB) (CNDDB 2011a, b), and the Consortium of California Herbaria (Jepson Online Interchange 2011).

For this project, the term "*greater vicinity of the project area"* extends north to Ash Meadows National Wildlife Refuge and Death Valley, west to the towns of Shoshone and Tecopa, and south to Mesquite and Sandy valleys and the Clark Mountains. This larger area was used to check for potentially occurring species in recognition of the fact that the distributions of many special-status plant species in the Mojave Desert are poorly known, and new, and sometimes numerous, localities often are discovered many miles distant from localities that were previously known. For each potentially occurring special-status plant species, information was compiled on conservation status, distribution, habitat characteristics, blooming time, and presence in the project region.

[1] Also referred to as Tecopa Road.

[2] The term "special-status" species is not limited in scope to describe threatened, endangered or candidate species under the federal ESA or CESA. Instead, the term "special-status" is a more expansive term, employed by many agencies as described herein.

The natural vegetation of the HHSEGS site and 250-foot buffer consists of Mojave Desert scrub and shadscale scrub. Ruderal vegetation occurs within the site in the abandoned orchard on the west side of the corner of Silver Street and Old Spanish Trail Highway, and along the southern boundary of the site in the roadsides of Old Spanish Trail Highway. Ruderal vegetation also occurs within the 250-foot buffer in the roadsides along the southern edge of the Old Spanish Trail Highway. No distinctive wash vegetation was observed within the site or the 250-foot buffer.

Eleven species of target weeds were identified and mapped within the site and the 250-foot buffer. Of these 11 species, red brome, halogeton, African mustard and Russian thistle were the most abundant and widespread.

No plant species that are federally or state-listed, proposed or candidate for listing as threatened, endangered or rare were found: (1) within the HHSEGS site, or (2) within the 250-foot buffer. Nine species of special-status plants were identified during the surveys. These species are: pink funnel-lily (*Androstephium breviflorum*), gravel milkvetch (*Astragalus sabulonum*), Preuss' milkvetch (*Astragalus preussii* var. *preussii*), Tidestrom's milkvetch (*Astragalus tidestromii*), Wheeler's skeletonweed (*Chaetadelpha wheeleri*), purplenerve springparsley (*Cymopterus multinervatus*), Pahrump Valley buckwheat (*Eriogonum bifurcatum*), Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) and desert wing-fruit (*Selinocarpus nevadensis*). In addition, Nye milkvetch (*Astragalus nyensis*) was identified for the first time in California within the site and 250-foot buffer. Species accounts for each of these species are provided in the report.

In addition to the site survey reported here, late-season protocol-level surveys for special-status plants were conducted within the HHSEGS site in October 2010, and within the 250-foot buffer and the 180-acre temporary construction laydown and parking area in October 2011. A 1-mile buffer surrounding the site was surveyed at a reconnaissance-level in spring 2011. Additional reconnaissance-level offsite surveys were conducted in several locations in California and Nevada in spring of 2011. A protocol-level survey of the transmission line/gas line corridor was completed in spring of 2011. Results of these surveys are addressed in separate reports.

Contents

SECTION 1

Introduction

This report describes the protocol-level botanical survey completed in spring of 2011 within the Hidden Hills Solar Electric Generating System (HHSEGS) site and the 250-foot buffer. In addition to the site survey reported here, a protocol-level botanical survey also was conducted in spring of 2011 for the proposed transmission/ gas line corridor for the HHSEGS project. A 1-mile buffer surrounding the site was also surveyed at a reconnaissance-level in spring 2011. Offsite surveys were conducted for special-status plants in several locations in California and Nevada in the vicinity of the HHSEGS site. Late season protocol-level surveys for special-status plants were conducted within the HHSEGS site in October 2010, and within the 250-foot buffer and 180-acre temporary construction laydown and parking area in October 2011. These results are addressed in separate reports.

1.1 Project Description

The following description of the project is excerpted from the Application for Certification (AFC) for the Hidden Hills Solar Electric Generating System, filed with the California Energy Commission (CEC) on August 5, 2011. The entire AFC can be accessed through the CEC website.

The Hidden Hills Solar Electric Generating System will be located on approximately 3,277 acres of privately owned land in Inyo County, California, adjacent to the Nevada border and north of Old Spanish Trail Highway (also known as Tecopa Road). The project site is approximately 18 miles south of Pahrump, Nevada, and approximately 45 miles west of Las Vegas, Nevada (Figure 1-1, Appendix A).

HHSEGS will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres, and Solar Plant 2 will occupy approximately 1,510 acres. A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres (Figure 1-2, Appendix A).

Each solar plant will use heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a solar receiver steam generator (SRSG) atop a solar power tower near the center of each solar field. The solar power tower technology for the HHSEGS project design incorporates an important technology advancement, the 750-foot-tall solar power tower. One principle advantage of the HHSEGS solar power tower design is that it results in more efficient land use and greater power generation. The new, higher, 750-foot solar power tower allows the heliostat rows to be placed closer together, with the mirrors at a steeper angle. This substantially reduces mirror shading and allows more heliostats to be placed per acre. More megawatts can be generated per acre and the design is more efficient overall.

In each solar plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and, unless augmented, will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a natural-gas-fired auxiliary boiler, used to augment the solar operation when solar energy diminishes or during transient cloudy conditions, a startup boiler, used during the morning startup cycle, and a nighttime preservation boiler, used to maintain system temperatures overnight. On an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun. To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration

complex. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats.

Two distinct transmission options are being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230-kilovolt (kV) transmission line to a new VEA-owned substation (Tap Substation) at the intersection of Old Spanish Trail Highway (Tecopa Road) and Nevada State Route (SR) 160 (the Tecopa/SR 160 Option). The other option is a 500-kV transmission line that interconnects to the electric grid at the Eldorado Substation (the Eldorado Option), in Boulder City, Nevada.

A 12- to 16-inch-diameter natural gas pipeline will be required for the project. It will exit the HHSEGS site at the California-Nevada border and travel on the Nevada side southeast along the state line, then northeast along Old Spanish Trail Highway (also referred to as Tecopa Road) until it crosses under SR 160. From this location a 36-inch line will turn southeast and continue approximately 26 miles, following the proposed Eldorado Option transmission line corridor, to intersect with the Kern River Gas Transmission (KRGT) pipeline. A tap station will be constructed at that point to connect it to the KRGT line. The total length of the natural gas pipeline will be approximately 35.3 miles.

The transmission and natural gas pipeline alignments will be located in Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), except for small segments of the transmission line (both options) in the vicinity of the Eldorado Substation, which is located within the city limits of Boulder City, Nevada. A detailed environmental impact analysis of the transmission and natural gas pipeline alignments will be prepared by BLM.

1.2 Environmental Setting

The HHSEGS site is located in Inyo County, California, within the southern Pahrump Valley. It is north of Old Spanish Trail Highway, with its eastern boundary along the California-Nevada state line. This area is at the toe of an alluvial fan complex, or bajada, that extends southwest from the Spring Mountains about 13 miles to the northeast. The Pahrump Valley is part of a northwest-southeast-trending valley system that includes Sandy (Mesquite) Valley to the southeast and Stewart Valley to the northwest of Pahrump Valley. In the vicinity of the project site, drainage is generally to the west and northwest toward Pahrump Playa. The elevation of the Pahrump Valley floor ranges from 2,515 feet at Pahrump Dry Lake to about 2,655 feet in the southwestern part of the basin along Old Spanish Trail Highway. Topography within the HHSEGS site is gently sloping, with the highest elevations in the southeast corner and the lowest near the northwest boundary. Several ephemeral washes enter from the eastern boundary.

The project area is located within the northeastern Mojave Desert, and its biogeography and climate are typical of that region. The climate is arid with extreme fluctuations in daily and seasonal temperatures. The average annual temperature for the town of Pahrump, Nevada, is 78.6 degrees Fahrenheit (°F) (WRCC 2011). Average annual precipitation for Pahrump is 4.83 inches (ibid.). The Pahrump average monthly high and low temperatures and average monthly precipitation amounts are shown for the cool season (January to March) and the hot season (July to September) in the following summary (WRCC 2011).

Average Monthly Precipitation and Temperature in the Pahrump Area

	January	February	March	July	August	September	Annual Average
Average High (°F)	57.6	62.4	67.9	101.2	99.8	92.3	78.6
Average Low (°F)	27.3	32.2	37.2	67.2	65.7	56.7	45.6
Precipitation (in.)	0.65	0.88	0.58	0.33	0.35	0.3	4.83

Most rainfall occurs from November through March (WRCC 2011). Snow is very uncommon. Late summer rainfall is a regular occurrence. Precipitation records from the National Weather Service Pahrump recording station show that 5.59 inches were recorded from October 2010 through September 2011, which is 108 percent of average (NOAA 2011).

In terms of surface water hydrology, the Pahrump Valley has no surface outlet to the ocean. It is part of the southwestern hydrographic Great Basin. White to pale brown silty soils cover large areas in the lower parts of the Pahrump Valley. Sandy and gravelly soils are more common on higher ground.

The vegetation of the Pahrump Valley is composed of natural vegetation types, except in developed areas. In the vicinity of Pahrump Dry Lake the terrain is barren in the lowest areas, with alkali sink scrub on the lower shoreline. At slightly higher elevations, the predominant vegetation is often determined by soil type. Shadscale scrub is common in pale-colored silty soils. Mojave Desert scrub occupies areas with sandy to gravelly soils with better drainage. Roadsides and developed areas contain ruderal vegetation. Some developed areas are landscaped with non-native plant species.

1.3 Previous Botanical Surveys in the Pahrump Valley Region

Plant collection records indicate that, prior to 2011, few botanical explorations had been made in the southern Pahrump Valley, Inyo County, California. The Consortium of California Herbaria (Consortium) lists only 59 collections prior to 2010 (Jepson Online Interchange 2011). Most of these were made by Dr. Carl B. Wolf, on May 15, 1941, including the first specimen of the special-status plant, Pahrump Valley buckwheat (*Eriogonum bifurcatum*). On June 12, 2010, James Andre collected eight specimens in the vicinity of the site, near Old Spanish Trail Highway (ibid.). The Consortium lists a total of only 67 specimens collected in the Pahrump Valley prior to surveys conducted for this project. This low number of specimens indicates that few botanists had visited the southern Pahrump Valley in California and its flora was relatively unknown prior to these surveys.

SECTION 2

Methods

This section describes the methods for the spring survey of botanical resources conducted in 2011 at the HHSEGS site and within the 250-foot buffer. For this report, the HHSEGS site and 250-foot buffer constitute the *study area*. The 2011 spring survey of the study area was conducted on April 16-19, 21, 23, and 26-30, using approximately 72 person-days to complete the field portion of the survey.

For the HHSEGS site, average rainfall, and annual rainfall for the 2010-2011 season are not available. Plant growth response at the site from March through May, 2011, was vigorous and sustained, indicating that precipitation occurred at intervals throughout the winter and early spring, and totals were near average or possibly above average at the HHSEGS site. The average annual precipitation for the nearest National Weather Service (NWS) recording station, Pahrump, Nevada, is 4.83 inches (WRCC 2011). Precipitation records from the NWS Pahrump recording station show that 5.59 inches were recorded from October 2010 through September 2011, which is 108 percent of average (NOAA 2011). A weather station was set up within the HHSEGS site in the spring of 2011.

Following a late summer rainfall event that elicited a vegetation response, a late season protocol-level survey of special-status plants was conducted within the site in October 2010. This survey is described in a separate report.

2.1 Pre-field Preparations

Pre-field research was conducted to select special-status plant species with potential to be found within the study area. A list of special-status plants with known presence in the greater vicinity of the project area was developed through searches of plant databases, including the California Native Plant Society's (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2011), the California Natural Diversity Database (CNDDB) (CNDDB 2011a, b), and the Consortium of California Herbaria (Consortium) (Jepson Online Interchange 2011). For each potentially occurring special-status plant species, information was compiled on conservation status, distribution, habitat characteristics, blooming time, and presence in the project region.

In accordance with the guidance provided by the California Department of Fish and Game (CDFG) *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), a plant was considered to be of special status if it met one or more of the following criteria:

- Federally or state-listed, proposed, or candidate for listing, as rare, threatened or endangered (USFWS 1996a, 2006; CDFG 2011, CNPS 2011); or
- Special Plant as defined by the California Natural Diversity Database (CNDDB 2011c); or
- Designated by the California Native Plant Society in its online *Inventory of Rare and Endangered Plants of California* (CNPS 2011); or
- Meets the definition of rare or endangered under CEQA Section 15380 (b) and (d) (CDFG 2009); or
- Considered a locally significant species[3] (CDFG 2009).

A species was determined to have potential to occur within the study area if its known or expected geographic range includes the project area or the greater vicinity of the project area, and if its known or

[3] "Locally significant species" are defined as a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region, or is so designated in local or regional plans, policies, or ordinances (CDFG 2009)

expected habitat is found within or near the project area. For this project, the *greater vicinity of the project area* extends north to Ash Meadows National Wildlife Refuge and Death Valley, west to the towns of Shoshone and Tecopa, and south to Mesquite and Sandy valleys and the Clark Mountains. This large area was used to check for potentially occurring species in recognition of the fact that the distributions of many special-status plant species in the Mojave Desert are poorly known, and new localities often are discovered many miles distant from localities that were previously known.

Table 2-1 (Appendix B) includes information on 60 species of special-status plants derived from database searches. Twenty-seven of these were identified as having the potential to occur within the study area prior to beginning the field surveys. Thirty-three additional species were identified as having no potential to occur within the study area. All 60 species were selected from those known to occur within U.S. Geological Survey (USGS) 7.5' quadrangles within the greater vicinity of the project area. Eleven of the species in Table 2-1 bloom or are otherwise identifiable in the late part of the blooming season, and were searched for during the late season surveys in October 2010 and October 2011.

2.2 Field Survey Methods

The 2011 spring survey included reconnaissance visits, reference site visits, and a protocol-level survey for special-status plants, using the intuitive controlled method. In addition, non-native invasive plant species were mapped and their abundance was estimated, and the vegetation was classified and mapped. Cacti are present in very low numbers, and no individuals of any species of *Yucca* are present within the study area, so these plants were not mapped.

2.2.1 Reconnaissance Visits

Reconnaissance visits were conducted on March 14-17 and April 10, 2011, by GANDA Senior Botanist Ann Howald, CH2M HILL Botanist Amy Hiss and UC Riverside Herbarium Director Andrew Sanders. The purpose of the March reconnaissance was to determine the progress of the blooming season, prepare a preliminary plant species list, and evaluate the habitat suitability for special-status plants. In March, the HHSEGS site was examined, and habitat quality was assessed near portions of an early version of the proposed transmission line route. The April reconnaissance focused on the study area and a nearby section of the proposed transmission line corridor.

2.2.2 Reference Site Visits

The special-status plant survey guidelines of the CDFG (2009) and the CNPS (2001) recommend reference site visits to determine the blooming condition of potentially occurring special-status plants, to the degree that this is reasonable given the scope of the project and the presence of reference sites in the vicinity of the project area. These visits are intended to assure that the plants are in flower and identifiable at the time of the survey, and to obtain a visual image of the plant, and the habitat and vegetation in which it occurs (CDFG 2009). Many of the special-status plant localities that served as reference sites for the spring 2011 survey consisted of the first place where the species was encountered during field surveys. Often the next-nearest known location was many miles distant from the project area, so it was impractical to visit these distant locations prior to beginning the field survey.

Many of the reference site locations described below are newly documented or are in Nevada, so no CNDDB Element Occurrence[4] numbers have been assigned to these locations.

Reference sites described below are those used for the spring 2011 survey of the study area. Some of these localities are within the segment of the proposed transmission line corridor that is along Old

[4] *Element Occurrence* (EO) is a term used by CNDDB to indicate a location where a rare plant is found. An EO can consist of a single individual or a group of individuals, which may include sub-groups. Element occurrences are, by definition, separated from the nearest EO(s) by 0.25 mile or more (NatureServe 2010, CNDDB 2011c). An EO is usually not equivalent to a biological population.

Spanish Trail Highway (also known as Tecopa Road). Surveys for the transmission line corridor, including reference sites used for that survey, are described in a separate report. Additional reference sites were visited in October 2010 for the late season survey. These are described in a separate report.

- **Pink funnel-lily (*Androstephium breviflorum*):** Twenty plants in fruit and in flower were observed by the entire survey team when this species was first identified within the HHSEGS site, in Mojave Desert scrub, on April 12, 2011. The reference site location is in southeastern Inyo County, California, at approximately 2,625 feet elevation.
- **Nye milkvetch (*Astragalus nyensis*):** This species was observed by the entire survey team when it was first identified in the transmission line corridor on April 14, 2011, in Mojave Desert scrub, in western Clark County, Nevada. Approximately 20 plants were observed, in flower and in fruit. This species also was observed by the entire survey team in several additional locations at the HHSEGS site in April and May 2011.
- **Preuss' milkvetch (*Astragalus preussii* var. *preussii*):** About 200 individuals of Preuss' milkvetch in flowering and fruiting condition were observed by the entire survey team on the north side of Old Spanish Trail Highway, 0.3 mile east of the California-Nevada border, in southern Nye County, Nevada, on April 14, 2011. The plants were growing in whitish, silty soil, within the cleared roadside margin, at 2,730 feet elevation.
- **Tidestrom's milkvetch (*Astragalus tidestromii*):** Tidestrom's milkvetch was observed by the entire survey team when it was first identified in the transmission line corridor on April 14, 2011, in Mojave Desert scrub, in western Clark County, Nevada. Approximately ten plants were observed with flowers and young fruit. Plants with mature fruits were observed by the entire survey team in several additional locations in California and Nevada, on several dates in late April and in May 2011.
- **Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*):** Hundreds of plants of Pahrump silverscale were observed by the entire survey team in the BLM Nopah Wilderness, southeastern Inyo County, California, south of Highway 178, 0.3 mile west of the California-Nevada border, on April 12, 2011. This location is in alkali sink scrub, at 2,500 feet elevation. Plants were in flowering and fruiting condition, and the diagnostic elongate inflated hairs were observed by all. This location is CNDDB Element Occurrence (EO) #1 for this species.
- **Wheeler's skeletonweed (*Chaetadelpha wheeleri*):** Plants in vegetative condition and in bud were observed by the entire survey team when this species was first identified in the transmission line corridor on April 13, 2011. This location is approximately one mile east of the California-Nevada border, north of Old Spanish Trail Highway, in western Clark County, Nevada. Wheeler's skeletonweed was observed in flower in several additional locations in California and Nevada, on several dates in late April and in May 2011, by the entire survey team.
- **Pahrump Valley buckwheat (*Eriogonum bifurcatum*):** This species was observed on the site on 26-30 October, 2010, and on multiple dates in April and May, 2011, by the entire survey team, in shadscale scrub vegetation. In October the distinctive skeletons and some flowering plants were observed. In early April skeletons and rosettes were observed. Later in the season flowering plants were observed in many locations in southeastern Inyo County, California, by the entire survey team.
- **Reveal's buckwheat (*Eriogonum contiguum*):** Hundreds of individuals of Reveal's buckwheat were observed in flower by the entire survey team in the BLM Nopah Wilderness, southeastern Inyo County, on 12 April, 2011. This location is south of Highway 178, 0.3 mile west of the California-Nevada border, in alkali sink scrub vegetation, at 2,500 feet elevation.
- **Parish's phacelia (*Phacelia parishii*):** More than 300 flowering and vegetative plants of Parish's phacelia were observed by six team members in California Valley, on Mesquite Valley Road, 2.7 miles southwest of its intersection with Old Spanish Trail Highway, in Inyo County, California, on April 25, 2011. The plants were growing in light-colored, silty soil, in alkali sink scrub vegetation, at

2,460 feet elevation. This population is the first documented locality for this species in Inyo County (Jepson Online Interchange 2011).

- **Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*):** Approximately 100 plants of Goodding's phacelia in flower and in vegetative condition were observed by the entire survey team within the HHSEGS site, just west of the California-Nevada border, in southeastern Inyo County, California, on April 11, 2011. This location is in Mojave Desert scrub at approximately 2,625 feet elevation.
- **Desert wing-fruit (*Selinocarpus nevadensis*):** Plants of desert wing-fruit in vegetative condition and in bud were observed by the entire survey team when this species was first identified in Mojave Desert scrub in the transmission line corridor on April 13, 2011. This location is approximately one mile east of the California-Nevada border, north of Old Spanish Trail Highway, in western Clark County, Nevada, at approximately 2,650 feet elevation. Plants of this species in flower and fruit were observed in many additional locations in California and Nevada, on several dates in late April and in May 2011.

2.2.3 Special-status Plant Survey Protocols

Methods used to complete the spring 2011 special-status plant survey were in compliance with the recommended protocols for botanical surveys of the California Department of Fish and Game (CDFG 2009), the U.S. Fish and Wildlife Service (USFWS 1996b), and the California Native Plant Society (CNPS 2001). The late season surveys conducted in October 2010 within the HHSEGS site, and in October 2011 within the 250-foot buffer and the 180-acre temporary construction laydown and parking area, satisfied the CDFG recommendation for multiple survey dates when needed to cover the blooming times of all potentially occurring special-status plant species.

The methodology used for the spring 2011 survey followed the *Intuitive Controlled* approach, as described in Attachment A of the Renewable Energy Action Team's (REAT) *Desert Renewable Energy Projects Best Management Practices and Guidance Manual* (REAT 2010). The Intuitive Controlled approach is approved by the BLM (BLM 2011) and the U.S. Forest Service.

Key elements of the Intuitive Controlled approach, as implemented for the spring 2011 survey within the study area, include:

- Survey timing (April) coincided with the period when spring-blooming special-status plants with estimated potential to occur within the study area were blooming or otherwise identifiable.
- Good access to the study area was provided by an existing network of unpaved roads located on section and half-section lines.
- All of the study area was surveyed.
- All surveyors were experienced surveyors with several to many years of Mojave Desert experience, and in-depth knowledge of Mojave Desert plant species, habitats, and vegetation types.
- Surveys were conducted by crews walking through all parts of their assigned sub-areas.
- All habitat types were examined, with emphasis placed on habitats with greater likelihood of supporting special-status plants.
- For the HHSEGS site, the survey effort was organized by quarter-section, meaning that one crew worked systematically within one quarter-section until it was completed before moving to the next quarter-section.
- For the spring survey of the 250-foot buffer, crews covered the area by walking through assigned linear segments of the buffer.
- Lists of all plant species observed were compiled for the site and for the 250-foot buffer.

Crews were provided with aerial photo-based, labeled, paper basemaps to assist with orientation. In addition, crews used Trimble Global Positioning System (GPS) units containing background files showing the site and the 250-foot buffer boundaries. The background file included the road network, which divides the site into quarter-sections, and a grid that divided each quarter-section into four equal parts (Figure 2-1, Appendix A). Each crew used the road network and grid lines for orientation while searching its assigned quarter-section. For the 250-foot buffer, the GPS unit background file contained transect lines that were used by surveyors to space themselves evenly while searching the buffer.

Special-status plant localities were mapped as points, using Trimble GeoXT or GeoXH GPS units (see Section 2.4). Abundance and habitat data for each point were recorded on the GPS units, using a project-specific data dictionary, and a backup set of data was recorded for each point on a paper data sheet. Recorded data included scientific name, number of individuals, phenology (vegetative, flowering, in fruit), substrate type, vegetation type, and associated species. Wildlife observations and other notes were recorded only on paper data sheets. Data sheets were collected and reviewed daily by the field supervisor. Representative photos were taken of special-status plant species, and their habitats.

The survey team consisted of a field supervisor (GANDA Senior Botanist Ann Howald), a Mojave Desert plant expert (UC Riverside Herbarium Director Andrew Sanders), and eight additional botanists and biologists that are experienced Mojave Desert plant surveyors. Each team member met the BLM Las Vegas Office requirements for botanical surveyors. Resumes for all members of the survey team are included in Section 5.2A of the AFC. The entire survey team worked in the field, typically in crews of two or three. Within the HHSEGS site, each crew spent approximately one day (16 person-hours total) surveying each quarter-section. Within the 250-foot buffer, each crew covered 2 to 3 miles of buffer length in one day.

2.2.4 Invasive Weed Survey Protocols

Invasive non-native plants (weeds) were searched for, mapped when found, and data were recorded for each mapped locality. Targeted weed species included those of significance to the California Department of Food and Agriculture (CDFA), the California Invasive Plant Council (Cal-IPC), and the Nevada Department of Agriculture (NDA) as indicated by current lists (CDFA 2011; Cal-IPC 2006, 2009; NDA 2011). Table 2-2, below, lists the target weed species. Target weeds were searched for during field surveys that covered the entire study area. All observed plant species were identified, so any additional noxious weed species not on the target list would have been detected.

Each weed locality was mapped as a point with a GPS unit (see Section 2.4), and data on abundance and local disturbance factors were recorded on the data dictionary of the GPS unit and on a paper data sheet as a backup.

The number of individuals was counted or estimated, and was recorded by abundance class. The abundance classes used were: 1-10, 11-100, 101-500, 501-1000, 1001-5000, and 5001-10,000.

The evaluation of disturbance condition was based on observations of the immediate vicinity of the weed location. The disturbance categories included: natural, human-caused, natural and human-caused, and none. Natural disturbance conditions included such things as rodent burrowing, recent history of fire, or presence of the weed in a natural area where runoff flows or ponds. Examples of human-caused disturbance conditions included roads, off-road vehicle tracks, and abandoned agricultural land (i.e., peach orchard).

TABLE 2-2
Non-native Invasive Plants (weeds) with Potential to Occur Within the Hidden Hills SEGS Project Area, California and Nevada

Code	Scientific Name	Common Name	CDFA Rating	Cal-IPC rating	NVDA Rating
ACRE	*Acroptilon repens*	Russian knapweed	B	Moderate	B
ALMA	*Alhagi maurorum*	Camelthorn	A	Moderate	A
BRTO	*Brassica tournefortii*	Saharan mustard	none	High	B
BRMAR	*Bromus madritensis* ssp. *rubens*	Red brome	none	High	none
BRTE	*Bromus tectorum*	Cheatgrass	none	High	none
CHTE	*Chorispora tenella*	Purple mustard	B	Watch list	none
COAR	*Convolvulus arvensis*	Field bindweed	C	Watch list	none
HAGL	*Halogeton glomeratus*	Halogeton	A	Moderate	none
MAAF	*Malcolmia africana*	African mustard	none	Watch list	none
PEHA	*Peganum harmala*	African rue	A	Watch list	A
PESE	*Pennisetum setaceum*	Green fountain grass	none	High	A
SAL	*Salsola* spp.	Russian thistle	A or C	Limited to Moderate	none
SIAL	*Sisymbrium altissimum*	Tumble mustard	none	Watch list	none
SIIR	*Sisymbrium irio*	London rocket	none	Moderate	none
SOEL	*Solanum elaeagnifolium*	white horse-nettle	B	Watch list	B
TAAP	*Tamarix aphylla*	Athel	none	none	C
TARA	*Tamarix ramosissima*	Tamarisk	B	High	C
TRTE	*Tribulus terrestris*	Puncturevine	C	Watch list	C

Sources:

California Department of Food and Agriculture (CDFA 2011).
California Invasive Plant Council (Cal-IPC 2006, 2009).
Nevada Department of Agriculture (NDA 2011).

Cal-IPC ratings:

High – These species have severe ecological impacts on physical processes, plant and animal communities and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed.

Moderate – These species have substantial and apparent – but generally not severe – ecological impacts on physical processes, plant and animal communities and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although establishment is generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Watch list – plants not currently included on the Cal-IPC statewide inventory list, which have been reported from wildlands in California. When additional information is received on distribution and impacts to wildlands, these species may become candidates for listing on the Cal-IPC list.

TABLE 2-2
Non-native Invasive Plants (weeds) with Potential to Occur Within the Hidden Hills SEGS Project Area, California and Nevada

Code	Scientific Name	Common Name	CDFA Rating	Cal-IPC rating	NVDA Rating

CDFA ratings:

"A" rated weeds are those for which eradication, containment, control or other holding action is conducted at the discretion of the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.

"B" rated weeds are those for which eradication, containment, control or other holding action is conducted at the discretion of the County Agricultural Commissioner.

"C" rated weeds are those for which state-endorsed holding action and eradication is conducted only when the weed is found in a nursery; action to retard spread outside of nurseries is at the discretion of the County Agricultural Commissioner; reject only when found in a cropseed for planting or at the discretion of the commissioner.

"Q" rated weeds are those that receive a temporary "A" action outside of nurseries at the state-county level pending determination of a permanent rating.

Nevada Department of Agriculture Noxious Weed Categories

Category "A": Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations

Category "B": Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur

Category "C": Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

2.3 Methods for Classifying Vegetation

The principle references used in naming and classifying the vegetation of the project area include *Terrestrial Vegetation of California* (Barbour et al. 2007) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). *A Manual of California Vegetation* (Sawyer et al. 2009), and *Mojave Desert Ecosystem Program: Central Mojave Vegetation Database* (Thomas et al. 2004) were consulted, as well. The latter two sources use a classification system that classifies vegetation into series, alliances, and associations, at a finer scale than is required for agency review of this project. Furthermore, describing vegetation at the alliance or association level requires data such as percent cover of individual species (ibid.) that was beyond the scope of this project to collect. Series, alliances and unique stands identified in these sources (Thomas et al. 2004, Sawyer et al. 2009) that possibly are included within the broader vegetation types used in this report are listed for each vegetation type.

Site-specific information on species composition and habitat characteristics was used to determine which vegetation types were present within the project area. A preliminary project-specific description of vegetation types was developed during the HHSEGS site reconnaissance in March 2011. These descriptions were refined and expanded during the protocol-level survey.

2.4 Global Positioning System/Geographic Information System Data Collection and Analysis, and Quality Assurance

Data collected in the field was recorded using Trimble GeoXH or GeoXT GPS units. Location data collected with these units is accurate to the sub-meter level after the data have been post-processed. GPS units were equipped with background files for navigation, and with data dictionaries for data collection. All data recorded on GPS units was backed up on paper data sheets. Project-specific background files included HHSEGS site and 250-foot buffer boundaries, the site's internal road network,

an orientation grid that divided each quarter-section of the site into four equal parts, and parallel transect lines within the 250-foot buffer (Figure 2-1, Appendix A). The road network, site grid and buffer transect lines were used to orient surveyors as the survey crews with GPS units walked through the entire site and 250-foot buffer. A project-specific data dictionary was used in the field to increase data recording efficiency and data quality. Surveyors were proficient in the use of the GPS units from previous experience.

All data collected with GPS units was downloaded and backed up each night onto laptop computers, and emailed to the project's Geographic Information System (GIS) technician. GPS data were post-processed by the GIS technician and downloaded into a project GIS database. All location data was mapped onto aerial photograph base maps by the GIS technician. These draft figures were checked for accuracy by the field supervisor, using the backup data on the paper data sheets.

SECTION 3

Results: Vegetation

This section describes the vegetation of the Hidden Hills SEGS site and 250-foot buffer. Figure 3-1 (Appendix A) shows the distribution of vegetation types within the site and 250-foot buffer. Appendix C contains a complete list of all plant species observed during botanical surveys conducted within the HHSEGS site and 250-foot buffer in 2010 and 2011.

3.1 Vegetation of the Hidden Hills SEGS Site and 250-foot Buffer

The natural vegetation of the HHSEGS site and 250-foot buffer consists of Mojave Desert scrub and shadscale scrub. Ruderal vegetation occurs within the site in the abandoned orchard on the west side of the corner of Silver Street and Old Spanish Trail Highway, and along the southern boundary of the site in the roadside of Old Spanish Trail Highway. Ruderal vegetation also occurs within the 250-foot buffer in the roadsides along the southern edge of the Old Spanish Trail Highway (also known as Tecopa Road). Wash vegetation consists mainly of species of low shrubs also observed in upland sites, so does not correspond to Mojave wash scrub as described by Holland (1986).

3.1.1 Mojave Desert Scrub

Mojave Desert scrub vegetation is dominated by evergreen and drought-deciduous shrubs 1-4 feet in height. This type corresponds to Holland's Mojave creosote bush scrub (Holland 1986). It is widespread throughout much of the Mojave Desert from 2,000 to 3,500 feet in elevation (ibid.). It occurs on many different soil types, on level and sloping terrain (Barbour et al. 2007). The most common dominant shrubs are creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa*), although this type may include up to 30 different species of desert shrubs (ibid.).

Mojave Desert scrub is the dominant vegetation in the eastern half of the HHSEGS site and adjacent 250-foot buffer (Figure 3-1, Appendix A). Within the site and 250-foot buffer, Mojave Desert scrub occurs mainly in sandy-gravelly gray or brown soils. The most common dominant shrub is creosote bush, which grows in association with one or more of the following sub-dominant shrubs: burrobush, four-wing saltbush (*Atriplex canescens*), and rabbit-thorn (*Lycium pallidum* var. *oligospermum*). In some areas, particularly in the southwest quadrant of the site, rabbit-thorn dominates and creosote bush is an associate. Other shrubs found in this vegetation type include Death Valley ephedra (*Ephedra funerea*), Nevada ephedra (*Ephedra nevadensis*), Shockley's goldenhead (*Acamptopappus shockleyi*), Virgin River encelia (*Encelia virginensis*), broom snakeweed (*Gutierrezia microcephala*), Mojave indigo bush (*Psorothamnus arborescens*), pima ratany (*Krameria erecta*), desert mallow (*Sphaeralcea ambigua*), Anderson's box-thorn (*Lycium andersonii*), and Cooper's box-thorn (*Lycium cooperi*). Virgin River encelia, broom snakeweed, and Mojave indigo bush are abundant within some of the shallow washes that traverse the site and 250-foot buffer.

The understory of Mojave Desert scrub consists of a large variety of annual and perennial forbs that are mainly native, a few species of native perennial grasses, and a few species of non-native annual grasses. Common and characteristic native annual and perennial forbs include woolly desert marigold (*Baileya pleniradiata*), pebble pincushion (*Chaenactis carphoclinia*), brightwhite (*Prenanthella exigua*), cushion cryptantha (*Cryptantha circumscissa*), stickseed (*Lappula redowskii*), chuckwalla combseed (*Pectocarya heterocarpa*), prince's-plume (*Stanleya pinnata*), Fremont's milkvetch (*Astragalus lentiginosus* var. *fremontii*), Nye milkvetch (*Astragalus nyensis*), Fremont's phacelia (*Phacelia fremontii*), desert golden poppy (*Eschscholzia glyptosperma*), branching gilia (*Ipomopsis polycladon*), glandular skeleton-weed (*Eriogonum brachypodum*), and little desert trumpet (*Eriogonum trichopes*). Native perennial grasses include Indian rice-grass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), Porter's muhly

(*Muhlenbergia porteri*), alkali sacation (*Sporobolus airoides*), and sixweeks fescue (*Vulpia octoflora*). Non-native annual grasses include red brome, cheatgrass, foxtail barley (*Hordeum murinum* ssp. *leporinum*), and Mediterranean grass (*Schismus arabicus*).

Cacti are present but very uncommon in Mojave Desert scrub vegetation within the site and 250-foot buffer. Widely scattered small individuals of three species were observed: beavertail cactus (*Opuntia basilaris* var. *basilaris*), silver cholla (*Opuntia echinocarpa*), and pencil cactus (*Opuntia ramosissima*). A total of fewer than 100 individuals of cacti was observed. No individuals of any *Yucca* species were observed in Mojave Desert scrub.

Included within Mojave Desert scrub areas within the site are large pebble flats that can be sparsely vegetated by native annual species or densely invaded by the non-native invasive plant, halogeton. Barbour and others (2007) describe the annual vegetation of these pebble flats, or pavement plains, as a distinct category of vegetation, although they call it an artificial type. Pebble flats within the site do not include any distinctive species not found elsewhere in Mojave Desert scrub within the site, so here they are regarded as a feature within this vegetation type.

Non-native invasive plants (weeds) are locally common in Mojave Desert scrub, along roads, especially red brome, halogeton, Russian thistle, and African mustard; at the bases of shrubs (red brome); in recently burned areas (Russian thistle), and in low-lying moist microsites (London rocket). See Section 4 for more information on weeds.

All nine special-status plant species found within the site and 250-foot buffer occur most frequently in Mojave Desert scrub, except Pahrump Valley buckwheat (*Eriogonum bifurcatum*), which is more common in shadscale scrub; and Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) , which is about equally common in both types. See Section 5 for more information on special-status plants.

Mojave Desert scrub at the site may correspond to one or more of the following alliances from *A Manual of California Vegetation* (Sawyer et al. 2009): *Ambrosia dumosa* Shrubland Alliance, *Atriplex canescens* Shrubland Alliance, *Encelia virginensis* Shrubland Alliance, *Ephedra funerea* Provisonal Shrubland Alliance, *Ephedra nevadensis* Shrubland Alliance, *Larrea tridentata* Shrubland Alliance, *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance, or *Lycium andersonii* Shrubland Alliance.

3.1.2 Shadscale Scrub

Shadscale scrub vegetation is composed of low-growing, gray-green shrubs with some tolerance for alkaline conditions (Holland 1986). It is widespread in the Mojave Desert. It typically grows in pale, silty soils; usually in valleys, sometimes on the higher margins of dry lakes (ibid.)

Shadscale scrub is the dominant vegetation in the western half of the HHSEGS site and 250-foot buffer (Figure 3-1, Appendix A). Shadscale scrub within the site and 250-foot buffer consists of densely spaced, gray-green evergreen and drought-deciduous shrubs, mainly two feet or less in height. The dominant shrub species is shadscale (*Atriplex confertifolia*). Associated shrubs include winterfat (*Krascheninnikovia lanata*), desert allysum (*Lepidium fremontii*), Anderson's boxthorn, rabbit-thorn, Emory's globemallow (*Sphaeralcea emoryi*), and prince's plume. The understory varies from sparse to dense, depending on local hydrology. Drier sites are often barren, except for scattered annuals such as Pahrump Valley buckwheat and showy gilia (*Gilia cana*). Low areas where water ponds during the rainy season are densely vegetated with native hog potato (*Hoffmannseggia glauca*) and Fremont's milk-vetch, and the non-native invasive weeds African mustard and red brome.

Non-native invasive plants are abundant in shadscale scrub, especially within and near unpaved roads of the site's internal road network, in recently burned areas, and in areas where water flows or ponds during rainfall events that generate runoff. The most abundant species are: halogeton, African mustard, and red brome. See Section 4 for more information on weeds.

Special-status plant species that are found with high frequency in shadscale scrub include Pahrump Valley buckwheat and Goodding's phacelia. See Section 5 for more information on special-status plants.

Shadscale scrub at the HHSEGS site may correspond to one or more of the following alliances from *A Manual of California Vegetation* (Sawyer et al. 2009): *Atriplex confertifolia* Shrubland Alliance, *Atriplex polycarpa* Shrubland Alliance, or *Krascheninnikovia lanata* Shrubland Alliance.

3.1.3 Ruderal Vegetation

Ruderal vegetation typically consists mainly or entirely of non-native plants, including invasive weeds, that grow in highly disturbed locations. In the Mojave Desert, some native species thrive under disturbed conditions (e.g., *Astragalus* species), and these species may be found as a component of ruderal vegetation, but they do not define it. Ruderal vegetation is not a natural type, so it is not included in the classification systems of Holland (1986) or Sawyer and others (2009).

Ruderal vegetation within the HHSEGS site and 250-foot buffer occupies the abandoned peach orchard at the corner of Silver Street and Old Spanish Trail Highway, and the roadsides of Old Spanish Trail Highway. This ruderal vegetation is dominated by halogeton, Russian thistle, and red brome. Native shrubs are lacking.

Within the abandoned peach orchard occurs one of only two locations within the site for the noxious weed Russian knapweed, and the only location for the non-native plant species, tumbleweed (*Amaranthus albus*). Peach trees (*Prunus persica*) that are mostly dead, and planted blue Arizona cypress (*Cupressus arizonica* var. *glabra*) also are found only within the abandoned peach orchard.

Within the southern section of the 250-foot buffer, ruderal vegetation occupies the southern roadside of Old Spanish Trail Highway. This area south of Old Spanish Trail Highway in the 250-foot buffer is the only location for the noxious weed, tamarisk, found within the study area. Within the buffer, the mapped localities are mainly on the south side of Old Spanish Trail Highway, near rural residences, where this species has been planted.

SECTION 4

Results: Non-native Invasive Plants

This section discusses the results of field surveys for non-native invasive plants, generally referred to as *weeds*. Eleven species of target weeds were identified and mapped within the HHSEGS site and the 250-foot buffer. Of these 11 species, red brome, halogeton, African mustard and Russian thistle were the most abundant and widespread.

Surveys for weeds were conducted concurrently with the floristic, protocol-level surveys for special-status plants. Table 2-2 includes the list of target weeds that were searched for during field surveys. Eleven species of weeds were identified and mapped within the study area (see Figures 4-1 through 4-7, Appendix A). These include Russian knapweed, red brome, cheatgrass, purple mustard, field bindweed, halogeton, African mustard, Russian thistle, tumble mustard, London rocket, and tamarisk.

The ecological significance, distribution and abundance of weeds found within the project area is discussed below by weed species. Figures 4-1 through 4-7 in Appendix A show the distribution of weeds within the site and the 250-foot buffer. The number of weed individuals at each location was recorded by abundance category, as described in Section 2. Table 4-1 lists the number of weed locations recorded for each species by abundance category. Most of the weed species encountered during surveys are annual plants, so their abundance and distribution within the project area may vary from year to year, depending on local soil moisture and disturbance levels, and the weed's ability to disperse.

TABLE 4-1
Numbers of Weed Locations Found Within the Hidden Hills SEGS Site and the 250-foot Buffer in 2011

Abundance Categories	HHSEGS Site	HHSEGS 250-foot Buffer	Total Number of Localities
Russian knapweed (*Acroptilon repens*)			
11–100	1	0	1
501–1,000	1	0	1
Totals	**2**	**0**	**2**
Red brome (*Bromus madritensis* ssp. *rubens*)			
11–100	2	0	2
101–500	11	2	13
501–1,000	16	9	25
1,001–5,000	44	26	70
5,001–10,000	92	16	108
Totals	**165**	**53**	**218**
Cheatgrass (*Bromus tectorum*)			
1–10	6	1	7
11–100	7	3	10
101–500	2	1	3
501–1,000	0	1	1
Totals	**15**	**6**	**21**
Purple mustard (*Chorispora tenella*)			
1–10	1	0	1
11–100	1	0	1
Totals	**2**	**0**	**2**

TABLE 4-1
Numbers of Weed Locations Found Within the Hidden Hills SEGS Site and the 250-foot Buffer in 2011

Abundance Categories	HHSEGS Site	HHSEGS 250-foot Buffer	Total Number of Localities
Field bindweed (*Convolvulus arvensis*)			
11–100	0	1	1
Totals	**0**	**1**	**1**
Halogeton (*Halogeton glomeratus*)			
1–10	1	2	3
11–100	5	1	6
101–500	7	1	8
501–1,000	10	5	15
1,001–5,000	17	6	23
5,001–10,000	69	11	80
Totals	**109**	**26**	**135**
African mustard (*Malcolmia africana*)			
1–10	6	2	8
11–100	25	8	33
101–500	24	3	27
501–1,000	21	1	22
1,001–5,000	10	16	26
5,001–10,000	18	6	24
Totals	**104**	**36**	**140**
Russian thistle (*Salsola* spp.)			
1–10	5	2	7
11–100	19	2	21
101–500	9	3	12
501–1,000	3	4	7
1,001–5,000	11	4	15
5,001–10,000	1	3	4
Totals	**48**	**18**	**66**
Tumble mustard (*Sisymbrium altissimum*)			
1–10	7	1	8
11–100	7	2	9
101–500	0	2	2
501–1,000	0	1	1
Totals	**14**	**6**	**20**
London rocket (*Sisymbrium irio*)			
1–10	9	0	9
11–100	19	4	23
101–500	14	4	18
501–1,000	2	1	3
1,001–5,000	0	0	0
5,001–10,000	1	0	1
Totals	**45**	**9**	**54**

TABLE 4-1
Numbers of Weed Locations Found Within the Hidden Hills SEGS Site and the 250-foot Buffer in 2011

Abundance Categories	HHSEGS Site	HHSEGS 250-foot Buffer	Total Number of Localities
Tamarisk (*Tamarix ramosissima*)			
1–10	0	4	4
11–100	0	4	4
101–500	0	1	1
Totals	**0**	**9**	**9**

Source: Field surveys conducted in spring 2011 for this project.

4.1 Russian knapweed (*Acroptilon repens*)

Russian knapweed is more common in northern California and the Great Basin, but also occurs in the Mojave Desert and other parts of California. It invades agricultural lands, roadsides, and other disturbed sites. This species appears to have the ability to chemically inhibit the growth of other plants (known as allelopathy), and is an aggressive competitor (DiTomaso and Healy 2007). Infestations grow rapidly and persist due to the plant's extensive root system (ibid.). Russian knapweed accumulates high levels of zinc, which it transfers to soil. It is toxic to horses and can cause "chewing disease" (nigropallidal encephalomalacia) (ibid.).

Russian knapweed was found in two locations, both within the site (Figure 4-1, Appendix A). It was observed in the abandoned peach orchard adjacent to Old Spanish Trail Highway, and along one of the interior roads. Russian knapweed was not detected within the 250-foot buffer.

4.2 Red brome (*Bromus madritensis* ssp. *rubens*)

Red brome is a widespread weed throughout most of California. Its distribution in the Mojave Desert is limited by dry conditions, but in moister locations it can grow very densely and result in troublesome ecological effects, which include extreme reduction of the native flora, including annuals and shrubs (Brooks 2000). In the eastern Mojave Desert it can form dense stands in washes, beneath shrubs and in other mesic microsites, especially in wet years. Control methods are limited in effectiveness, and most are not practical for large scale or wildland use (ibid.).

Red brome was one of the most widespread and abundant noxious weed species found within the study area. It was found in the site and the 250-foot buffer in a total of 218 locations (Figure 4-2, Appendix A). It was most abundant in areas receiving runoff, sites where water ponds briefly after rain, and around the bases of shrubs. Human-caused disturbance factors associated with red brome include roads and abandoned agricultural land.

4.3 Cheatgrass (*Bromus tectorum*)

Cheatgrass is widespread but not especially common in the Mojave Desert, where adverse ecological effects from this species have not been documented. It is a serious weed in the Great Basin, where it forms extensive dense stands, changes the structure of sagebrush scrub vegetation, outcompetes native plants, and leads to increased frequency of range fires (Young 2000).

Within the study area, cheatgrass was found in 21 locations, scattered throughout the western half of the site (Figure 4-3, Appendix A). Most of these locations had a low number of individuals. Cheatgrass was sometimes associated with roads.

4.4 Purple mustard (*Chorispora tenella*)

In California, purple mustard has been documented from the Cascade Range, the Central Valley, Southern California, and the Great Basin (DiTomaso and Healy 2007). It is usually associated with heavily disturbed agricultural areas, especially areas where winter wheat is grown (ibid.).

Purple mustard was found in two locations within the site, in low abundance in both locations (Figure 4-1, Appendix A). These areas were low-lying and wetter than the surrounding habitat. One was near a road. It was not seen in the 250-foot buffer.

4.5 Field bindweed (*Convolvulus arvensis*)

Field bindweed is a very deep-rooted perennial that invades agricultural fields and roadsides and is difficult to control (DiTomaso and Healy 2007). Infestations in fields of cereal crops can reduce yields by 30-40 percent (ibid.). Field bindweed was found in one location in low abundance within the 250-foot buffer, near Old Spanish Trail Highway (Figure 4-1, Appendix A).

4.6 Halogeton (*Halogeton glomeratus*)

Halogeton is a California Department of Food and Agriculture (CDFA) A-rated weed, meaning that eradication is a priority (CDFA 2011). Halogeton foliage contains soluble sodium oxalates and can be fatally toxic to livestock, especially to sheep, when ingested in quantity (DiTomaso and Healy 2007). Many control methods have been tried to combat the enormous infestations in the Great Basin, but poor rangeland management over many years has allowed this species to become so widespread that some states consider it ineradicable. It infests many thousands of acres in Nevada, yet is not a rated weed in that state (NDA 2011).

Halogeton is abundant and widespread in the western two-thirds of the site and the adjacent 250-foot buffer. It is more common in shadscale scrub than in Mojave Desert scrub. It is especially dense along roadsides, but also forms dense stands on gravel flats where no source of disturbance is apparent. Within the site, 109 locations were mapped (Figure 4-4, Appendix A), and 69 of these were of the highest abundance category. In the 250-foot buffer, 26 locations were mapped. This species was observed to be very common on the southern boundary of the site, along Old Spanish Trail Highway. The halogeton infestations within the site and in other areas of the southern Pahrump Valley in California are very likely the largest infestations of this species in California.

4.7 African mustard (*Malcolmia africana*)

African mustard has been recorded in only a few locations in California (DiTomaso and Healy 2007, Jepson Online Interchange 2011). In 2011 an infestation was detected in Death Valley National Park that the National Park Service is attempting to eradicate. In Nevada, African mustard has been observed to invade gypsum and alkaline soils, forming dense stands that compete with special-status plants in those areas.

African mustard is widespread and abundant within the northern two-thirds of the site, in the adjacent 250-foot buffer, and in the vicinity of Old Spanish Trail Highway. Within the site, it is often associated with the interior roads, and forms dense stands in depressions that pond water briefly during the rainy season. A total of 104 locations were mapped within the site, and 36 locations were mapped within the buffer (Figure 4-5, Appendix A). Many of these mapped locations contained thousands of plants.

4.8 Russian thistle (*Salsola* spp.)

Russian thistle infests rangelands and other agricultural lands throughout much of California. In the Central Valley and the deserts it can form very large infestations of large plants, which can be a serious

hazard on roads and freeways under windy conditions. Mature plants can accumulate oxalates to levels that are toxic to livestock, especially sheep (DiTomaso and Healy 2007). Large infestations create fire hazards. These plants serve as the alternate host for the beet leafhopper (*Circulifer tenellus*), an insect that can carry the virus causing curly top in sugar beets, tomatoes, melons, and other crops (ibid.). Biological control agents have been introduced to California that appear to reduce the size of individual plants of Russian thistle, but do not eliminate them (ibid.). It has recently been recognized that several species of *Salsola* are present in California, and the taxonomy of this group of plants is not well-understood. Mature plants with seeds are required for identification. Russian thistle plants do not mature until late in the growing season, so the seedlings observed on the site and in the 250-foot buffer could not be identified to species, and more than one species may be present.

Russian thistle was observed to be very common within the site during late season surveys conducted in October 2010 and October 2011, although weeds were not mapped during those surveys. The localities mapped in the spring of 2011 are an underestimate of the actual abundance of Russian thistle within the study area because the plants are present only as small seedlings in the spring, so are inconspicuous then. Within the site, Russian thistle is more common in the northern half, although large infestations occur along Old Spanish Trail Highway. A total of 48 localities were mapped within the site, and 18 within the site buffer (Figure 4-6, Appendix A), many of them large.

4.9 Tumble mustard (*Sisymbrium altissimum*)

Tumble mustard is more common in the Great Basin, but is sometimes seen in the Mojave Desert, and can be found throughout California (DiTomaso and Healy 2007). It infests agricultural lands and can create dense infestations along roadsides and in overgrazed rangelands. The seeds are widely dispersed by wind when the dry, mature plant breaks off at the base and tumbles across the landscape.

Within the site and 250-foot buffer, tumble mustard was mapped mainly in the eastern third of the site. It was more common in sandy soil areas. Within the site a total of 14 localities were mapped, with an additional six in the buffer (Figure 4-1, Appendix A). Most of these locations contained low numbers of individuals.

4.10 London rocket (*Sisymbrium irio*)

London rocket is found in the Central Valley, the eastern San Francisco Bay region, Southwestern California, and Eastern California, including the Great Basin and Mojave deserts (DiTomaso and Healy 2007). The California Invasive Plant Council rates the ecological impacts of London rocket as moderate, and notes that these vary locally (Cal-IPC 2006). In the Mojave Desert, it often infests roadsides and areas of natural disturbance such as canyons and washes.

London rocket was scattered widely within the site and the 250-foot buffer. It was especially abundant along Old Spanish Trail Highway, and in low areas with higher soil moisture. Within the site, 45 localities were mapped, with an additional nine in the buffer (Figure 4-7, Appendix A). Many London rocket localities were in places where water flows during the rainy season, or along roadsides.

4.11 Tamarisk (*Tamarix ramosissima*)

Tamarisk has been widely planted in the Mojave Desert, and has escaped from cultivation to invade canyons and floodplains (Lovich 2000). It is a large, deep-rooted shrub that utilizes groundwater that would otherwise be available for native species, and it brings salts to the surface that are deposited on the ground through leaf drop (ibid.). In the desert it competes directly with native riparian shrubs and trees for water, often replacing native plants. The value to wildlife of native riparian shrubs and trees is much higher than that of tamarisk (Lovich and de Gouvenain 1998).

Tamarisk was mapped only within the 250-foot buffer. The mapped localities are mainly on the south side of Old Spanish Trail Highway, near rural residences, where tamarisk has been planted (Figure 4-1, Appendix A).

SECTION 5

Results: Special-status Plants

This section presents the results of the spring 2011 protocol-level survey for special-status plants within the HHSEGS site and 250-foot buffer. For completeness, the results of the late season 2010 and 2011 surveys are also included here.

In total, nine species of special-status plants were detected within the HHSEGS site and 250-foot buffer. These species are: pink funnel-lily, gravel milkvetch, Preuss' milkvetch, Tidestrom's milkvetch, Wheeler's skeletonweed, purplenerve springparsley, Pahrump Valley buckwheat, Goodding's phacelia and desert wing-fruit. In addition, Nye milkvetch was detected within the HHSEGS site and 250-foot buffer. None of these plant species are federally or state-listed, or proposed or candidate species for listing as threatened, endangered, or rare. Species accounts for each of these species are provided below.

Table 5-1 presents data on the numbers of localities and individuals for the HHSEGS site and the 250-foot buffer. Table 5-2 summarizes the conservation status for each of the nine special-status plant species. Figures showing the distribution of special-status plants within the HHSEGS site and 250-foot buffer are found in Appendix A.

TABLE 5-1
Numbers of Special-status Plants Observed Within the Proposed HHSEGS Site and 250-foot Buffer

Common Name *Scientific Name*	Number of Localities Within Site	Number of Individuals Within Site	Number of Localities in 250-foot Buffer	Number of Individuals in 250-foot Buffer	Total Number of Individuals (Localities)
Pink funnel-lily *Androstephium breviflorum*	66	352	24	88	**440 (90)**
Gravel milkvetch* *Astragalus sabulonum*	5*	150*	*	*	**150 (5)***
Preuss' milkvetch *Astragalus preussii* var. *preussii*	2	4	1	3	**7 (3)**
Tidestrom's milkvetch *Astragalus tidestromii*	74	3,134	20	248	**3,382 (94)**
Wheeler's skeletonweed *Chaetadelpha wheeleri*	56	783	29	408	**1,191 (85)**
Purplenerve springparsley *Cymopterus multinervatus*	1	1	0	0	**1 (1)**
Pahrump Valley buckwheat *Eriogonum bifurcatum*	57	estimated 15,000	11	346	**estimated 15,346 (68)**
Goodding's phacelia *Phacelia pulchella* var. *gooddingii*	232	27,706	65	6,227	**33,933 (297)**
Desert wing-fruit *Selinocarpus nevadensis*	13	63	0	0	**63 (13)**

* Gravel milkvetch (*Astragalus sabulonum)* was designated CRPR 2.2 in October 2011 and entered into the CNDDB central database on October 25, 2011. This species was not included on the CNNDB Special Plants List at the time the surveys were conducted; therefore, it was not considered to be a special-status plant during the surveys. Five gravel milkvetch localities with approximately 150 plants were mapped during the surveys as voucher specimens. In addition to these five mapped locations, a few other localities occur onsite (estimated between 3 to 7 localities, with 150 plants) but they were not mapped. The total number of gravel milkvetch individuals and localities onsite, including the plants that were not mapped, is estimated to be between 8 to 12 localities and 300 individuals. Data in the table is based on mapped voucher specimen locations, field notes and observations.

Source: Data collected in 2010 and 2011 during field surveys for this project.

TABLE 5-2
Conservation status of special-status plant species found within the HH segs site and the 250-foot buffer

Common Name *Scientific Name*	Federal Status	Conservation Status in California				Conservation Status in Nevada			
		State Status	BLM Sensitive	CRPR	CNDDB	State Status	BLM Sensitive	Nevada NPS	Nevada NHP
Pink funnel-lily *Androstephium breviflorum*	-	-	-	2.3	G5 S1.3	-	-	-	-
Gravel milkvetch[a] *Astragalus sabulonum*	-	-	-	2.2	G5 S2	-	-	-	-
Preuss' milkvetch *Astragalus preussii* var. *preussii*	-	-	-	2.3	G4T4 S1.2	-	-	-	-
Tidestrom's milkvetch *Astragalus tidestromii*	-	-	-	2.2	G4G5 S2	-	-	-	-
Wheeler's skeletonweed *Chaetadelpha wheeleri*	-	-	-	2.2	G4 S1S2	-	-	-	-
Purplenerve springparsley *Cymopterus multinervatus*	-	-	-	2.2	G5? S2	-	-	-	-
Pahrump Valley buckwheat *Eriogonum bifurcatum*	-	-	Yes	1B.2	G2 S2	-	Yes	Threatened	G2 S2
Goodding's phacelia *Phacelia pulchella* var. *gooddingii*	-	-	-	2.3	G5T2T3 S1.3?[b]	-	-	-	-
Desert wing-fruit *Selinocarpus nevadensis*	-	-	-	2.3	G5 S1.3	-	-	-	-

[a] *Astragalus sabulonum* was designated CRPR 2.2 in October 2011 and entered into the CNDDB central database on October 25, 2011.

[b] The rank for Goodding's phacelia (*Phacelia pulchella var. gooddingii*) is G5T2T3/S1.3?. The question mark denotes that there is uncertainty in the heritage portion of the rank (e.g.,it could be between two values).

Notes:

CRPR = California Rare Plant Rank
CNDDB = California Natural Diversity Database

Sources: CNDDB 2011b, BLM 2007, BLM 2009, CNPS 2011, Nevada Native Plant Society (NNPS) 2010, Nevada Natural Heritage Program (NNHP) 2010, U.S. Dept. of Agriculture (USDA), Natural Resource Conservation Service, Plants Database (USDA 2011).

5.1 Pink funnel-lily (*Androstephium breviflorum*) – CRPR 2.3

Pink funnel-lily is a bulb-forming perennial (geophyte) in the Lily Family (*Liliaceae*). The flowers are white to pale pink or pale violet. The erect stem is typically 12 inches or less in height, and bears an umbel of 3 to 12 flowers, each with six floral parts (Baldwin et al. 2002, Flora of North America [FNA] 2009). The leaves are up to 12 inches in length, very narrow, channeled, and appear before the flowering stalk. In California, pink funnel-lily flowers from March to April. The fruit is a three-lobed capsule that splits open at maturity to reveal rows of large black seeds. Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1977). Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

Pink funnel-lily grows in sandy soil, in open desert scrub in California (Baldwin et al. 2002). The CNDDB (2011a) describes its habitat in California as desert dunes, and on bajadas in Mojave Desert scrub, from about 700 to 4,800 feet.

In California, pink funnel-lily is known from the Mojave Desert in San Bernardino County and the northeastern Colorado Desert in Riverside County. It is also found in Nevada, Arizona, Utah, Wyoming, Colorado and New Mexico (USDA 2011, FNA 2009, Cronquist et al. 1977). The CNDDB (2011a) lists 87 element occurrences (EOs), from San Bernardino, Riverside, and possibly Inyo counties. Eight of these are historic, and 79 are recent, meaning seen within the last 20 years. The Consortium (Jepson On-line Interchange 2011) lists 18 specimens of pink funnel-lily, 17 from San Bernardino County and one from Riverside County. Locations found during surveys for this project are likely the first confirmed records for this species from Inyo County.

Pink funnel-lily was observed mainly in Mojave Desert scrub, in sandy-gravelly soil, in the northern and eastern parts of the study area (Figure 5-1, Appendix A). Within the site, 352 individuals were detected, in 66 localities, and within the 250-foot buffer, 88 individuals were observed in 24 locations (Table 5-1). Nearly all of the plants were in vegetative or fruiting condition when observed.

Pink funnel-lily was also found in several locations within the Hidden Hills SEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, pink funnel-lily was found in several additional new offsite locations in Inyo County, California, near the California-Nevada state line.

Pink funnel-lily is not state or federally listed. In California, it has a California Rare Plant Rank[5] (CRPR) of 2 (CNDDB, 2011). It has no conservation status in Nevada. Its conservation status is summarized in Table 5-2.

5.2 Gravel milkvetch (*Astragalus sabulonum*) – CRPR 2.2

Gravel milkvetch is a pink flowered annual in the Pea Family (*Fabaceae*). This species is distinguished from the other annual *Astragalus* species observed during surveys for the HHSEGS project by its pod characteristics, and by its pink flowers, which are darker colored and larger than those of *A. didymocarpus, A. nuttallianus* or *A. nyensis* (Barneby 1989, Baldwin et al. 2002). In California and Nevada, gravel milkvetch is most commonly found in sandy sites, such as sand dunes, sandy flats, sandy washes, and sandy roadsides, but sometimes in soils with silt and clay, as well as sand (CNPS 2011). In California it blooms from February to June, and has been recorded from 200 to 3,050 feet in elevation (CNPS 2011). Line drawings of this species are in Baldwin and others (2002) and in Barneby (1989). Photographs of this species can be accessed through the CalPhotos website.

In California, prior to surveys for the HHSEGS project, gravel milkvetch was known from a few locations in the eastern Mojave and Sonoran deserts, in Imperial, Inyo, Riverside and San Diego counties (CNPS 2011, Jepson Online Interchange 2011). The Consortium has 28 collection records for this species (Jepson Online Interchange 2011). One of these was collected in the southern Pahrump Valley in 2010 by James Andre. Gravel milkvetch also is found in Nevada, Arizona, New Mexico, Utah; and Sonora, Mexico (Barneby 1989, Kartesz 1988, CNPS 2011). As of October 2011 the CNDDB had identified 18 EOs, of which two are recent, and 18 are historic. These do not include information from the HHSEGS surveys.

Gravel milkvetch did not obtain conservation status in California until October 2011. Therefore, this species was not systematically mapped during HHSEGS protocol-level surveys conducted in spring of 2011. However, estimates of numbers of localities and individuals can be provided, based on mapped voucher collections, field notes, and observations made during surveys in spring of 2011. Gravel milkvetch was collected and mapped in five localities within the site (see Figure 5-2), Appendix A). One collection locality contained more than 100 individuals. The other four had approximately 10 individuals each. In addition to these five mapped locations, a few other localities occur onsite (estimated between

[5] In April 2011 CNPS changed the name of the CNPS List to "California Rare Plant Rank," The rank designations (1A, 1B, 2, 3, 4) and their definitions are identical to those used in the CNPS List.

3 to 7 additional localities, with 150 plants) but they were not mapped. The total number of gravel milkvetch individuals and localities onsite, including the plants that were not mapped, is estimated to be between 8 to 12 localities and 300 individuals. Gravel milkvetch was collected in one offsite location in the southern Pahrump Valley and was observed within the HHSEGS proposed transmission line corridor.

Gravel milkvetch is not state or federally listed. In October 2011 it was designated as CRPR 2.2 by the California Native Plant Society. The CNDDB added gravel milkvetch to its central database on October 25, 2011, and ranks it G5 S2. Its conservation status in California and Nevada is summarized in Table 5-2.

5.3 Preuss'milkvetch (*Astragalus preussii* var. *preussii*) – CRPR 2.3

Preuss' milkvetch is a pink and white-flowered perennial herb in the Pea Family (*Fabaceae*). Mature plants are bushy, about 1 foot tall, and give off a strong unpleasant odor characteristic of *Astragalus* species that concentrate selenium (Barneby 1989). The pods are straight, single-chambered, and reddish at maturity (Baldwin et al. 2002). In California, Preuss' milkvetch flowers from April to June. Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

In California, Preuss' milkvetch grows in silty soil, in open sites within shadscale scrub or Mojave Desert scrub (Baldwin et al. 2002, CNPS 2011).

Prior to surveys completed for this project, Preuss' milkvetch was known in California only from three locations, near Mesquite Lake and in Mesquite Valley in San Bernardino County, and northwest of Panamint Valley in Inyo County (Jepson Online Interchange 2011). The Consortium contains five collection records for this species (ibid.). The CNDDB lists 4 EOs, two recent and two historic (CNDDB 2011a). Preuss' milkvetch is also known from Nevada, Arizona and Utah (Barneby 1989, Kartesz 1988, CNPS 2011).

Within the study area, Preuss' milkvetch was observed in light-colored silty soil, growing in an unpaved road within shadscale scrub, in the southeastern quarter of the site, and within the western section of the 250-foot buffer (Figure 5-3, Appendix A). Within the site, four individuals were observed in two localities, and within the 250-foot buffer, three individuals were observed in one location (Table 5-1). The plants were in flowering and fruiting condition when observed.

Preuss' milkvetch was also found in several locations within the HHSEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, Preuss' milkvetch was found in several additional new offsite locations near the state line and about five miles west of the state line, in Inyo County, California.

Preuss' milkvetch is not state or federally listed. In California, Preuss' milkvetch is designated as CRPR 2 (Table 5-2) by the California Native Plant Society. In Nevada, this species has no conservation status.

5.4 Tidestrom's milkvetch (*Astragalus tidestromii*) – CRPR 2.2

Tidestrom's milkvetch is a purple and white-flowered perennial herb in the Pea Family. Mature plants are grayish in color, hairy, and acaulescent (stemless). The pods are large (1-1 ½ inches long), strongly curved into a half-circle or greater, stiff and leathery, with one seed chamber, and a raised suture on the outer side (Baldwin et al. 2002). In California, Tidestrom's milkvetch flowers from April to May. Photos can be viewed on the CalPhoto website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

In California and Nevada, Tidestrom's milkvetch grows on calcareous substrates, including rocky limestone slopes, but can also be found in sandy washes, and in sandy-silty substrates in valley bottoms.

It can be locally common on roadsides and grows in unpaved, infrequently used roads. It is usually associated with Mojave Desert scrub in California (Baldwin et al. 2002, CNPS 2011).

Tidestrom's milkvetch superficially resembles the common Mojave Desert species, Layne's milkvetch (*Astragalus layneae*), and has been confused with it. Tidestrom's milkvetch differs from Layne's milkvetch in the following characters:

- **Tidestrom's milkvetch:**
  - Acaulescent (stemless)
  - Inflorescence 3-16-flowered
  - Pod one-chambered
  - Pod flattened
  - Pod with rib on suture on both sides
  - Hairs on plant and pod appressed
- **Layne's milkvetch:**
  - Stem well-developed
  - Inflorescence 10-45-flowered
  - Pod two-chambered
  - Pod round in cross-section
  - Pod with groove on the outer side suture
  - Hairs on plant and pod spreading

Specimens in the UC Riverside Herbarium labeled as *Astragalus layneae* were checked in April 2011 by Andrew Sanders, and many of them were found to be misidentified specimens of *Astragalus tidestromii*. It appears that Tidestrom's milkvetch is much more common on limestone substrates in the Eastern Mojave Desert than previously known, and likely much more common than Layne's milkvetch in that area. No individuals of Layne's milkvetch were found in the Pahrump Valley or in surrounding areas during surveys conducted for this project. Tidestrom's milkvetch was found to be widespread on calcareous substrates in these areas.

Prior to surveys completed for this project, Tidestrom's milkvetch was thought to be uncommon and limited in distribution in California. The Consortium lists only 17 specimens, mainly from the San Bernardino, Clark, Kingston, and Ivanpah mountains in San Bernardino County (Jepson Online Interchange 2011). Re-evaluated specimens at UC Riverside have approximately doubled the number of Tidestrom's milkvetch specimens listed in the Consortium, and surveys for this project have expanded its range in California. The CNDDB lists 15 EOs for this species, including 6 recent and 9 historic (CNDDB 2011a). Tidestrom's milkvetch is also known from the Spring Mountains and other locations in Nevada (Niles and Leary 2007, Kartesz 1988).

Within the study area, Tidestrom's milkvetch was found in open areas, in sandy-gravelly to light-colored calcareous and silty soils in shadscale scrub and Mojave Desert scrub, mainly in the eastern half of the site (Figure 5-4, Appendix A). Within the site, 3,134 individuals were observed in 74 localities, and within the 250-foot buffer, 248 individuals were observed in 20 locations (Table 5-1). The plants were in flowering and fruiting condition when observed.

Tidestrom's milkvetch was also found in several locations within the HHSEGS project's proposed transmission line corridor. During offsite surveys conducted for this project, Tidestrom's milkvetch was found in several additional new offsite locations in Inyo County, California.

Tidestrom's milkvetch is not state or federally listed. In California, Tidestrom's milkvetch is designated as CRPR 2 (Table 5-2) by the California Native Plant Society. In Nevada this species has no conservation status.

5.5 Wheeler's skeletonweed (*Chaetadelpha wheeleri*) – CRPR 2.2

Wheeler's skeletonweed is a white-flowered perennial herb in the Sunflower Family (*Asteraceae*). The mature plants are about 1 foot tall, broom-like, with many bright green stems with very small leaves (Baldwin et al. 2002). In California, this species flowers from April to September (CNPS 2011). Line drawings of this species are found in Baldwin and others (2002) and Cronquist and others (1994). Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

Wheeler's skeletonweed grows in sandy to silty soil, in desert dunes, Mojave Desert scrub, and Great Basin scrub in California (CNPS 2011).

Prior to surveys completed for this project, Wheeler's skeletonweed was known in California mainly from the Death Valley region (CNPS 2011), and the nearest known locality to the site was about 50 miles north, in dunes at the base of the Last Chance Range, east of Death Valley (Jepson Online Interchange 2011). Thus, localities found during surveys for this project provide a 50-mile southern range extension for this species in California. The Consortium includes 38 collection records for this species, of which six are duplicates (Jepson Online Interchange 2011). The CNDDB lists 10 EOs, of which three are recent, and seven are historic (CNDDB 2011b). Wheeler's skeletonweed is also known from Nevada and Oregon (Cronquist et al. 1994, Kartesz 1988).

Within the study area, Wheeler's skeletonweed was observed mainly in Mojave Desert scrub, in sandy-gravelly soil, in the eastern portion of the site, within 0.5 mile of the California-Nevada border (Figure 5-5, Appendix A). Within the site, 783 individuals were detected, in 56 localities, and within the 250-foot buffer, 408 individuals were observed in 29 locations (Table 5-1). All of the plants were in vegetative to flowering condition when observed.

Wheeler's skeletonweed was also found in several locations within the HHSEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, Wheeler's skeletonweed was found in several additional new locations in Inyo County, California, near the California-Nevada state line.

Wheeler's skeletonweed is not state or federally listed. In California, Wheeler's skeletonweed is designated as CRPR 2 (Table 5-2) (CNDDB 2011). In Nevada this species has no conservation status.

5.6 Purplenerve springparsley (*Cymopterus multinervatus*) – CRPR 2.2

Purplenerve springparsley is a purplish-flowered perennial herb in the Carrot Family (*Apiaceae*). The mature plants are stemless, low-growing, gray-green, with leaves and flower stalks attached underground to the buried stem or taproot (Cronquist et al. 1997, Baldwin et al. 2002). The winged fruits with purple veins are distinctive (ibid.). In California, this species flowers from March to April (CNPS 2011). Line drawings are included in Cronquist and others (1997). Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

Purplenerve springparsley grows in sandy to gravelly soil, in Mojave Desert scrub and pinyon-juniper woodland in California, at elevations of 790 to 1800 meters (CNPS 2011).

Prior to surveys completed for this project, purplenerve springparsley was known in California to be uncommon, but widely distributed from the Death Valley area south to the eastern Mojave Desert, and west to the edge of the San Bernardino Mountains (Jepson Online Interchange 2011). The nearest known locality to the site was about 25 miles south, in the vicinity of Clark Mountain (ibid). The Consortium includes 15 records for this species (ibid.). The CNDDB lists 27 EOs, of which 17 are recent and ten are historic (CNDDB 2011b). This species is also known from Nevada, Arizona, Utah, New Mexico, Texas, and Baja California (Cronquist et al. 1997, CNPS 2011).

Within the site, one individual of purplenerve springparsley was observed in Mojave Desert scrub, in sandy-gravelly soil, in the southeastern portion of the site (Figure 5-6, Appendix A; Table 5-1). No individuals of this species were observed within the 250-foot buffer. The single plant observed within the site was in fruiting condition when observed.

During offsite surveys conducted for this project, purplenerve springparsley was found in several additional new offsite locations in the Pahrump Valley in Inyo County, California, and in Nye County, Nevada. This species was not found within the HHSEGS project's proposed transmission line corridor.

Purplenerve springparsley is not state or federally listed. In California, purplenerve springparsley is included in CRPR 2 (Table 5-2) (CNDDB 2011). In Nevada this species has no conservation status.

5.7 Pahrump Valley buckwheat (*Eriogonum bifurcatum*) – CRPR 1B.2

Pahrump Valley buckwheat is an annual herb in the Buckwheat Family (*Polygonaceae*). Its distinctive features include involucres (structures surrounding a group of flowers) that are sessile (attached directly to the major branches) and upright, stout branches, and a strongly dichotomous (forked) branching pattern (Reveal 1971, 2010; Baldwin et al. 2002). Both living plants and skeletons are distinctive, and can be identified at a distance. Line drawings of Pahrump Valley buckwheat are included in Mozingo and Williams (1980) and Baldwin and others (2002). Photographs of this species can be viewed at the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

The habitat for Pahrump Valley buckwheat in California has been described as sandy soil areas in chenopod scrub at 2,330 to 2,625 feet in elevation (CNPS 2011, CNDDB 2011a). In Nevada, the habitat is described as barren, saline, heavy clay or silty hardpan soils on and near dry playa margins, and on adjacent shore terraces and stabilized sand dunes, at 2,300 to 2,800 feet (Reveal 2010, NNHP 2001). Pahrump Valley buckwheat has been described as endemic to the Pahrump, Stewart, Mesquite and Sandy valleys, near the California-Nevada border (ibid.). It was noted by Beatley (1976) as common near the California-Nevada border west of Pahrump.

Prior to studies conducted for this project, the most recent comprehensive account of Pahrump Valley buckwheat in Nevada is provided by the Nevada Natural Heritage Program's 2001 rare plant fact sheet for this species (NNHP 2001). Population census information from this fact sheet states that 18 occurrences are known for Pahrump Valley buckwheat in Nevada using a mapping separation of 1.0 km (0.6 mile), or 47 occurrences if a separation of 0.16 km (0.1 mile) is used. This fact sheet also states that the total estimated number of individuals in Nevada is 1,109 or more, and the total estimated area occupied by this species is 651 or more hectares (1,609 or more acres) (ibid.). In California, the Consortium includes two records, which are duplicates of a single collection from the southern Pahrump Valley, collected in 1941 (Jepson Online Interchange 2011).

Within the study area, Pahrump Valley buckwheat was mapped during the October 2010 and October 2011 (late season) surveys and the spring 2011 survey. Pahrump Valley buckwheat was found mainly in white to pale brown, silty soils, in shadscale scrub, in the western half of the site (Figure 5-7, Appendix A). Combining data from the 2010 surveys, within the site an estimated total of 15,000 plants was observed in 57 localities, and in the 250-foot buffer, 346 plants were observed in 11 localities (Table 5-1). More information on data collected during the October 2010 and October 2011 surveys is available in a separate report.

Offsite surveys in California and Nevada conducted as a part of this project confirmed the existence of large populations of Pahrump Valley buckwheat in previously known locations and in new locations. In California, populations with thousands of individuals, including some with at least 100,000 plants and some much larger, were documented in Stewart Valley, northern and southern Pahrump Valley, and in Chicago Valley. The Chicago Valley locality, with at least 100,000 individuals, was newly discovered during offsite surveys for this project. It is on the west side of the Nopah Range, so it represents an extension of this species into a new watershed to the west of its previously known range. In Nevada, populations with at least 100,000 plants, some much larger, were documented in Stewart Valley, on the east side of Stewart Dry Lake. Additional large populations were documented in Nevada in the northern Pahrump Valley, within and near the town of Pahrump and northeast of Pahrump Dry Lake. One new locality of 5,000 or more individuals was found in the HHSEGS project's proposed offsite transmission line corridor.

Pahrump Valley buckwheat is not state or federally listed. It is included in CRPR 1B.2 by the California Native Plant Society. Until 2010, Pahrump Valley buckwheat was documented in California from only four CNDDB Element Occurrences (EOs #1-4). In 2010 CNPS changed the status of Pahrump Valley buckwheat from 1B.1 to 1B.2, and added five new EOs for this species to its database (EOs #5-9). These new records are from the Kingston Spring and Kingston Peak USGS 7.5' quadrangles (Thomas 2001, CNDDB 2010a) and, if accurate, they would represent a range expansion to the west in California for this species, compared with previous accounts (Reveal 2010). These newly added occurrences are based on data collected in 1997 from a project to map the vegetation of the central Mojave Desert (Thomas 2001). There do not appear to be voucher specimens from the locations represented by EOs #5-9, and those localities have not been checked recently, so the current status of Pahrump Valley buckwheat in these locations is uncertain. Of the nine current EOs, seven are recent and two are historic (CNDDB 2011a).

The CNDDB ranking of Pahrump Valley buckwheat is G2 S2. The Nevada Natural Heritage Program also ranks it G2 S2 (NNHP 2010). Pahrump Valley buckwheat is a BLM sensitive species in California and Nevada. The conservation status of this species is summarized in Table 5-2.

5.8 Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) – CRPR 2.3

Goodding's phacelia is a small, purple-flowered annual herb in the Waterleaf Family (*Hydrophyllaceae*). Its distinctive features include flowers that are all purple, stamens that are included within the corolla (flower), and leaves that are longer than wide, and entire to only slightly lobed (Baldwin et al. 2002). Line drawings of this species are found in Baldwin and others (2002). Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

In California, the habitat of Goodding's phacelia has been described as alkaline clay soils in Mojave Desert scrub, from 2,500 to 3,280 feet in elevation (CNPS 2011, CNDDB 2011a).

Prior to 2010, Goodding's phacelia was known in California only from Mesquite Valley (Jepson Online Interchange 2011), and possibly from Salsberry Pass in the Amargosa Mountains, south of Death Valley. One specimen previously identified as this species from Clark Mountain has been re-examined by Andrew Sanders and is actually *Phacelia barnebyana* (ibid.). Currently, the Consortium lists five collections of this species from San Bernardino and Inyo counties (ibid.). The CNDDB contains six EOs, of which three are recent and three are historic (CNDDB 2011b). Goodding's phacelia is also known from Nevada, Arizona and Utah (Kartesz 1988).

Within the study area, Goodding's phacelia was widespread and very common. It was observed in Mojave Desert scrub and shadscale scrub vegetation, in silty to sandy-gravelly soil, and on gravel flats, throughout the study area (Figure 5-8, Appendix A). Within the site, 27,706 individuals were detected in 232 localities, and within the 250-foot buffer, 6,227 individuals were observed in 65 locations (Table 5-1). All of the plants were in vegetative to flowering condition when observed.

Goodding's phacelia was also found in a number of locations within the HHSEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, Goodding's phacelia was found in several additional new offsite locations in Inyo County, California.

Goodding's phacelia is not state or federally listed. In California, this species is included in CRPR 2 (Table 5-2) (CNDDB 2011). In Nevada Goodding's phacelia has no conservation status.

5.9 Desert wing-fruit (*Selinocarpus nevadensis*) – CRPR 2.3

Desert wing-fruit is a white-flowered perennial herb in the Sand-verbena Family (*Nyctaginaceae*). The mature plants form low mounds a few inches tall. The leaves are oval and slightly succulent. The winged

opalescent fruits are diagnostic (Baldwin et al. 2002). In California and Nevada, this species flowers from May to September (CNPS 2011). Line drawings of this species are found in Baldwin and others (2002). Photos can be viewed at the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

Desert wing-fruit grows in sandy to gravelly soil, in Mojave Desert scrub and Joshua tree woodland in California and Nevada (CNPS 2011).

Prior to surveys completed for this project, desert wing-fruit was known in California from a single location (CNDDB EO#1) in Mesquite Valley near the California-Nevada border (Jepson Online Interchange 2011). The Consortium includes two records, which are duplicates of one collection (Jepson Online Interchange 2011). This species is also found in Nevada, Arizona and Utah (Baldwin et al. 2002).

Within the study area, desert wing-fruit was observed mainly in the southwest part of the site, in shadscale scrub and Mojave Desert scrub (Figure 5-9, Appendix A). Sixty-three individuals were counted in 13 locations (Table 5-1). No individuals of this species were observed in the 250-foot buffer.

Desert wing-fruit was found in several locations within the HHSEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, desert wing-fruit was found in several additional new offsite locations in Inyo County, California, near the California-Nevada state line.

Desert wing-fruit is not state or federally listed. In California, this species is included in CRPR 2 (Table 5-2) (CNDDB 2011). Desert wing-fruit is common in Nevada, and has no conservation status there.

SECTION 6

Results: Other Plants of Consideration

Nye milkvetch was identified within the HHSEGS site and 250-foot buffer during surveys conducted in 2011. CNDDB is reviewing information on this species and may assign a conservation status in the near future (CNDDB 2011). The distribution of Nye milkvetch within the HHSEGS site is shown on Figure 6-1 in Appendix A. A species account is provided below.

6.1 Nye milkvetch (*Astragalus nyensis*)

Nye milkvetch is a small, white-flowered annual herb in the Pea Family (*Fabaceae*). The flowers have a blunt keel (type of petal) with a pink spot at the tip, which is one character of several that distinguishes this species from two others with similar pods: *A. nuttallianus* var. *imperfectus* and *A. acutirostris* (Kartesz 1988). Prior to surveys for this project, Nye milkvetch had not been documented from California, so information about this species is derived from Nevada sources and observations made during surveys for this project. The blooming time for Nye milkvetch in California and Nevada is April to May. Photos can be viewed on the CalPhotos website (http://calphotos.berkeley.edu//flora/), and in Appendix D.

In Nevada, Nye milkvetch grows in the foothills of desert mountains, on calcareous outwash fans and gravelly flats, sometimes in sandy soil, in Mojave Desert scrub (NNHP 2001). It has been recorded from 1,100 to 5,600 feet in Nevada. There are documented locations in Nye, Clark and Lincoln counties (Kartesz 1988).

In California, the first state records for Nye milkvetch were made during surveys conducted for this project. Within the site, Nye milkvetch was found in Mojave Desert scrub, in sandy-gravelly soil, in the eastern half of the site (Figure 6-1, Appendix A). Within the site, 4,859 individuals were detected in 162 localities, and in the 250-foot buffer, 2,368 individuals were recorded in 34 localities, for a total of 7,227 individuals in 196 localities. The plants were in flowering and fruiting condition when observed.

Nye milkvetch also was observed in several locations within the HHSEGS project's proposed offsite transmission line corridor. During offsite surveys conducted for this project, Nye milkvetch was found in several additional new offsite locations in southeastern Inyo County, California. Locations with large numbers of individuals were found in California within five miles of the California-Nevada state line, north and south of the site.

Nye milkvetch is not state or federally listed. The conservation status of Nye milkvetch in California is currently under review (CNDDB 2011). In Nevada, Nye milkvetch is tracked by the Nevada Natural Heritage Program (NNHP 2010). The Nevada Native Plant Society previously designated it a "watch" species, but does not at present (NNPS 2010).

SECTION 7

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Appendix A
Figures

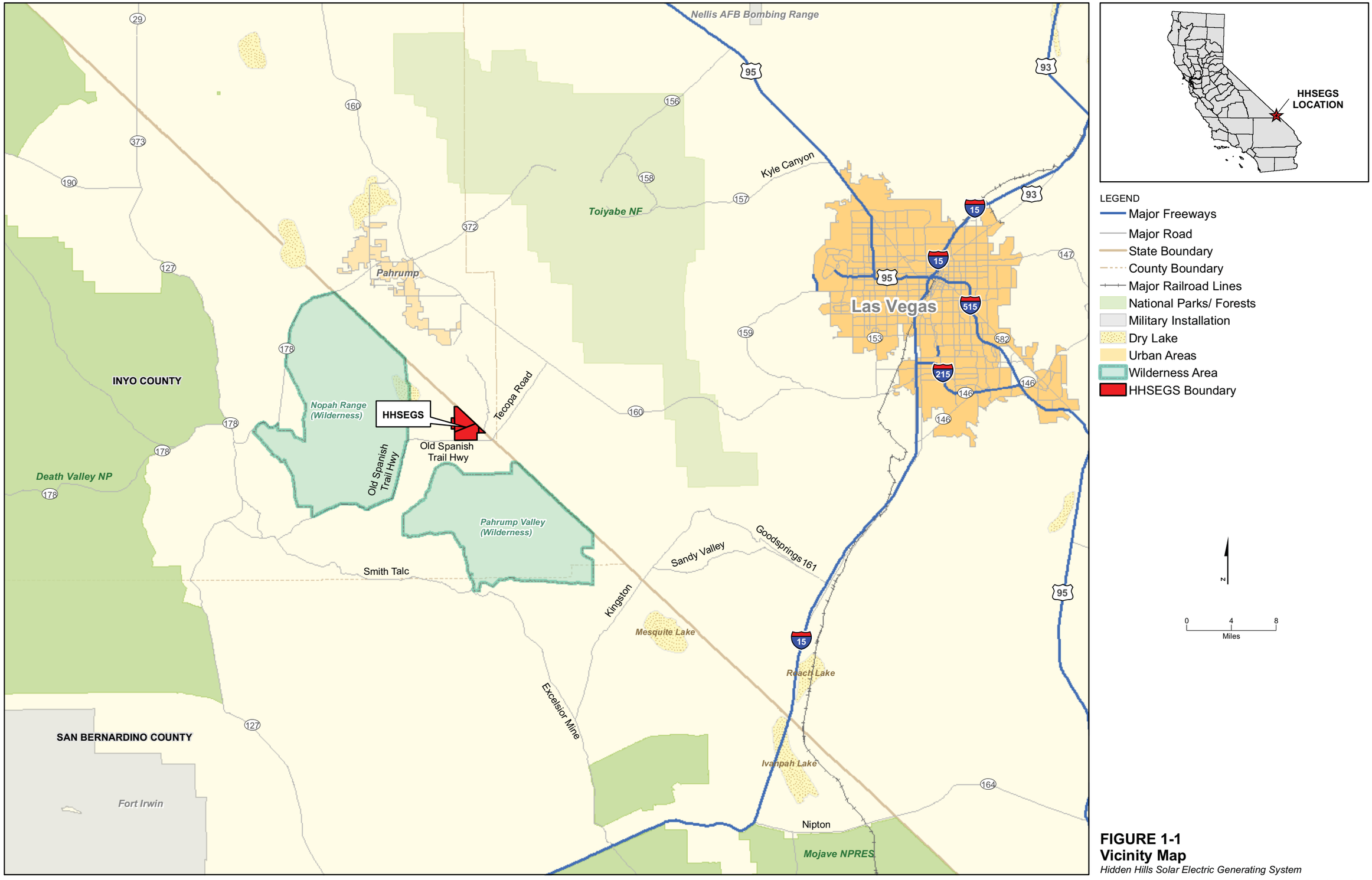


FIGURE 1-1
Vicinity Map
Hidden Hills Solar Electric Generating System

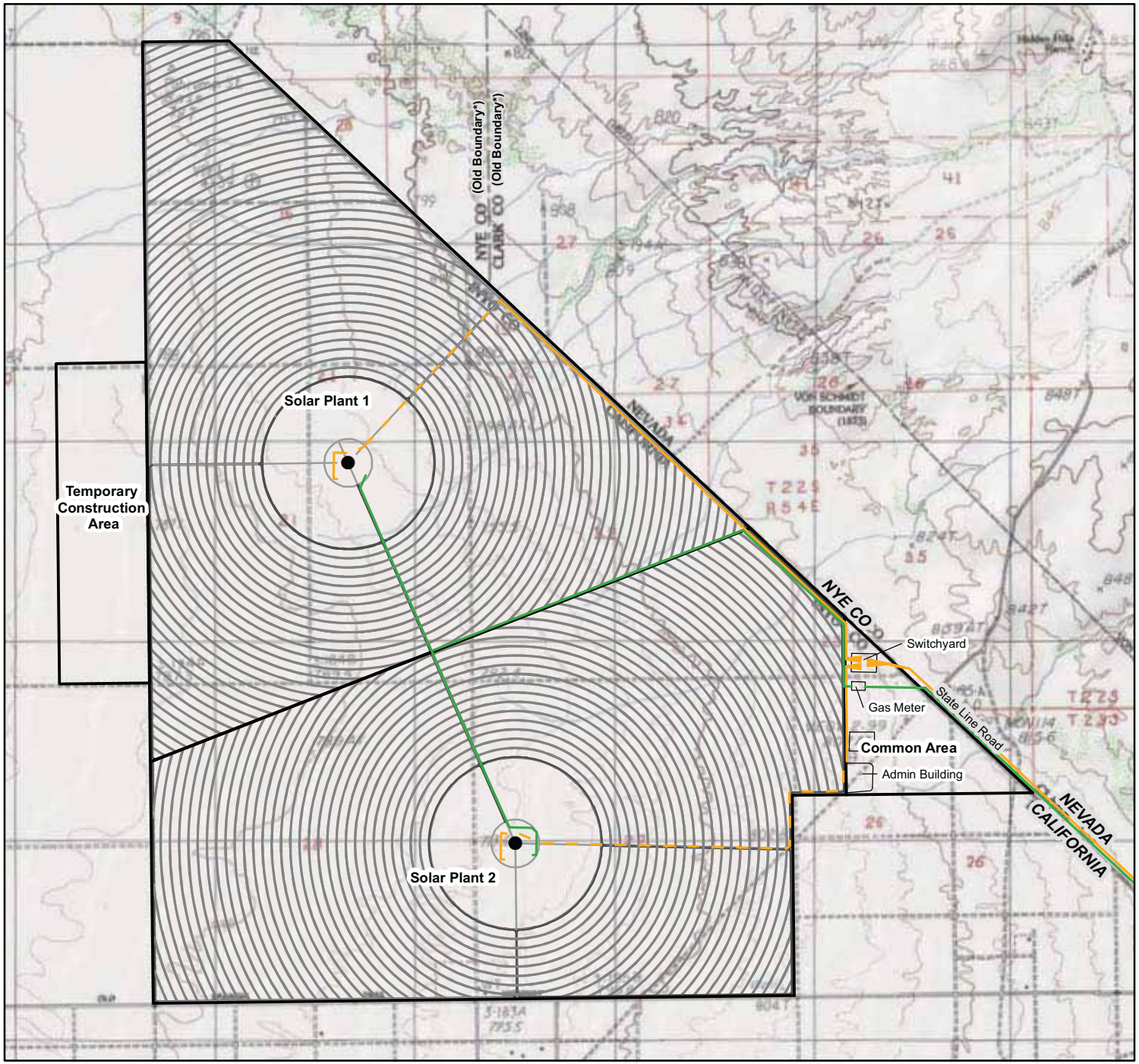
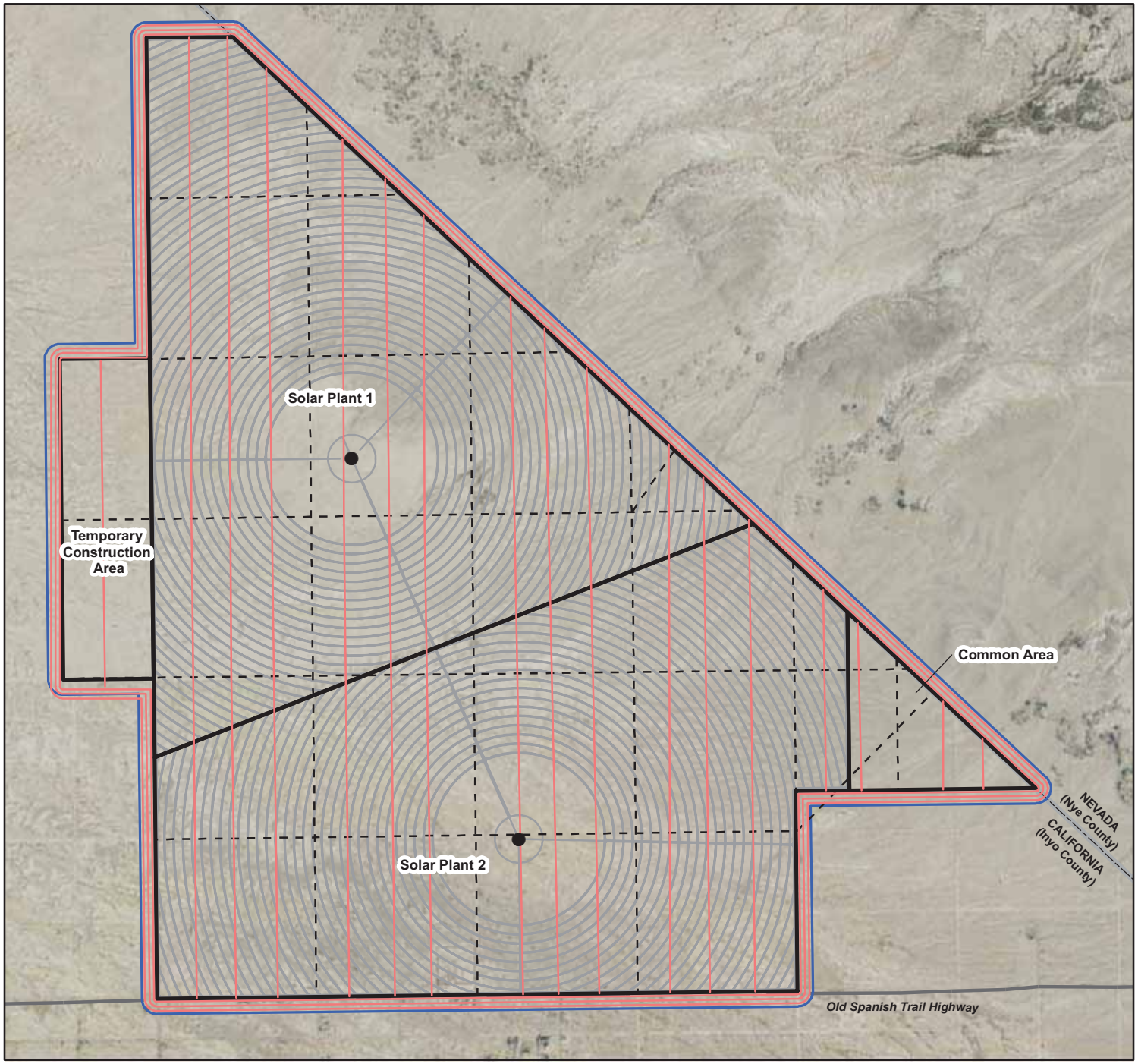


Figure 1-2
Site Plan and Linear Facilities
Hidden Hills Solar Electric Generating System



LEGEND

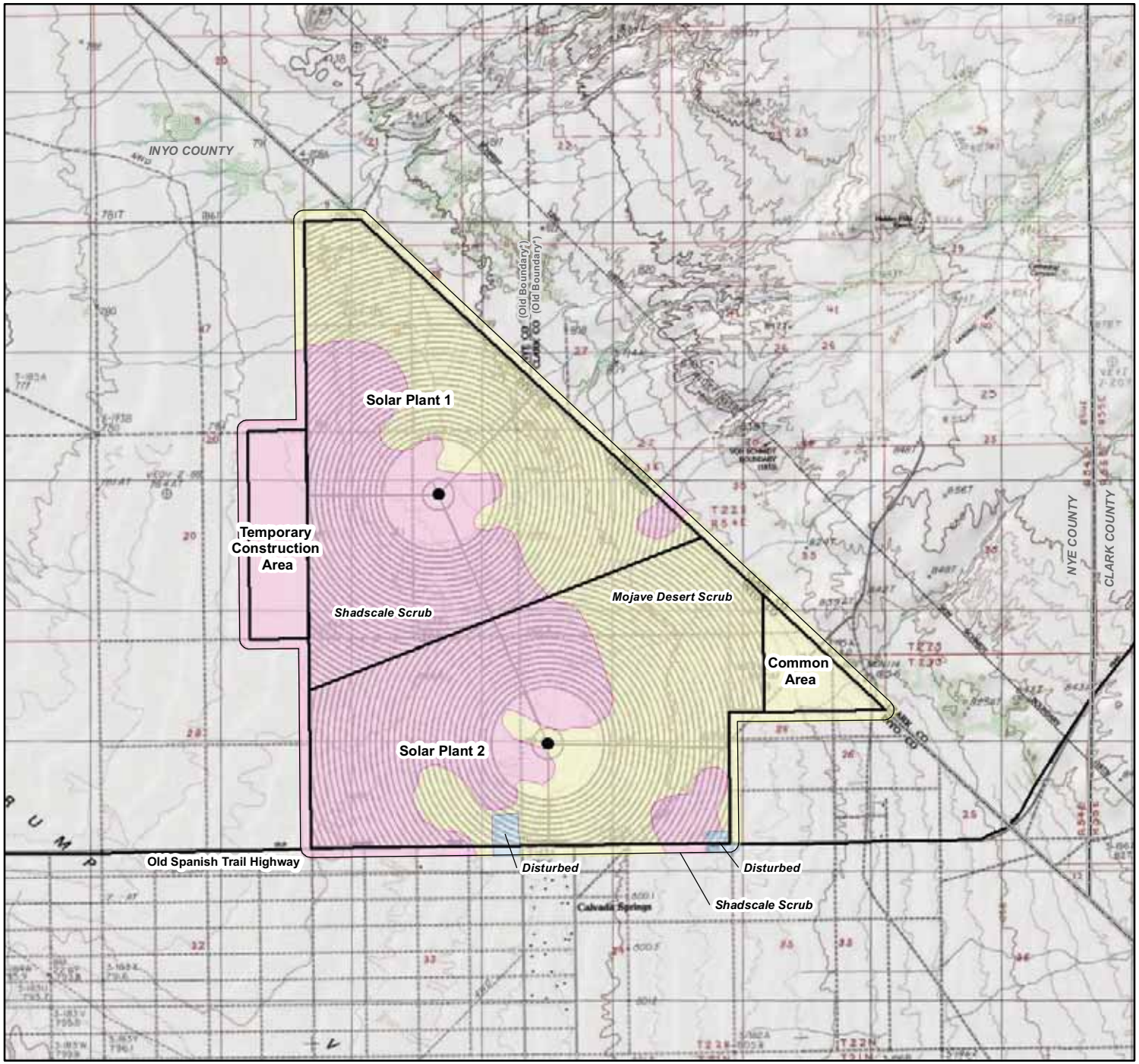
- Solar Power Tower
- 2011 Site Orientation Lines
- 2011 Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 2-1
Site Field Map
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower
- HHSEGS Boundary
- 250-foot Buffer of HHSEGS

Vegetation Types

- Disturbed (excluding roads)
- Shadscale Scrub
- Mojave Desert Scrub

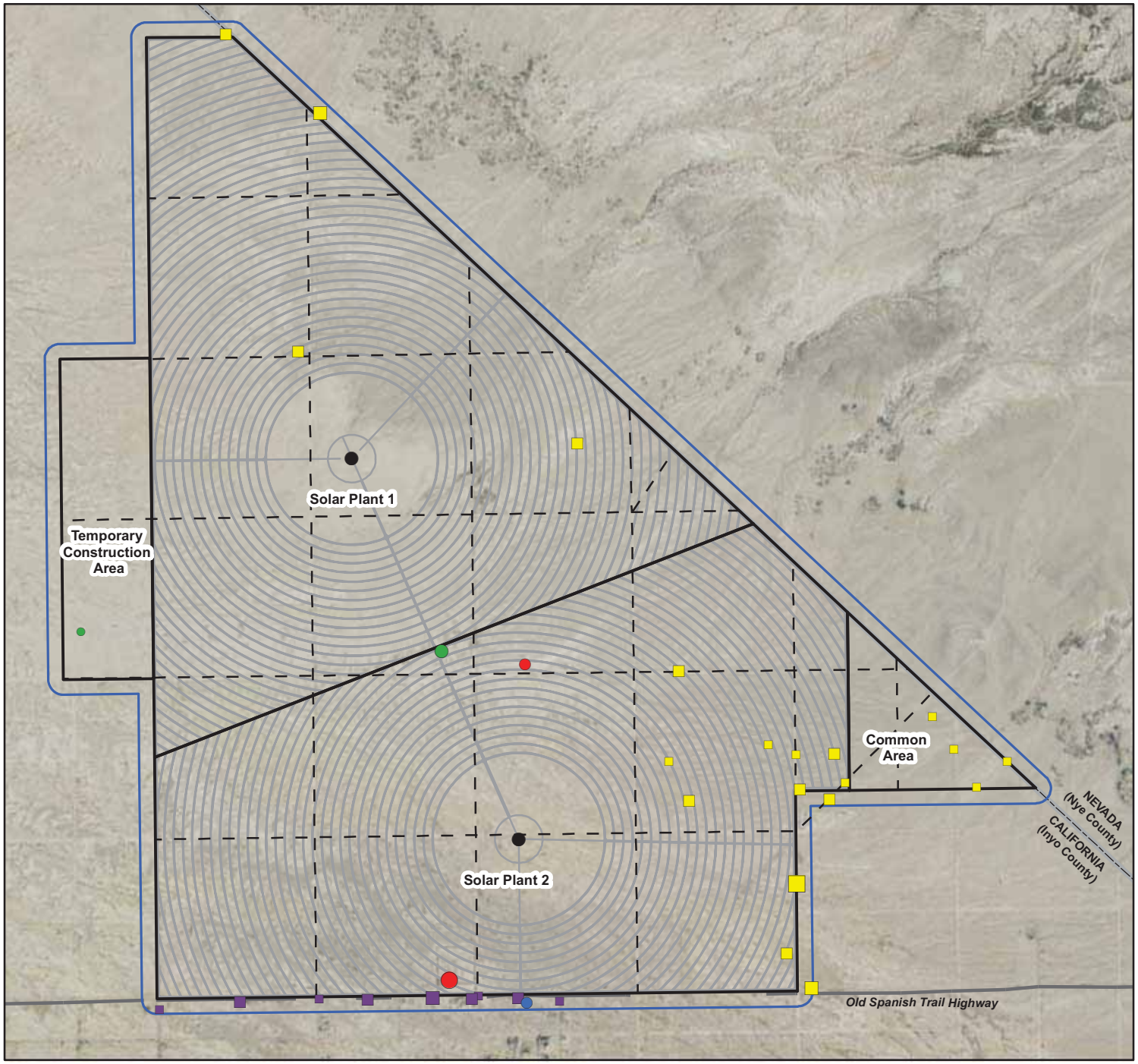
*County boundary moved due to annexation, 2001

Data Source:
GANDA Botanical Survey, 2011

N

0 1,800 3,600
Feet

Figure 3-1
Vegetation Map
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Acroptilon repens (Russian knapweed)

- 11-100
- 5001-10000

Chorispora tenella (Purple mustard)

- 1-10
- 11-100

Convolvulus arvensis (Bindweed)

- 11-100

Sisymbrium altissimum (Tumble mustard)

- 1-10
- 11-100
- 101-500
- 501-1000

Tamarix ramosissima (Tamarisk)

- 1-10
- 11-100
- 101-500

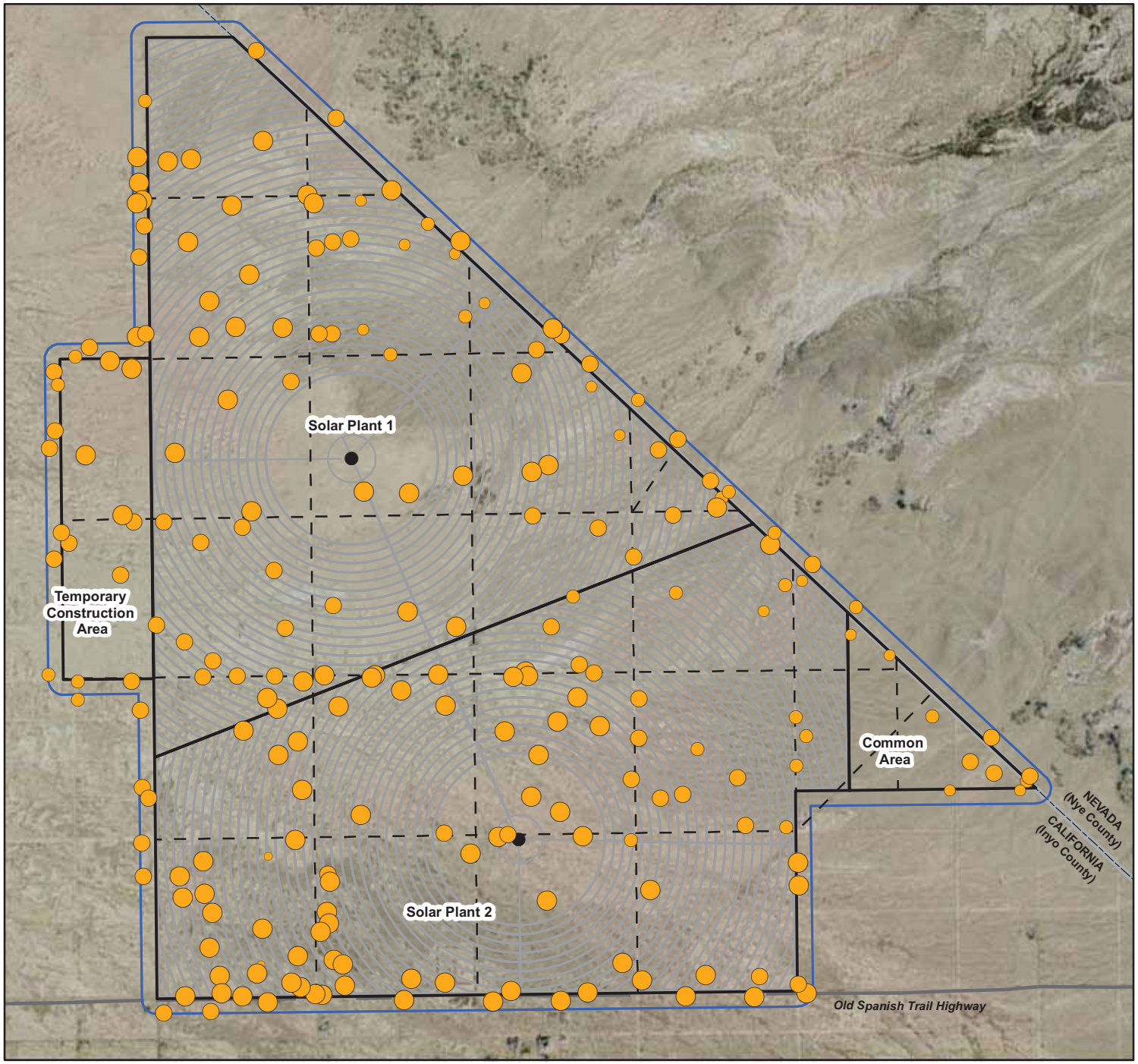
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 4-1
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Bromus madritensis ssp. *rubens* (Red brome)

- 11-100
- 101-500
- 501-1000
- 1001-5000
- 5001-10000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

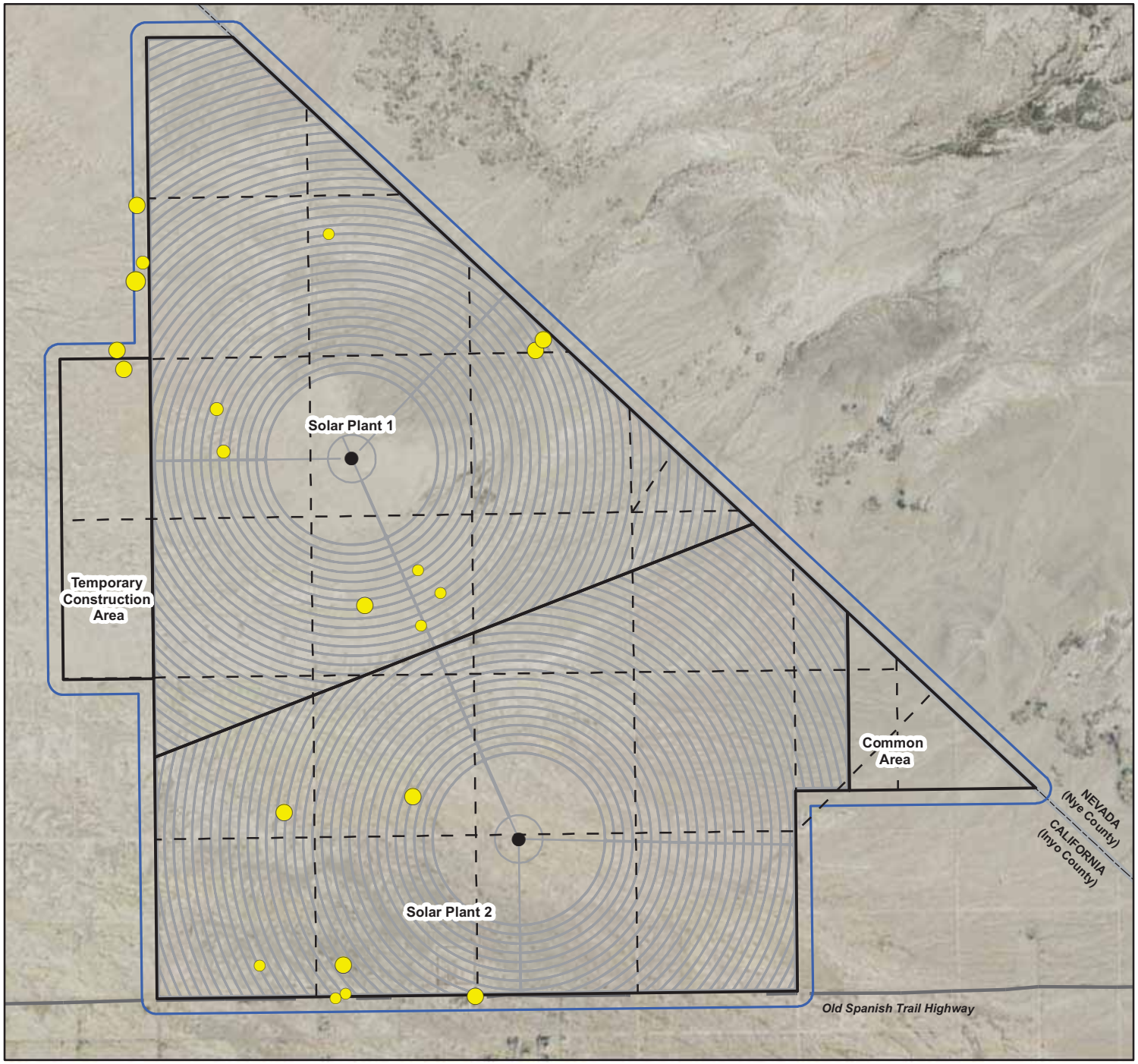
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-2
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Bromus tectorum (Cheatgrass)

- 1-10
- 101-500
- 11-100
- 501-1000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

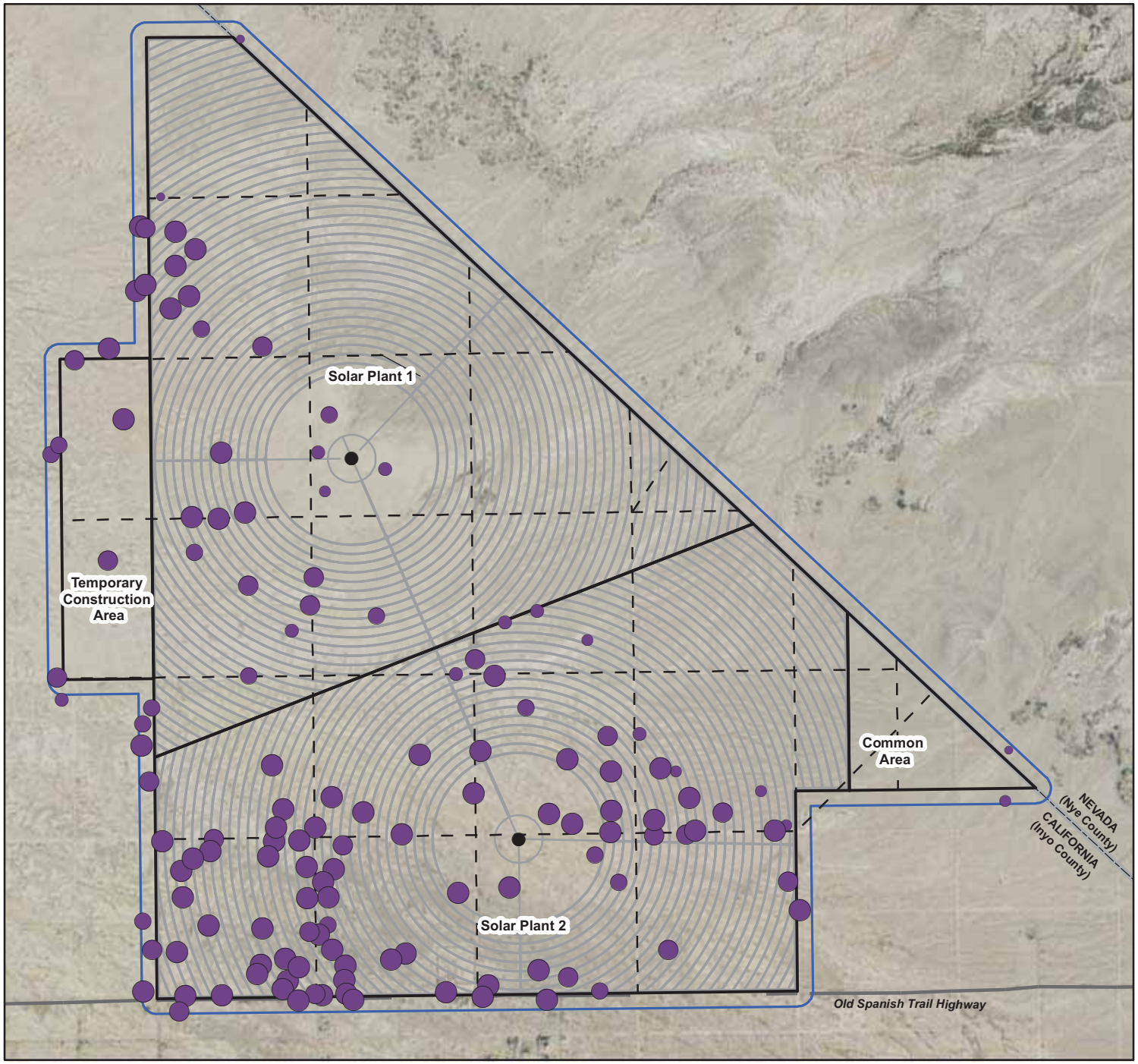
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-3
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Halogeton glomeratus (Halogeton)

- 1-10
- 11-100
- 101-500
- 501-1000
- 1001-5000
- 5001-10000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

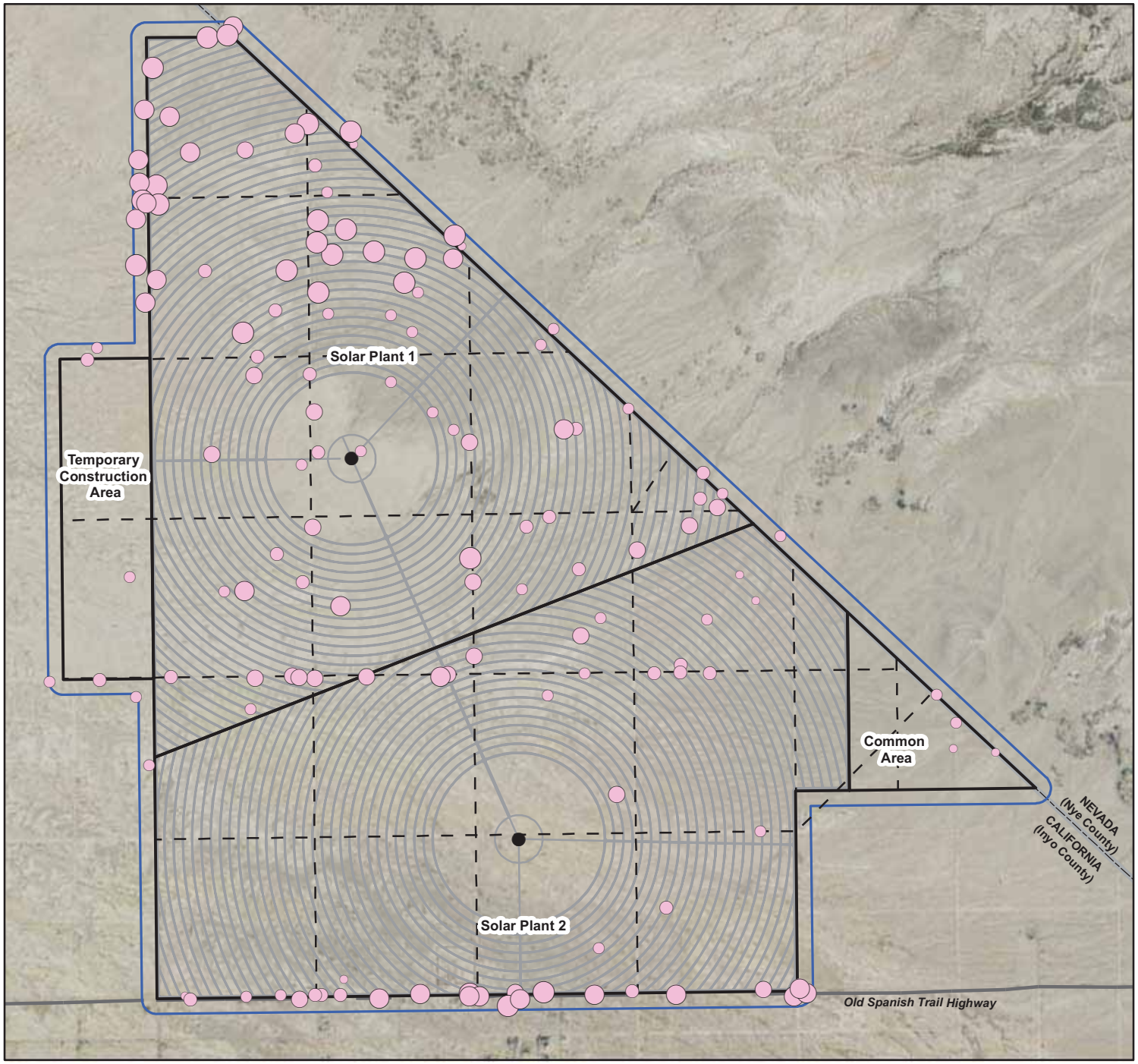
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-4
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Malcolmia africana (African mustard)

- 1-10
- 11-100
- 101-500
- 501-1000
- 1001-5000
- 5001-10000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

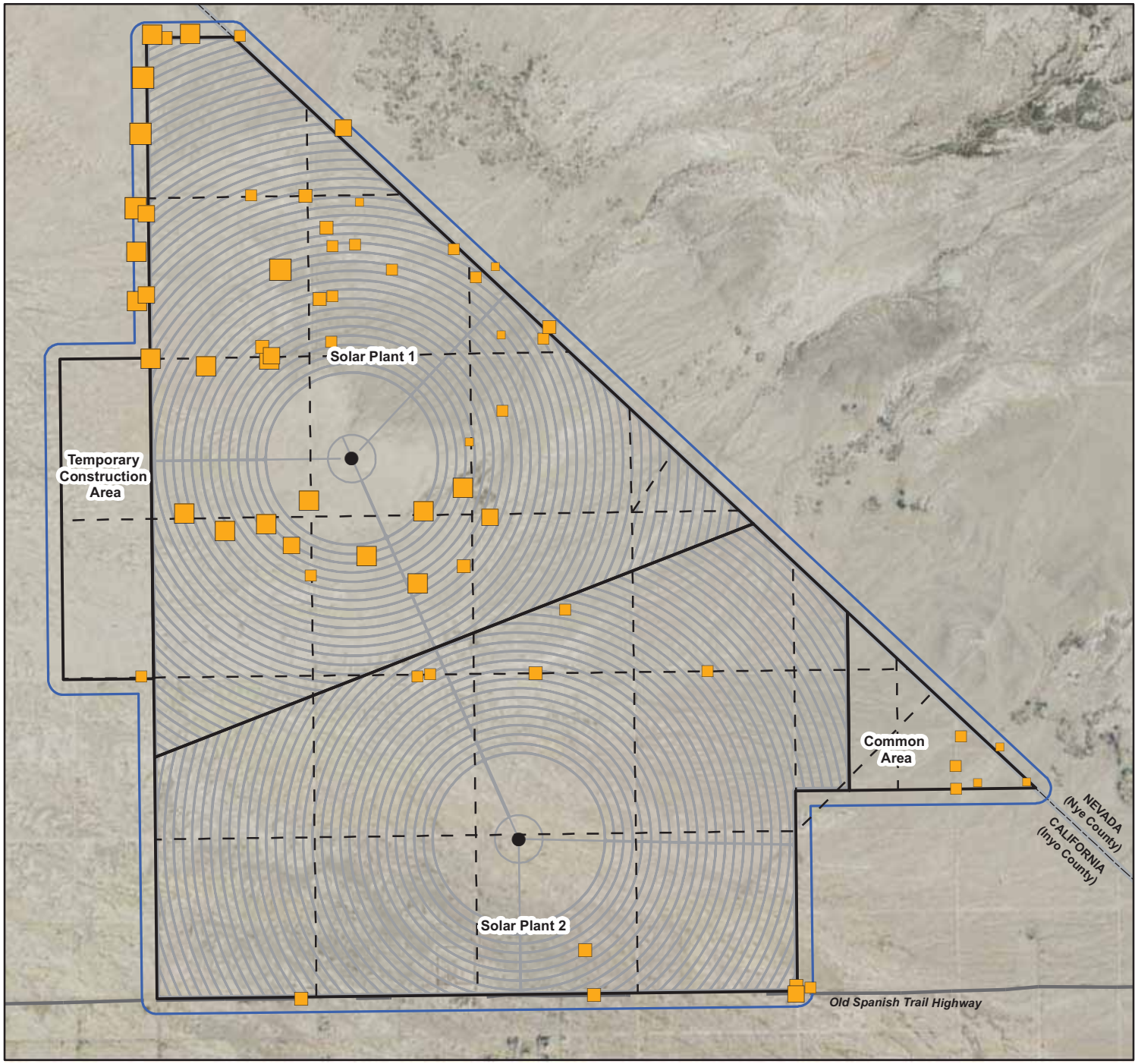
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-5
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Salsola spp. (Russian thistle)

- 1-10
- 11-100
- 101-500
- 501-1000
- 1001-5000
- 5001-10000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

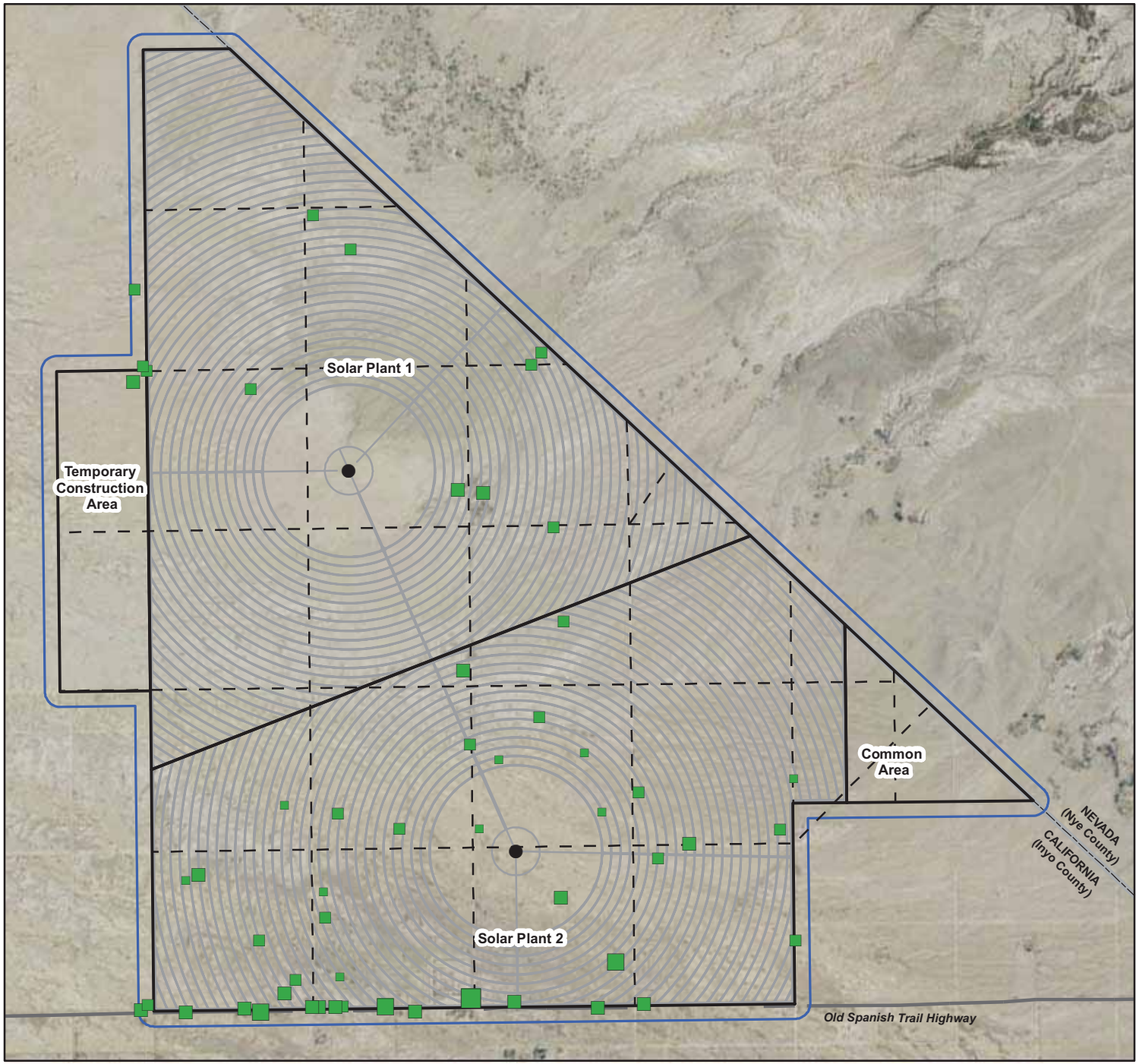
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-6
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

- Solar Power Tower

Sisymbrium irio (London rocket)

- 1-10
- 11-100
- 101-500
- 501-1000
- 5001-10000
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

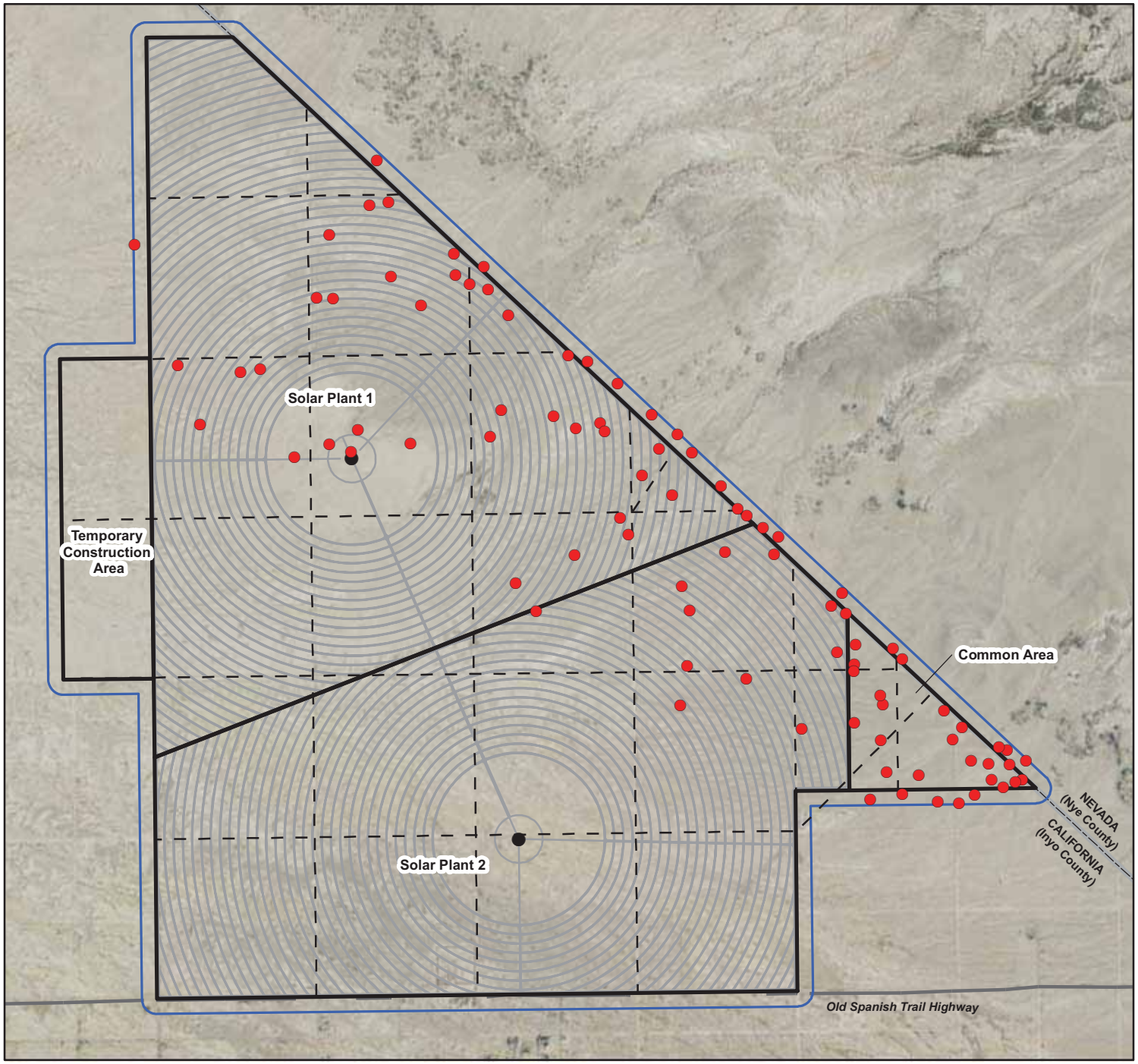
Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400

Feet

Figure 4-7
Results of Weed Survey
Hidden Hills Solar Electric Generating System



LEGEND

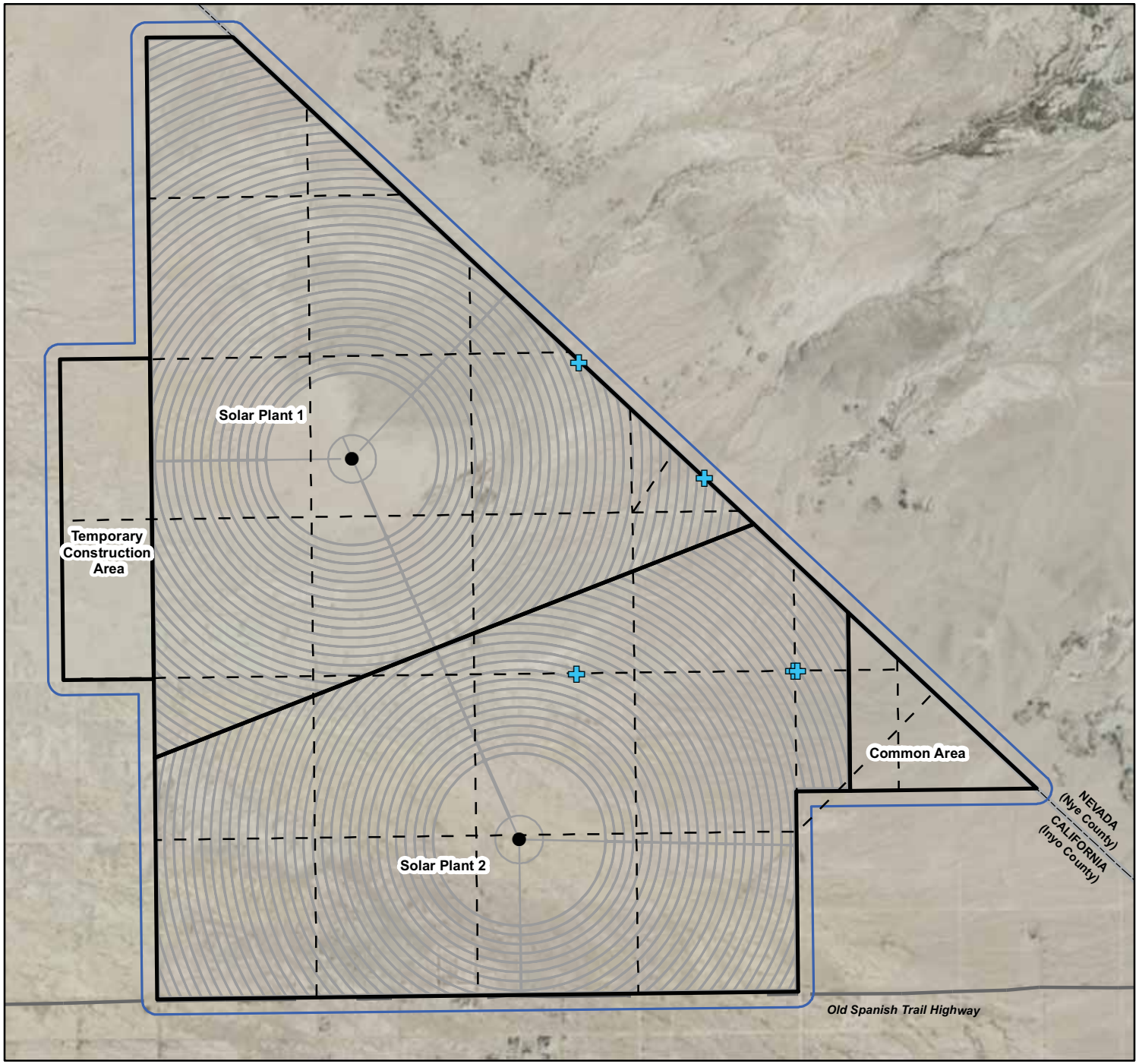
- *Androstephium breviflorum* (Pink funnel-lily)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-1
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

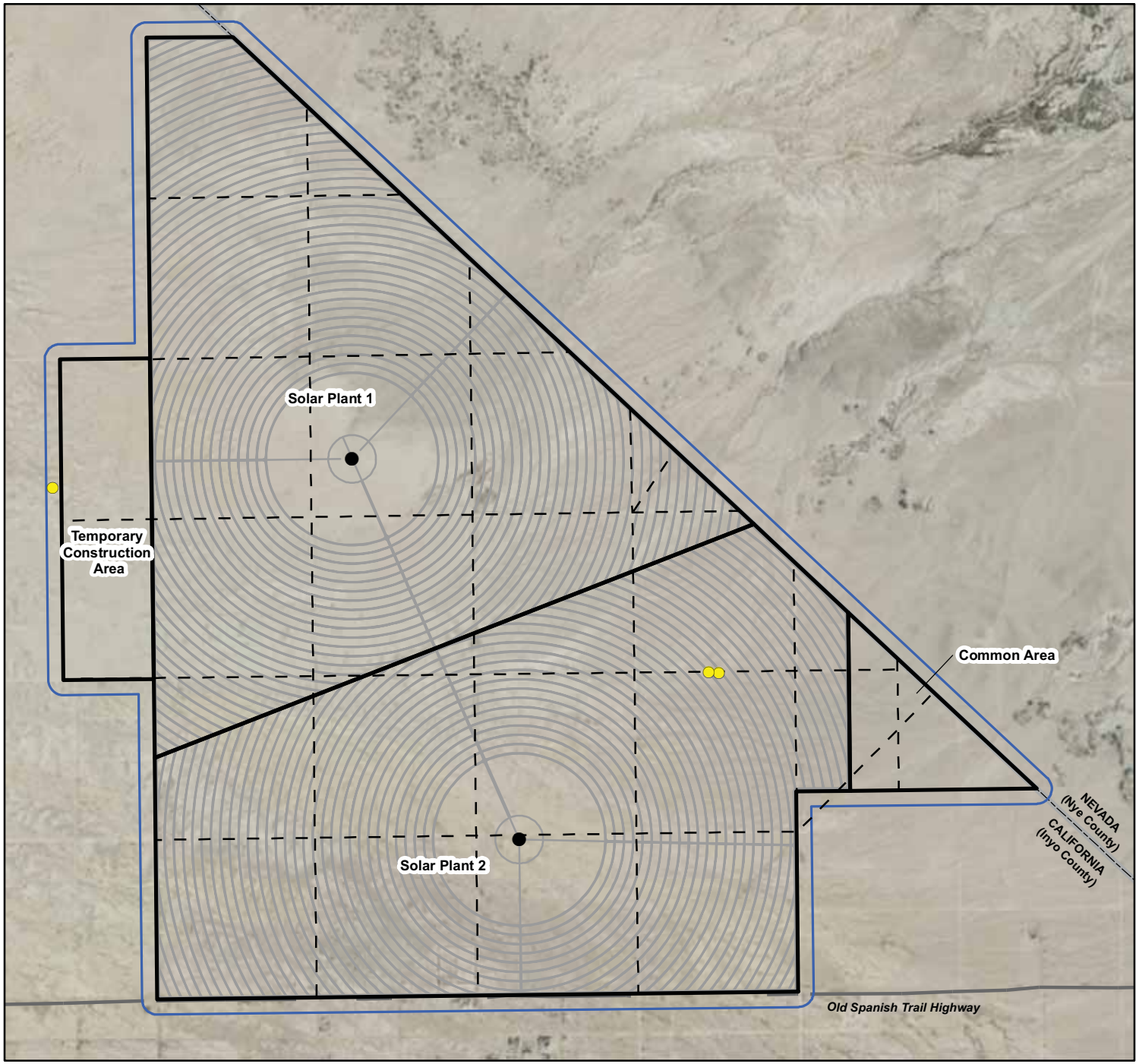
- *Astragalus sabulonum* (Gravel milkvetch)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-2
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

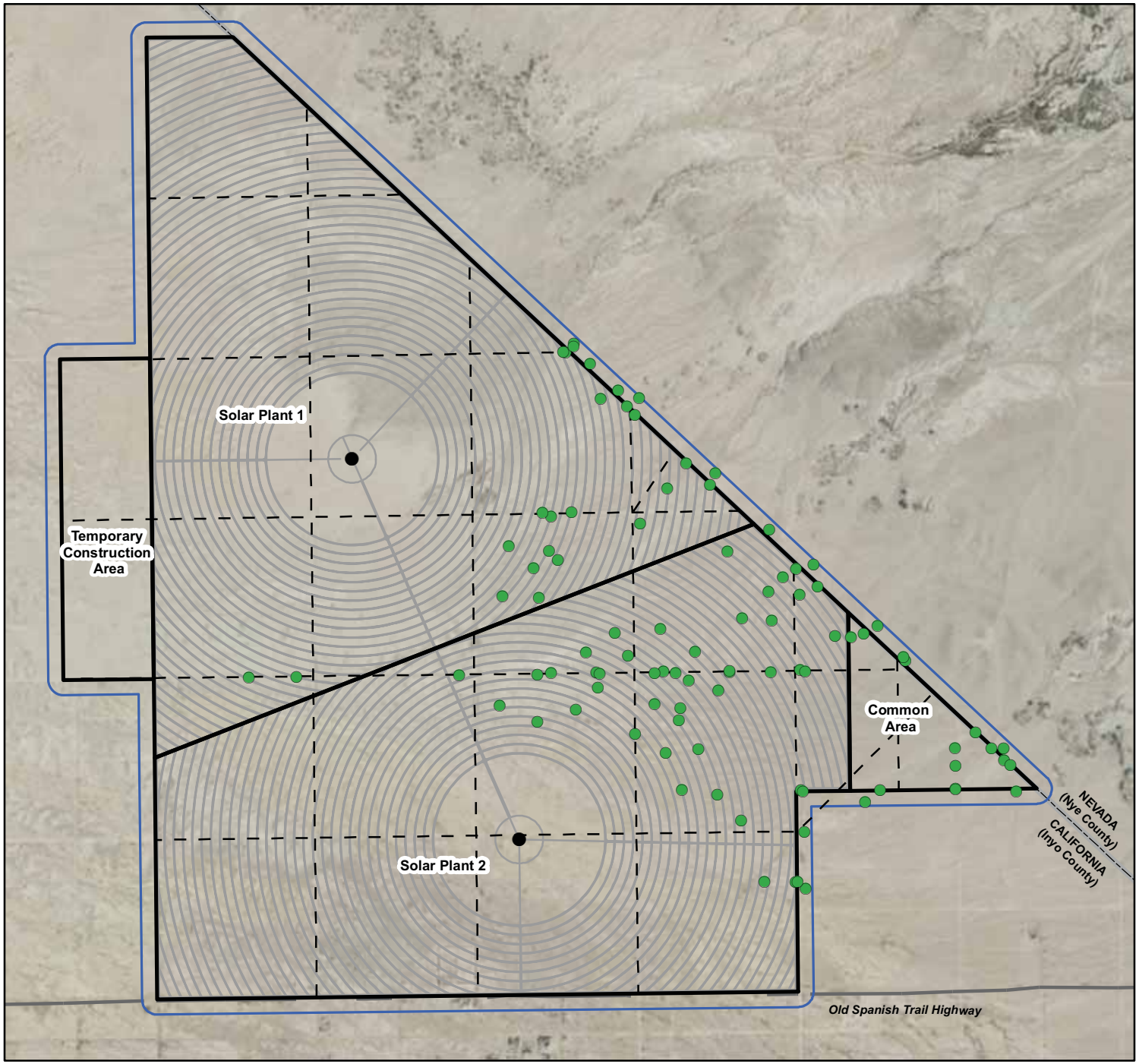
- *Astragalus preussii* var. *preussii* (Preuss' milkvetch)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-3
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

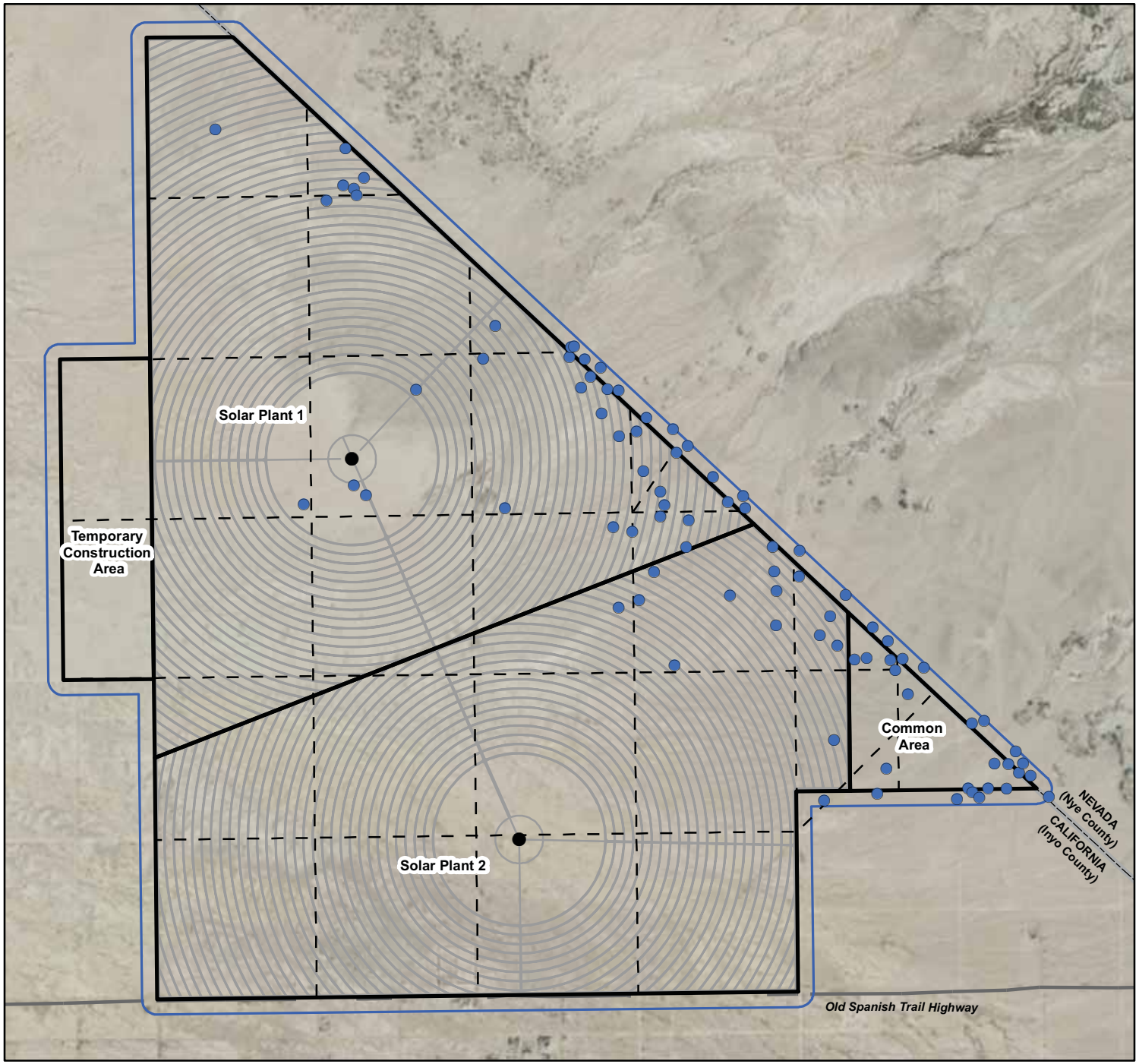
- *Astragalus tidestromii* (Tidestrom's milkvetch)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-4
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

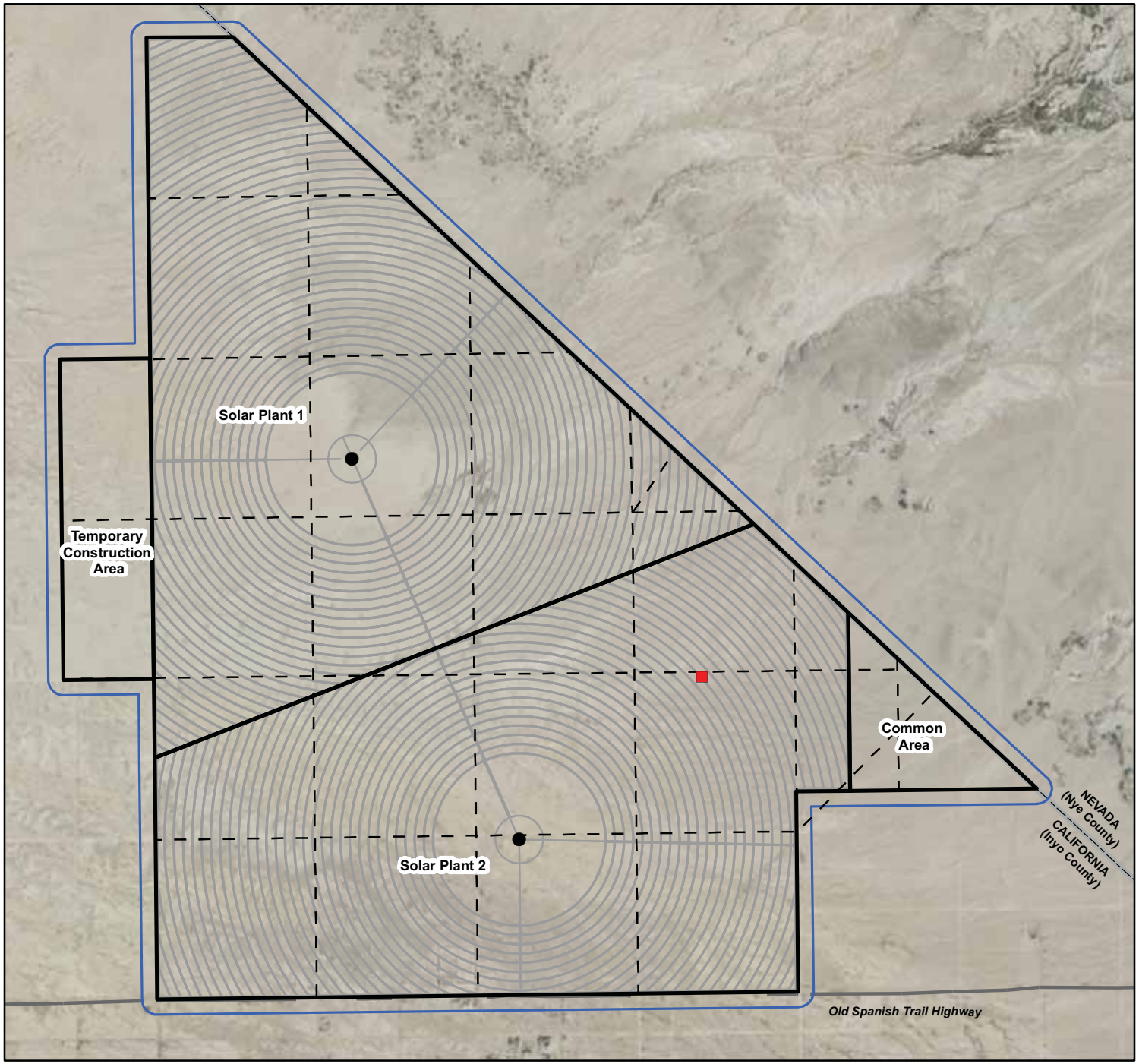
- *Chaetadelpha wheeleri* (Wheeler's skeletonweed)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-5
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

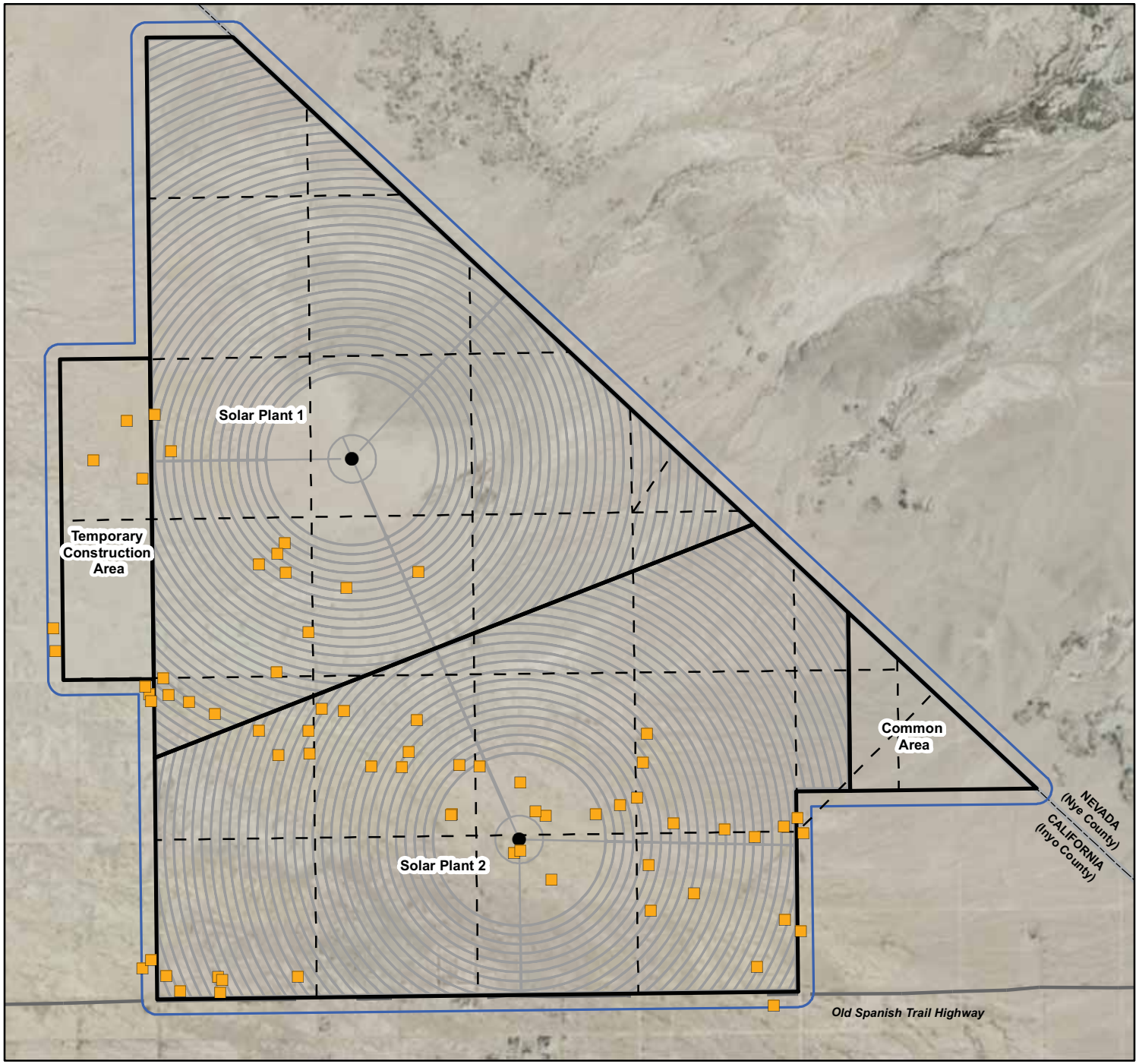
- *Cymopterus multinervatus* (Purplenerve spingparsley)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-6
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

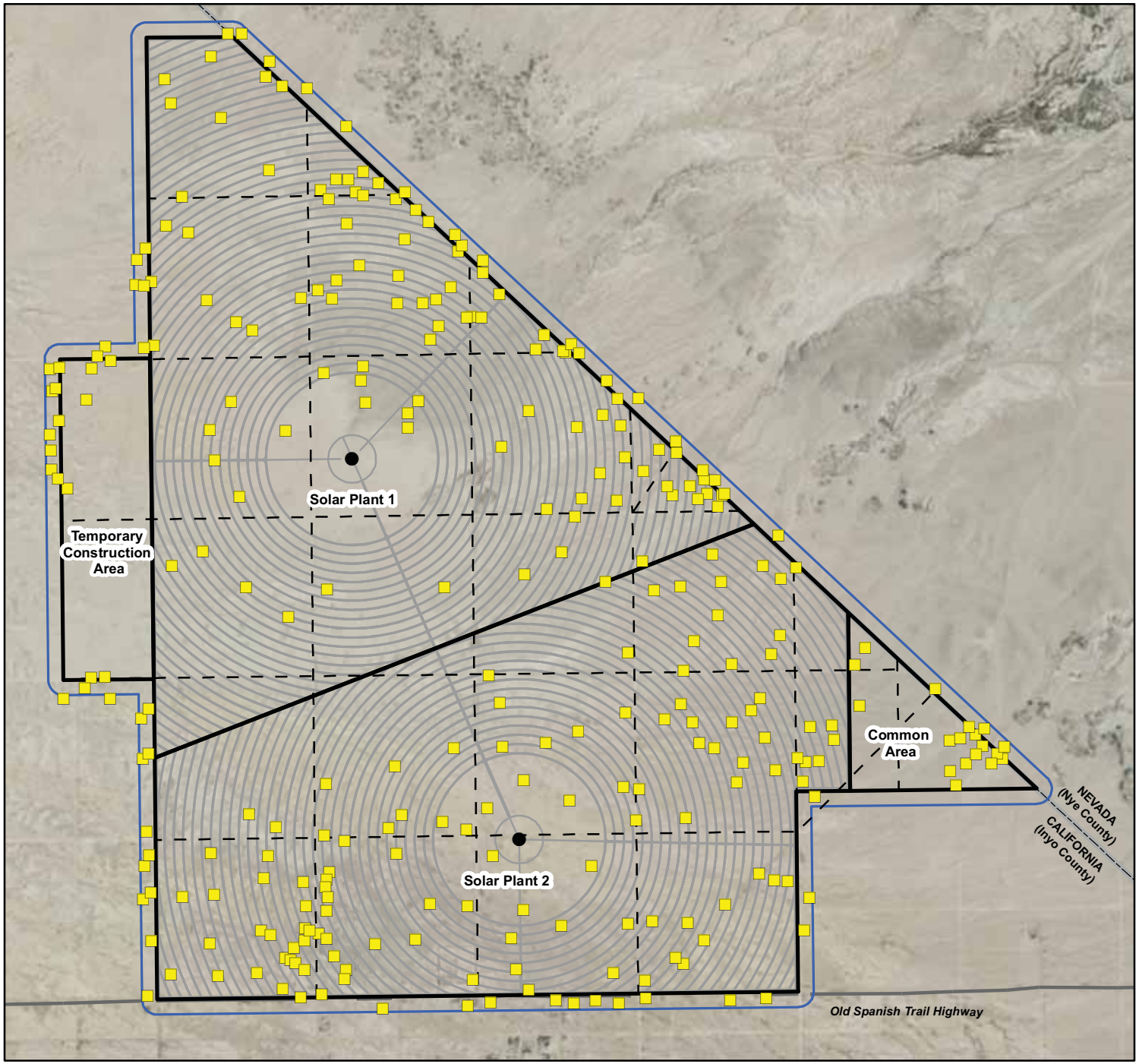
- *Eriogonum bifurcatum* (Pahrump Valley buckwheat)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-7
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

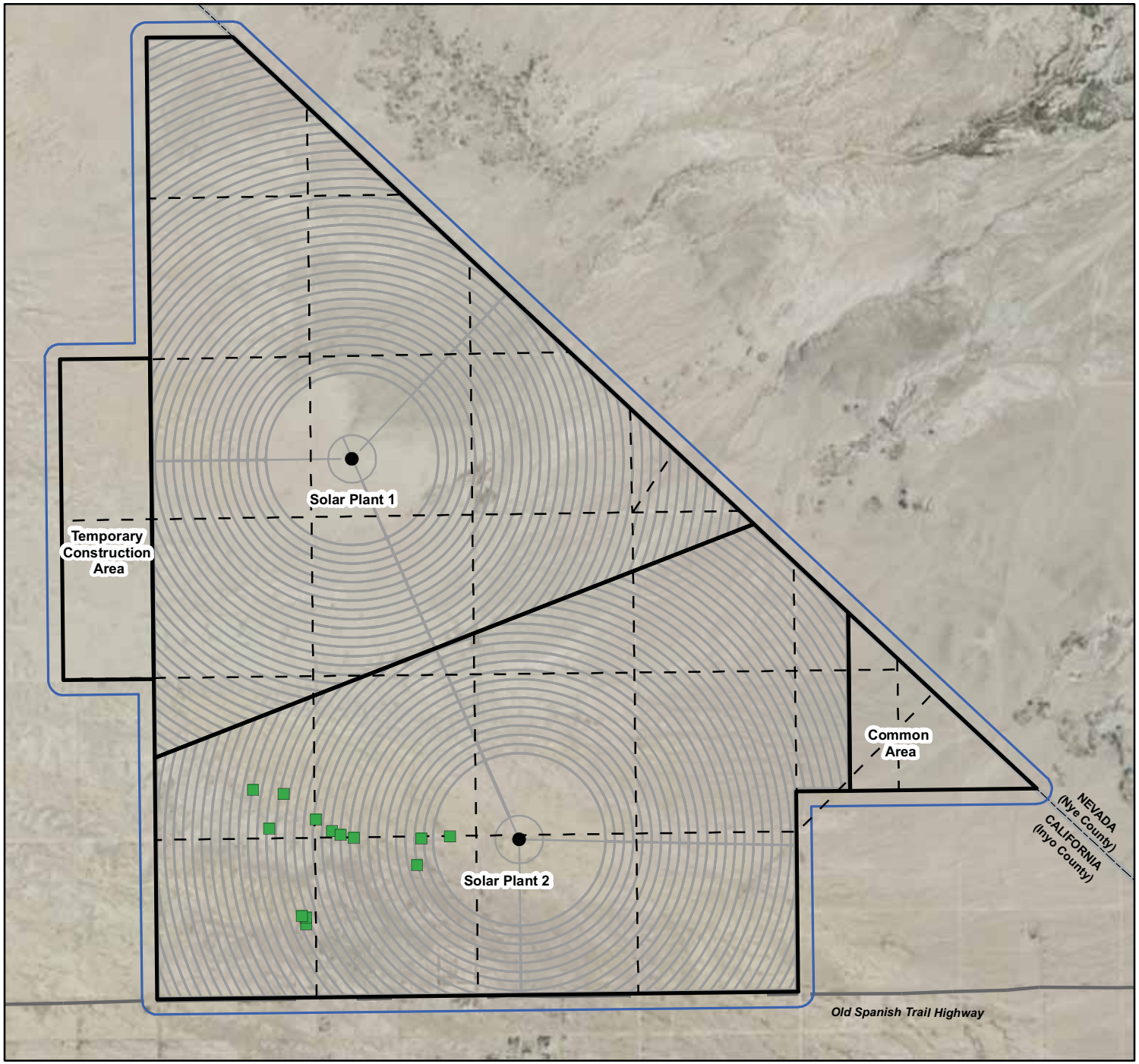
- *Phacelia pulchella* var. *gooddingii* (Goodding's phacelia)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-8
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

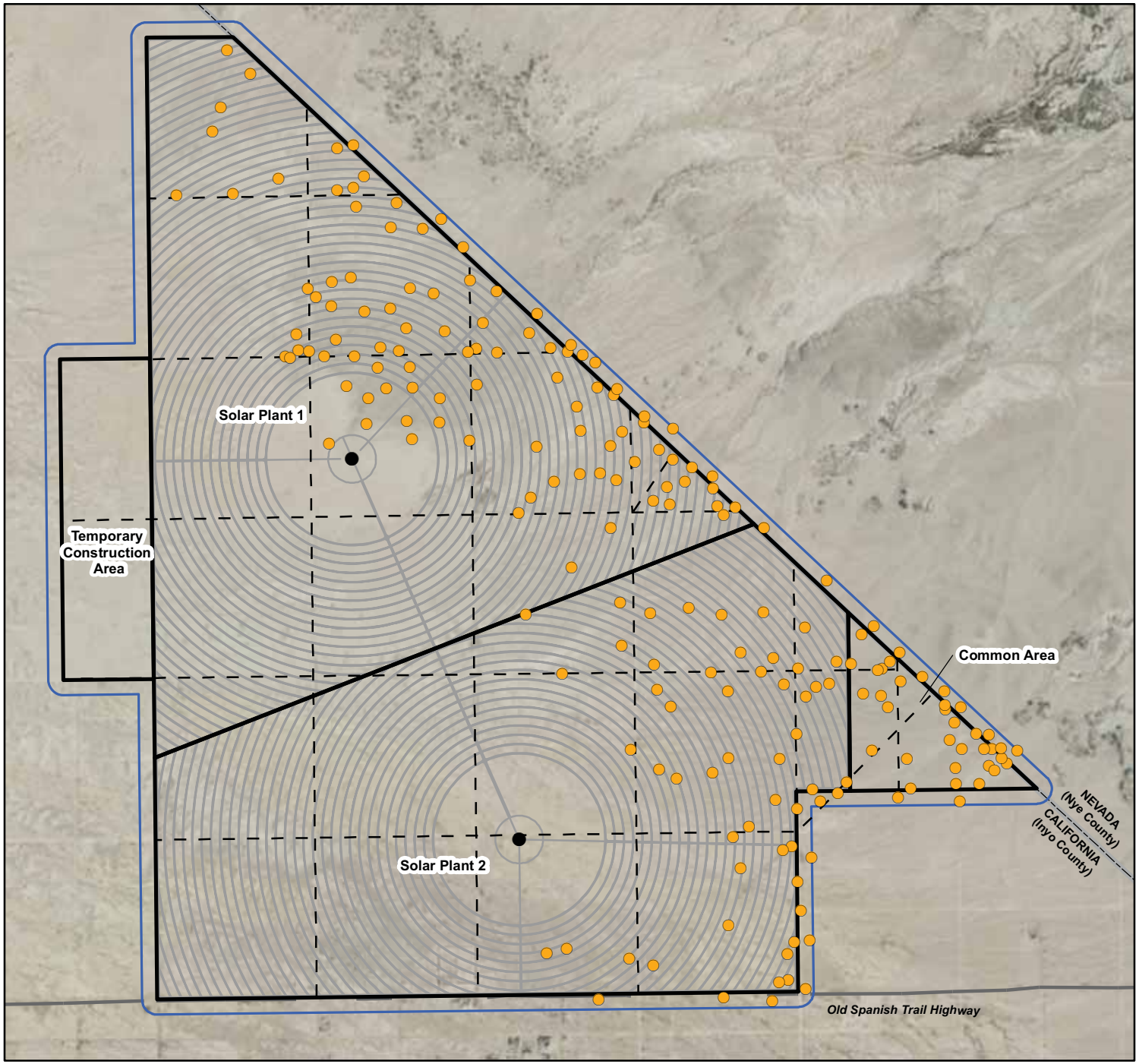
- *Selinocarpus nevadensis* (Desert wing-fruit)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 5-9
Results of Special-status Plant Survey
Hidden Hills Solar Electric Generating System



LEGEND

- *Astragalus nyensis* (Nye milkvetch)
- Solar Power Tower
- Site Road
- Solar Field Heliostat Arrays
- HHSEGS Boundary
- 250-foot Buffer

Data Source: GANDA Botanical Survey, 2011

N

0 1,200 2,400
Feet

Figure 6-1
Locations of Nye Milkvetch (*Astragalus nyensis*)
Hidden Hills Solar Electric Generating System

Appendix B
Table 2-1

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Mormon needle grass (*Achnatherum aridum* [=*Stipa arida*])	BLM: none NNHP: none NNPS: none CRPR 2.3	Joshua tree woodland, pinyon-juniper woodland; carbonate substrates. 500 to 2570m	May–July	**None.** Habitat not present in study area. Nearest known localities 10 to 15 miles south of the project area.
Ivory-spined agave (*Agave utahensis* var. *eborispina*)	BLM: none NNHP: none NNPS: dropped CRPR 1B.3	Mojave desert scrub; rocky carbonate slopes. 945 to 1370m	May–June	**None.** Habitat not present in study area. Nearest known locality on east side of the Nopah Range, 5 to 7 miles west of the project area.
Clark Mountain agave (*Agave utahensis* var. *nevadensis*)	BLM: none NNHP: none NNPS: dropped CRPR 4.2	Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland; carbonate or volcanic. 900 to 1585m	May–July	**None.** Nearest known locality is in Kingston Range, about 15 miles south of the project area.
Ripley's aliciella (*Aliciella* [=*Gilia*] *ripleyi*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Mojave desert scrub; carbonate. 305 to 1950m	May–July	**None.** Habitat not present in study area. Nearest known locality is in Kingston Range, about 15 miles south of the project area.
Coyote gilia (*Aliciella* [=*Gilia*] *triodon*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Great Basin scrub, pinyon-juniper woodland; sometimes sandy. 610 to 1700m	Apr–June	**Very Low.** Nearest known locality west slope of the Nopah Range, about 8 miles west of the project area.
Inyo onion (*Allium atrorubens* var. *cristatum*)	BLM: none NNHP: none NNPS: none CRPR 4.3	Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland; sandy or rocky. 1200 to 2560m	Apr–June	**Very Low.** Nearest known locality in the Kingston Range, about 15 miles south of the project area.
Nevada onion (*Allium nevadense*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland; sandy or gravelly. 1300 to 1700m	Apr–May	**None.** Habitat not present in study area. Nearest known locality is at Horsethief Spring, Kingston Range, about 15 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Pink star-tulip (*Androstephium breviflorum*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Desert dunes, Mojave desert scrub; bajadas; sandy. 220 to 640m	Mar–Apr	**Very Low.** Prior to surveys for this project, nearest known locality near the Valjean Hills, about 25 miles southwest of the project area.
White bear poppy (*Arctomecon merriamii*)	BLM: NS NNHP: S NNPS: watch CRPR 2.2	Chenopod scrub, Mojave desert scrub; rocky. 490 to 1800m	Apr–May	**None.** Nearest known location is at the southern end of the Nopah Range, about 15 miles southwest of the project area.
Borrego milk-vetch (*Astragalus lentiginosus* var. *borreganus*)	BLM: none NNHP: none NNPS: M CRPR 4.3	Mojave desert scrub, Sonoran desert scrub; sandy. 30 to 270m	Feb–May	**None.** Nearest known locality is at the Salt Spring Hills, about 25 miles southwest of the project area.
Providence Mountains milk-vetch (*Astragalus nutans*)	BLM: none NNHP: none NNPS: none CRPR 4.3	Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland; Sonoran desert scrub; sandy or gravelly. 450 to 1950m	Mar–June (Oct)	**Very Low.** Nearest known locality is in the Kingston Range, about 15 miles south of the project area.
Preuss' milk-vetch (*Astragalus preussii* var. *preussii*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Chenopod scrub, Mojave desert scrub; clay. 750 to 780m	May–June	**Low.** Prior to surveys for this project, **n**earest known localities are about 15 miles southeast in Mesquite Valley in CA, and about 30 miles northwest in Ash Meadows National Wildlife Refuge in NV.
Tidestrom's milk-vetch (*Astragalus tidestromii*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Mojave desert scrub; carbonate, sandy. 600 to 1585m	Apr–July	**Very Low.** Prior to surveys for this project, nearest known localities were southeast of the Nopah Range and south side of the Kingston Range, about 15 miles from the project area.
Scaly cloak fern (*Astrolepis cochisensis* ssp. *cochisensis*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Joshua tree woodland, pinyon-juniper woodland; rocky, carbonate. 900 to 1800m	None	**None.** Habitat not present in study area. Nearest known locality is in the Clark Mountains, > 20 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Pahrump silverscale (*Atriplex argentea* var. *longitrichoma*)	BLM: CS NNHP: track NNPS: watch CRPR 1B.1	Mojave desert scrub, chenopod scrub; alkaline, sometimes roadsides. 700 to 850m	Apr–May	**Moderate.** Potentially suitable habitat present in study area. Nearest known locality is < 5 miles north of the study area.
Three-awned gramma (*Bouteloua* trifida)	BLM: none NNHP: none NNPS: none CRPR 2.3	Mojave desert scrub; rocky, carbonate. 700 to 2000m	May–Sept	**None.** Habitat not present in study area. Nearest known localities in the Kingston Range, 10 to 15 miles south of the project area.
Booth's hairy evening-primrose (*Camissonia boothii* ssp. *intermedia*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Great Basin scrub (sandy), pinyon-juniper woodland. 1500 to 2150m	June	**Very Low.** Habitat not present in study area. Nearest known locality in the Kingston Range, 10 to 15 miles south of the project area.
California sawgrass (*Cladium californicum*)	BLM: none NNHP: none NNPS: M CRPR 2.2	Meadows and seeps, marshes and swamps; alkaline or freshwater. 60 to 600m	June–Sept	**None.** Habitat not present in study area. Nearest known locality is near Tecopa, about 15 miles west of the project area.
Tecopa bird's-beak (*Cordylanthus tecopensis*)	BLM: CS, NS NNHP: S NNPS: T CRPR 1B.2	Mojave desert scrub, meadows and seeps; mesic, alkaline. 60 to 900m	July–Oct	**None**. Habitat not present within study area. Nearest known locality is near Tecopa, about 15 miles west of the project area.
Desert pincushion (*Coryphantha chlorantha*)	BLM: none NNHP: none NNPS: none CRPR 2.1	Joshua tree woodland, Mojave desert scrub, pinyon-juniper woodland; carbonate, gravelly, rocky. 45 to 1525m	Apr–Sept	**None.** Habitat not present in study area. Nearest known locality is in the Kingston Range, 10 to 15 miles south of the project area.
Hall's meadow hawksbeard (*Crepis runcinata* ssp. *hallii*)	BLM: none NNHP: none NNPS: none CRPR 2.1	Mojave desert scrub, pinyon-juniper woodland; mesic, alkaline. 1250 to 1980m	May–July	**None.** Nearest known locality is near Shoshone, about 20 miles west of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Gilman's cymopterus (*Cymopterus gilmanii*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Mojave desert scrub; often carbonate. 915 to 2000m	Apr–May	**None.** Nearest known locality is in the Kingston Range, 10 to 15 miles south of the project area.
Purple-veined cymopterus (*Cymopterus multinervatus*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Mojave desert scrub, pinyon-juniper woodland; sandy or gravelly. 790 to 1800m	Mar–Apr	**Low.** Potential habitat present within the study area. Nearest known locality is Clark Mountain, about 25 miles south of the study area.
Harwood's eriastrum (*Eriastrum harwoodii*)	BLM: none NNHP: none NNPS: none CRPR 1B.2	Desert dunes. 200 to 915m	Mar–June	**Very Low.** Nearest known locality is at the Cadiz Dunes, > 30 miles south of the project area.
White-flowered rabbitbrush (*Ericameria* [=*Chrysothamnus*] *albida*)	BLM: none NNHP: none NNPS: none CRPR 4.2	Chenopod scrub, meadows and seeps, playas; saline or alkaline. 300 to 1950m	June–Nov	**Very Low**. Nearest known locations are near Tecopa and Shoshone, about 15 to 20 miles west of the project area.
Narrow-leaved yerba santa (*Eriodictyon angustifolium*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland. 1500 to 1900m	May–Aug	**None.** Habitat not present in study area. Nearest known locality is in west Mesquite Valley, 12 to 15 miles southeast of the project area.
Pahrump Valley buckwheat (*Eriogonum bifurcatum*)	BLM: CS, NS NNHP: S NNPS: T CRPR 1B.2	Chenopod scrub; sandy. 700 to 810m	Apr–June (Sept–Oct)	**High**. Nearest known localities are within the study area, found in October 2010 during survey conducted for this project.
Reveal's buckwheat (*Eriogonum contiguum*)	BLM: none NNHP: track NNPS: M CRPR 2.3	Mojave desert scrub; sandy. 30 to 1320m	(Feb) Mar–May (June)	**Moderate.** Nearest known locality is in Stewart Valley, < 5 miles north of the study area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Juniper sulphur-flowered buckwheat (*Eriogonum umbellatum* var. *juniporinum*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Mojave desert scrub, pinyon-juniper woodland. 1300 to 2500m	July–Oct	**None.** Nearest known localities in the Kingston Range, 10 to 15 miles south of the project area.
Hairy erioneuron (*Erioneuron pilosum*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland; rocky, sometimes carbonate. 1500 to 2010m	May–June	**None.** Habitat not present in the study area. Nearest known locality is in the Kingston Range, 10 to 15 miles south of the project area.
Hot springs fimbristylis (*Fimbristylis thermalis*)	BLM: none NNHP: none NNPS: M CRPR 2.2	Meadows and seeps; alkaline, near hot springs. 110 to 1340m	July–Sept	**None**. Habitat not present in the study area. Nearest known locality near Shoshone, 15 miles west of the project area.
Kingston Mountains bedstraw (*Galium hilendiae* ssp. *kingstonense*)	BLM: CS, NS NNHP: S NNPS: T CRPR 1B.3	Lower montane coniferous forest, pinyon-juniper woodland; rocky. 1200 to 2100m	June	**None.** Habitat not present in the project area. Nearest known localities in the Kingston Range, about 15 miles south of the project area.
Desert bedstraw (*Galium proliferum*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Joshua tree woodland, Mojave desert scrub, pinyon-juniper woodland; rocky, carbonate. 1190 to 1570m	Mar–June	**None.** Habitat not present in the study area. Nearest known locality in the Kingston Range, about 15 miles south of the project area.
Ash Meadows gumplant (*Grindelia fraxinipratensis*)	FT BLM: SS NNHP: S NNPS: T CRPR 1B.2	Meadows and seeps; mesic clay. 635 to 700m.	June–Oct	**None**. Habitat not present in the study area. Known from three extant EOs in CA. Nearest known localities are in Carson Slough, Amargosa River drainage, about 30 miles northwest of the project area.
Prickle-leaf (*Hecastocleis shockleyi*)	BLM: none NNHP: none NNPS: M CRPR 3	Chenopod scrub, Mojave desert scrub; rocky slopes, washes; often carbonate or slate. 1200 to 2200m	May–July	**None.** Nearest known locality is in northeastern part of the Kingston Range, about 15 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Copperwort (*Iva acerosa*)	BLM: none NNHP: none NNPS: M CRPR 4.2	Meadows and seeps (alkaline), playas (saline). 60 to 900m	May–Dec	**None**. Nearest known locality near Tecopa Hot Springs, about 15 miles west of the project area.
Kingston Mountains ivesia (*Ivesia patellifera*)	BLM: none NNHP: none NNPS: none CRPR 1B.3	Pinyon-juniper woodland; granitic, rocky. 1400 to 2100m	June–Oct	**None.** Habitat not present in the project area. Nearest known localities in the Kingston Range, about 15 miles south of the project area.
Cooper's rush (*Juncus cooperi*)	BLM: none NNHP: none NNPS: none CRPR 4.3	Meadows and seeps; mesic, alkaline or saline. 260 to 1770m	Apr–May (Aug)	**None**. Nearest known localities near Tecopa and Shoshone, about 15 to 20 miles west of the project area.
Inyo blazing star (*Mentzelia inyoensis*)	BLM: CS NNHP: track NNPS: watch CRPR 1B.3	Great Basin scrub, pinyon-juniper woodland; rocky, sometimes carbonate. 1160 to 1980m	Apr–Oct	**None.** Habitat not present in the project area. Nearest known locality in the Kingston Range, 10 to 15 miles south of the project area.
Wing-seed blazing star (*Mentzelia pterosperma*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Mojave desert scrub; gypsum soils. 1140m	Apr–June	**Low**. Prior to surveys for this project, known in CA only from the Valley Wells and Clark Mountain areas, about 35 miles south of the project area.
Spiny-hair blazing star (*Mentzelia tricuspis*)	BLM: none NNHP: none NNPS: none CRPR 2.1	Mojave desert scrub; sandy, gravelly, slopes and washes. 150 to 1280m	Mar–May	**Low**. Nearest known locality is in the northeast Kingston Range, about 15 miles south of the project area.
Red four-o'clock (*Mirabilis coccinea*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland. 1070 to 1800m	May–July	**None.** Habitat not present within the project area. Nearest known locality is in the northeast Kingston Range, about 15 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Utah mortonia (*Mortonia utahensis*)	BLM: none NNHP: none NNPS: none CRPR 4.3	Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland; carbonate. 760 to 2100m	Mar–May	**None.** Habitat not present within the project area. Nearest known localities are at the southern end of the Nopah Range, about 8 miles west of the project area.
Crowned muilla (*Muilla coronata*)	BLM: none NNHP: none NNPS: M CRPR 4.2	Chenopod scrub, Mojave desert scrub, Joshua tree woodland, pinyon-juniper woodland. 765 to 1960m	Mar–Apr (May)	**Low.** Nearest known localities in vicinity of Clark Mountain, > 20 miles south of the project area.
Amargosa nitrophila (*Nitrophila mohavensis*)	FE BLM: SS NV: CE NNHP: track CA: SE CRPR 1B.1	Playas; mesic, clay. 425 to 750m.	May–Oct	**None**. Habitat not present within the study area. Fewer than five EOs in CA, mainly near Carson Slough in the Amargosa Desert. Nearest known locality near Tecopa, about 15 miles southwest of the project area.
Spiny cliff-brake (*Pellaea truncata*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland; volcanic or granitic, rocky. 1200 to 2150m	None	**None.** Habitat not present within the study area. Nearest known location in the Kingston Range, about 15 miles south of the project area.
Amargosa beardtongue (*Penstemon fruticiformis* var. *amargosae*)	BLM: CS, NS NNHP: S NNPS: T CRPR 1B.3	Mojave desert scrub. 850 to 1400m	Apr–June	**Low.** Nearest known locality in the southern Nopah Range, about 10 miles west of study area.
Stephen's beardtongue (*Penstemon stephensii*)	BLM: none NNHP: none NNPS: none CRPR 1B.3	Mojave desert scrub, pinyon-juniper woodland; usually carbonate, rocky. 1160 to 1850m	Apr–June	**None.** Habitat not present in study area. Many known localities in the Kingston Range, about 15 miles south of the project area.
Utah beardtongue (*Penstemon utahensis*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Chenopod scrub, Great Basin scrub, Mojave desert scrub, pinyon-juniper woodland; rocky. 1065 to 2500m	Apr–May	**Low.** Nearest known localities in the Kingston Range, about 15 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Spine-noded milk-vetch (*Peteria thompsoniae*)	BLM: none NNHP: none NNPS: M CRPR 2.3	Mojave desert scrub; sandy, alluvial fans. 800 to 825m. Known in CA from only one EO in California Valley (near project site – check)	May–June	**Low.** Known in CA from only one EO, in California Valley, about 5 miles southwest of the project area.
Death Valley round-leaved phacelia (*Phacelia mustelina*)	BLM: CS NNHP: track NNPS: watch CRPR 1B.3	Mojave desert scrub, pinyon-juniper woodland; carbonate or volcanic; gravelly or rocky. 730 to 2620m.	May–July	**None.** Known in CA from 20 EOs; most historic. Nearest known locality is from the Salsberry Peak area, about 20 miles west of the project area.
Parish's phacelia (*Phacelia parishii*)	BLM: CS, NS NNHP: S NNPS: watch CRPR 1B.1	Mojave desert scrub, playas; clay or alkaline. 540 to 1200m	Apr–May (June–July)	**Very Low.** Nearest known localities in CA near the T-line route include: Coyote Dry Lake. Also known from Pahrump Valley in NV.
Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Mojave desert scrub; clay, often alkaline. 800 to 1000m.	Apr–June	**High.** Prior to surveys for this project, known in CA from only four EOs, all historic, including two in Pahrump Valley.
Small-flowered rice grass (*Piptatherum micranthum* [=*Stipa divericata*])	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland; gravelly, carbonate. 700 to 2950m.	June–Sept	**None.** Habitat not present within the project area. Nearest known locality is in the Kingston Range, 10 to 15 miles south of the project area.
Desert popcorn-flower (*Plagiobothrys salsus*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Playas; alkaline. 700m.	May–Aug	**None.** Known in CA from approx. five EOs, of which four are historic. Nearest known locality is in the vicinity of Death Valley Junction, about 20 miles northwest of the project area.
Death Valley sage (*Salvia funerea*)	BLM: none NNHP: S NNPS: watch CRPR 4.3	Mojave desert scrub; carbonate. 0 to 1865m	Mar–May	**None.** Habitat not present within the study area. Nearest known locality is near Ryan, about 35 miles northwest of the study area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys
Johnson's bee-hive cactus (*Sclerocactus johnsonii*)	BLM: none NNHP: none NNPS: none CRPR 2.2	Mojave desert scrub; granitic. 500 to 1200m	Apr–May	**Very Low.** Nearest known locality is at the southern end of the Nopah Range, about 8 miles west of the project area.
Desert wing-fruit (*Selinocarpus nevadensis*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Joshua tree woodland, Mojave desert scrub; rocky. 1160 to 1250m.	June–Sept	**Very Low**. Prior to surveys for this project, known in CA from only one locality, at the northeastern end of the Kingston Range, about 10 miles southeast of the project area.
Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*)	BLM: none NNHP: none NNPS: none CRPR 1B.2	Joshua tree woodland, Mojave desert scrub. 975 to 1500m.	Mar–June	**None.** Endemic to CA. Known from approx. 20 EOs in Death Valley NP and near Clark Mountain. Nearest known locality is in the Kingston Range, 10 to 15 miles south of the project area.
Plummer's woodsia (*Woodsia plummerae*)	BLM: none NNHP: none NNPS: none CRPR 2.3	Pinyon-juniper woodland; granitic, rocky. 1600 to 2000m.	None	**None.** Habitat not present within the study area. Nearest known locality on high peaks of the Kingston Range, 10 to 15 miles south of the project area.

TABLE 2-1
Special-status Plants with Potential to Occur Within the HHSEGS Site and 250-foot Buffer, Inyo County, California

Common Name *Scientific Name*	Conservation Status (Fed/CA/NV/CNPS)	Habitat Preferences	Flowering Period	Potential to Occur within the Study Area, as Estimated Prior to Surveys

Status Codes:

USFWS Status
FE = Federally listed as Endangered
FT = Federally listed as Threatened

BLM Status
SS = Special status
CS = Sensitive in California
NS = Sensitive in Nevada

California State Status (CA)
SE = State listed as endangered
ST = State listed as threatened
SR = State listed as rare

Nevada State Status (NV)
CE = Critically Endangered

Nevada Natural Heritage Program Status (NNHP)
Track = location data is maintained for these species

Nevada Native Plant Society Status (NNPS)
Watch = conservation concern in Nevada
M = Marginal – conservation concern in Nevada but more widespread elsewhere
Dropped = no longer of conservation concern in Nevada

California Native Plant Society (CRPR) Status
1A = Plants presumed extinct in California
1B = Plants rare, threatened, or endangered in California and elsewhere
2 = Plants rare, threatened, or endangered in California, but more common elsewhere
3 = Plants about which we need more information – a review list
4 = Plants of limited distribution – a watch list

CRPR Threat Code Extensions
.1 = Seriously endangered in California
.2 = Fairly endangered in California
.3 = Not very endangered in California
? = Not determined

Appendix C
List of Plant Species Observed within the HHSEGS Site and 250-foot Buffer

TABLE C-1
Plant List for the HHSEGS Site and the 250-foot Buffer

Scientific Name	Common Name	Site	250-foot Buffer	Life Form
GYMNOSPERMS				
Cupressaceae	**Cypress Family**			
Cupressus arizonica var. *glabra**	blue Arizona cypress	x		tree
Ephedraceae	**Ephedra Family**			
Ephedra funerea	Death Valley ephedra	x	x	shrub
Ephedra nevadensis	Nevada ephedra	x	x	shrub
FLOWERING PLANTS: DICOTS				
Amaranthaceae	**Amaranth Family**			
*Amaranthus albus**	tumbleweed	x		annual
Apiaceae	**Carrot Family**			
Cymopterus multinervatus	purplenerve springparsley	x		perennial
Asclepiadaceae	**Milkweed Family**			
Asclepias erosa	desert milkweed	x	x	perennial
Asteraceae	**Sunflower Family**			
Acamptopappus shockleyi	Shockley's goldenhead	x	x	shrub
Acamptopappus sphaerocephalus var. *sphaerocephalus*	goldenhead	x	x	shrub
*Acroptilon repens**	Russian knapweed	x		annual
Adenophyllum cooperi	Cooper's dogweed	x		subshrub
Ambrosia dumosa	burrobush	x	x	shrub
Baccharis brachyphylla	short-leaf baccharis	x		shrub
Baccharis sergiloides	desert baccharis		x	shrub
Baileya multiradiata var. *multiradiata*	desert marigold	x	x	annual
Baileya pleniradiata	woolly desert marigold	x	x	annual
Calycoseris wrightii	white tackstem		x	annual
Chaenactis carphoclinia	pebble pincushion	x	x	annual
Chaenactis fremontii	desert pincushion	x	x	annual
Chaenactis macrantha	Mojave pincushion	x	x	annual
Chaenactis stevioides	desert pincushion	x	x	annual
Chaetadelpha wheeleri	Wheeler's dune broom	x	x	perennial
Chrysothamnus nauseosus	rubber rabbitbrush	x		shrub
Encelia virginensis	Virgin River encelia	x	x	shrub
Eriophyllum wallacei	Wallace's woolly daisy	x	x	annual
Glyptopleura marginata	carved seed	x	x	annual
Gutierrezia microcephala	broom snakeweed	x	x	shrub
Gutierrezia sarothrae	broom snakeweed	x	x	shrub
Hymenoclea salsola	cheesebush	x	x	shrub
Isocoma acradenia	goldenbush	x		shrub
Malacothrix coulteri	snake's head	x		annual
Malacothrix glabrata	desert dandelion	x	x	annual
Monoptilon bellioides	desert star	x	x	annual
Pectis papposa	chinchweed	x		annual
Prenanthella exigua	brightwhite	x	x	annual

TABLE C-1
Plant List for the HHSEGS Site and the 250-foot Buffer

Scientific Name	Common Name	Site	250-foot Buffer	Life Form
Psathyrotes annua	turtleback	x	x	annual
Psilostrophe cooperi	paper-daisy	x	x	subshrub
Rafinesquia neomexicana	desert chicory	x	x	annual
Stephanomeria exigua	small wire-lettuce	x		annual
Stephanomeria pauciflora	wire-lettuce	x	x	perennial
Stylocline micropoides	desert nest-straw	x		annual
Tetradymia axillaris	cotton-thorn		x	shrub
Xylorhiza tortifolia	Mojave aster	x	x	perennial
Boraginaceae	**Borage Family**			
Amsinckia tessellata	fiddleneck	x	x	annual
Cryptantha angustifolia	narrow leaved cryptantha	x	x	annual
Cryptantha barbigera	bearded cryptantha		x	annual
Cryptantha circumscissa	cushion cryptantha	x	x	annual
Cryptantha micrantha ssp. *micrantha*	purple-rooted cryptantha	x	x	annual
Cryptantha nevadensis	Nevada cryptantha	x	x	annual
Cryptantha pterocarya	wingnut cryptantha	x	x	annual
Cryptantha recurvata	curved cryptantha	x	x	annual
Cryptantha virginensis	Virgin River cat's-eye	x		annual
Heliotropium curassavicum	heliotrope		x	perennial
Lappula redowskii var. *cupulata*	stickseed	x	x	annual
Pectocarya heterocarpa	chuckwalla combseed	x	x	annual
Pectocarya platycarpa	broadfruit combseed	x	x	annual
Pectocarya recurvata	curvenut combseed		x	annual
Plagiobothrys jonesii	Jones' popcorn flower	x		annual
Brassicaceae	**Mustard Family**			
Caulanthus cooperi	Cooper's jewelflower	x	x	annual
*Chorispora tenella**	blue mustard	x		annual
Descurainia pinnata ssp. *glabra*	tansy mustard	x	x	annual
*Descurainia sophia**	flix weed	x	x	annual
Guillenia lasiophylla	California mustard	x	x	annual
Lepidium fremontii	desert alyssum	x	x	subshrub
Lepidium lasiocarpum var. *lasiocarpum*	modest peppergrass	x	x	annual
*Malcolmia africana**	African mustard	x	x	annual
*Sisymbrium altissimum**	tumble mustard	x	x	annual
*Sisymbrium irio**	London rocket	x	x	annual
*Sisymbrium orientale**	Indian hedge mustard		x	annual or per
Stanleya pinnata var. *pinnata*	prince's-plume	x	x	subshrub
Streptanthella longirostris	longbeak streptanthella	x	x	annual
Cactaceae	**Cactus Family**			
Opuntia basilaris var. *basilaris*	beavertail cactus	x	x	stem succulent
Opuntia echinocarpa	silver cholla	x	x	stem succulent
Opuntia ramosissima	pencil cholla	x		stem succulent
Chenopodiaceae	**Goosefoot Family**			

TABLE C-1
Plant List for the HHSEGS Site and the 250-foot Buffer

Scientific Name	Common Name	Site	250-foot Buffer	Life Form
Atriplex canescens	four-wing saltbush	x	x	shrub
Atriplex confertifolia	shadscale	x	x	shrub
Atriplex polycarpa	allscale	x	x	shrub
*Halogeton glomeratus**	halogeton	x	x	annual
Kraschenninikovia lanata	winter fat	x	x	shrub
Salsola sp.*	Russian thistle	x	x	annual
Convolvulaceae	**Morning Glory Family**			
*Convolvulus arvensis**	bindweed		x	perennial herb/vine
Cuscutaceae	**Dodder Family**			
Cuscuta cf. *californica*	California dodder	x	x	parasitic vine
Euphorbiaceae	**Spurge Family**			
Chamaesyce albomarginata	rattlesnake weed	x	x	perennial
Chamaesyce micromera	desert spurge	x		annual
Fabaceae	**Pea Family**			
Astragalus lentiginosus var. *fremontii*	freckled milk-vetch	X	x	perennial
Astragalus nuttallianus	Nuttall locoweed	X	x	annual
Astragalus nyensis	Nye milk-vetch	X	x	annual
Astragalus preussii var. *preussii*	Preuss' milk-vetch	x	x	perennial
Astragalus sabulonum	gravel milk-vetch	x	x	annual
Astragalus tidestromii	Tidestrom's milk-vetch	x	x	perennial
*Gleditsia triacanthos**	honey locust	x		tree
Hoffmannseggia glauca	hog potato	x	x	perennial
Prosopis glandulosa	honey mesquite	x	x	shrub
Psorothamnus arborescens var. *arborescens*	Mojave indigo bush	x	x	shrub
Senna armata	desert senna	x		shrub
Geraniaceae	**Geranium Family**			
*Erodium cicutarium**	red-stemmed filaree	x	x	annual
Hydrophyllaceae	**Waterleaf Family**			
Nama demissum	purple mat	x	x	annual
Phacelia crenulata var. *ambigua*	purple phacelia	x	x	annual
Phacelia fremontii	Fremont's phacelia	x	x	annual
Phacelia ivesiana	Ive's phacelia		x	annual
Phacelia pulchella var. *gooddingii*	Goodding's phacelia	x	x	annual
Krameriaceae	**Rhatany Family**			
Krameria erecta	pima ratany	x	x	shrub
Lamiaceae	**Mint Family**			
Salazaria mexicana	Mexican bladder sage	x		shrub
Loasaceae	**Sandpaper-plant Family**			
Mentzelia cf. *albicaulis*	little blazing star	x	x	annual
Malvaceae	**Mallow Family**			
Eremalche rotundifolia	desert five-spot	x		annual
Sphaeralcea ambigua	desert mallow	x	x	subshrub
Sphaeralcea emoryi	Emory's globemallow	x	x	subshrub

TABLE C-1
Plant List for the HHSEGS Site and the 250-foot Buffer

Scientific Name	Common Name	Site	250-foot Buffer	Life Form
Nyctaginaceae	**Four-o'clock Family**			
Mirabilis bigelovii	wishbone bush	x		perennial
Selinocarpus nevadensis	desert moonpod	x		perennial
Oleaceae	**Olive Family**			
Menodora spinescens	spiny menodora	x		shrub
Fraxinus sp.*	ash		x	tree
Onagraceae	**Evening-primrose Family**			
Camissonia boothii	Booth's sun cup	x	x	annual
Camissonia brevipes	yellow cups	x	x	annual
Camissonia claviformis	brown-eyed evening-primrose	x		annual
Camissonia refracta	narrowleaf suncup	x	x	annual
Gaura coccinea	scarlet beeblossom	x	x	perennial
Oenothera primiveris	yellow evening-primrose	x	x	annual
Papaveraceae	**Poppy Family**			
Eschscholzia glyptosperma	desert golden poppy	x		annual
Plantaginaceae	**Plantain Family**			
Plantago ovata	woolly plantain	x	x	annual
Polemoniaceae	**Phlox Family**			
Aliciella sp.	Marta Beckett's tutu	x	x	annual
Gilia sp.	gilia	x	x	annual
Gilia cana ssp. *speciformis*	showy gilia	x	x	annual
Gilia stellata	star gilia	x	x	annual
Ipomopsis polycladon	branching gilia	x	x	annual
Langloisia setosissima ssp. *setosissima*	lilac sunbonnet	x	x	annual
Linanthus jonesii	Jones' linanthus	x		annual
Loeseliastrum matthewsii	desert calico	x	x	annual
Loeseliastrum schottii	Schott's calico	x	x	annual
Polygonaceae	**Buckwheat Family**			
Chorizanthe brevicornu var. *brevicornu*	brittle spineflower	x	x	annual
Chorizanthe rigida	rigid spiny-herb	x	x	annual
Eriogonum bifurcatum	Pahrump Valley buckwheat	x	x	annual
Eriogonum brachypodum	glandular skeleton-weed	x	x	annual
Eriogonum inflatum var. inflatum	desert trumpet	x	x	perennial
Eriogonum nidularium	birdnest buckwheat	x		annual
Eriogonum trichopes	little desert trumpet	x	x	annual
Ranunculaceae	**Buttercup Family**			
Delphinium parishii var. *parishii*	desert larkspur	x		perennial
Rosaceae	**Rose Family**			
*Prunus persica**	peach (planted)	x		tree
Scrophulariaceae	**Figwort Family**			
Antirrhinum filipes	tangled snapdragon	x	x	annual
Antirrhinum kingii	King's snapdragon		x	annual
Castilleja angustifolia	desert paintbrush	x	x	perennial

TABLE C-1
Plant List for the HHSEGS Site and the 250-foot Buffer

Scientific Name	Common Name	Site	250-foot Buffer	Life Form
Solanaceae	**Nightshade Family**			
Datura wrightii	devil's trumpet	x		perennial
Lycium andersonii	Anderson's box-thorn	x	x	shrub
Lycium cooperi	Cooper's box-thorn	x	x	shrub
Lycium pallidum var. *oligospermum*	rabbit-thorn	x	x	shrub
Tamaricaceae	**Tamarisk Family**			
*Tamarix ramosissima**	tamarisk	x	x	tree
Zygophyllaceae	**Caltrop Family**			
Larrea tridentata	creosote bush	x	x	shrub
FLOWERING PLANTS: MONOCOTS				
Liliaceae	**Lily Family**			
Androstephium breviflorum	pink star-tulip	x	x	perennial
Calochortus flexuosus	winding mariposa lily	x		perennial
Dichelostemma capitatum var. *pauciflora*	desert blue dicks	x		perennial
Poaceae	**Grass Family**			
Achnatherum hymenoides	Indian ricegrass	x	x	perennial
Achnatherum speciosum	desert needlegrass	x		perennial
Bromus madritensis ssp. *rubens**	red brome	x	x	annual
*Bromus tectorum**	cheat grass	x	x	annual
*Cynodon dactylon**	Bermuda grass	x	x	perennial
Elymus elymoides	squirreltail	x	x	perennial
Erioneuron pulchellum	fluff grass	x		perennial
Hordeum murinum ssp. *leporinum**	foxtail barley	x	x	annual
Muhlenbergia porteri	Porter's muhly	x		perennial
Pleuraphis rigida	big galleta	x	x	perennial
*Schismus arabicus**	Mediterranean grass	x	x	annual
Sporobolus airoides	alkali sacaton	x		perennial
Vulpia octoflora	sixweeks fescue	x	x	annual

* = introduced species (not native to California)

Notes:

Source: data collected by GANDA.

Scientific names from Baldwin and others (2002).
Common names from Baldwin and others (2002) and CalFlora (2011).

Appendix D
Photographs

Pink funnel-lily (*Androstephium breviflorum*)

Nye milkvetch (*Astragalus nyensis*)

Preuss' milkvetch (*Astragalus preussii* var. *preussii*)

Tidestrom's milkvetch (*Astragalus tidestromii*) (Photo by Chloe Scott)

Wheeler's skeletonweed (*Chaetadelpha wheeleri*) (Photo by Bill Clark)

Purplenerve springparsley, showing fruit (*Cymopterus multinervatus*)

Pahrump Valley buckwheat (*Eriogonum bifurcatum*) (Photo by Bill Clark)

Goodding's phacelia (*Phacelia pulchella* ssp. *gooddingii*) (Photo by Bill Clark)

Desert wing-fruit showing fruits (*Selinocarpus nevadensis*) (Photo by Chloe Scott)

Mojave Desert Scrub vegetation, looking southwest toward the Nopah Range

Shadscale Scrub vegetation, looking west toward the Nopah Range

Appendix E
Field Personnel

TABLE E-1
Field Personnel

Area Surveyed:	Scouting/ Training				HHR SEGS Site								250-foot Buffer		
Survey Dates:	April 2011														
Staff	**09**	**10**	**11**	**12**	**16**	**17**	**18**	**19**	**21**	**23**	**26**	**27**	**28**	**29**	**30**
Howald, Ann	T	T	W	W	W	R	W	W	W	W	R/T	T	O	O	O
Bishop, Meghan			T	W	W	R	W	W	W	W					
Clark, Bill	S	S	T	W	W	W	W	W	W	W	W	W	W	W	W
Elliott, Brian			T	W	W	R	W	W	W	W	W	W	W	W	W
Kokx, Russell			T	W	W	R	W	W	O	O	W	W	W	W	O
Laeger, Eve			T	W	W	W	W	W	W	O	O	O	O	O	W
Sanders, Andy			W	W	O	O	O	W	W	O	O	O	O	O	O
Scott, Chloe			T	W	W	R	W	W	T	O	W	W	W	W	R
Singh, Onkar			T/W	W	W	W	W	W	O	O	O	O	O	W	W
Utter, Josh					W	W	W	W	W	W	W	W	W	W	W

Notes:

S = Scouting
T = Travel
W = Work
R = Rest
O = Off

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM PROJECT*
HIDDEN HILLS SOLAR HOLDINGS, LLC

DOCKET NO. 11-AFC-2

PROOF OF SERVICE
(Revised 12/22/2011)

APPLICANT
Stephen Wiley
BrightSource Energy
1999 Harrison Street, Suite 2150
Oakland, CA 94612-3500
swiley@brightsourceenergy.com

Andrew Miller
Michelle L. Farley
BrightSource Energy
1999 Harrison Street, Suite 2150
Oakland, CA 94612-3500
amiller@brightsourceenergy.com
mfarley@brightsourceenergy.com

Clay Jensen
Gary Kazio
BrightSource Energy
410 South Rampart Blvd., Suite 390
Las Vegas, Nevada 89145
cjensen@brightsourceenergy.com
gkazio@brightsourceenergy.com

APPLICANT'S CONSULTANTS
Susan Strachan
Strachan Consulting, LLC
P.O. Box 1049
Davis, CA 95617
susan@strachanconsult.com

John Carrier
CH2MHill
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833-2987
jcarrier@ch2m.com

COUNSEL FOR APPLICANT
Chris Ellison
Jeff Harris
Samantha Pottenger
Ellison, Schneider and Harris, LLP
2600 Capitol Avenue, Suite 400
Sacramento, CA 95816-5905
cte@eslawfirm.com
jdh@eslawfirm.com
sgp@eslawfirm.com

INTERESTED AGENCIES
California ISO
e-recipient@caiso.com

Great Basin Unified APCD
Duane Ono
Deputy Air Pollution Control Officer
157 Short Street
Bishop, CA 93514
dono@gbuapcd.org

INTERVENORS
Jon William Zellhoefer
P.O. Box 34
Tecopa, CA 92389
jon@zellhoefer.info

*Lisa T. Belenky, Sr. Attorney
Center for Biological Diversity
351 California Street, Ste. 600
San Francisco, CA 94104
e-mail service preferred
lbelenky@biologicaldiversity.org

*Ileene Anderson, Public Lands
Desert Director
Center for Biological Diversity
PMB 447
8033 Sunset Boulevard
Los Angeles, CA 90046
e-mail service preferred
ianderson@biologicaldiversity.org

*indicates change

ENERGY COMMISSION – DECISIONMAKERS

KAREN DOUGLAS
Commissioner and Presiding Member
e-mail service preferred
kldougla@energy.state.ca.us

CARLA PETERMAN
Commissioner and Associate Member
cpeterma@energy.state.ca.us

Ken Celli
Hearing Officer
kcelli@energy.state.ca.us

Galen Lemei
e-mail service preferred
Adviser to Commissioner Douglas
glemei@energy.state.ca.us

Jim Bartridge
Adviser to Commissioner Peterman
jbartrid@energy.state.ca.us

ENERGY COMMISSION - STAFF

Mike Monasmith
Senior Project
mmonasmi@energy.state.ca.us

Richard Ratliff
Staff Counsel IV
dratliff@energy.state.ca.us

ENERGY COMMISSION – PUBLIC ADVISER

Jennifer Jennings
Public Adviser's Office
e-mail service preferred
publicadviser@energy.state.ca.us

DECLARATION OF SERVICE

I, Mary Finn, declare that on, December 30, 2011, I served and filed copies of the attached Hidden Hills SEGS Data Response, Set 1B-2, dated December 30, 2011. The original document, filed with the Docket Unit or the Chief Counsel, as required by the applicable regulation, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/hiddenhills/index.html].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__x__ Served electronically to all e-mail addresses on the Proof of Service list;

____ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

__x__ by sending an original paper copy and one electronic copy, mailed with the U.S. Postal Service with first class postage thereon fully prepaid and e-mailed respectively, to the address below (preferred method); *OR*

____ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

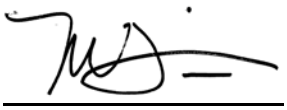
CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

____ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.



Mary Finn, CH2M Hill