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GALATI | BLEK LLP

455 Capitol Mall Suite 350
Sacramento CA 95814
Tel •916.441.6575
Fax •916.441.6553

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Subject: **PALEN SOLAR HOLDINGS, LLC'S SUPPLEMENTAL SPRING 2013 BIOLOGICAL SURVEYS**
PALEN SOLAR ELECTRIC GENERATING SYSTEM
DOCKET NO. (09-AFC-7C)

Enclosed for filing with the California Energy Commission is the electronic version of **PALEN SOLAR HOLDINGS, LLC'S SUPPLEMENTAL SPRING 2013 BIOLOGICAL SURVEYS**, for Palen Solar Electric Generating System (09-AFC-7C).

Sincerely,

Marie Fleming

Palen Solar Electric Generating System

Supplemental Spring 2013 Biological Surveys

Prepared By:

Alice E. Karl, Ph.D.
Alice E. Karl and Associates
P.O. Box 74006
Davis, California 95617
heliophile@mindspring.com

Prepared For:

Palen Solar Holdings, LLC
1999 Harrison Street
Oakland, California 94612

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LIST OF ABBREVIATIONS

BLM	Bureau of Land Management
BO	Biological Opinion
CDFG	California Department of Fish and Game (now Wildlife)
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CH	Designated Critical Habitat
CHU	Critical Habitat Unit
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
DWMA	Desert Wildlife Management Area
ESA	Endangered Species Act of 1973, as amended
FWS	U.S. Fish and Wildlife Service
gen-tie	generation-tie transmission line
GPS	Global Positioning System
I-10	Interstate 10
kV	Kilovolt
MW	megawatt
NECO	Northern and Eastern Colorado Desert Coordinated Management
NEPA	National Environmental Policy Act
OHV	Off-Highway-Vehicle
Project	PSEGS Project
PSEGS	Palen Solar Electric Generating System
PSPP	Palen Solar Power Project
PSH	Palen Solar Holdings
RU	Recovery Unit
RBS	Red Bluff Substation
ROW	Right-of-Way
WHMA	Wildlife Habitat Management Areas

Palen Solar Electric Generating System
Supplemental Spring 2013 Biological Surveys

1.0 BACKGROUND

Palen Solar III, LLC (PSIII), a wholly-owned subsidiary of Palen Solar Holdings, LLC (PSH)[1] proposes to construct, operate, maintain, and decommission an approximately 500 megawatt (MW) solar energy generating facility, the Palen Solar Electric Generating System (PSEGS or "Modified Project"), in Riverside County, California. Technology for PSEGS will be BrightSource Energy, Inc's. thermal power tower technology, wherein heliostats reflect solar energy onto a steam generator at the top of the tower. The Palen Solar Power Project (PSPP or "Approved Project"), a solar trough facility originally targeted for the PSEGS site, was licensed by the California Energy Commission (CEC) in 2010 (CEC 2010). Two alternatives were approved: Alternatives 2 and 3. The footprints were slightly different, with Alternative 3 fully developed on Bureau of Land Mangement (BLM) land and Alternative 2 allowing development on both BLM land and certain private parcels, should they be acquired. A Record of Decision (ROD) was never issued by the BLM, and the PSPP was never constructed. PSH bought the Approved Project in bankruptcy court in June 2012. PSH filed an Amendment Petition to CEC for the Modified Project in December 2012 (PSH 2012). PSIII submitted a Plan of Development, Revision 2 (POD), to the BLM in support of an application for a Right-of-Way (ROW) grant on 8 February 2013. BLM is conducting a concurrent process to issue a ROD to PSIII for approximately 5200 acres of public lands.

1.1 Project Terminology

For the purposes of this document, the following terminology applies:

- "Modified Project" refers to the PSEGS (Figures 1 and 2).
- "Approved Project" refers to PSPP (Figure 2).
- "Survey Area" is the area that was surveyed for each species (Figure 3). This area was larger than the final Project disturbance footprint to accommodate Project engineering considerations and meet individual species protocols.
- "Solar Plant" is the area that includes the main, fenced Project area. This includes the solar fields, power blocks and onsite switchyard, as well as the Common Area (evaporation ponds, onsite meter/valve station for incoming natural gas service, and maintenance and administration facilities).
- "Linear Facilities" includes the 230 kV generation-tie (gen-tie) line, natural gas pipeline and access road.
- Modified Linear Facilities refers to the modified portion of the gen-tie and the new natural gas pipeline.
- "ROW" is the area included in the ROW grant requested from the BLM

[1] PSH is a joint venture between Abengoa Inc. and BrightSource Energy Inc. For reference the applicant will be referred to as PSH.

- "Linear Corridor" is the corridor within which all of the Linear Facilities ultimately will be located. The Linear Corridor is substantially wider than what will ultimately become the Linear ROW, to accommodate flexibility in the micrositing of the Linear Facilities. The entire Modified Linear Corridor was surveyed.
- "Project vicinity" is intended to be a general term to describe the broader area surrounding the Project.
- In general, statute measurements are provided except where specific protocols have been written in metric units, in which case the units are presented as written in the protocols, for consistency with those protocols.

1.2 Description of the Modified Project

A description of the Approved Project can be found in the CEC's final license (CEC 2010). The PSEGS Amendment Petition (PSH 2012) provides detail on the modifications, including the Modified Project's altered design and function. Differences between the two projects are summarized below.

The Modified Project will have a nominal output of 500 megawatts (MW), and consist of two adjacent and independent Solar Plants of approximately 250 MW each. While both Solar Plants will share common facilities, each will have a dedicated tower, solar field/heliostat array, and a dedicated non-reheat Rankine-cycle steam turbine generator/power block. The total solar power tower structure height is approximately 750 feet, including the solar receiver steam generator (SRSG) located in the top 130 feet. The final site layout will be completed during detailed design but is expected to consist of approximately 85,000 heliostats in each solar field.

The Approved Project did not include a natural gas supply pipeline but rather was approved to use LPG for its auxiliary fuel. The Modified Project will use natural gas to fire its auxiliary and nighttime preservation boilers. The natural gas supply for PSEGS will be provided by Southern California Gas (So Cal Gas).

The following modifications to the Approved Project is a summary of those modifications that are potentially relevant to special-status biological resources:

- Change from solar parabolic trough technology to power tower technology
- Reduction in the Solar Plant footprint by 572 acres, from 4366 acres to approximately 3794 acres
- Reduction in water use both during construction (from 5,750 acre feet to 1,130 acre-feet) and during operation (from 300 acre feet per year [AFY] to 201 AFY)
- Maintenance of natural hydrology across the site and beyond, via minimal grading required for erecting heliostats versus complete site grading and planing necessary for solar trough mirrors
- Mowing versus the elimination of all vegetation
- Reduction from four, four-acre evaporation ponds to two, two-acre ponds, only one of which will be used at any single point in time
- Elimination of the relocation of the existing Southern California Edison (SCE) 161 kV transmission line to the edge of the Project

- Re-routing of the redundant telecommunication line to the gen-tie route, where it will be buried in the roadbed
- Potential elimination of a secondary access road
- The Modified Project will lie completely within the disturbance footprint of the Approved Project, except:
    - An extension of the gen-tie 1128 ft west beyond the western end of the approved gen-tie
    - A new natural gas pipeline extending from the So Cal Gas pipeline south of Interstate 10 (I-10) north to the Solar Facility

The gen-tie extension (Figure 2) comprises 18.9 acres, and lies immediately adjacent (125 ft on center) of the Desert Sunlight project gen-tie, currently under construction. At its southern extent, it enters SCE's Red Bluff Substation, currently under construction. The gen-tie ROW is 120 ft, although only the tower pads and stub roads or access road will actually be subject to surface disturbance. Engineering is currently underway that will identify actual pad locations and necessary access. The natural gas pipeline is 50 ft wide, approximately 3000 ft long, and comprises 3.3 acres.

The Approved Project assumed that all surfaces within the Project disturbance outline would be completely disturbed (bladed, planed, and compacted). This required extensive grading to maintain a consistent grade for interconnecting piping and resulted in three major drainage channels to route the water through and around the entire solar field. The Modified Project will require only moderate grading because the heliostat technology does not require a planed surface. Due to this very limited grading, most of the natural drainage features will be maintained and any grading required will be designed to maintain the existing flow, where possible. Consequently, while the storm water management system will include necessary diversion channels or swales to direct run-on flow from up-slope areas and run-off flow through and around each facility, the several major diversion channels that routed all onsite water to areas outside the Solar Plant on the north and northeast will be eliminated.

The Common Area for the Approved Project was sited at the southern end of the entire facility; it would lie at the southwestern end for the Modified Project. The evaporation ponds for the Approved Project were sited within the solar block area (approximate center) of each solar unit; for the Modified Project, the two, smaller, ponds would be located in the Common Area in the southwest.

Maintenance of internal facilities and the gen-tie line would be similar for both projects, including mirror washing, which is anticipated to occur on a weekly basis for both the Approved Project (Solar Millennium, LLC, and Chevron Energy Solutions 2009) and Modified Project (PSH 2012). The major difference would be the periodic mowing of shrubs, probably every two to five years after initial mowing, to preclude their interference with the heliostats. In areas not required for access or construction, the vegetation will not be removed but will be mowed (if needed) to a height of approximately 12 to 18 inches.

Phasing of the Approved Project was to be accomplished in two, overlapping phases, requiring 39 months for completion, with Unit 2 completion within six months after Unit 1. For the Modified Project, the two phases will be constructed over a similar time frame, 34 months, with

construction of Solar Plant 1 (Phase 1) beginning only a few months prior to that for Solar Plant 2 (Phase 2), and both beginning commercial operation on the same date. The gen-tie will be constructed during Phase 1; the natural gas line will be constructed during Phase 2 (see Table 1).

Facility closure is not expected to be different for the Approved Project and the Modified Project.

1.3 Supplemental Surveys

Surveys for vegetation mapping, special-status plants, State waters, desert tortoise, burrowing owl, and special-status wildlife were previously completed for PSPP, which is both larger than PSEGS and completely encompasses it, except for the extended gen-tie and new gas pipeline. Accordingly, to permit the Modified Project, CEC Staff, California Department of Fish And Wildlife (CDFW) biologists, U.S. Fish and Wildlife Service (FWS) and BLM requested supplemental surveys for these biological resources on the Modified Linear Facilities only (6 March 2013 conference call with FWS, BLM and CDFW; 17 April CEC workshop), to provide information on biological resources on these expanded portions of the Modified Project footprint. The results of those surveys are reported here. Surveys for spring avian presence and Project site use, golden eagles and bats are addressed in separate reports (Bloom Biological 2013a, b; Brown and Rainey 2013).

2.0 PROJECT LOCATION AND ENVIRONMENTAL SETTING

2.1 Location and General Environmental Setting

The Modified Project is located in western Chuckwalla Valley, an internally draining valley in the Sonoran Desert about 10 miles east of Desert Center in unincorporated Riverside County, California (Figure 1). It is entirely on federal land, BLM ROW # CACA 48810, in Townships 5 and 6 South, Range 17 East. The Modified Linear Facilities lie along a north-northeast trending, very gently sloping bajada that terminates in Palen Dry Lake. Elevations are approximately 650 ft above mean sea level. Representative site photographs are located in Appendix A.

2.2 Anthropogenic Influences in the Project Vicinity

Anthropogenic conversion of native habitats in Chuckwalla Valley in the Project vicinity includes agricultural, residential, renewable energy and recreation development (Figure 1). Much of the agriculture has waned in the past 10-15 years, including most of the aquaculture (fish farms) and jojoba ventures. However, several crops are still grown, including a citrus orchard just west of the Modified Project and a citrus and date palm orchard abutting the Project's northwestern border (Figure 2). There is also a fish farm next to the palm orchard that is being gradually decommissioned.

The habitats at the Modified Linear Facilities and Solar Plant Site have experienced substantial disturbance in the past half-century, the most biologically significant of which is Interstate-10 (I-10). This is a major interstate travel and commerce route. To protect the freeway from flooding, the drainages upslope (south) of the freeway were redirected to a few discrete washes that flow under the freeway at infrequent intervals. Save for these occasional washes, the natural water flow to much of the bajada on the downslope side (Project side) of the freeway has been completely severed. Ongoing degradation of the vegetation in the downslope sheet flow is

evident in the sparse vegetation and numerous dead or partially dead ironwood trees (Appendix A: Photograph 6). There are also many tracks of four-wheel-drive (4WD) vehicles near the freeway, presumably made during freeway construction, that have disrupted the surface and are clearly evident in the interfluvial desert pavement.

South of I-10, there are four transmission lines (three high-voltage) that intersect the bajada immediately south of the existing Southern California (SoCal) Gas line, with concomitant access roads. Chuckwalla Road, a paved, two-lane road that formerly serviced east-west travel in the area prior to the construction of I-10, also crosses the bajada south of the Project gas line Linear Corridor. Recreational uses of the area are moderate, limited to minor target shooting and off-highway-vehicle (OHV) use.

Recent construction in the Survey Area includes SCE's Red Bluff Substation (RBS), along the south side of I-15, and the Desert Sunlight high-voltage transmission line, immediately adjacent (125 ft from centerline to centerline) and parallel to the PSEGS modified gen-tie. It, too, is serviced by the RBS.

2.3 Special Management Areas

In 1976, Congress designated the 25-million-acre California Desert Conservation Area. Since then, the BLM has completed a series of regional plan amendments. Among these was the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO Plan) (BLM and California Department of Fish and Game [CDFG] 2002), which encompasses 5.5 million acres in the southeastern California desert, including the Project site. The NECO Plan provides for conservation and management of several special-status species, in large part through a system of broad management areas including:

- Desert Wildlife Management Areas (DWMAs) for desert tortoises,
- Wildlife Habitat Management Areas (WHMAs) for other special-status species and natural communities,
- Continuity WHMAs for connections between DWMAs, and
- Areas of Critical Environmental Concern (ACECs) and Wilderness Areas.

BLM had previously developed habitat categories, ranging in decreasing importance from Category I to Category III, were designed as management tools to insure future protection and management of desert tortoise habitat and its populations (BLM 1988 and 1992). These designations were based on tortoise density, estimated local tortoise population trends, habitat quality, and other land-use conflicts. Category I areas are considered essential to the maintenance of large, viable populations and all DWMAs in the NECO Plan are designated as Category I. Outside of desert tortoise DWMAs, the NECO Plan treats all areas previously categorized as Category I, II, or III as Category III for purposes of compensation.

In June 1994, the final Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan) was released (FWS 1994a), with a revised version released in May 2011 (FWS 2011b). The revised Recovery Plan identifies five evolutionarily significant units of the desert tortoise in the Mojave region, termed recovery units (RUs), based on differences in tortoise behavior, ecology, physiology and genetics, geographic barriers, vegetation, and climate. Within those recovery units, suggested DWMAs act as reserves in which recovery actions are implemented. The

Recovery Plan works in concert with critical habitat, designated for the desert tortoise in 1994 (FWS 1994b), by prescribing management actions to aid recovery, with critical habitat providing legal protection for areas that are considered to have essential features for tortoise survival.

A multi-species WHMA overlaps the Modified Project, including portions of the originally permitted gen-tie (Figure 1). A DWMA Continuity WHMA overlaps the southern part of the Solar Plant and new gas line; the gen-tie is sufficiently close, given the coarse scale of the NECO maps, to be included in this WHMA. (In fact, there is higher quality habitat and more tortoises along the gen-tie than the gas pipeline.) The only part of the Modified Linear Facilities that overlaps a DWMA is the gen-tie, which intersects the northern edge of the Chuckwalla DWMA, between I-10 and the RBS. The remainder of the gen-tie and the entire gas line is in Category III habitat. The Project is in the Colorado Desert RU, and both Modified Linear Facilities partially intersect the Chuckwalla Critical Habitat Unit (CHU). Critical habitat overlaps part of the east-west portion and all of the north-south portion of the modified gen-tie; it overlaps the gas line only south of I-10, near the existing SoCal Gas line.

3.0 SURVEY METHODS

This section describes the methods for the focused biological surveys on the Modified Linear Facilities in Spring 2013. Surveys adhered to standardized protocols for all relevant species for which there were protocols, as well as to biologically sound approaches for the remaining species. Surveys also incorporated NECO Plan requirements. The NECO Plan has specifically identified situations for which surveys must be completed for projects in the NECO planning area:

- Special-status plants – Survey in all mapped ranges
- Special-status wildlife – Survey at all known locations
- Bats – Identify all significant roosts within one mile
- Prairie falcon and golden eagle - Identify all eyries within 0.25 miles
- Burrowing owl – Identify presence and locations
- Crissal thrasher - Identify presence
- Couch's spadefoot – Identify all ephemeral impoundment areas
- Natural and artificial water sources – Identify presence within 0.25 miles

Survey methods for all but State Waters were presented to the CEC, CDFW, BLM, and FWS on 25 March 2013 for their comments, prior to conducting the surveys (Centerline 2013b). The only specific comments received were for the burrowing owl surveys, requested by CDFW in the 17 April 2013 CEC workshop. Those were incorporated and are presented in the methods below for burrowing owls. During the 17 April 2013 CEC workshop, CDFW requested that State Waters on the Modified Linear Facilities be re-surveyed, using updated techniques. Again, those were incorporated in the methods for State Waters, discussed below.

3.1 Literature Review

Several species known to occur on or in the Project Vicinity are accorded "special-status" by federal and state agencies because of their recognized rarity or potential vulnerability to extinction. These species typically have a limited geographic range and/or limited habitat and are referred to collectively as "special-status" species. A target list of special-status species that may be affected by the Project was developed (Table 1) based on the results of previous field surveys, available literature and databases (e.g., California Native Plant Society [CNPS], California Natural Diversity Data Base [CNDDB), and consultation with local experts. Species for which no habitat or site use could occur (e.g., mountain or aquatic (permanent water) specialists) were eliminated. Desert kit fox (*Vulpes macrotis*), a protected furbearer (California Department of Fish and Game [CDFG] Code 14 CCR §460), was also included in the target list. This list was provided to the CEC on 25 March (Centerline 2013b).

3.2 Vegetation Mapping

Vegetation was mapped on the Modified Linear Facilities during the desert tortoise and wildlife survey. Vegetation was mapped in the Linear Corridor and on each of the desert tortoise buffer transects (200 m, 400 m, and 600 m from each edge of the Linear Corridor), and thereby was assessed to and beyond the 1000 ft (300 m) survey limit for linear facilities required by CEC.

3.3 Special-Status Plants

Special-status plant surveys were conducted in accordance with the CNDDB *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), the CNPS' *Botanical Survey Guidelines* (CNPS 2009) and the BLM's *Survey Protocols Required for NEPA and ESA Compliance for BLM Special Status Plant Species* (BLM 2009). Although plant surveys typically follow BLM (2009) guidelines for an intuitive controlled survey, wherein a full survey is completed (i.e., 100 percent visual examination) in habitats with the highest potential for rare plants, with sampling in the remaining areas, the PSEGS survey covered such a small area that both linear routes were entirely surveyed. Surveys covered 100% of the Modified Linear Facilities routes, where plants might be directly affected during Project construction and Project operations, plus areas outside the routes where project activities might affect offsite populations.

All individuals of cacti, yucca and trees protected by the California Desert Native Plant Act (CDNPA) also were tallied[2], with mapping occurring by individuals, populations or Project segment, depending on biological relevancy or practicality.

A list of invasive plant species, as well as concentrations, was recorded, if observed.

The special-status plant survey was conducted on 30 March. Primary production was average to better than average and annuals were fruiting, with many still flowering, enabling a comprehensive survey and good species identification. Tim Thomas and Glenn Rink, both of

[2] Note: BLM required PSPP to map and tally certain cacti species – cottontop cactus (*Echinocactus polycephalus*), hedgehog cactus (*Echinocereus engelmannii*) and barrel cactus (*Ferocactus cylindraceus*). However, these cacti, among several other species, are covered by the CDNPA.

Table 1. Special-status and Other Target Plant and Wildlife Species Observed or with Potential to be Present on the PSEGS Modified Linear Facilities. Presence is documented only for the surveys on the Modified Linear Facilities. For birds and bats, separate surveys were conducted for the Solar Plant Site and Project Vicinity[4.5.6]. Species included are those known from Imperial County, eastern San Bernardino County, and Riverside County east of the central Coachella Valley, in habitats that occur on or could be indirectly affected by Project activities.

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Plants						
Abrams's Spurge (*Euphorbia abramsiana*)	---	---	G4/S2/3	2	Sandy sites, especially swales, in Mojavean and Sonoran Desert scrubs in eastern California; 0 to 3,000 feet	Possible; grows in summer/fall
Algodones Dunes Sunflower (*Helianthus niveus tephrodes)*	---	E	G4T2/S1.2	1B	Desert dunes, especially Algodones Dunes	Not present; no habitat
Angel Trumpets *(Acleisanthes longiflora)*	---	---	G5/S1	2	Sonoran Desert Scrub (limestone); mountains or base of mountains, 0-8,202 ft.	Not present; no habitat
Darlington's Blazing Star *(Mentzelia puberula*)	---	---	G4/S2	2.2	Rocky, generally mountainous sites from the Ord Mts. to northern Baja California.	Not present; no habitat
Arizona Cottontop *(Digitaria californica*)	---	---	G5/S1.3	2	Rocky Sonoran and Mojavean Desert Scrubs; three consortium records in California; 950 to 4,900 feet	Not present; no habitat
Arizona Spurge (*Euphorbia arizonica*)	---	---	G5/S1.3	2	Sandy flats in Sonoran Desert Scrub, below ~1,000 feet	Not present; no habitat
Ayenia (*Ayenia compacta*)	---	---	G4/S3?	2	Sandy and gravelly washes and canyons in desert scrubs, 450 to 6,000 feet	Unlikely; not observed
Bitter Hymenoxys *(Hymenoxys odorata)*	---	---	G5/S2	2	Riparian scrub and Sonoran Desert Scrub, sandy flats near Colorado River, known only from the Colorado River alluvial plain, 150- 495 feet	Highly unlikely; not observed; grows in spring as well as summer/fall
California Ditaxis (*Ditaxis serrata* var. *californica*)	---	---	G5T2T3/S2	3	Sonoran Creosote Bush Scrub from 100 to 3,000 feet	Possible; not observed but grows all year
California Satintail *(Imperata brevifolia*)	---	---	G2/S2.1	2	Wet springs, meadows, and flood plains in Chaparral, Coastal Scrub, Mojavean Desert Scrub; 0 - 1650 feet	Not present; no habitat

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Chaparral Sand Verbena (*Abronia villosa* var.*aurita*)	---	---	G5T3T4/S2	1B	Loose to aeolian sands; chaparral and coastal sage scrub; below 2,000 feet	Not present; no habitat
Cove's Cassia (*Senna covesii)*	---	---	G5?/S1	2	Dry washes and slopes in Sonoran Desert Scrub, 1,600 to 1,900 feet	Not present; not observed
Crown of Thorns *(Koeberlinia spinosa tenuispina*)	---	---	G4T4/S2.2	2	Creosote Bush Scrub in Sonoran Desert; 500 to 1700 feet	Not present; not observed
Crucifixion Thorn (*Castela emoryi*)	---	---	G2G3/S2S3	2	Mojavean and Sonoran Desert Scrubs; typically associated with drainages	Not present; not observed
Desert Portulaca *(Portulaca halimoides)*	---	---	G5/S3	4	Sandy areas and flats in Joshua tree woodland and desert mountains; 3280-3937 feet	Highly unlikely due to lack of habitat and elevational constraints; grows mostly in fall
Desert Sand-parsley (*Ammoselinum giganteum*)	---	---	G2G3/SH	2	Sonoran Desert Scrub; known from one site near Hayfield Dry Lake at 1,200 feet	Highly unlikely; not observed
Desert Spike Moss (*Selaginella eremophila*)	---	---	G4/S2.2?	2	Shaded rocky habitats in the Sonoran Desert, to Arizona and northern Mexico; below 3,600 feet	Not present; no habitat
Desert Unicorn Plant (*Proboscidea althaeifolia*)	---	---	G5/S3.3	4	Sandy areas in Sonoran Desert Scrub throughout southeastern California, below 3,300 feet.	Possible; grows in summer/fall but seed pods often obvious other times of year; none was observed
Dwarf Germander *(Teucrium cubense depressum)*	---	---	G4G5T3T4/S2	2	Sandy soils, washes, fields; below 1,300 feet	Possible; not observed
Flat-seeded Spurge (*Euphorbia platysperma*)	BLM Sensitive	---	G3/S1.2?	1B	Sandy flats and dunes in Sonoran Desert Scrub; below 350 feet	Not present; no habitat
Foxtail Cactus (*Coryphantha alversonii*)	---	---	G3/S3.2	4	Primarily rocky substrates between 250 and 4,000 feet in Creosote Bush Scrub	Not present; not observed
Glandular Ditaxis (*Ditaxis claryana*)	---	---	G4G5/S1	2	Sandy flats in Mojavean and Sonoran Creosote Bush Scrubs in Imperial, San Bernardino, and Riverside counties; below 1,500 feet	Possible; not observed
Graham's fishhook cactus (*Mammillaria grahami*i var. *grahamii)*	---	---	G4T4/S2	2	Sandy or rocky canyons, washes in creosote bush scrub; 1,000-2,970 feet	Possible; not observed
Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii*)	---	---	G5T3/S2.2?	2	Dunes and sandy habitats below 1,200 feet, east of the Coachella Valley	Possible; not observed

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Harwood's Phlox (*Eriastrum harwoodii*)	---	---	G2/S2	1B	Desert dunes below 7,000 feet., eastern Riverside, San Bernardino and San Diego Counties	Not present; no habitat
Jackass Clover *(Wislizenia refracta* var. *refracta*)	—	—	G5T5?/S1.2?	2	Sandy washes, roadsides, flats; 1,900 to 2,700 feet	Not present; no habitat
Las Animas Colubrina (*Colubrina californica*)	---	---	G4/S2S3.3	2	Sonoran Desert Creosote Bush Scrub, < 3,300 feet	Not present; not observed
Lobed Ground Cherry *(Physalis lobata)*	---	---	G5/S1.3?	2	Mojave Desert Scrub, playas, granitic soils, 1640-2625 feet	Highly unlikely due to habitat and elevation constraints and known range.
Mesquite Nest Straw (*Stylocline sonorensis*)	---	---	G3G5/SX	1A	Open sandy drainages; known from one site near Hayfields Dry Lake	Highly unlikely; not observed
Mojave Fishhook Cactus *(Sclerocactus polyancistrus*)	---	---	G4/S3.2	4	Mojavean Desert Scrub (Creosote Bush Scrub and Pinyon-Juniper Woodland, and Great Basin Scrub. Kern, San Bernardino, and Inyo Counties to Nevada; 2100 to 7650 feet	Not present; not observed
Newberry's Velvet-mallow *(Horsfordia newberryi*)	---	---	G4/S3.3	4	Mostly rocky canyons and toeslopes in Sonoran Desert Scrub; 10 – 2650 ft	Highly unlikely; not observed
Orocopia Sage (*Saliva greatae*)	BLM Sensitive	---	G2/S2	1B	Mojavean and Sonoran Desert Scrubs; gravelly/ rocky bajadas, mostly near washes; below 3,000 feet	Not present; not observed
Palmer's Jackass Clover (*Wislizenia refracta palmeri*)	---	---	G5T2T4/S2?	2	Sandy washes and dunes in Sonoran Desert Scrub, to northwestern Mexico; potentially Mojave Desert (unverified); <430 ft.	Not present; no habitat
Parish's Club Cholla (*Grusonia parishii*)	---	---	G3G4/S2	2	Joshua Tree Woodland in Mojavean and Sonoran Desert Scrubs; 1,000 -5,000 ft	Not present; not observed
Parry's Spurge (*Euphorbia parryi)*	---	---	G5/S1.3	2	Dunes an Aeolian soils in Mojavean Desert Scrub; in California, known only from Kelso; 1300-2400 ft	Not present; no habitat
Pink Fairy Duster (*Calliandra eriophylla*)	---	---	G5/S2S3	2	Sonoran Desert Scrub; washes	Not present; not observed
Pink Velvet Mallow *(Horsfordia alata)*	---	---	G4/S3.3	4	Rocky areas in Sonoran Desert Scrub, 328-1640 ft	Highly unlikely; not observed

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Pointed Dodder (*Cuscuta californica* var. *apiculata*)	---	---	G5T3?/S2S3	3	Sonoran and Mojavean Desert Scrubs in San Bernardino County (one record in western Riverside County), to Nevada and Baja, California; 0 – 1650 ft	Possible; not observed
Ribbed Cryptantha (*Cryptantha costata*)	---	---	G4G5/S3.3	4	Dunes in Mojavean and Sonoran Desert Scrub, 197-1640 ft	Not present; no habitat
Sand Evening Primrose (*Camissonia arenaria*)	---	---	G4?/S2	2	Sandy washes and rocky slopes below 1,300 feet	Possible; not observed
Slender Woolly-heads (*Nemacaulis denudata* var. *gracilis*)	---	---	G3G4T3?/S2	2	Dunes in coastal and Sonoran Desert Scrubs, primarily in the Coachella Valley; below 1,500 feet	Not present; no habitat
Spearleaf (*Matelea parvifolia*)	—	—	G5?/S2.2	2	Rocky ledges and slopes, 1,000 to 6,000 feet, in Mojave and Sonoran Desert Scrubs	Highly unlikely due to habitat constraints; not observed
Spiny Abrojo (*Condalia globosa* var. *pubescens*)	---	---	G5T3T4/S3.2	4	Sonoran Creosote Bush Scrub; 500 to 3,300 feet	Not present; not observed
Thorny Milkwort (*Polygala acanthoclada*)	---	---	G4/S1	2	Pinyon-Juniper and Joshua Tree Woodlands, Chenopod Scrub; 2500-7550 ft	Not present; not observed
Winged Cryptantha (*Cryptantha holoptera*)	---	---	G3G4/S3?	4	330-5500 feet in Mojave and Sonoran Desert Scrubs; often sandy habitats	Possible; not observed
Amphibians						
Couch's Spadefoot Toad (*Scaphiopus couchii*)	BLM Sensitive	SC	G5/S2S3	---	Various arid communities in extreme southeastern California and east, south	Possible individuals, but no breeding habitat
Reptiles						
Colorado Desert Fringe-toed Lizard (*Uma notata*)	BLM Sensitive	SC	G3/S2?	---	Restricted to aeolian sandy habitats in the southeastern Sonoran Desert	Not present; no habitat
Desert Rosy Boa (*Charina trivirgata gracia*)	---	---	G4G5/ S3S4	---	Rocky uplands and canyons; often near stream courses	Possible
Mojave Fringe-toed Lizard (*Uma scoparia*)	BLM Sensitive	SC	G3G4/ S3S4	---	Restricted to aeolian sandy habitats in the Mojave and northern Sonoran deserts	Not present; no habitat
Desert Tortoise (*Gopherus agassizii*)	T	T	G4/S2	---	Most desert habitats below approximately 5,000 feet in elevation	Present

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Invertebrates						
Riverside Cuckoo Wasp (*Hedychridium argenteum*)	---	---	G1/?S1?	---	Dunes; one CNDDB record 18 mi west of Blythe along I-10; no other distribution information available, although may be endemic to Colorado Desert	Not present; no habitat
Bradley's Cuckoo Wasp (*Ceratochrysis bradleyi*)	---	---	G1/S1	---	Dunes; one CNDDB record 6 mi north of Blythe, although may be endemic to Colorado Desert	Not present; no habitat
Birds						
American Peregrine Falcon (*Falco peregrinus anatum*)	Delisted BCC	Delisted Fully Protected	G4T3/S2	---	Dry, open country, including arid woodlands; nests in cliffs	Not observed. Possible forager only; no nesting habitat (see separate avian report[4])
Bendire's Thrasher (*Toxostoma bendirei*)	BCC BLM Sensitive	SC	G4G5/S3	---	Arid to semi-arid brushy habitats, usually with yuccas, cholla, and trees	Possible; not observed (see separate avian report[4])
Brewer's Sparrow (*Spizella breweri*)	BCC	--	G5/S3	---	Open meadows and flats	Possible; not observed (see separate avian report[4])
Burrowing Owl (*Athene cunicularia*)	BCC BLM Sensitive	SC	G4/S2	---	Open, arid habitats	Observed on buffers only; entire Linear Corridor offers habitat
Crissal Thrasher (*Toxostoma crissale*)	BCC	SC	G5/S3	---	Dense mesquite and willows along desert streams and washes	Highly unlikely; no habitat
Ferruginous Hawk (*Buteo regalis*)	BCC	---	G4/S3S4	---	Arid, open country	Possible as wintering resident or migrant; not observed (see separate avian report[4])
Gila Woodpecker (*Melanerpes uropygialis*)	---	E	G5/S1S2	---	Requires woodlands containing large trees or columnar cactus for nesting	Unlikely except as transient; not observed (see separate avian report[4])
Golden Eagle (*Aquila chrysaetos*)	BCC	SC Fully Protected	G5/S3	---	Open country; nests in large trees in open areas or cliffs	Possible; not observed (see separate avian report[5])
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	SC	G4/S4	---	Arid habitats with perches	Observed

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Mountain Plover (*Charadrius montanus*)	BCC BLM Sensitive	SC	G2/S2?	---	Dry upland habitats, plains, bare fields	No habitat; possible migrant only (see separate avian report[4])
Northern Harrier (*Circus cyaneus*)	---	SC	G5/S3	---	Open habitats; nests in shrubby pen land and marshes	Possible; not observed (see separate avian report[4])
Prairie Falcon (*Falco mexicanus*)	BCC	---	G5/S3	---	Dry, open country, including arid woodlands; nests in cliffs	Possible; not observed (see separate avian report[4])
Short-eared Owl (*Asio flammeus*)	---	SC	G5/S3	---	Open habitats: marshes, fields; nests on ground and roosts on ground, low poles	Possible; not observed (see separate avian report[4])
Swainson's Hawk (*Buteo swainsoni*)	BCC	T	G5/S2	---	Forages in open stands of grass-dominated vegetation, sparse shrublands, and small, open woodlands.	Likely - common migrant in area; not observed (see separate avian report[4])
Yellow-breasted Chat (*Icteria virens*)	---	SC	G5/S3	---	Dense streamside thickets, willows; brushy hillsides and canyons	Unlikely; not observed (see separate avian report[4])
Mammals						
American Badger (*Taxidea taxus*)	---	SC	G5/S4	---	Many habitats	Possible; not observed
Burro (*Equus asinus*)	---	---	---	Protected	Various habitats near water	Highly unlikely; no sign observed
Burro Deer (*Odocoileus hemionus eremicus*)	---	Game Species	---	---	Arboreal and densely vegetated drainages	Scat and tracks observed in buffer transects
California Leaf-nosed Bat (*Macrotus californicus*)	BLM Sensitive	SC	G4/S2S3	WBWG:MH	Lowland desert associate, found in caves, mines, tunnels and old buildings	Possible (see separate bat report[6])
Colorado Valley Woodrat (*Neotoma albigula venusta*)	---	---	---	---	Under mesquite in Creosote Bush Scrub; southeastern California	Highly unlikely; no preferred habitat
Desert Kit Fox (*Vulpes macrotis*)	---	Protected furbearer	---	---	In open desert scrub and dunes.	Present; sign observed
Nelson's Bighorn Sheep (*Ovis canadensis nelsoni*)	BLM Sensitive	---	---	---	In mountains and adjacent valleys in desert scrub	Highly unlikely; no sign observed
Pallid Bat (*Antrozous pallidus*)	BLM Sensitive	SC	G5/S3	WBWG:H	Several desert habitats	Not observed, but detected in separate survey [6]

Species	Status[1]				Habitat	Potential for Presence on Modified Linear
	Federal	State	CNDDB Rank[2]	CNPS[3]/Other		
Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)	---	SC	G4/S2S3	WBWG:M	Variety of arid areas in pinyon-juniper woodland, desert scrubs, palm oases, drainages, rocky areas	Possible (see separate bat report[6])
Cave Myotis (*Myotis velifer*)	BLM Sensitive	SC	G5/S1	WBWG:M	Caves, mines and buildings in lower desert scrub habitats; also near streams and in woodlands, old agricultural fields	Possible (see separate bat report[6])
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	BLM Sensitive	SC	G4/S2S3	WBWG:H	Broad habitat associations. Roosts in caves and manmade structures; feeds in trees	Possible (see separate bat report[6])
Western Mastiff Bat (*Eumops perotis californicus*)	BLM Sensitive	SC	G5T4/S3?	WBWG:H	Cliffs, trees, tunnels, buildings in desert scrub	Possible (see separate bat report[6])
Yuma Myotis (*Myotis yumanensis yumanensis*)	BLM Sensitive	---	G5 /S4?	WBWG:LM	Several habitat associations, but typically near open water; often roosts in manmade structures	Possible (see separate bat report[6])
Yuma Puma (*Felis concolor browni*)	---	SC	---	---	Mountains and Colorado River bottomlands	Unlikely; no sign observed

Sources: Unless noted, information is from *The Jepson Manual* (Baldwin et al. 2002), California Native Plant Society (CNPS) Online Inventory (CNPS 2010), and Jepson Flora Project (http://ucjeps.berkeley.edu/)

[1] CDFG and Habitat Data Analysis Branch, Biogeographic Data Branch 2009, http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf

- E Endangered
- T Threatened
- BCC USFWS Bird of Conservation Concern
- State SC CDFG Species of Special Concern (species that appear to be vulnerable to extinction)
- Fully Protected Species that cannot be taken without authorization from the Fish and Game Commission
- BLM Sensitive Species under review, rare, with limited geographic range or habitat associations, or declining. BLM policy is to provide the same level of protection as USFWS candidate species
- WBWG = Western Bat Working Group (http://wbwg.org)
  - H – High Priority – These species should be considered the highest priority for funding, planning, and conservation actions.
  - M – Medium Priority – These species warrant closer evaluation, more research, and conservation actions of both the species and the threats
  - L – Low Priority – Most of the existing data support stable populations of the species and that the potential for major changes in status is unlikely

[2] CNDDB 2011: California Department of Fish and Game, California Natural Diversity Database, Special Animals , January 2011 (www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf) and CDFG Special Vascular Plants, Bryophytes, and Lichens List, January 2011 (www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf).

Global Rank
- G1 = Critically Imperiled
- G2 = Imperiled
- G3 = Vulnerable
- G4 = Apparently Secure
- G5 = Secure

State Rank
- S1 = Critically Imperiled
- S2 = Imperiled
- S3 = Vulnerable
- S4 = Apparently Secure
- S5 = Secure
- SX= All California sites are extirpated

Subspecies or Variety Rank and Other Symbols

T1-T5: same definition as global and state ranks, except that rank only applies to the particular variety or subspecies.

X: species is considered extirpated

[3] CNPS. 2010:

List 1A - Plants presumed extinct in California

List 1B - Plants rare and endangered in California and elsewhere

List 2 - Plants rare and endangered in California but more common elsewhere

List 3 - Plants about which CNPS needs more information

List 4 - Plants of limited distribution (Watch List)

(Note: CNPS lists 1 and 2 require CEQA consideration. List 4 plants that must be surveyed per the Northern and Eastern Colorado Desert Management Plan (BLM and CDFG 2002) were also included for surveying)

Threat Ranks: 0.1-Seriously threatened in California (high degree/immediacy of threat)

0.2-Fairly threatened in California (moderate degree/immediacy of threat)

0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)

[4] Bloom Biological, Inc. (2013a)

[5] Bloom Biological, Inc. (2013b)

[6] Brown and Rainey (2013)

whom were very familiar with the area and species, including special-status species, conducted the surveys. They had just completed other identical surveys in the area and were completely aware of the phenology and current conditions of all plants in the area, so had excellent search images and honed identification skills.

3.4 State Jurisdictional Waters

Prior to delineating the potential jurisdictional State Waters on the new and altered linear features, the 2009 State Waters Jurisdictional Delineation for PSPP (AECOM 2009a) and newer guidance from the CEC (Vyverberg 2010) were reviewed to ensure that the 2013 PSEGS surveys incorporated the more recent recognition of hydrological conditions that are specific to the arid southwest and was also consistent with the previous, approved delineation for PSPP. The surveyor for the 2013 PSEGS State Waters assessment, Dr. Alice Karl, also brought to the assessment over three decades of experience examining and analyzing factors associated with geomorphology and hydrology in the southwestern deserts as they relate to wildlife. Given that wildlife values associated with streams are the basis of CDFW's Streambed Alteration Agreement, this experience is assumed to be beneficial for assessing State Waters. Table 2 provides a matrix that defines the channel types present on the PSEGS new and altered linear features, in the context of the earlier delineation and the more current CEC guidance. Those hydrological features, as they occur on the PSEGS Modified Linear Facilities, are more thoroughly described below:

Primary Channel – Distinct, arboreal channel in which one of the dominant species is a riparian tree species (typically ironwood [*Olneya tesota*] on the PSEGS Modified Linear Facilities, but occasionally palo verde [*Parkinsonia florida*]); other dominant species are primarily upland species (creosote bush [*Larrea tridentata*], white bursage [*Ambrosia dumosa*]) (Appendix C: Photograph C-2). Other wash-dependent species (e.g., cheesebush [*Ambrosia salsola*], desert lavender [*Hyptis emoryi*], chuckwalla bush [*Bebbia juncea*], belloperone [*Justicia californica*], catclaw acacia [*Senegalia* [=*Acacia*] *greggii*]) may be present but are generally only sparsely present except in deep, well-developed washes (Appendix C: Photograph C-1). Primary channels are usually, but not necessarily, broad and/or incised.

Table 2. A Comparison of the PSEGS 2013 Channel Designation with those of Vyverberg (2010) and the PSPP Jurisdictional Delineation (AECOM 2009a).

Jurisdictional State Waters Category	PSEGS 2013 Designation	Analogous Vyverberg Designation	PSPP 2009 Designation	
Desert Dry Wash Woodland	*Primary channel*	*Single-thread channel*	*Vegetated ephemeral wash*	Primary wash
	Secondary channel	*Single-thread or discontinuous channel*		*Secondary wash*

	Riparian interfluves are a feature of larger and deeper channels that do not occur in this part of PSEGS; there, they are considered an integral part individual channel morphology rather than a discrete channel feature	*Riparian interfluves* are part of a larger, compound channel, not occurring in this portion of PSEGS	(i.e., with wash-dependent vegetation)	*Riparian interfluve*
	Sheet flood - a discrete hydrological feature replete with highly braided primary and secondary channels, discontinuous channels, and rilled to hydrologically altered surfaces between those channels	*Sheet flood*	As a unit, *sheet flood* was not included as a State Water; individual channels in the sheet flood areas were assessed for inclusion as a State Water	
Unvegetated Ephemeral Dry Wash	U_H - Single-thread or discontinuous channel with upland vegetation, but no or only rare wash-dependent vegetation	*Discontinuous channel*	*Unvegetated ephemeral wash* (no or only occasional wash-dependent vegetation)	
	U_L -Single-thread or discontinuous channel, with a low density of upland vegetation and no or very rare wash-dependent vegetation	*Discontinuous channel*	Not included as a State Water	
	Swale	*Discontinuous channel*	Not included as a State Water	

Secondary Channel – At PSEGS, these channels are typically, narrow, shallow, single-thread and often discontinuous channels with scattered to occasional riparian trees; there are few individuals of other wash-dependent species. Upland species dominate the shrub layer. (See Appendix C: Photographs C-3 and C-4.)

Sheet or Sheet Flood – These are hydrologically dynamic zones where water has obviously flowed overland, both in and out of channels, during intensive storm events. These zones

comprise a highly braided system of single-thread and discontinuous channels - including both Desert Dry Wash Woodland (DDWW) (Appendix C: Photographs C-5 and C-6) and "unvegetated" ephemeral washes (see below) - and interfluvial spaces where gravels have been rilled by the action of flowing water (Appendix C: Photograph C-7). Sheet zones are considered a unit, rather than a series of discrete individual channels, because internal channel morphologies are subject to rapid change and because the entire zone is important for seed and sediment transport.

Desert Dry Wash Woodland – DDWW includes both individual arboreal washes (*sensu* Holland [1986]; e.g., Appendix C: Photograph C-1) and actual woodland. The latter is a subset of sheet flood described above, in which riparian trees (typically ironwood at PSEGS) are scattered throughout the sheet zone (Appendix C: Photographs C-5 and C-6). While common along the edges of primary and secondary washes, the trees are not always confined to distinct channels in sheet flood zones. Cheesebush is the most common riparian shrub species in the sheet flood DDWW at the PSEGS Modified Linear Facilities.

"Unvegetated" Ephemeral Wash (U_H) – These are primarily discontinuous channels, but may be single thread for part of their reaches. These washes are not actually unvegetated and, in fact, upland vegetation reaches a higher density there than outside of the channels, as a result of the higher water availability (Appendix C: Photograph C-8). This higher density of shrub-layer species provides greater cover and sequestering/nesting opportunities for wildlife, as well as increased foraging opportunities due to the trapping of sediment and seeds, resulting in a higher density and diversity of understory plants. Wash-dependent vegetation, typically small ironwood trees or shrubs, may be occasionally present. These channels may or may not have distinct beds and banks.

"Unvegetated" Ephemeral Wash, Low Shrub Density (U_L) – These are the same as U_H, except that shrub-layer density is low; individuals of riparian species are rare (Appendix C: Photograph C-9).

Swale – Swales are typically discontinuous, very shallow depressions less than approximately 5 cm deep that are either completely isolated or ultimately connect to a channel. On the PSEGS Modified Linear Facilities, they often arise on desert pavement patches. Vegetation is variable, ranging from herbaceous species only, to scattered, primarily upland, shrubs (Appendix C: Photograph C-8).

To quantify Waters of the State on the Modified Linear Facilities, both edges of each Linear Corridor were walked for their entire lengths, to precisely map and describe all channels. Waypoints were taken for each channel that crossed the Linear Corridor boundaries, typically at both sides of the channel where it crossed the Linear Corridor boundary. Waypoints were taken at the outer, upper edge of each channel to be both conservation-oriented and account for the three-meter accuracy of the Global Positioning System (GPS) unit (Garmin 76CSx). For very narrow channels (less than approximately a meter wide, one waypoint was sometimes taken for the channel, rather than two. The following variables were measured and described for each channel crossed:

- Channel type (see Table 3)
- Channel width, depth and substrate
- Shrub, perennial grass, and tree species present, and relative abundance of each (i.e., dominant, common or occasional)
- Presence of wash-dependent vegetation
- Height of tree species, where present

All channels were mapped to show channel direction and continuity, where present, from Linear Corridor edge to edge.

To calculate acreages of State Waters, the Universal Transverse Mercator (UTM) locations for each waypoint and channel type were mapped using Global Information System (GIS). The channels were then fully delineated internally in the narrow Linear Corridors using the field maps and data and aerial photography. In all cases, the edges of channels or sheet areas were mapped conservatively (i.e., conservation-oriented). For instance, where a sheet area that crossed the Linear Corridor was composed primarily of unvegetated washes, it was mapped as DDWW if the area was clearly part of a larger DDWW system upslope or down. The percent cover of riparian vegetation in DDWW was conservatively assumed to be comparable to the higher quality wash in the southwestern portion of the solar facility, mapped in 2009 for the PSPP jurisdictional delineation (AECOM 2009a).

3.5 Desert Tortoise

Comprehensive biological resource surveys designed to meet all applicable FWS, BLM, and CDFW requirements were conducted on several dates between 7 and 30 April 2011. Surveys adhered to the (2010) survey protocols, with the addition that the three buffer surveys were conducted to ensure coverage of the Project "Action Area"[3], irrespective of whether tortoise sign were encountered in the Linear Corridor[4]. These methods were agreed to by all agencies in a conference call on 6 March 2013, with a follow-up e-mail on 7 March (e-mail from A. Karl).

The Survey Area included 100% coverage of the modified gen-tie (120 ft wide) and the gas pipeline (50 ft wide), using transects spaced 10 m apart (Figure 3). In addition, single 10-m-wide transects were walked at 200 m, 400 m and 600 m parallel to both edges of the Linear Corridors. Two experienced tortoise/desert biologists (Paul Frank and Alice Karl) conducted the surveys. Transects were pre-programmed into GPS units to ensure accurate and complete coverage. On each survey date, the weather was clear and calm, with wind speeds generally 2-4 mph, reaching the highest speed of 7-10 mph on part of one survey only. All survey temperatures were below the 40°C (air temperature at 5 cm above the ground) limit required by FWS protocols.

[3] "Action Area" is a term used by FWS to denote all areas in which a listed species may be directly and indirectly affected by project activities.

[4] The 2010 protocols do not require that buffer surveys be conducted if tortoise sign is observed in a linear corridor.

Underpasses within the buffer zone were also sought for evidence of tortoise use. The habitat in these was also described per request from FWS (J. Fraser, FWS Biologist, 11 March 2013 e-mail to A. Karl). Between buffer transects, sign was sought along the freeway. This also included most of the artificial swale next to the freeway pavement on the south side, although the density of the cheesebush in this swale is so high that only an intense, clearance-type of survey would be conclusive. That said, the sandy floors of the swale and underpasses provided a very good substrate for tortoise tracks; in fact, many tracks of other animals (rodents, birds, foxes, deer) were observed.

On all transects, all tortoise sign (tortoises, burrows, shells, scat, tracks, drinking depressions) observed was measured, mapped, and described relative to condition, age (Appendix D) and, if possible, gender; cover site locations were additionally described relative to location and associated sign. Tortoise location (e.g., aboveground, visible in burrow, not visible in burrow) was recorded. Shells and shell parts also were further evaluated relative to the cause of death, if possible, and whether each represented an entire individual. Current and recent weather conditions were recorded and the topography, drainage patterns, soils, substrates, plant cover, and aspect-dominant, common and occasional plant species described and mapped. All incidental sightings of common ravens (*Corvus corax*), other known tortoise predators, and other site features (e.g., anthropogenic influences) that could assist in the analysis of tortoise population impacts were recorded and mapped using a GPS unit. All transect data were recorded on specially-designed data forms and representative areas photographed.

To augment the focused plant survey, special-status plant species and invasive plant concentrations were recorded, if observed, during the desert tortoise survey as well as the focused plant survey.

3.6 Burrowing Owl

The most recent burrowing owl survey guidelines (CDFG 2012) were used to survey the Modified Linear Facilities. These require four field visits during the breeding season, where burrowing owl habitat exists. While no burrowing owls were observed in the vicinity of the Modified Linear Facilities during earlier surveys for PSPP (AECOM 2009b, 2010b), the Modified Linear Facilities offer suitable habitat. Accordingly, the entire Modified Linear Facilities were surveyed in 2013.

CDFW (M. Rodriguez 24 April 2013 e-mail to A. Karl) agreed that the first of the four required visits would be concurrent with the comprehensive wildlife and desert tortoise survey, conducted on 7 April. Transects were walked at 10 m intervals to locate burrowing owl burrows or other suitable burrows, and also observe individual owls, if present. The survey coverage is explained above, in the section on desert tortoise methods. The subsequent three surveys were conducted on 5 May, 25-26 May, and 26 June. These were walking surveys of the Modified Linear Facilities, with stop/scans at approximately 100 m intervals, conducted at the protocol-recommended morning and evening windows and weather. All birds detected were recorded (see Appendix D for sample data sheet). Since we had already walked the entire Modified Linear Corridor at 10 m intervals to find burrows (which is the purpose of the recommended 20 m intervals in the CDFW guidance) and the habitat is very open (<5-7% cover), CDFW agreed to transect widths of 40 m after the first survey. We ultimately walked narrower transects. On each survey day, a transect was walked in the center of the Linear

Corridor for both the modified gen-tie (120 ft [approximately 40 m] wide) and gas line (50 ft [approximately 20 m] wide). Buffer transects were spaced at 20 m intervals, out to 120 m from the Linear Corridor edges. One to two buffer transects were walked on each side of each Modified Linear Facility during each of the last three survey visits. Buffer transects were rotated among the visits and adjacent transects for each visit were generally not walked consecutively, in order to provide the maximum time for birds to fly into an area between transects, for optimum detection. For instance, if the buffer transects for a visit were 20 m east, 20 m west and 60 m west, first the Linear Corridor transect was walked, followed by the 60 m west, followed by the 20 m east, and then the 20 m west. Additionally, the survey of the gen-tie or gas line was rotated for the start time, so that each Linear Facility was surveyed in the morning and each in the evening. The weather was warm, calm, and clear on each visit. Dr. Alice Karl and Paul Frank, both very experienced with surveying and monitoring burrowing owls, conducted the surveys.

3.7 Other Special-Status Wildlife

Other special-status wildlife were specifically sought during desert tortoise surveys and recorded if observed during other surveys. The potential list of special-status species was provided to CEC on 25 March (Centerline 2013b). All observations of special-status wildlife species, their sign (e.g., scat, tracks, bones, feathers) and specialized habitats (e.g., water pooling areas) were mapped and recorded. Desert kit fox den complexes were mapped and described relative to age and size. An inventory was kept of all wildlife detected. All freeway underpasses and bridges in the buffer area of the Modified Linear Facilities that were not previously surveyed for PSPP were checked for bat sign.

4.0 SURVEY RESULTS

4.1 Vegetation

4.1.1 Vegetation Communities and Cover Types

Section 4.1.1 describes the vegetation communities that are present within Modified Project (Figure 4, Appendix B), consistent with documents for the Approved Project (AECOM 2009a, b and 2010a, b). Vegetation communities such as these are often used as a surrogate to describe a species habitat. However, habitat is far more than vegetation alone, especially the upper story vegetation typically used as a descriptor of desert habitats. When discussed in the context of wildlife and plants, habitat is best described by topography, substrates (coarse particle size, density and evenness), soils (texture and consistence) and drainage type, as well as vegetation (structure, dominant and common [i.e., important] species, cover, robustness). Section 4.2 provides a more fine-grained description of the mosaic of habitats on site.

Table 2 provides updated acreage for vegetation communities, as well as acreage for special-status species on the Modified Project.

4.1.1.1 Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)

Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance as defined by Sawyer, Keeler-Wolf and Evens [2009] and used by the CNDDB (CDFG 2010)

Table 3. Acreage of PSEGS and Compensable Habitats.

Project Element	Total Acreage	Vegetation (acres)						Species Impacts (acres)					
		Stabilized and Partially Stabilized Sand Dunes	Desert Dry Wash Woodland	Unvegetated Ephemeral Washes	Developed (I-10 and RBI)*	Sonoran Creosote Bush Scrub	TOTAL for Project Element	Mojave Fringe-toed Lizard			Desert Tortoise		
								Stabilized and Partially Stabilized Sand Dunes	Non-Dunes	*TOTAL*	Suitable Habitat outside Critical Habitat*	Critical Habitat only*	*TOTAL*
Direct Impacts													
Fenced Area (Solar Field and Common Area)	3793.5	186.90	192.30	161.30	0.00	3253.00	**3793.5**	186.8	1264.7	*1451.5*	3590.3	203.2	*3793.5*
Access Road	1.00	0.00	0.00	0.00	0.00	1.00	**1.0**	0.00	0.00	*0.00*	0.10	0.90	*1.00*
Gen-Tie (permitted plus modifications)	100.90	0.00	12.85	6.39	2.00	79.66	**100.9**	0.00	27.70	*27.70*	79.50	19.40	*98.90*
Gas Pipeline (50' corridor & 100's100' tap)	3.56	0.00	1.25	0.47	0.34	1.50	**3.6**	0.00	0.00	*0.00*	2.36	0.90	*3.26*
TOTAL	**3898.96**	**186.90**	**206.40**	**168.16**	**2.34**	**3335.16**	**3899.0**	**186.80**	**1292.40**	**1479.20**	**3672.26**	**224.40**	**3896.66**
Indirect Impacts													
161kv corridor through Project	11.70	0.00	0.03	0.04	0.00	11.63		0.00	0.00	*0.00*	8.00	3.70	*11.70*
Private parcel	39.70	0.00	0.00	0.47	0.00	39.23		0.00	39.70	*39.70*	39.70	0.00	*39.70*
TOTAL INDIRECT	**51.40**	**0**	**0.03**	**0.51**	**0**	**50.86**		**0**	**39.7**	**39.7**	**47.7**	**3.7**	**51.4**

* Most acreage inside the Cal Trans I-10 ROW is not considered suitable habitat; where DDWW occurs in the Cal Trans ROW, it has been included as both waters and tortoise habitat (although not suitable due to mortality potential).

characterizes large portions of both Linear Facilities (Appendix A: Photograph A-1). Along the Modified Linear Facilities, this vegetation community is dominated by creosote bush and ironwood; common understory shrubs are typically upland species because of the limited water availability, primarily white burr sage, but cheesebush, a wash-dependent colonizer, is sometimes present. Only one well-developed wash along the gen-tie, south of I-10, has other wash-dependent species: palo verde, desert lavender, catclaw acacia, chuckwalla bush, and white rhatany (*Krameria bicolor*).

4.1.1.2 Unvegetated Ephemeral Dry Wash

This vegetation community was used in the Approved Project to describe channels that had no to infrequent wash-dependent vegetation (AECOM 2009a). On the Modified Linear Facilities, the dominant shrub species in these channels are creosote bush, sometimes with white burr sage and occasional ironwood. The lack of vegetation is indicative of very low levels of available moisture. These channels are found throughout the sheet flow areas, and also intersect some of the desert pavement (see Section 4.1.1.3, below).

4.1.1.3 Sonoran Creosote Bush Scrub (Creosote Bush-White Burr Sage Scrub Alliance)

The remainder of the Modified Linear Facilities is within Sonoran Creosote Bush Scrub (Creosote Bush-White Burr Sage Scrub Alliance as defined by Sawyer, Keeler-Wolf and Evens [2009]). There, this vegetation community is dominated by creosote bush; white burr sage is co-dominant to sub-dominant. Within the vicinity of the Modified Linear Facilities, even typical upland vegetation is largely confined to channels (e.g., unvegetated ephemeral washes), including sheet flow, because most of the available water is in those channels due to the low regional rainfall and qualities of both substrate and soil. Within this plant community and along the Modified Linear Facilities are large patches of desert pavement where there are essentially no shrubs outside of water courses.

4.1.2 CNDDB Vegetation Communities of Special Concern

One CNDDB vegetation community (CNDDB 2010) that occurs on the Modified Linear Facilities is globally or state ranked as communities of special concern (G or S rank 1-3):

- Palo Verde-Ironwood Woodland Alliance – G4S3

CNDDB guidelines direct project proponents to determine if project-affected stands of these vegetation types represent high-quality occurrences of the given community to determine if there would be significant impacts to the vegetation type. The Palo Verde-Ironwood Woodland Alliance occurs in one segment of one wash on the Solar Plant Site and in several washes that cross the Linear Corridor. PSH expects that the Palo Verde-Ironwood Woodland Alliance will be compensated at 3:1 ratio.

4.2 Habitats

4.2.1 Modified Gen-Tie

Sheet flow dominates most of the gen-tie Linear Corridor north of I-10. There, it is characterized by a heterogeneous mixture of numerous shallow (a few centimeters deep), single-thread channels that are one-several meters wide (Appendix A: Photograph A-1). The more vegetated of these are arboreal washes that are often the result of coalescing smaller channels (Appendix

A: Photograph A-2). They have very limited wash-dependent vegetation due to the poor water availability, being dominated by creosote bush and ironwood trees, often with common to scattered white burr sage and cheesebush. Both trees and creosote are moderately robust, with the trees reaching 8 -10 m in height. The remainder and majority of the channels in the sheet flow have less vegetation and are frequently discontinuous. The most poorly vegetated have only a few, widely scattered shrubs, primarily upland species (creosote bush or white burr sage) (Appendix A: Photograph A-3). Percent shrub/tree cover is greatest in the more well-developed arboreal channels, about 7% (estimated visually), but decreases substantially, to about 2%, in the less vegetated channels. Soils are soft, slightly loamy coarse sand with a rilled, gravel substrate; fine and very fine gravels (90% total cover) comprises the substrates between rills.

Immediately south of I-10, a well-developed arboreal wash crosses the gen-tie corridor (Appendix A: Photograph A-4). This wash is approximately 5-7 m deep and 25 m wide. Wash-dependent vegetation is common, including ironwood, catclaw acacia, chuckwalla bush, cheesebush, desert lavendar, and belloperone; palo verde is present, but not a dominant tree species. Substrates comprise gravels over coarse sand, with scattered cobbles.

Immediately adjacent to I-10, between the freeway fence and the pavement, is an artificially developed swale created by the truncation of water flow from the bajada upslope of the freeway against the elevated berm of the freeway, plus the water runoff from the pavement itself. Large palo verde are variously scattered to abundant in this sandy swale; cheesebush and creosote bush are the other dominant species.

Near I-10, both to the south and north, the bajada is characterized by well-developed (i.e, highly consolidated and oxidized), gravel desert pavement (Appendix A: Photograph A-5). Shrub vegetation is very sparse, and largely confined to narrow (channel floors approximately 1 m wide), incised (1-1.5 m deep), sandy channels. Most of the shrub species are upland species, largely creosote bush, with occasional, scrubby ironwood, 2-3 m tall.

In the buffer transects east and west of the Linear Corridor (see Section 4.1, below), the habitat is similar to that on the Linear Corridor, although there are more and higher-quality washes west of the gen-tie. The major difference is south of the freeway, where the 600 m buffer transect intersects rolling foothills with boulders and incised channels. Less distinct is the minor change in the eastern buffer area, where the sheet flow diminishes somewhat and there are scattered, discrete, arboreal washes and, near the freeway, relatively broad (to 40 m) washes incised to 4-6 m.

4.2.2 Natural Gas Pipeline

The habitat along the natural gas pipeline corridor south of I-10 is mostly the well-developed desert pavement habitat described for the gen-tie. There is some well-developed arboreal sheeting in both the southern and northern ends. North of I-10, both the desert pavement and the sheeting continues, but because this area has been completely severed from the upslope sheeting on the south side of the freeway, it is highly degraded and has very minor flow, limited to whatever precipitation falls north of the freeway. Historic sheet flow is evident by the very rilled gravel substrates, but shrubs (creosote bush) are very sparse. In the few shallow washes, most of the ironwood are dead or partially dead (Appendix A: Photo A-6). The buffer is similar to the pipeline corridor.

4.3 Special-Status Plants

No special-status plant species were observed. Nor were any special-status plants observed in the vicinity of the Modified Linear Facilities by earlier PSPP surveys (Appendix B; AECOM 2009c, 2010b). However, the potential remains for several species that may have sporadic germination, are small or have obscure growth habits, or grow during other seasons. Those are noted in Table 1.

4.4 CDNPA Species

Six species protected by the CDNPA (Table 4) grow on the Modified Linear Facilities. Ironwood (*Olneya tesota*) is the most common tree, which is consistent with the quantity of microphyll woodland and sheet washing mapped during the vegetation and State Waters surveys. Pencil cholla (*Cylindopuntia ramosissima*) and silver cholla (*C. echinocarpa*) are both fairly common, with the highest number understandably on the longest portion of Linear Corridor, the gen-tie north of I-10. Fishhook cactus *(Mammillaria tetrancistra*) is scarce, but present. This small cactus species is typically infrequent, where present, and often obscured under shrubs. By contrast, cottontop, hedgehog, and barrel cacti, the species required by BLM to be surveyed on the Approved Project, are large, easily seen plants; none grow on the Modified Linear facilities.

Table 4. CDNPA Species found during Spring 2013 Surveys on the Modified Linear Facilities

Location within Survey Area	CDNPA-Protected Species					
	Pencil Cholla	**Silver Cholla**	**Fishhook Cactus**	**Ironwood**	**Palo Verde**	**Catclaw Acacia**
Gen-tie Corridor:						
East-West Portion North of I-10	1	0	0	2	0	0
North-South Portion North of I-10	25	16	2	60	2	2
South of I-10	0	0	0	12	0	0
Gas Pipeline Corridor	1	1	3	17	0	0
Total	**27**	**17**	**5**	**91**	**2**	**2**

4.5 Invasive Plant Species

Despite the anthropogenically altered habitats on and near the Modified Linear Facilities, and the dynamic nature of microphyll wash woodland, no concentrations of invasive species were observed to grow on the Modified Linear Facilities, nor were any invasive species abundant except for the common and pervasive annual, Mediterranean grass (*Schismus barbatus*). Sahara mustard (*Brassica tournefortii*) was present, but infrequent; no other exotic weed species were observed. AECOM did not describe any concentrations of weeds on the original PSPP gen-tie, although did state that “three invasive plant species, Russian thistle,

Mediterranean grass, and Saharan mustard, are prevalent throughout the Sonoran creosote bush scrub, especially across the southern half of the BRSA" (AECOM 2009b:45). The BRSA, or Biological Resources Study Area, completely overlapped the location of the current gas pipeline Linear Corridor. However, we did not observe any Russian thistle, nor was Sahara mustard prevalent on the gas pipeline Linear Corridor. In the botanical survey for PSPP, AECOM also noted that tamarisk (*Tamarix aphylla*) was interspersed throughout the desert dry wash woodland (AECOM 2009c:14); however, we observed no tamarisk on the Modified Linear Facilities.

4.6 State Jurisdictional Waters

A total of 13.88 acres of State Waters was delineated on the PSEGS Modified Linear Facilities (Table 2). Maps of the State Waters are provided in Figure 5. Appendix C provides the original data sheets for the State Waters assessment.

DDWW and Unvegetated Ephemeral Washes totaled 7.44 and 6.44 acres, respectively, which is 4.44 and 6.44 acres, respectively, more than the original estimate provided in the response to CEC Data Request 5 (Centerline 2013a). These increases were due to the more recent recognition of hydrological conditions and stream processes that are specific to the arid southwest and important for wildlife values.

4.7 Desert Tortoise

No live tortoises were found on the Linear Facilities routes or buffer transects (Tables 5 and 6, Figure 6). Sign of recent tortoise occupation included two burrows on the gen-tie buffer, south of I-10, and one questionable burrow in the buffer north of the freeway. Otherwise, all remaining sign were older, and included one burrow in the gen-tie buffer and two sets of shell fragments, each comprising only one or a few plates. All of the sign represented adult tortoises except one set of shell fragments, which was part of a mid-sized immature tortoise.

The FWS (2010) protocols do not provide a method for estimating tortoise density when no tortoises are observed. Presence is verified by tortoise sign, although current occupation cannot be verified except by the presence of sign that indicates current use. For the Modified Linear Facilities, there was sufficient recent sign in the buffers to substantiate tortoise use of this portion of the Project, which is not surprising since both facilities travel through fairly low quality tortoise habitat. Data from the Approved Project (AECOM 2009b and 2010b) and the adjacent Desert Sunlight project, for both their 2008-2010 surveys (Ironwood Consulting, Inc., 2010) and recent construction monitoring (Ironwood Consulting, Inc., 2013; K. Stein, pers. comm. to A. Karl) also confirm that there are tortoises in the vicinity of the gen-tie (Figures 7 and 8).

Table 5. All Special-Status Species Sign Observed on the Modified Linear Facilities, Spring 2013.

Individual sign corresponds to the map number on Figure 6.

Modified Project Element	Map # Corresponding to Figure 6	Species	Element Part	Sign Type	Date	Class (Condition or Age) and Size, as Appropriate	Comments
Modified Gen-Tie							
	1	Desert Tortoise	Buffer 600W, north of I-10	Burrow	7 April	Class 5; ~340 mm	Collapsed
	2	Desert Tortoise	Buffer 200E, north of I-10	Burrow	7 April	Class 4; 380 mm	In sandy, silty wash bank; old, but good size and shape.
	3	Desert Tortoise	Linear Corridor	Shell parts	7 April	>4 years; adult	Probably old female (very thin); 3-4 fragmented marginals and other plates
	4	Desert Tortoise	Buffer 200W, south of I-10	Burrow	24 April	Class 2/3; ~350 mm	Caliche burrow in side of large (5-6 m deep) wash, with TY2 adult (19-21mm wide) scat on mound and inside. Burrow has stick gates for construction monitoring.
	5	Desert Tortoise	Buffer 200W, south of I-10	Burrow	24 April	Class2/3; 630 mm	Caliche burrow in same wash as burrow above, ~20 m away. Cavern is very open inside and >2 m deep; scat.
	7	Burrowing owl	Buffer 400E, north of I-10	Individual	7 April		1 bird in large wash, adult, flew. Searched for coversite – none.
	8	Burro deer	Buffer 400E, north of I-10	Scat	7 April	TY2	Near the large wash that goes under wash in cement culvert.
	9	Burro deer	Buffer 600E, south of I-10	Scat	7 April	TY2	In wash next to freeway.
	12	Loggerhead Shrike	200 ft southwest of Linear Corridor, north of I-10	Individuals	5 May	---	Juvenile begging to adult
	13	Loggerhead Shrike	300 ft northeast of Linear Corridor, north of I-10	Individual	5 May	---	Adult perched on *Olneya*
	14	Loggerhead Shrike	300 ft east of Linear Corridor, north of I-10	Individual	5 May	---	Adult
	15	Loggerhead Shrike	180 ft west of Linear Corridor,	Individuals	5 May	---	Two adults, perched

Modified Project Element	Map # Corresponding to Figure 6	Species	Element Part	Sign Type	Date	Class (Condition or Age) and Size, as Appropriate	Comments
			north of I-10				
Natural Gas Pipeline							
	6	Desert Tortoise	Buffer 400E, north of I-10	Shell parts	29 April	>4 years; Carapace length ~140-160 mm	Right anal plate. In pack rat midden.
	10	Burro Deer	Buffer 200E, south of I-10	Tracks	7 April	Fresh	
	11	Burrowing Owl	Buffer 120E, north of I-10	Individual	25 May	Adult	Owl flew from a stationary point. A search was made for a coversite, but none was found with sign. Possible burrow at 0665067E 3727684N, but no sign.

Table 6. Summary of Desert Tortoise Sign Observed on the Modified Linear Facilities in Spring 2013.

Sign Type	Number of Observations				
	Gen-tie	Gen-tie Buffer	Natural Gas Pipeline	Natural Gas Pipeline Buffer	Total
Individual	0	0	0	0	0
Burrow - Recent	0	2	0	0	2
Burrow – Not Recent	0	1	0	0	1
Potential Burrow	0	1	0	0	1
Scat (not associated with burrow)	0	0	0	0	0
Shell Fragments < 4 years old	0	0	0	0	0
Shell Fragments > 4 years old	1	0	0	1	2

For the Approved Project, no live tortoises were observed within the PSPP boundaries. FWS used tortoises found in the buffer transects of the gen-tie (i.e., the Action Area) to estimate tortoise density for the Project and estimated that two subadult or adult tortoises occupy the Project (FWS 2011a:18). They further used regional estimates to extrapolate to the Project and concluded that 2-12 adult tortoises may occupy the site. They used these estimates to further estimate the number of juvenile tortoises and eggs. The current data from the 2013 surveys of the Modified Linear Facilities do not provide any information that would alter this analysis.

Carcasses are sometimes used to evaluate past tortoise density, although this is very difficult for shells that are over about four years in age. It is simply too difficult to age those shells accurately. Furthermore, shells are transported by scavengers, predators, and water flow. For example, one of the shell fragments observed was found in a woodrat (*Neotoma lepida*) nest. But, it can be reasonably concluded that at least one additional adult, probably a female, occupied the vicinity of the modified gen-tie and one immature tortoise occupied the vicinity of the gas line more than four years ago. Neither ravens nor coyotes (Canis latrans) ravens, both desert tortoise predators and often exhibiting increases in response to human activity, are common at the site. No ravens were observed, although their tracks were seen in the washes. Coyote scat and digs were rare.

Three freeway underpasses were present within the desert tortoise Survey Area, all in the buffer of the modified gen-tie (Figure 3):

1. Location: approximately 0.5 miles east of the gen-tie, 0656284E. This underpass is a cement span bridge over a natural arboreal wash, augmented by the re-direction of

additional upstream flows, and approximately 50 ft wide. The floor is coarse sand and gravels. Dominant wash-dependent species include cheesebush, chuckwalla bush and belloperone. The span is supported by cement pillars and has smooth cement walls.

2. Location: just east of the gen-tie, 0656095E. This underpass is entirely a smooth-walled, cement box culvert (see Appendix A: Photograph A-7). On either end is a well-developed arboreal wash with a sandy floor, incised to approximately 25 ft.

3. Location: approximately 0.25 miles west of the gen-tie, 0655639E. This underpass is a cement span bridge over a natural arboreal and shrub wash, approximately 50 ft wide, augmented by the re-direction of additional upstream flows (see Appendix A: Photograph A-8). The floor is coarse sand. Dominant wash-dependent species include cheesebush, chuckwalla bush, belloperone and palo verde. The span is supported by cement pillars and has smooth cement walls.

4.7.1 Disturbance Acreage

The Modified Linear Facilities overlay 22.2 acres, all of which is considered to be desert tortoise habitat except for the portions that span I-10 and are in the RGS (Table 7). The gen-tie comprises 18.9 acres, but because surface disturbance would only occur on the tower pads, pulling sites, and access or stub roads, as well as the burial trench for the telecommunications line, the amount of surface disturbance would be less than the 18.9 acres. At this time, however, the pads are not engineered, so the actual acreage of disturbance will be assumed to be 18.9 acres, of which some much smaller percentage will comprise a permanent loss of habitat (roads, towers). Both the tower pads around the actual towers and the gas line acreage are considered to be “permanent” for purposes of habitat compensation calculations, even though these areas would be restored and available for tortoise use following construction. Due to long vegetation recovery times in the desert, any areas that are similarly disturbed are actually semi-permanent relative to habitat quality and therefore are considered to be permanently impacted for the purposes of habitat compensation.

Only the gen-tie overlaps a DWMA, intersecting the northern edge of the Chuckwalla DWMA between I-10 and the RBS. The remainder of the gen-tie and the entire gas line is in Category III habitat. Both Modified Linear Facilities partially intersect the Chuckwalla Critical Habitat Unit (CHU). Critical habitat overlaps part of the east-west portion and all of the north-south portion of the modified gen-tie; it overlaps the gas line only south of I-10, near the existing SoCal Gas line. Acreages of overlap with DWMA and the CHU are shown in Table 7. Where applicable, acreage for the gen-tie that was already accounted for in the Approved Project has been subtracted the Modified Project acreage in Table 7. Developed acreage has also been accounted for in the calculation.

Table 7. Estimated Acres of Desert Tortoise Habitat Disturbed for the Modified Linear Facilities. (Source: BrightSource Energy, Inc.)

Location and Habitat Type	Total Modified Project	Phase 1	Phase 2	Total Approved Project from Point of Modification to Terminus[2]	Total Modified Project Minus Approved Project
Modified Gen-Tie[1]					
Total	18.9	18.9	0.0	17.0	1.9
Critical Habitat					
Total	*18.1*	*18.1*	*0.0*	*17.0*	*1.1*
Developed[3]	*2.0*	*NA*	*NA*	*4.0*	*2.0*
Balance (Undeveloped)	16.1	16.1	0.0	13.0	3.1
Outside Critical Habitat	0.8	0.8	0.0	0	0.8
DWMA					
Total	3.6	3.6	0.0	4.3	*-0.7*
Developed[3]	*1.4*	*NA*	*NA*	*3.5*	*-2.0*
Balance (Undeveloped)	2.2	2.2	0.0	0.8	1.4
Outside DWMA	15.3	15.3	0.0	12.7	2.6
Gas Pipeline					
Total	3.6	0.0	3.6	0	3.6
Critical Habitat	0.9	0.0	0.9	0	0.9
Outside Critical Habitat					
Total	*2.7*	*0.0*	*2.7*	*0*	*2.7*
Developed[4]	*0.34*	*0.0*	*NA*	*0*	*0.34*
Balance (Undeveloped)	2.26	*0.0*	2.26	0	2.36
DWMA	0.0	0.0	0.0	0	0.0
Outside DWMA	3.6	0.0	3.6	0	3.6

1. Because the modified gen-tie was moved 1128 ft west, where it parallels the original gen-tie route, most of the acreage was already accounted for in the original Biological Opinion (BO), with the additional acreage only in the east-west portion, plus a small amount south of I-10. The permitted gen-tie intersected critical habitat for the entire north-south portion and the DWMA south of I-10.
2. This column is shown for easy comparison with the route of the Modified Project. For the gen-tie, the termination is to the original RBS endpoint. There was no permitted gas pipeline.
3. In RBS and I-10
4. Under I-10

4.7.2 Desert Tortoise Compensation

To fully mitigate for habitat loss and potential take of desert tortoise, PSH will provide compensatory mitigation at a 5:1 ratio for all acreage in critical habitat on the Modified Linear

Facilities and 1:1 ratio for impacts to all Category 3 desert tortoise habitat, in accordance with the NECO Plan (Table 8). A ratio of 5:1 is also required by the NECO Plan for impacts to all desert tortoise habitat in a DWMA; however, all of the DWMA acreage for the Modified Linear Facilities is contained in critical habitat acreage.

Table 8. Compensation Acreage for Desert Tortoise Habitat Disturbed for the Modified Linear Facilities.

Location and Habitat Type	Phase 1	Phase 2	Compensation Ratio	Total
Modified Gen-Tie[1]				
Total	3.9	---	---	---
Critical Habitat	3.1	0.0	5:1	15.5
Outside Critical Habitat	0.8	0.0	1:1	0.8
Gas Pipeline				
Total	---	3.3	---	---
Critical Habitat	0.0	0.9	5:1	4.5
Outside Critical Habitat	0.0	2.4	1:1	2.4
Total				**23.2**

1. See Table 1 for adjustments based on acreage already accounted for the Approved Project.

4.7.3 Summary and Conclusion

The Spring 2013 surveys on the Modified Linear Facilities do not provide information that would alter the tortoise density estimated for the Approved Project. Nor are the impacts to critical habitat substantially changed, although 4.0 acres more are affected (Table 7). Because of the low estimated density, the proposed take of desert tortoise is expected to be low, and is not likely to have a biologically significant impact on the species or the local population or the species.

4.8 Burrowing Owl

Two burrowing owls were observed, both on buffer transects; no owls or their sign were observed in the Linear Corridors. One adult burrowing owl was observed on the 400 m buffer transect east of the gen-tie, north of I-10, on 7 April. The owl flew from a stationary point. No burrow was found, despite a search. On 25 May, a burrowing owl was observed 120 m east of the gas line, north of I-10. The owl flew from a stationary point. A search was made for the burrow, but none was found. Recent construction monitoring of the Desert Sunlight gen-tie, immediately adjacent to the PSEGS modified gen-tie also observed no burrowing owls (Figure 8). Nor did surveys for PSPP, conducted in 2009 and 2010, observe burrowing owls in the area of the Modified Linear Facilities (AECOM 2009b, 2010b). Despite this lack of observations of burrowing owls, the Modified Linear Facilities are burrowing owl habitat.

4.9 Other Wildlife

Both scat and tracks of burro deer were observed in arboreal washes east of the modified gen-tie, adjacent to the freeway (Table 5, Figure 6). One set of deer tracks was also observed in the buffer for the gas pipeline, south of the freeway. Several loggerhead shrikes, including young

birds of the year, were observed near the northern end of the modified gen-tie during focused burrowing owl surveys.

No other special-status species or specialized habitats occur on or in the indirect effect area of the Modified Linear Facilities.

4.9.1 Couch's Spadefoot Toad

There were no locations where water pools that could support Couch's spadefoot breeding. Nor are there any natural or artificial water sources within 0.25 miles of the Modified Linear Facilities. CEC Staff determined that there was no potential for Couch's breeding on the Approved Project, which included the original gen-tie, and the species was not expected (CEC 2010b:C.2-48).

4.9.2 Prairie Falcon and Golden Eagle Eyries

No prairie falcon or golden eagle eyries were observed within 0.25 miles of the Modified Linear Facilities.

4.9.3 Kit Fox

No dens of kit fox were observed. However, other kit fox sign was observed, so they would be expected in the vicinity of the Modified Linear Facilities.

4.9.4 Bats

Three freeway underpasses within one mile of the modified gen-tie were inspected for bats, accumulations of insect carcasses, and bat guano (Figure 3); the underpasses in the vicinity of the gas line had been previously surveyed for PSPP (AECOM 2010c) and were not resurveyed. Only two of the three underpasses had marginal habitat, where washes had been directed under the freeway. However, the slick concrete walls and pillars provided only marginal to negligible roosting opportunities. The third underpass was a completely boxed-in cement culvert. Not surprisingly, no bat sign was seen in any of these underpasses. A fourth underpass, approximately 0.7 miles west of the modified gen-tie was not surveyed. However, its construction properties are assumed to be the same as the bridges inspected, since this is the common underpass construction in this area. Dr. William Rainey, one of the bat biologists who conducted the bat acoustic survey for PSEGS (Brown and Rainey 2013), stated that the smooth concrete walls of these bridges offered negligible roosting surfaces; he did not expect bats in these structures (W. Rainey, pers. comm. to A. Karl).

In the Project Vicinity, roosting habitat is abundant for ground-roosting species, of which pallid bat is the only special-status ground-roosting species that may occur at the site. Diurnal roosts, including maternity colonies, are hidden in crevices in rocks, trees (e.g., dead ironwood) or holes in the ground. Further, pallid bats do not hibernate, but have reduced activity during the winter months. It is likely that they simply move deeper into their normal roosting burrows or rock crevices. Consequently, there is no systematic way to identify a pallid bat overwintering site. The other potential special-status species that may currently forage over the site all roost or hibernate (for those that hibernate) in rocks, mines and/or structures, so would only commute to the site from the nearby mountains or structures. (See Brown and Rainey [2013] for a thorough discussion of possible bat species at the site and natural history.)

5.0 EFFECTS OF THE MODIFIED PROJECT ON SPECIAL-STATUS PLANTS AND WILDLIFE

This section discusses the potential direct and indirect effects on the special-status biological resources that could result from the Modified Project activities in the absence of Project conservation measures described in the PSEGS *Supplement No. 1* (PSH 2013), PSEGS Draft Biological Assessment (Centerline 2013c) and in the PSPP Biological Opinion (FWS 2011a). By implementing these conservation measures, including habitat compensation, the Modified Project effects would be successfully avoided, minimized, and mitigated.

5.1 General Effects on Plants and Wildlife

The Modified Project will result in fewer direct and indirect effects to desert tortoises, wildlife and plant species. The reduction in the footprint will decrease the direct loss of habitat on the Solar Plant by 572 acres. The reduction in the number and sizes of the evaporation ponds will provide less attraction to ravens, which prey not only on desert tortoises, but on other small animals. Neither the concave trough mirrors nor heliostats provide suitable perching sites for ravens. Attraction of coyotes to the area will not change from the Approved Project. A reduction in indirect effects to plants and wildlife and direct effects to State Waters will result because the current hydrology will be largely preserved, rather than re-routed as for the Approved Project, so offsite habitats will generally remain unaffected by the Modified Project. Indirect effects to offsite plants may also be lessened because of the preservation of some substrates and vegetation onsite, with the resulting effect of decreased dust deposition offsite.

Leaving vegetation onsite will encourage small mammals, lizards, and birds to continue the use of the site, even though uses may change through time depending on vegetation height and project activities. Many of these species will have full access through the chain link fence to populations outside, so the site will not be an isolated island, but instead will permit populations to be less affected by the presence of the project. This is also true of plant species, which will be connected to outside populations via largely intact hydrology, mobile vectors (e.g., birds and insects), and wind dispersal.

However, periodic mowing and mirror washing or other maintenance is likely to result in disturbance and some losses of primarily above-ground vertebrates, although nesting birds can be avoided by mowing outside the nesting season. Small birds that use the project site for nesting may be more prone to depredation because of higher visibility in the mowed field. Some behavioral issues may also be associated, such as nest abandonment and failure, due to the modified shrub conditions. The Project Bird and Bat Conservation Plan (BBCS) will address such effects through monitoring, protective measures, and adaptive management. Continual mowing also has the potential to exacerbate existing weed populations, but the degree to which this might occur is unknown. The draft weed management plan has been modified to accommodate weed monitoring related to ongoing mowing and heliostat washing activities, as well as to the preservation of the site's hydrology.

5.2 Groundwater-Dependent Vegetation

The Modified Project will result in a substantial reduction in water use both during construction (from 5,750 acre feet to 1,130 acre-feet) and during operation (from 300 acre feet per year [

AFY] to 201 AFY). Accordingly, the Approved Project's analyses of water use are vastly overly conservative for the Modified Project.

5.3 Desert Tortoise

Differences in acreage of desert tortoise habitat that are attributable to the Modified Linears are identified in Table 2. As with the Approved Project, all tortoises will be translocated from the fenced solar fields and common area; the 161 kV "channel" also will be fenced to preclude trapping tortoises. Accordingly, continued maintenance inside the facility will not harm tortoises. The existing desert tortoise translocation plan and raven monitoring plan will not require changes to accommodate the Modified Project. There are no other direct effects due to the Modified Project that were not already addressed in the original BO.

There will be no biologically significant changes in impacts to designated critical habitat. While the common area for the Modified Project is sited in critical habitat, the Approved Project also had designed full surface disturbance for this portion of the site that overlaps critical habitat. However, 4.0 additional acres will be disturbed near the freeway. The BO for the Approved Project stated, "Therefore, while the habitat in this area may be considered low quality for some PCEs, the general area is occupied (based on the presence of sign) by a low density population and provides a vital role and function of the critical habitat designation, as reflected in the PCE for maintaining inter-DWMA population connectivity espoused in the species' recovery plan (Service 1994a)." Since the BO for the Approved Project was issued, FWS determined priority connectivity corridors for desert tortoise in solar energy development zones (FWS 2012). None was identified in the Project vicinity. However, this is only a view of connectivity in light of solar development, not of the importance of connectivity for population viability in the absence of solar development, some of which is uncertain. That said, the type of disturbance resulting from the Modified Linear Facilities will not disrupt connectivity, especially given the existing and ongoing projects in the immediate vicinity of the Modified Linear Facilities.

5.4 Migratory Birds, Raptors and Golden Eagles

PSH's response to CEC Data Request 5 (Centerline 2013a) provided an initial analysis of potential effects to avian species from the change in technology for the Modified Project. Intensive avian surveys are ongoing to provide baseline data for development of a BBCS, which will include monitoring, protective measures, and adaptive management components to address Project effects on avian species.

5.5 Kit Fox and American Badger

The reduced footprint will result in the avoidance of several kit fox burrows and den complexes observed on the project during 2010 surveys (Figure DR 5-6). The Modified Project presents no impacts, either direct or indirect, that have not been previously analyzed for the Approved Project. An American Badger and Desert Kit Fox Mitigation and Monitoring Plan will be developed to minimize impacts to these species.

5.6 Bats

The Approved Project was authorized to be completely bladed, such that there would be no habitat left onsite. The Modified Project primarily will be mowed low, to the point that there will

be no foraging habitat remaining. Because roosting, and not foraging, habitat is limited, the roosting habitat that remains will be so compromised by the lack of foraging potential that use for roosting purposes will very likely be highly diminished. Functionally, there will be no differences for site use between the projects.

Because foraging will be limited, it is anticipated that so will bat use of the Project site. Nonetheless, the BBCS will address Project effects on bat species. Bat surveys for the site are currently ongoing to provide baseline, pre-construction data for the BBCS.

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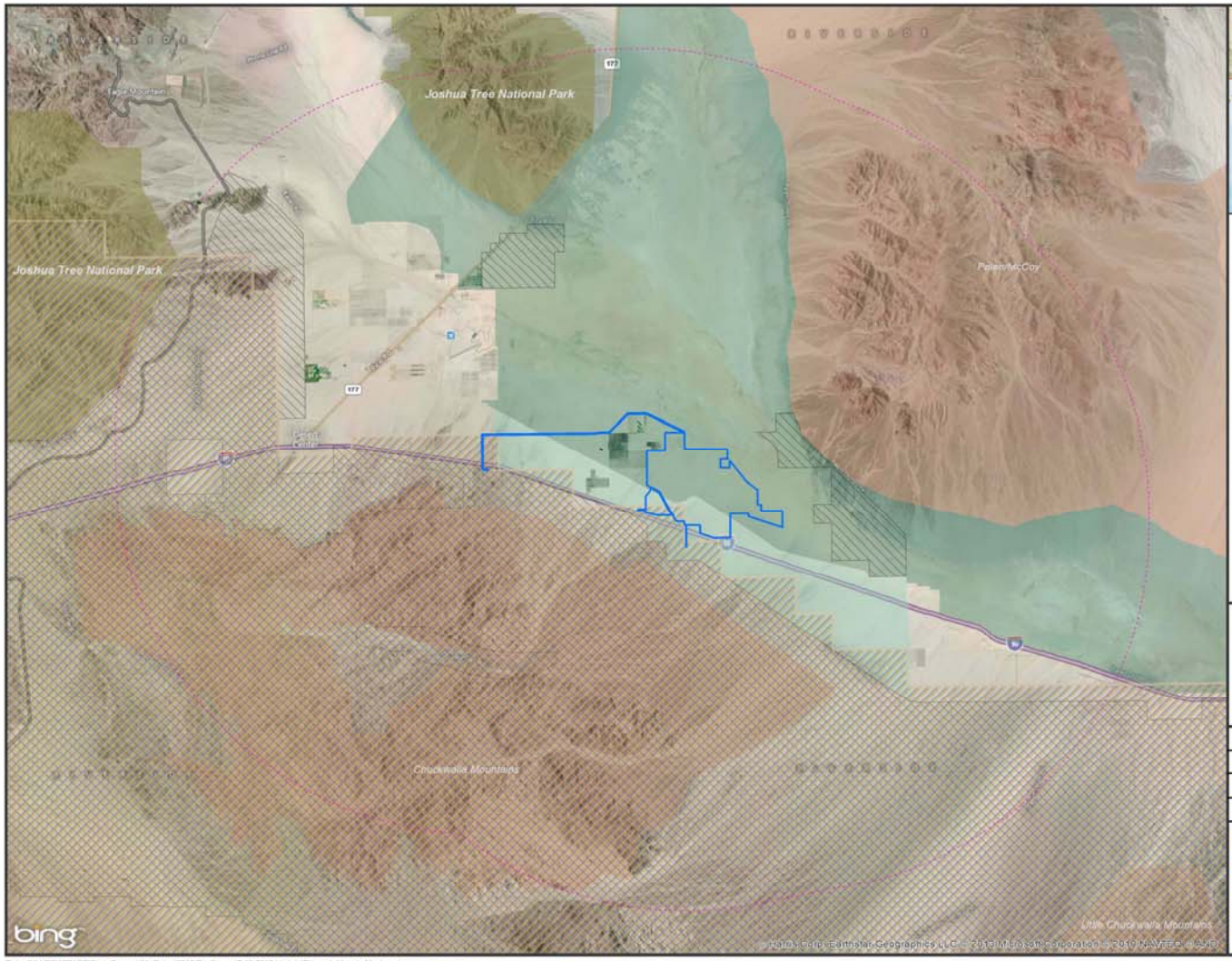
FIGURES



Palen Solar Electric Generating System Project Location

Legend

- PSEGS Site Boundary & Linears
- 10-Mile Project Buffer

Special Management Areas

- USFWS Desert Tortoise Critical Habitat
- ACEC or DWMA
- Proposed WHMA
- Proposed WHMA (DWMA Continuity)
- Wilderness Area
- National Park

N W E S

Scale: 1:165,000

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Scale correct when printed at 11x17
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Project:	PSEGS	
Date:	Jul 21, 2013	Figure No:
Revision:	A	1
Prepared By:	NS	

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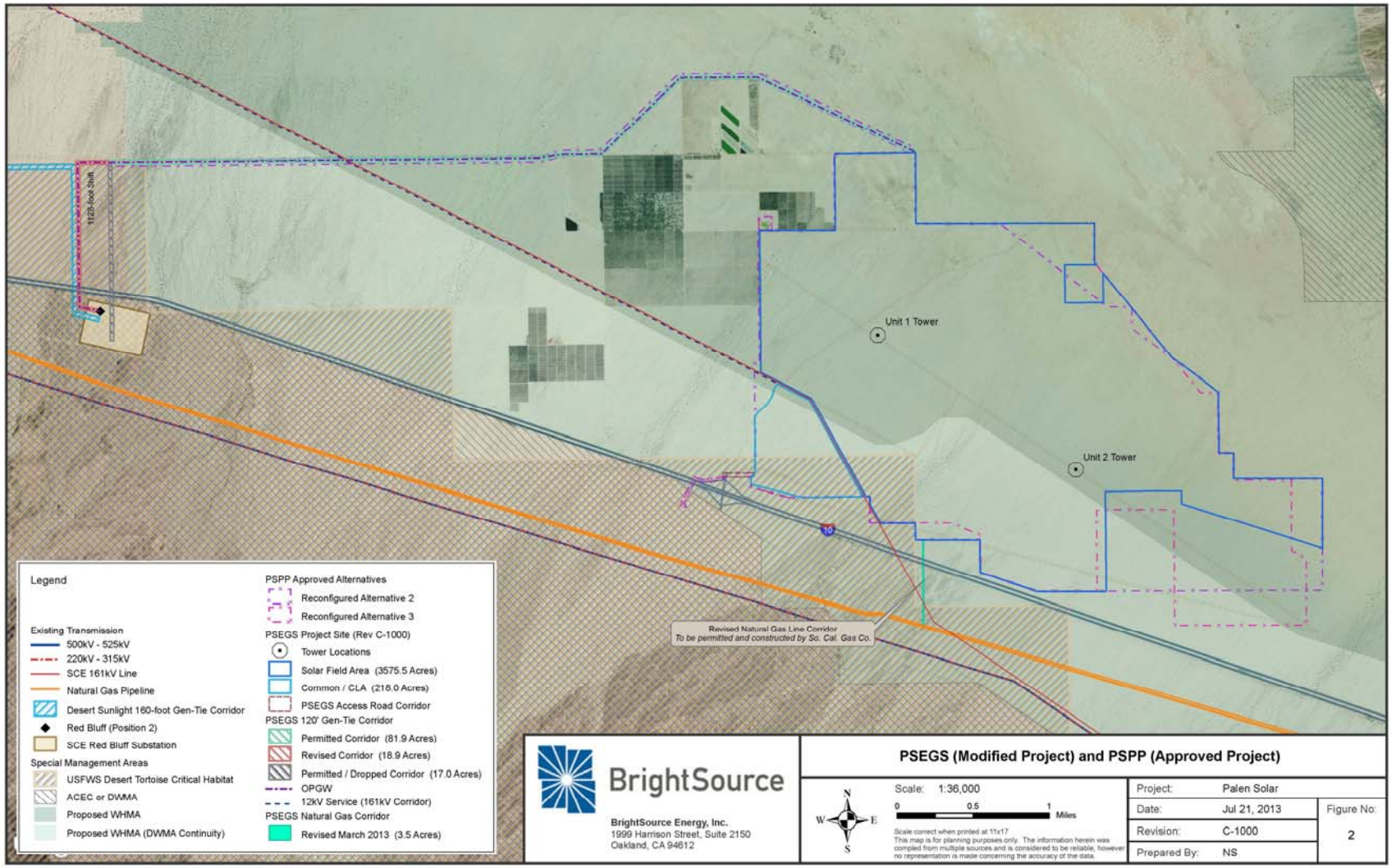

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PSEGS (Modified Project) and PSPP (Approved Project)

N W E S

Scale: 1:36,000

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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 2

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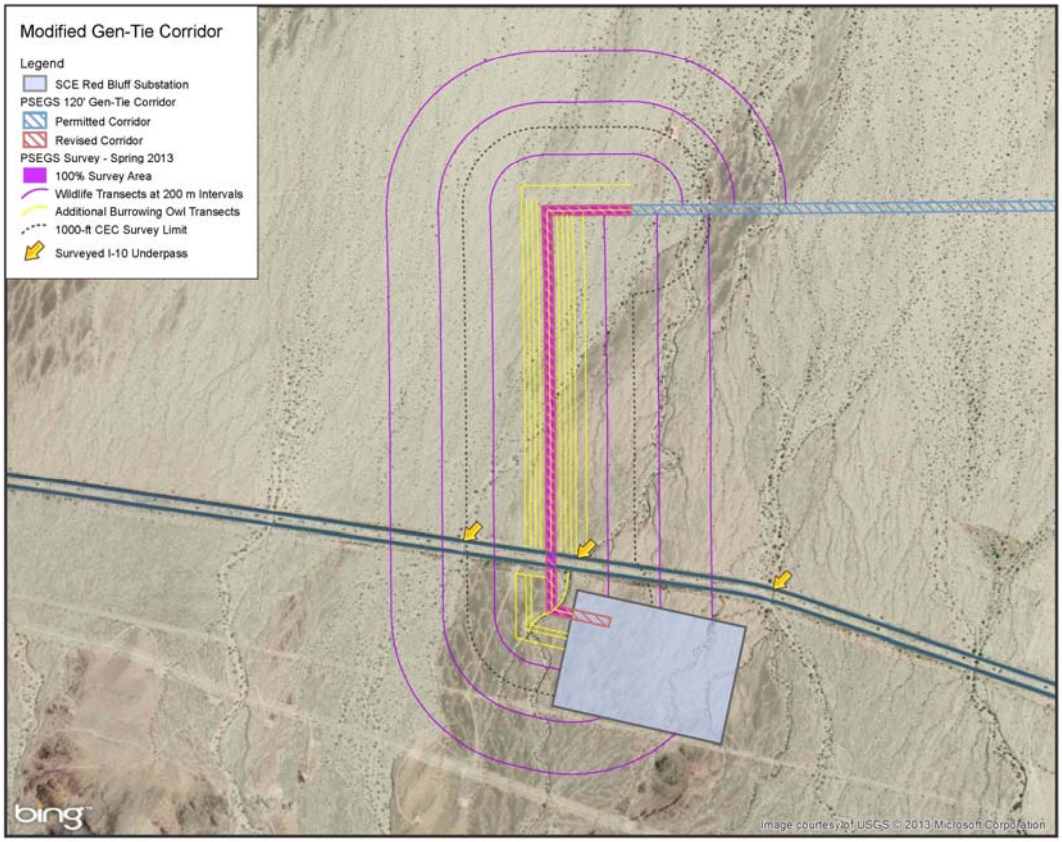

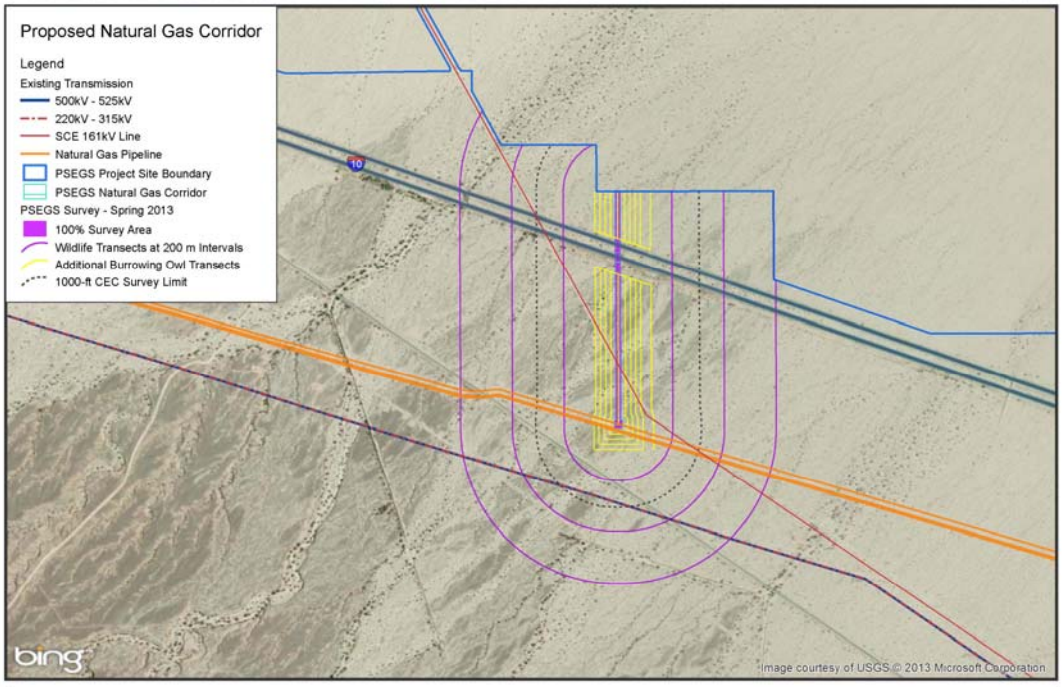

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Survey Area for the PSEGS Modified Linear Facilities, Spring 2013

Scale: 1:16,000

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Scale correct when printed at 11x17
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Project:	PSEGS	
Date:	Jul 19, 2013	Figure No:
Revision:	C-1000 nds	3
Prepared By:	NS	

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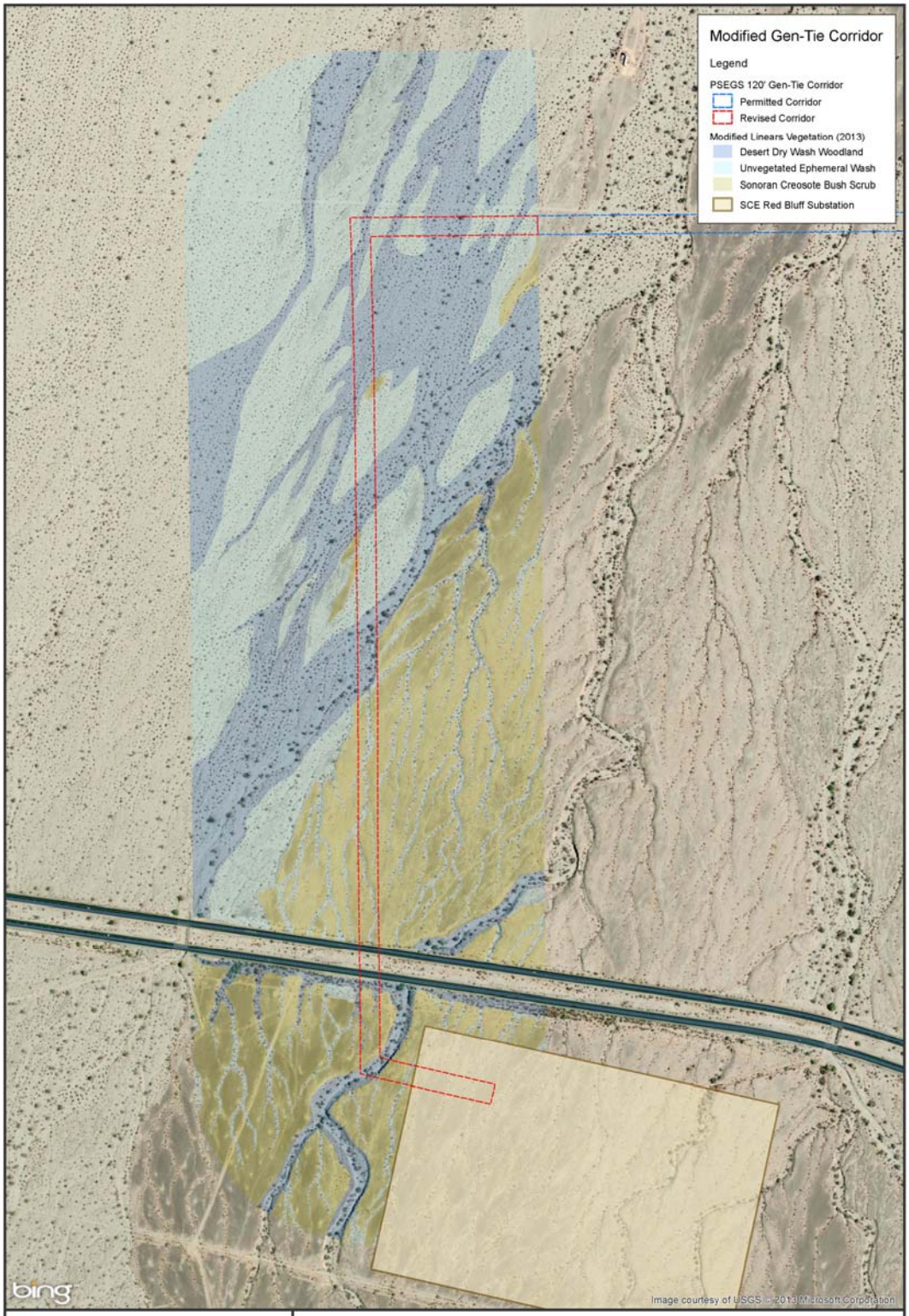

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Vegetation Communities on the PSEGS Modified Linear Facilities

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Project:	PSEGS
Date:	Jul 22, 2013
Revision:	C-1000 nds
Prepared By:	NS

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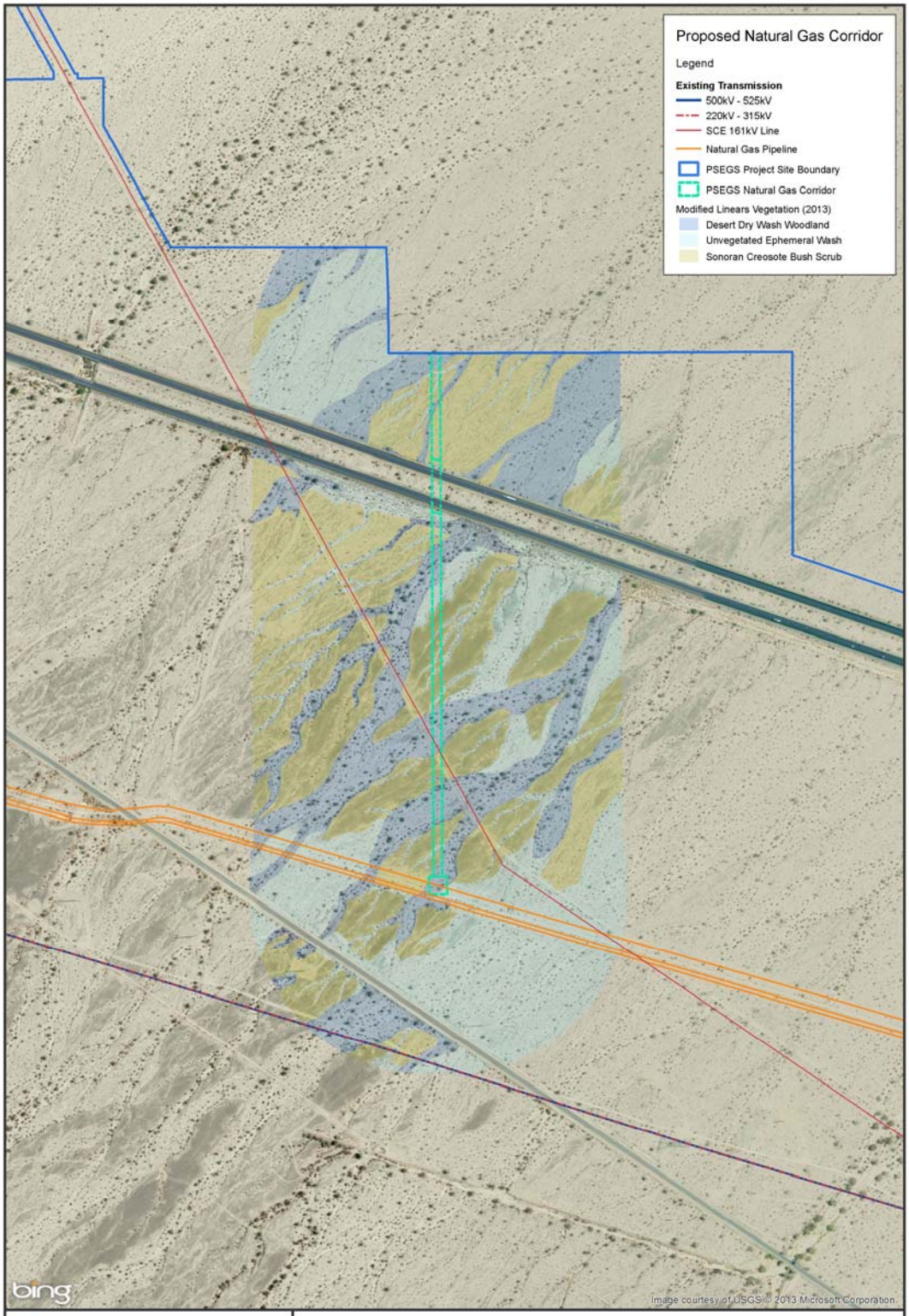

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Vegetation Communities on the PSEGS Modified Linear Facilities

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Project:	PSEGS
Date:	Jul 22, 2013
Revision:	C-1000 nds
Prepared By:	NS

Figure No: 4.2

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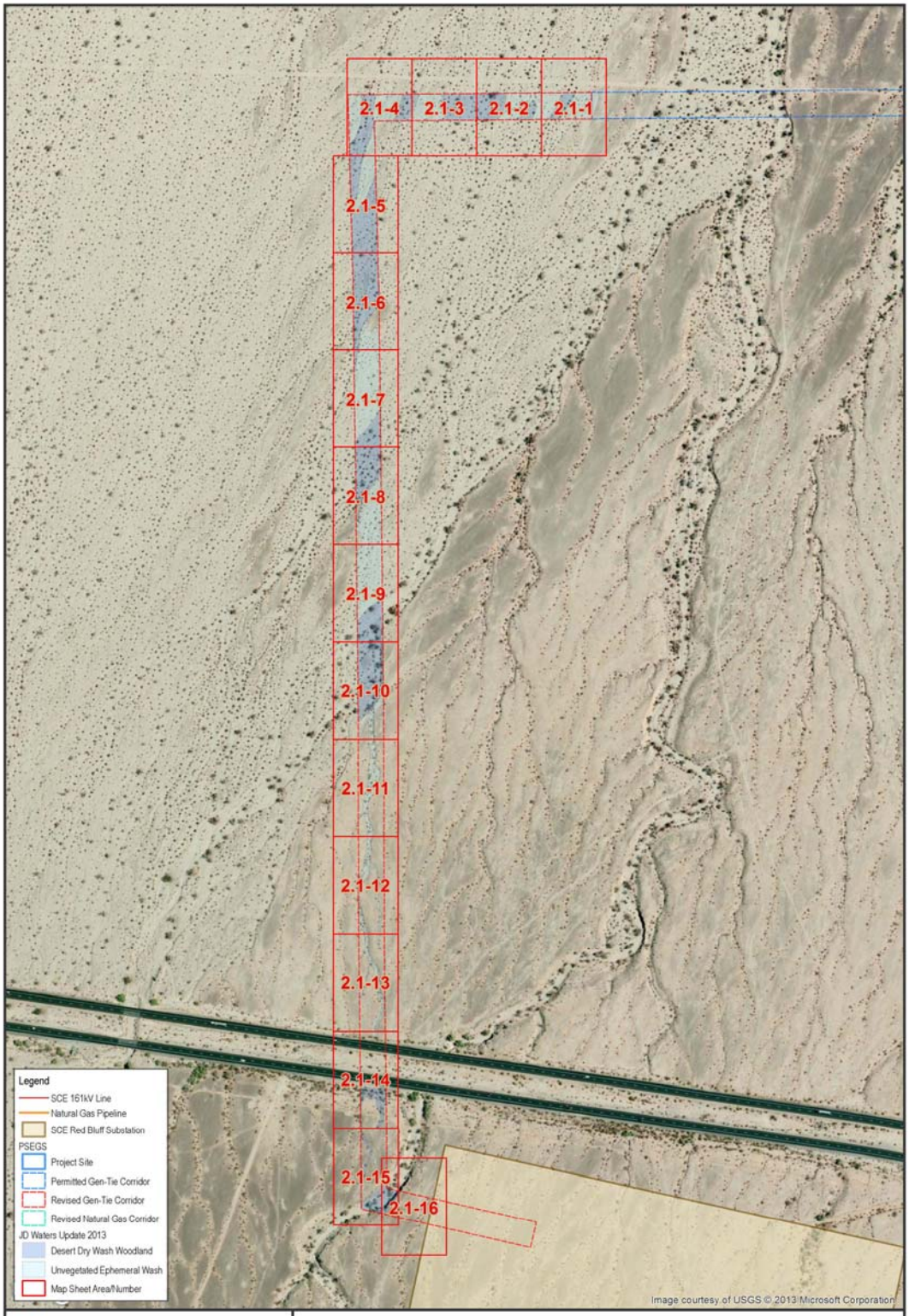

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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

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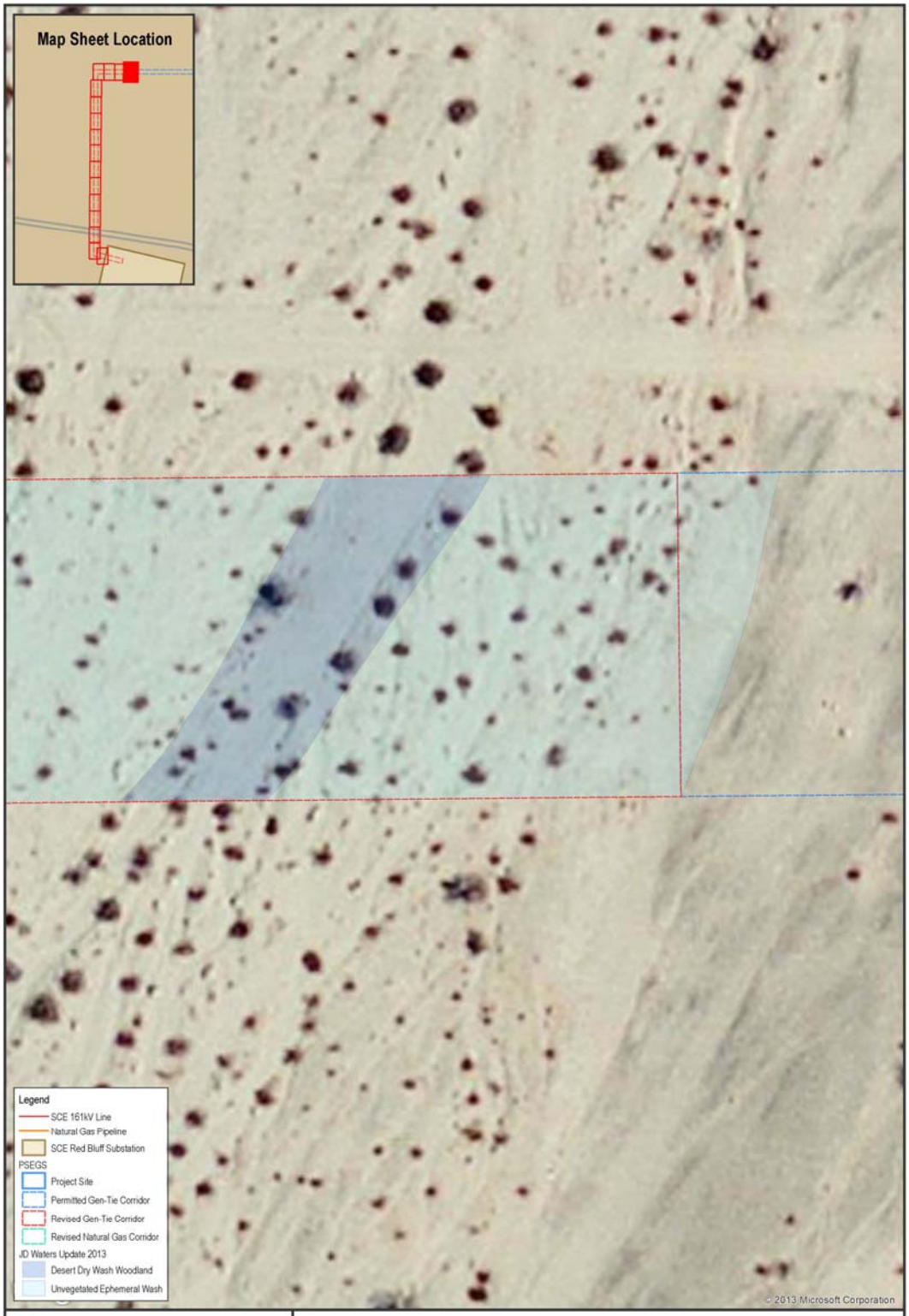

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Scale correct when printed at 11x17
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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-1

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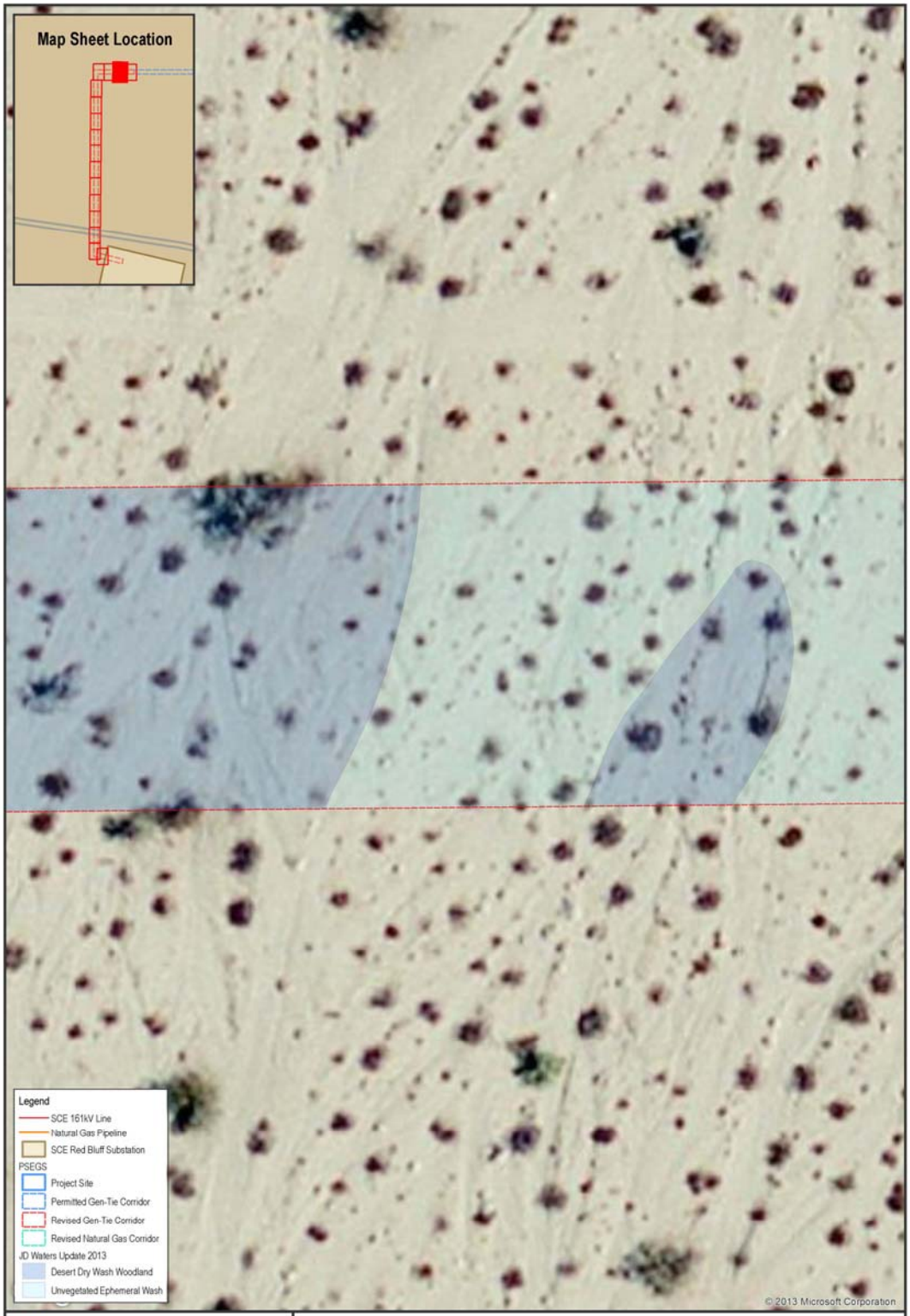

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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

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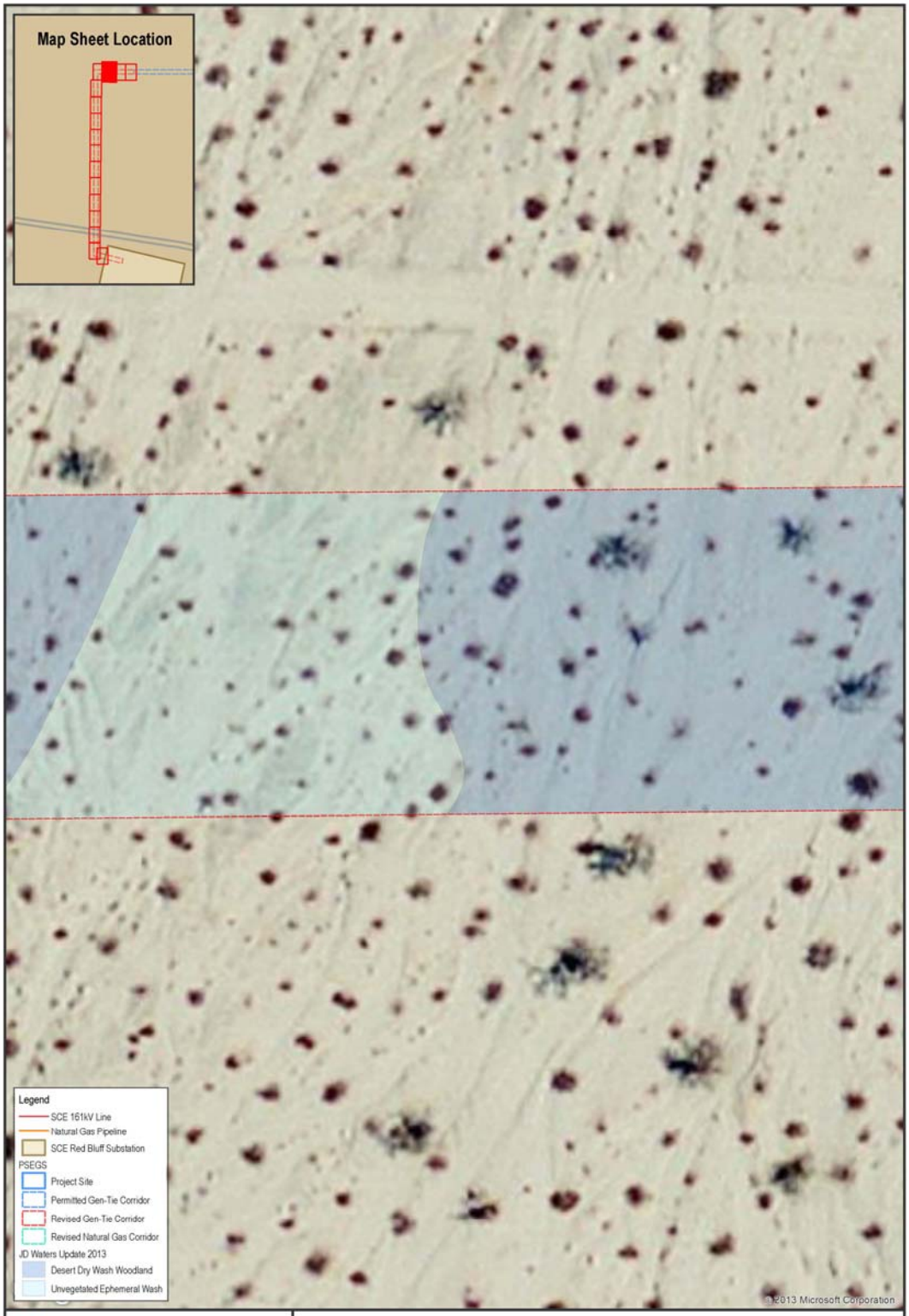

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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

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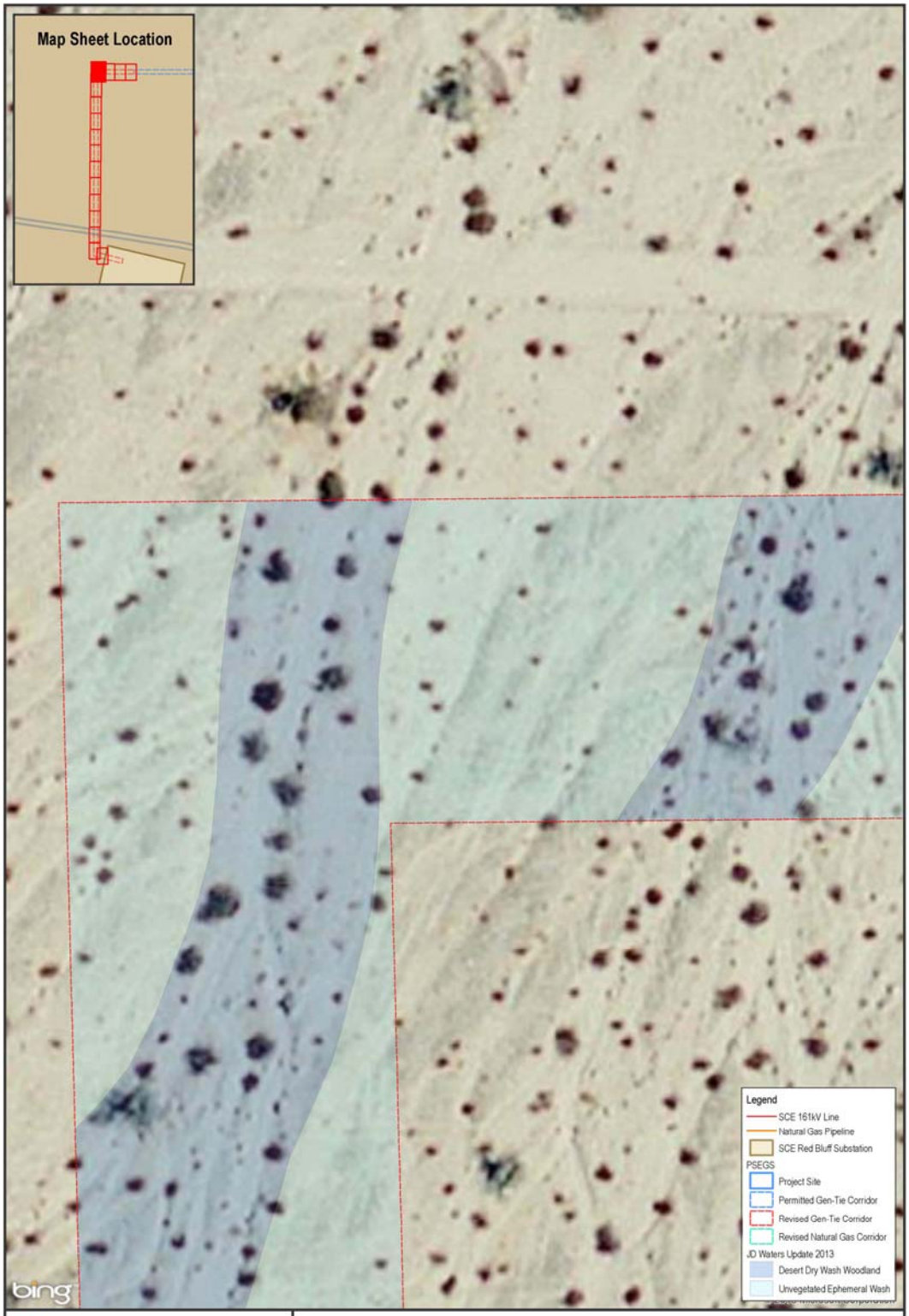

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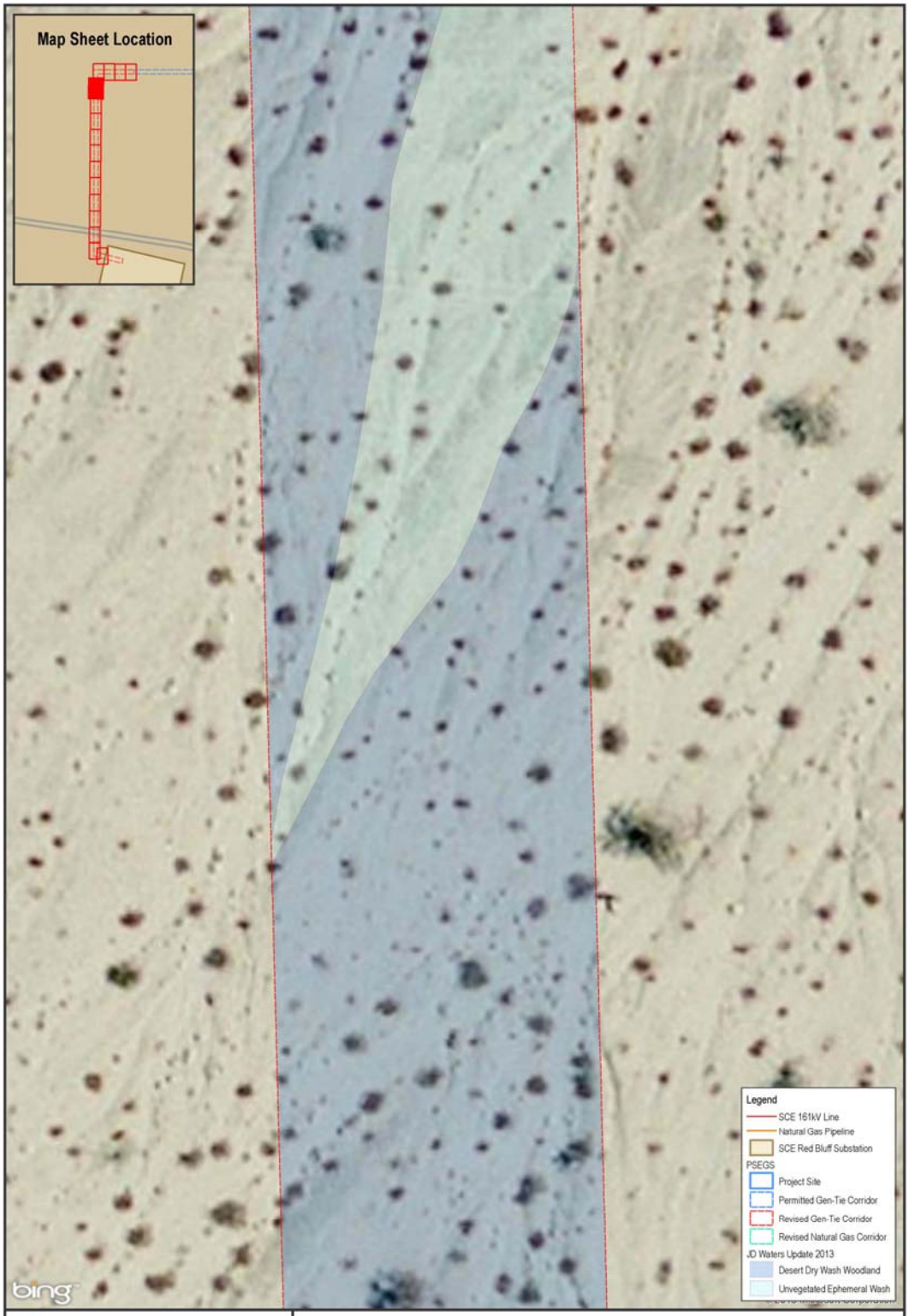

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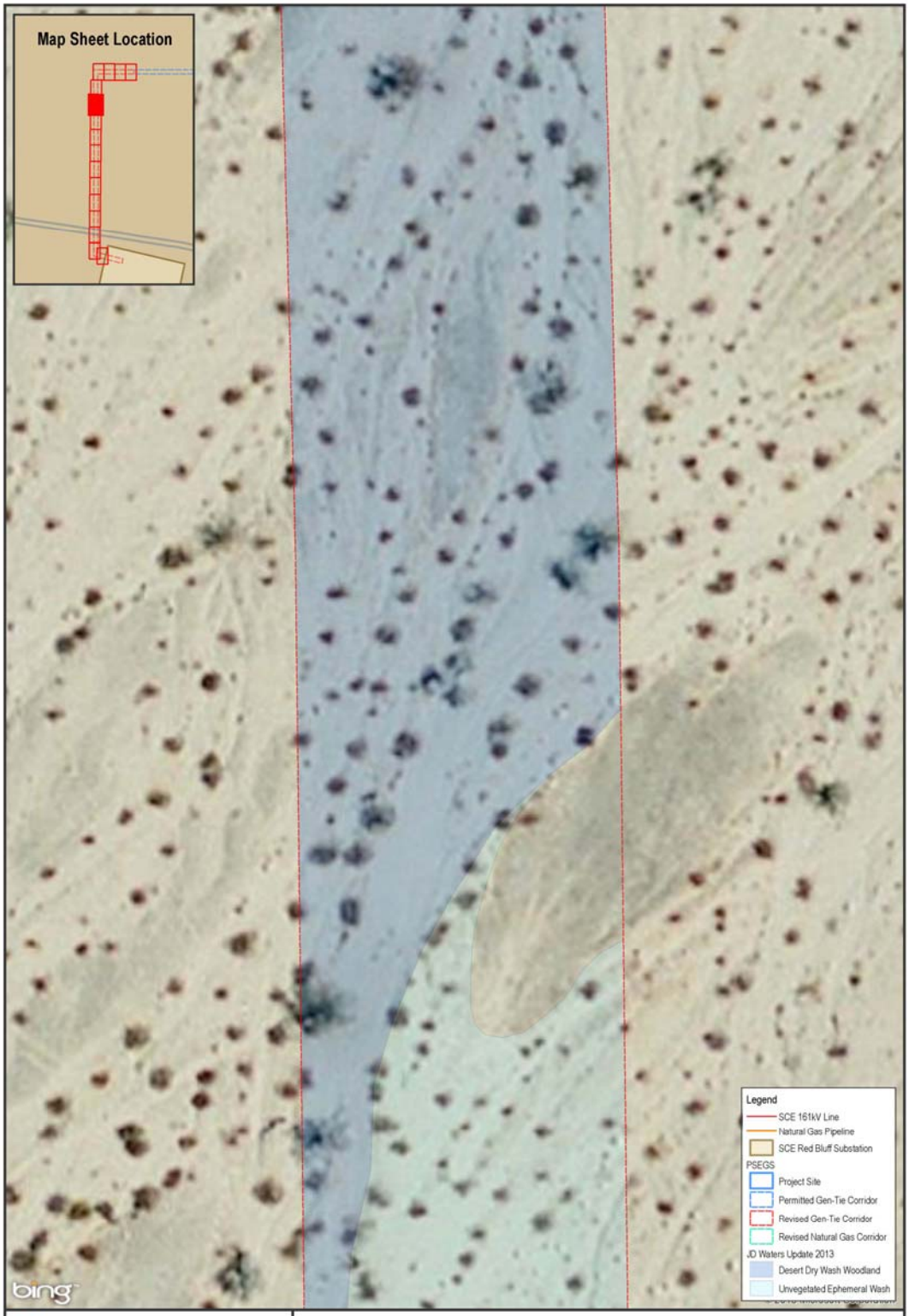

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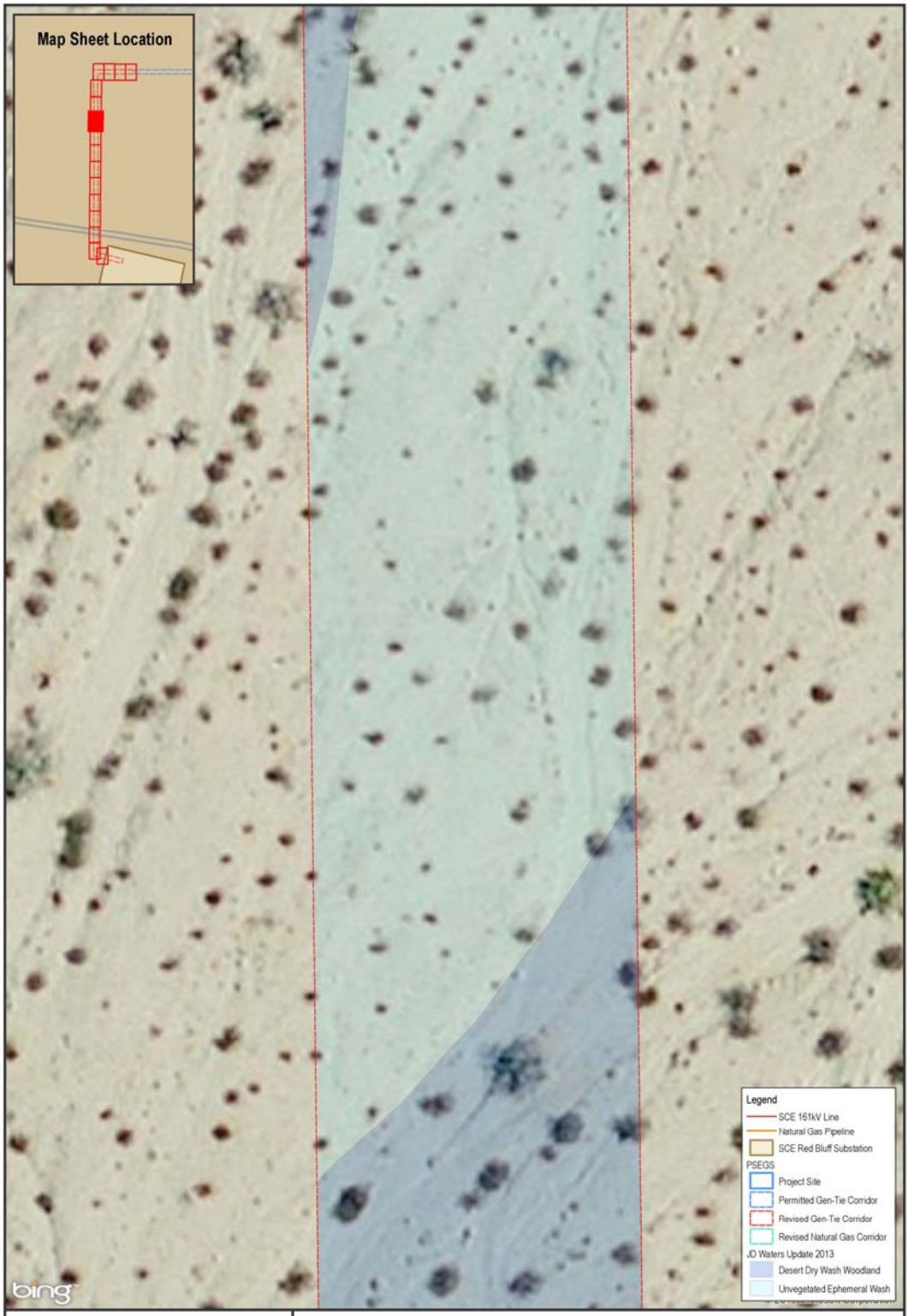

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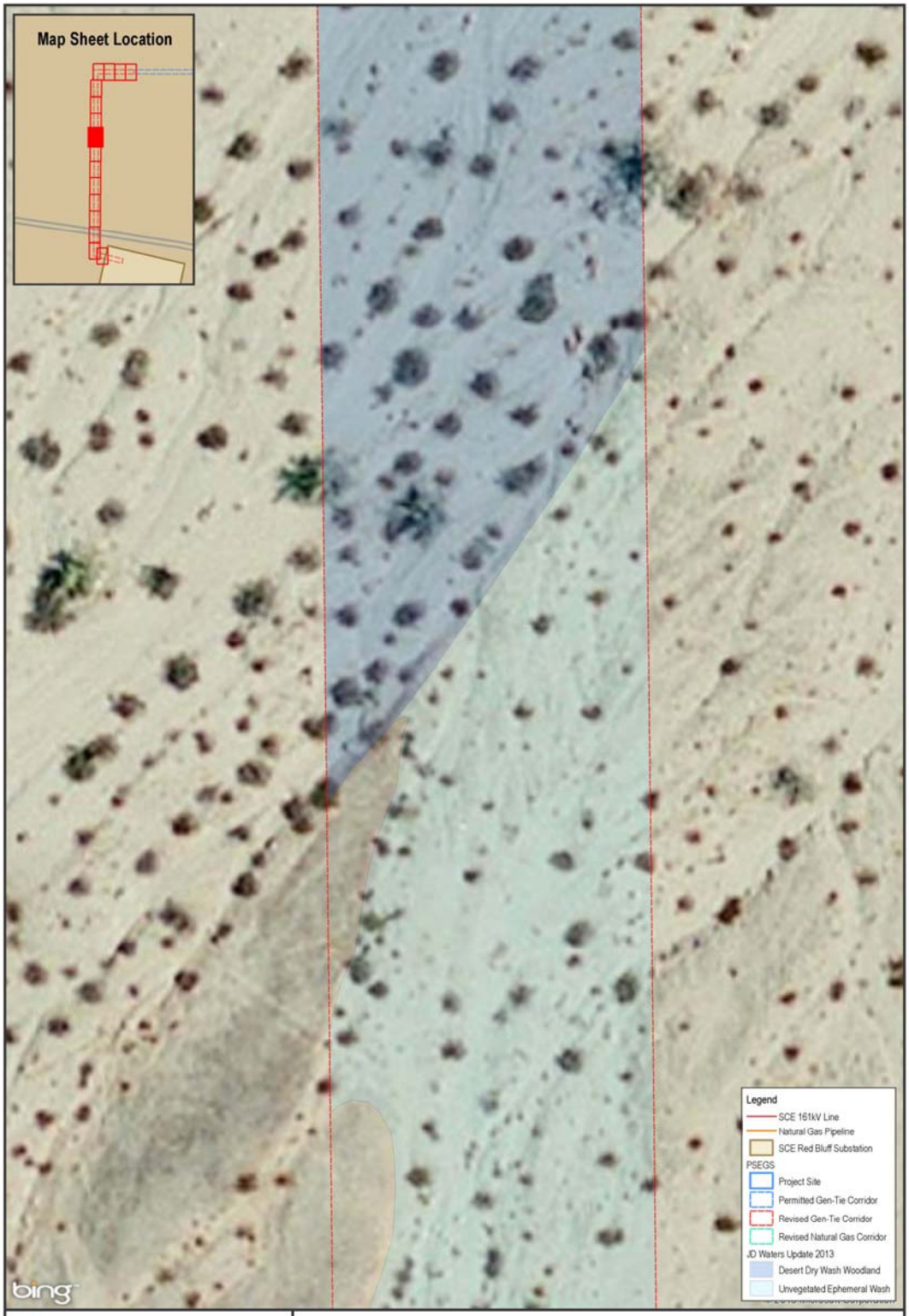

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Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
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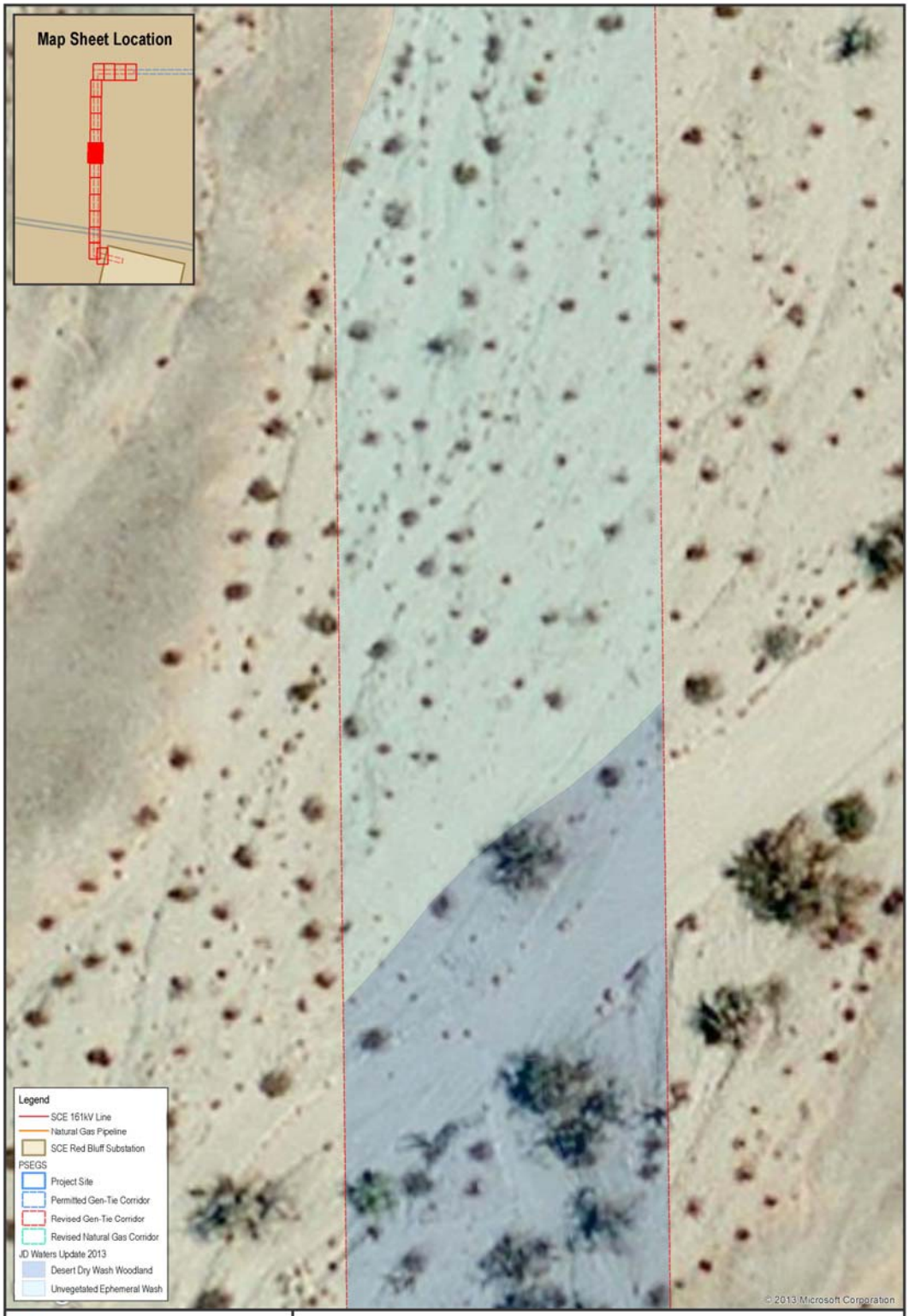

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Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

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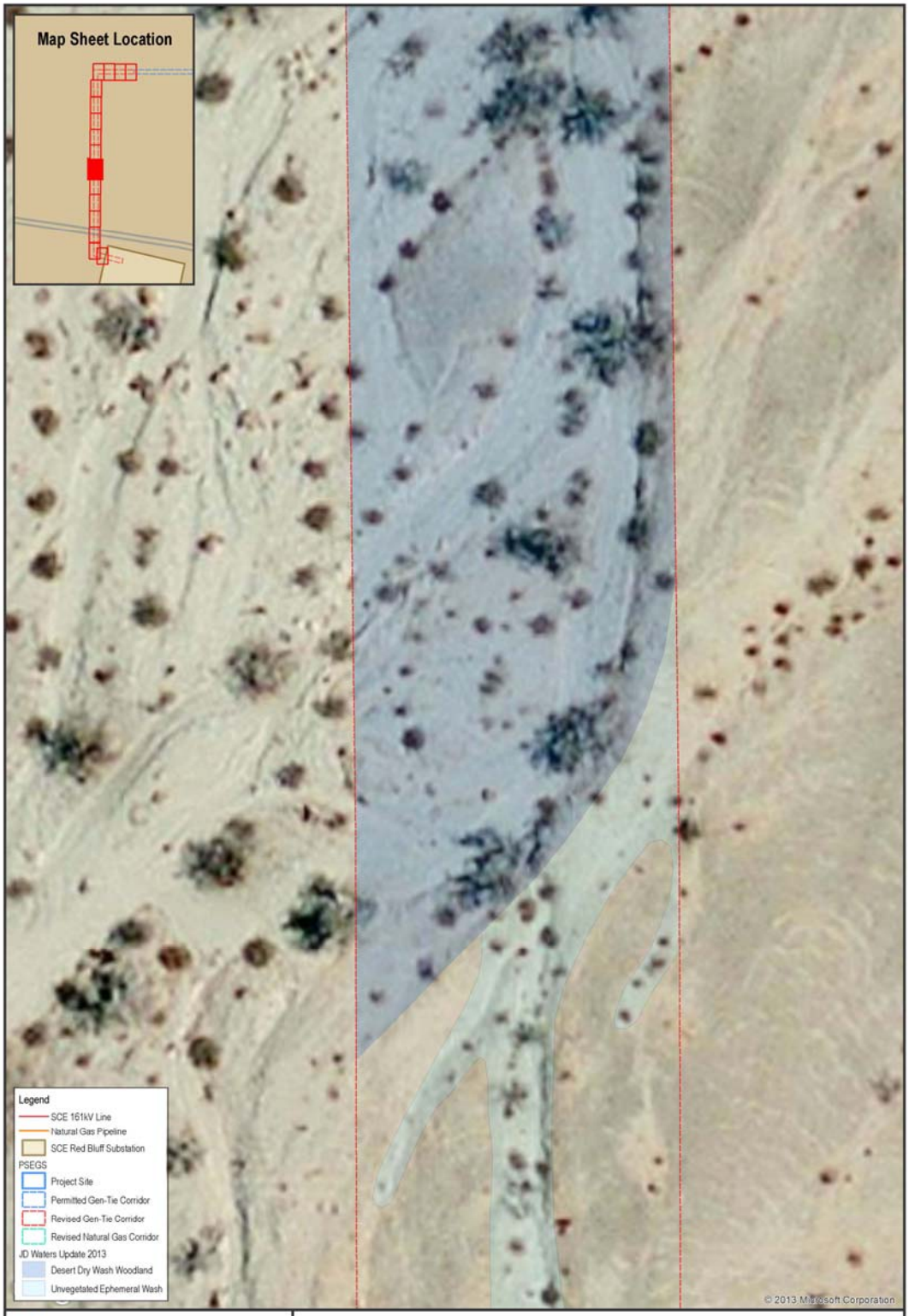

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Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

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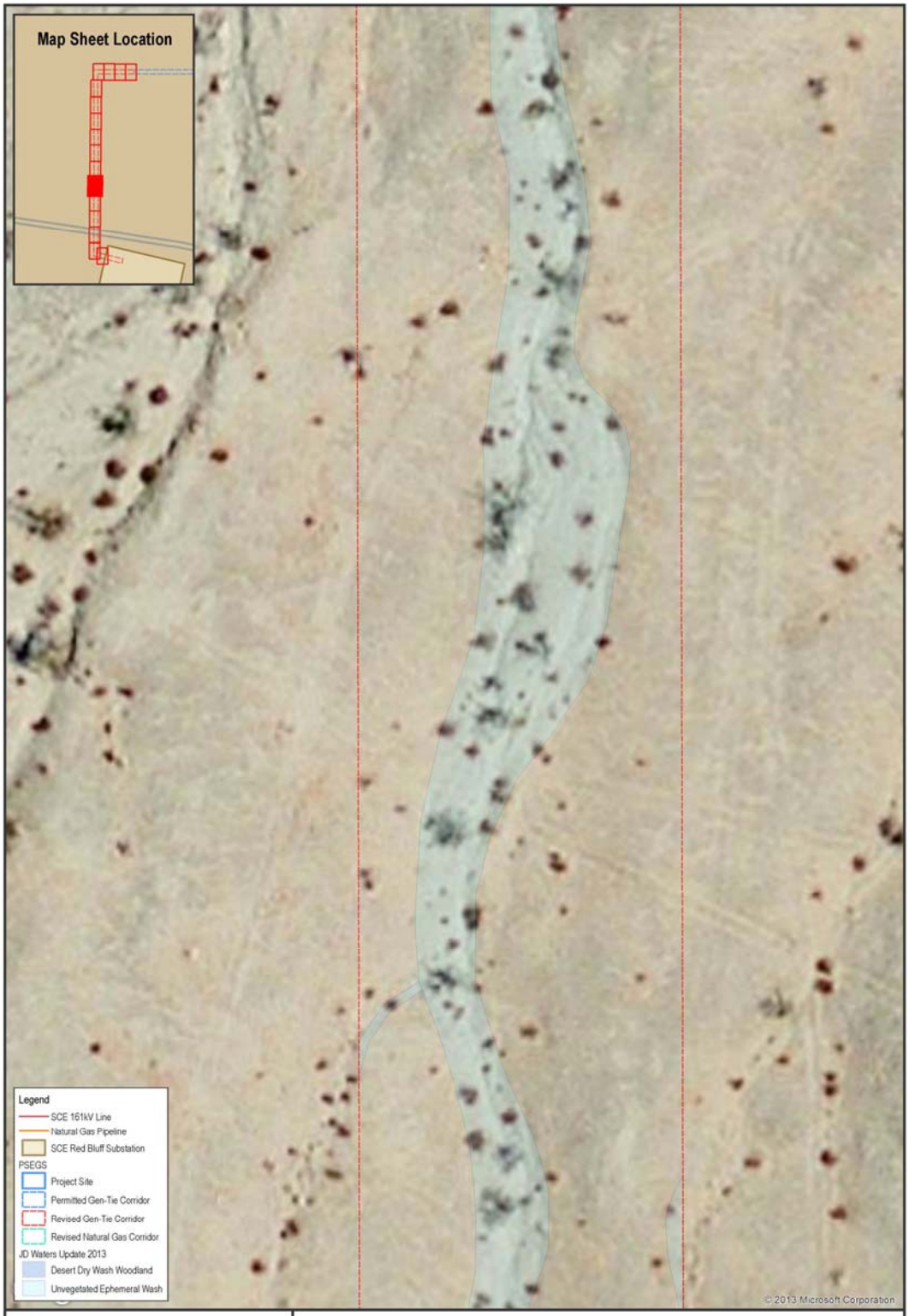

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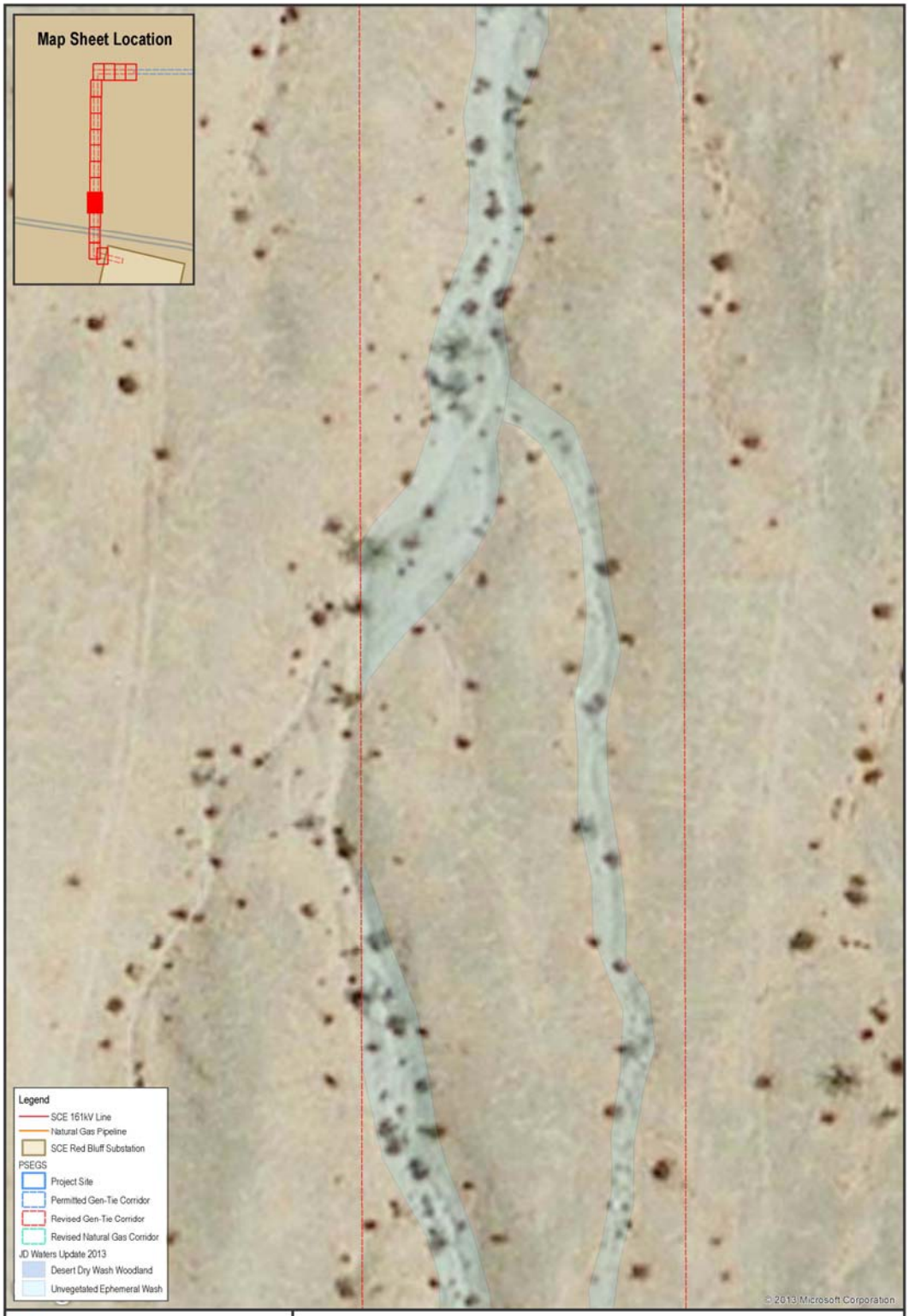
Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-11

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-12

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

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Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-13

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

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Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-14

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

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Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N W E S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-15

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

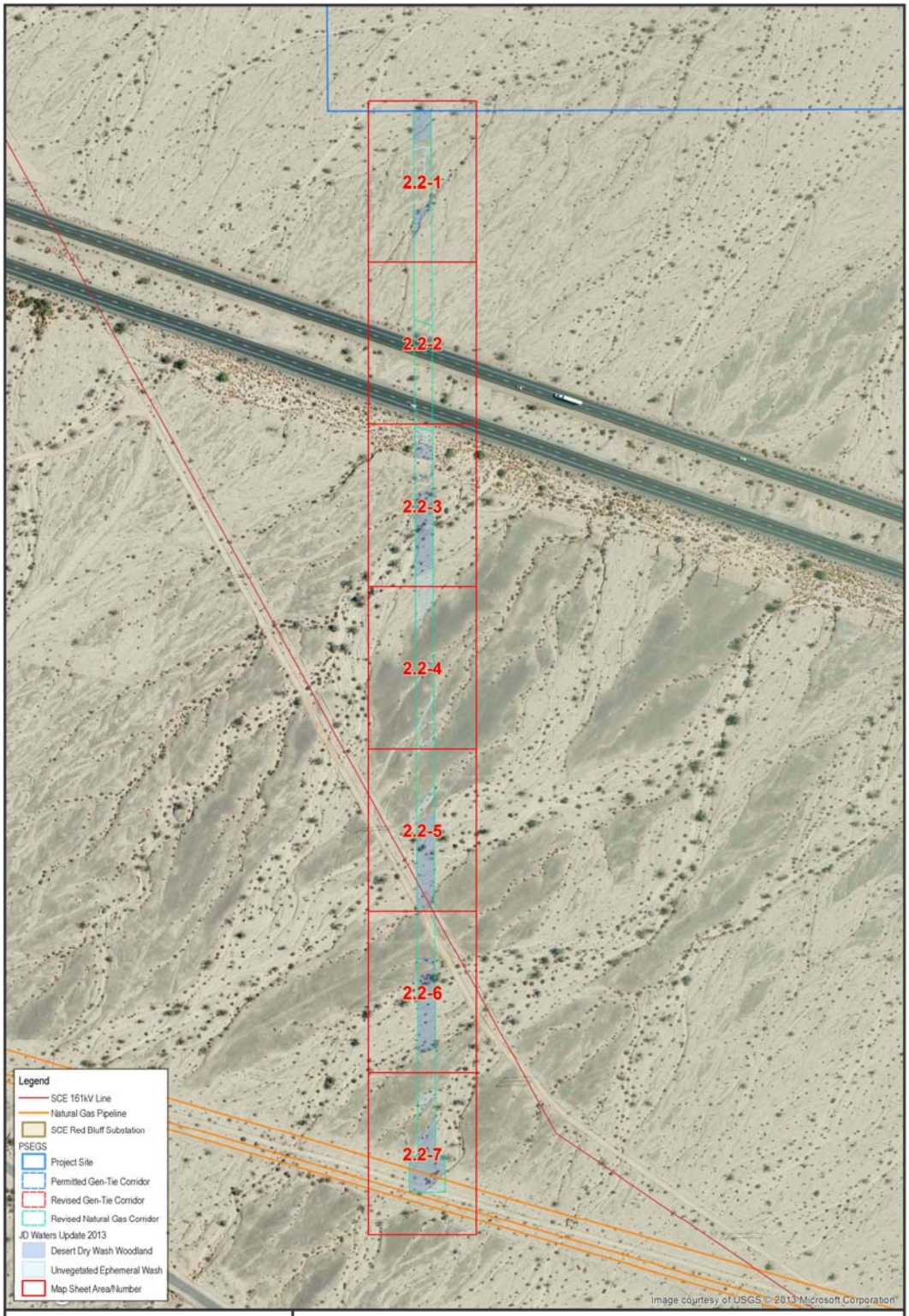
0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 22, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.1-16

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N W E S

Scale: 1:3,000

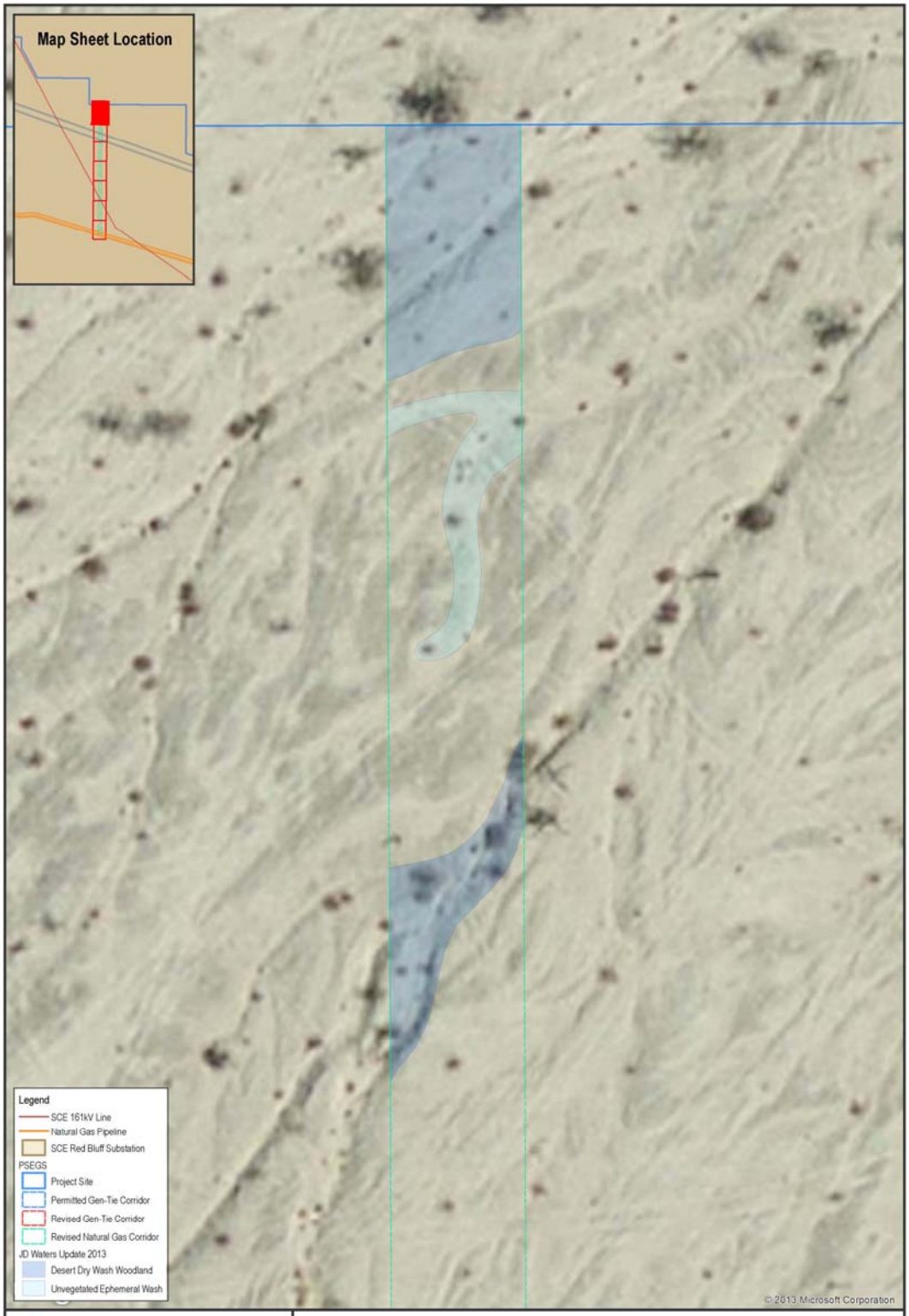
0 190 380 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-1

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

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Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N W E S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-2

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

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Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-3

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-4

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-5

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 5 (Waters Update 2013).mxd

BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-6

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BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

2013 State Jurisdictional Waters Update of PSEGS Modified Linears

N
W E
S

Scale: 1:400

0 25 50 Feet

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	Palen Solar
Date:	Jul 21, 2013
Revision:	C-1000
Prepared By:	NS

Figure No: 5.2-7

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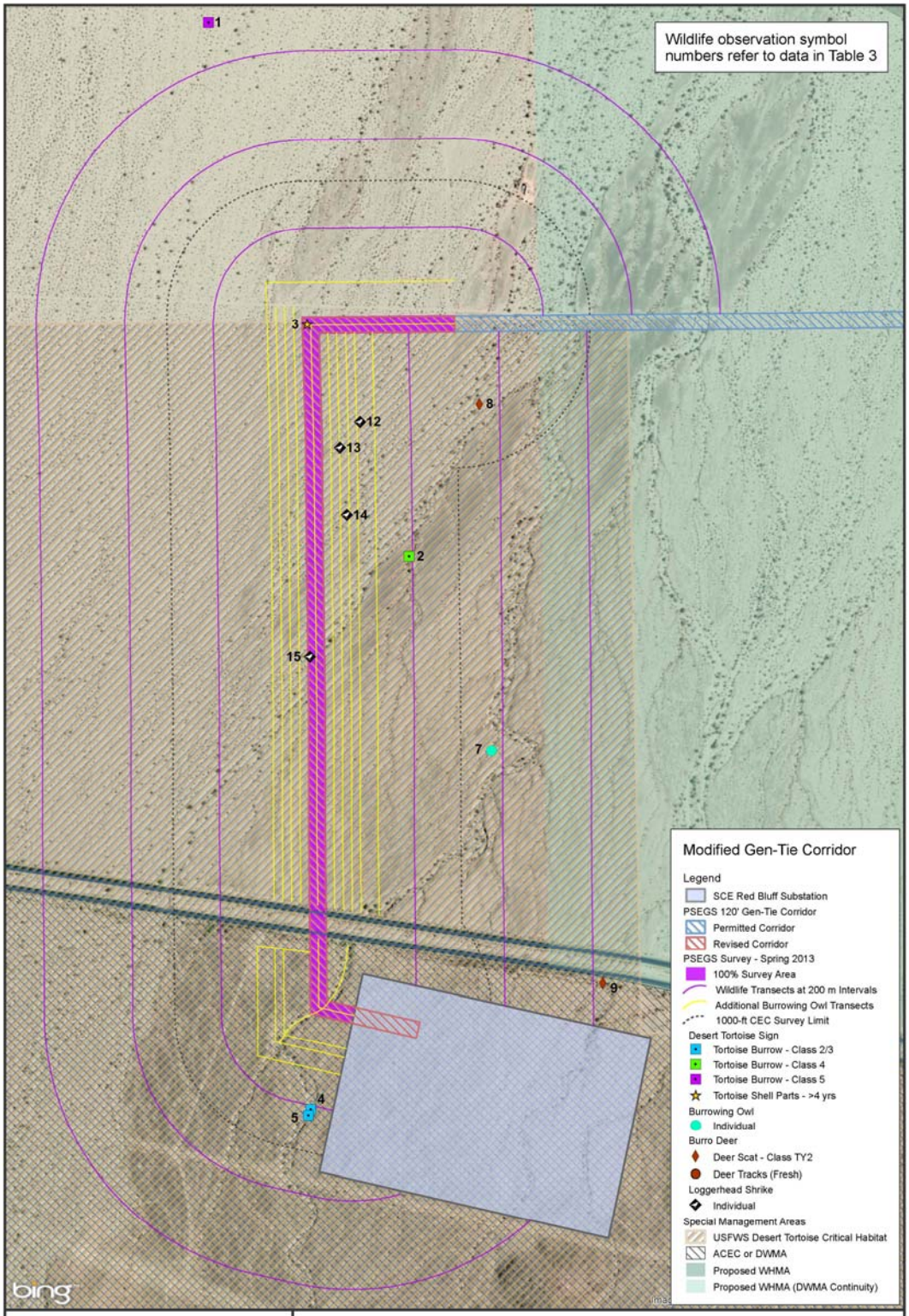


BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

PSEGS Spring 2013 Desert Tortoise and Other Wildlife Observations on the Modified Linear Facilities

N W E S

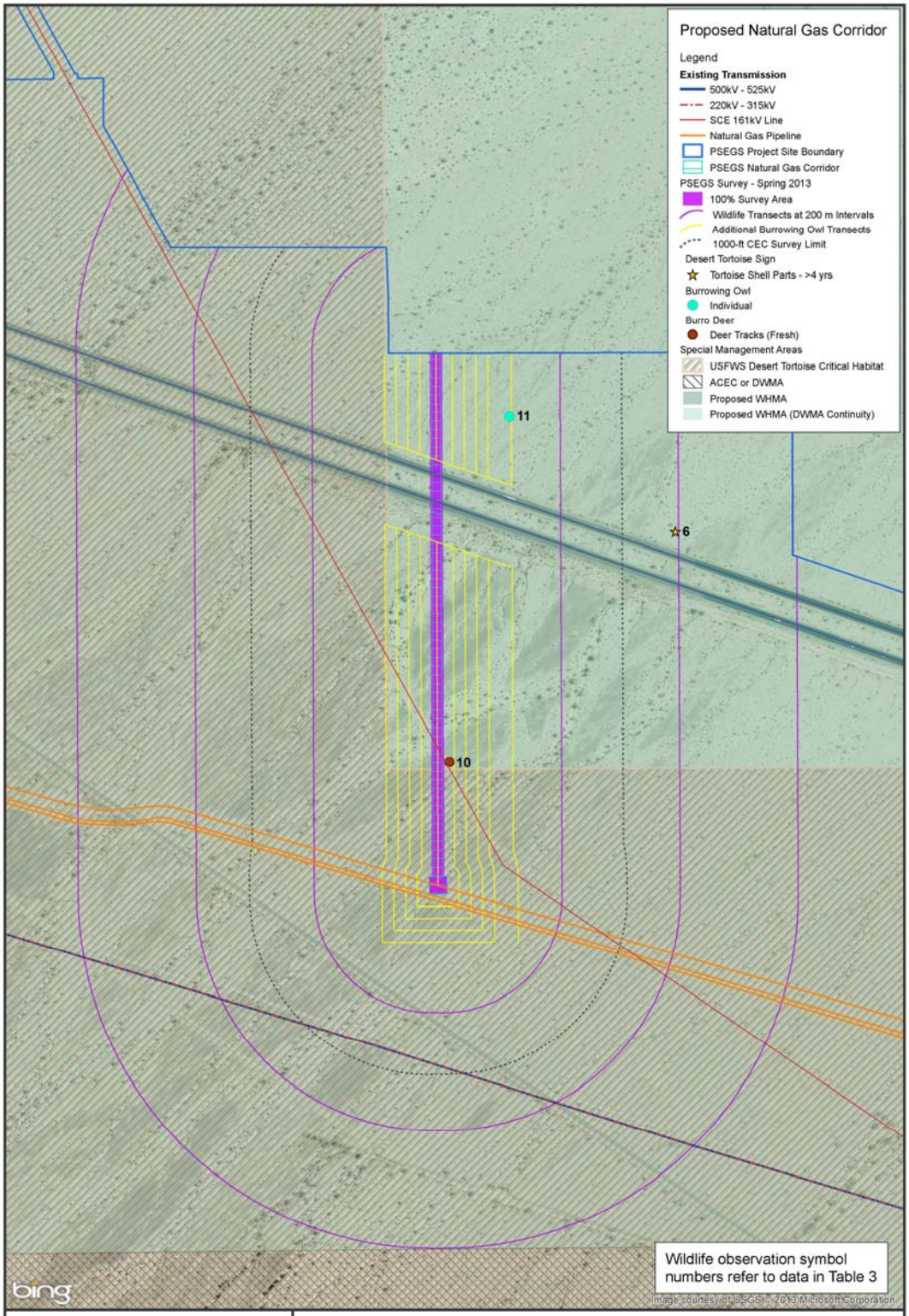
0 0.1 0.2 Miles

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	PSEGS
Date:	Jul 21, 2013
Revision:	C-1000 nds
Prepared By:	NS

Figure No: 6.1

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 6.1 (GenTie Wildlife).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

PSEGS Spring 2013 Desert Tortoise and Other Wildlife Observations on the Modified Linear Facilities

N
W E
S

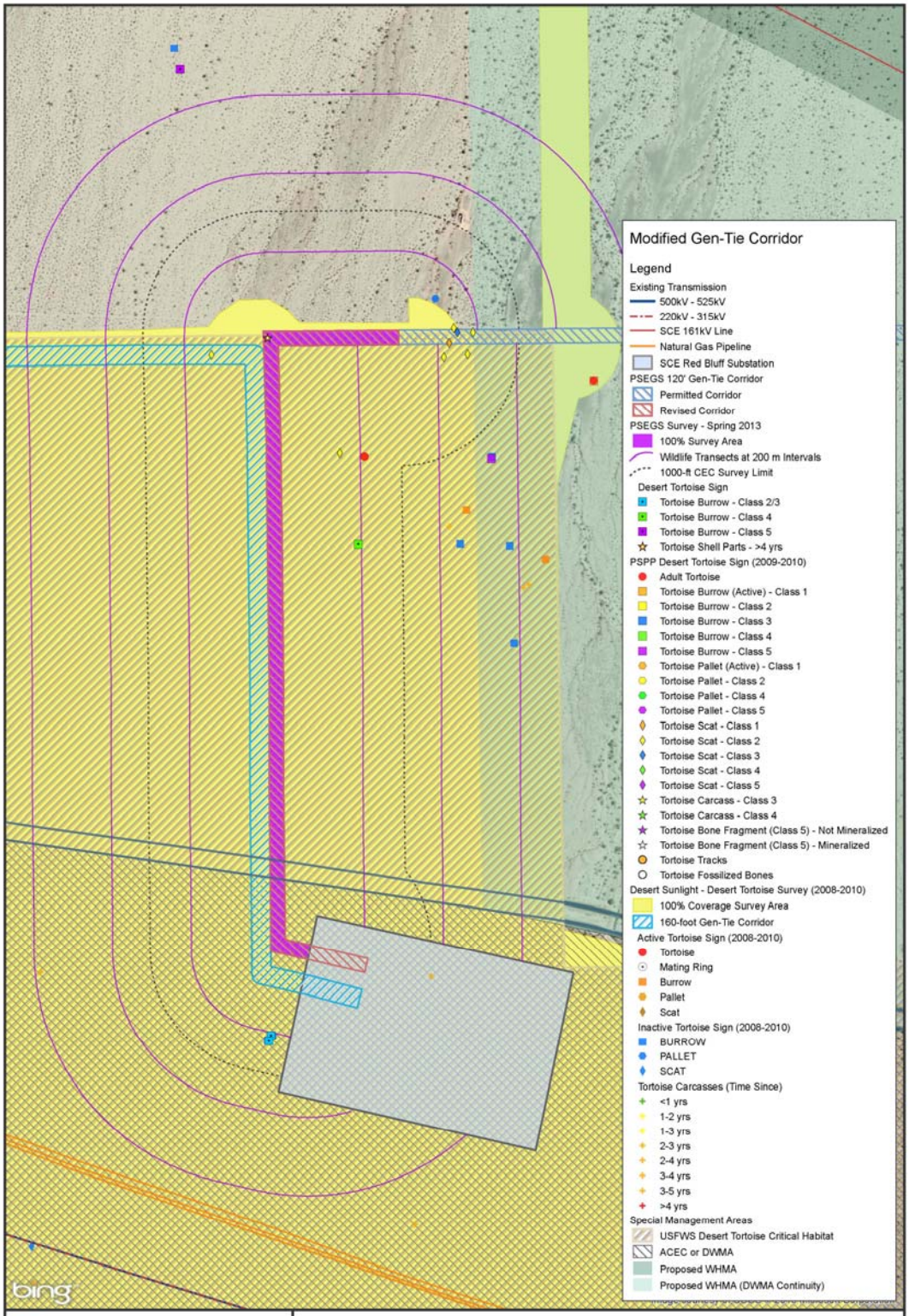
0 0.1 0.2 Miles

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	PSEGS
Date:	Jul 21, 2013
Revision:	C-1000 nds
Prepared By:	NS

Figure No: 6.2

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 6.2 (Nat Gas Wildlife).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

Cumulative Desert Tortoise Observations on the PSEGS Modified Linears Facilities, including Spring 2013

N
W E
S

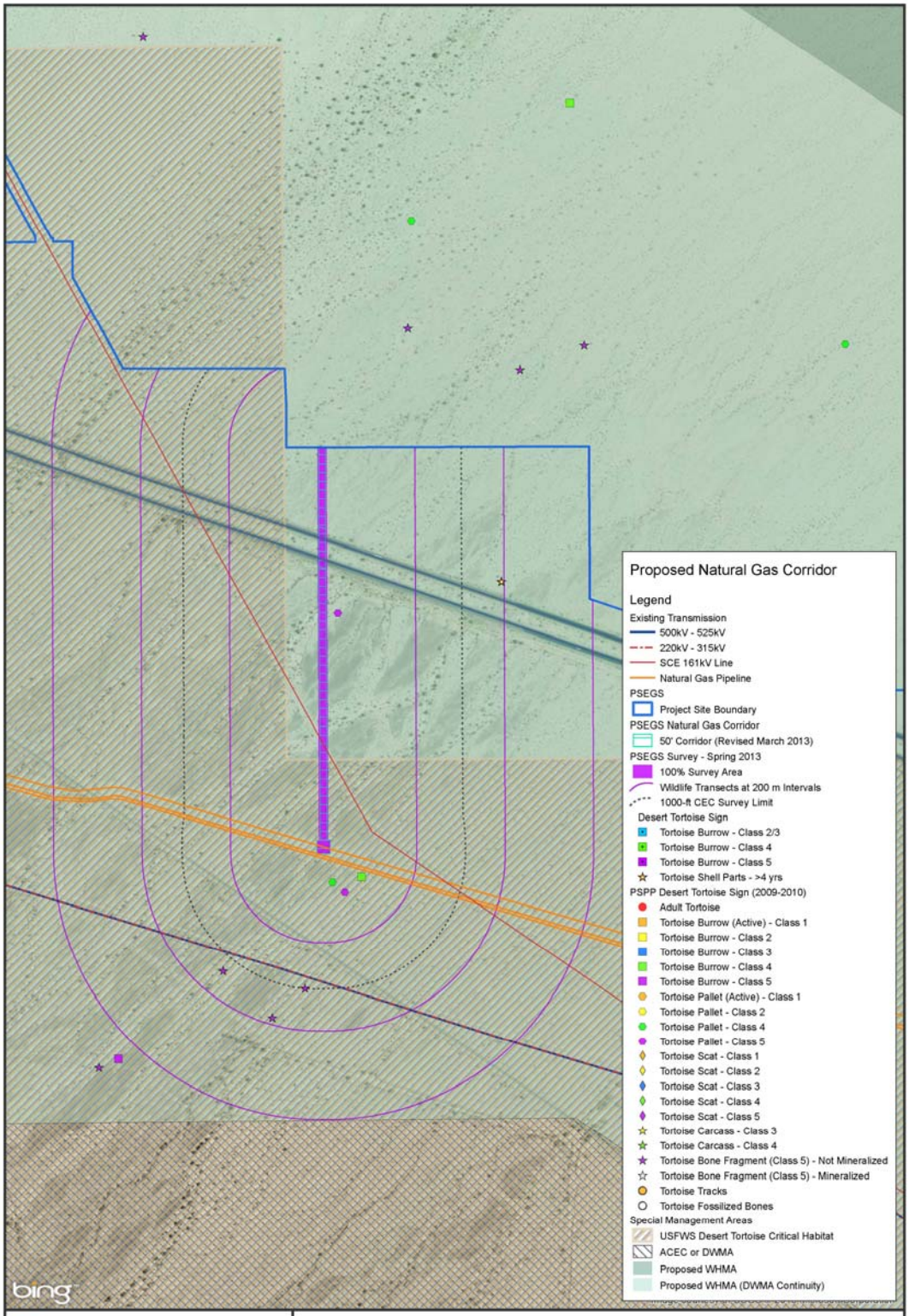
0 0.1 0.2 Miles

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	PSEGS
Date:	Jul 21, 2013
Revision:	C-1000 nds
Prepared By:	NS

Figure No: 7.1

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 7.1 (GenTie DT).mxd



BrightSource

BrightSource Energy, Inc.
1999 Harrison Street, Suite 2150
Oakland, CA 94612

Cumulative Desert Tortoise Observations on the PSEGS Modified Linears Facilities, including Spring 2013

N W E S

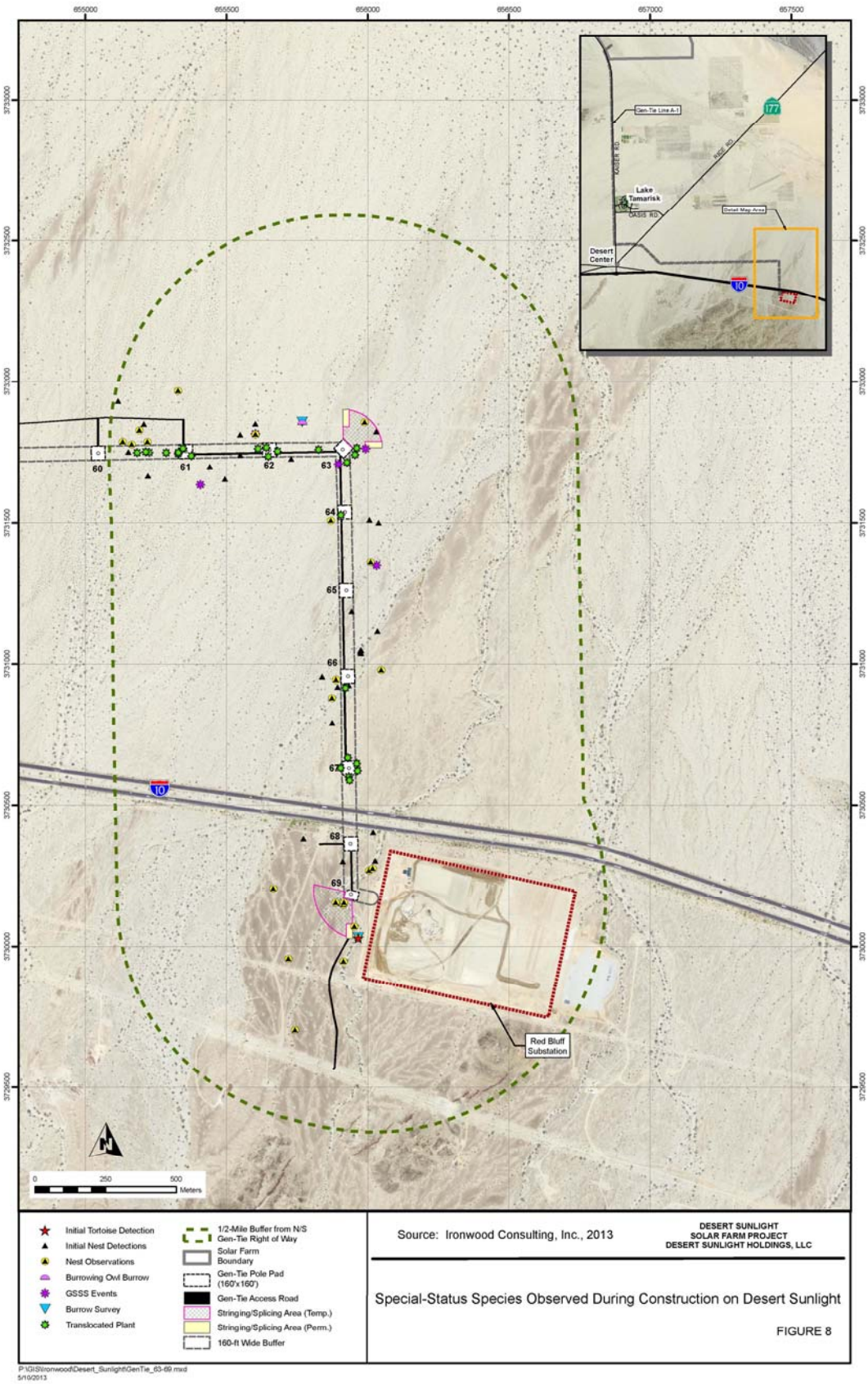
0 0.1 0.2 Miles

Scale correct when printed at 11x17
This map is for planning purposes only. The information herein was compiled from multiple sources and is considered to be reliable, however no representation is made concerning the accuracy of the data.

Project:	PSEGS
Date:	Jul 21, 2013
Revision:	C-1000 nds
Prepared By:	NS

Figure No: 7.2

Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Figure 7.2 (Nat Gas DT).mxd



Source: Ironwood Consulting, Inc., 2013

DESERT SUNLIGHT SOLAR FARM PROJECT
DESERT SUNLIGHT HOLDINGS, LLC

Special-Status Species Observed During Construction on Desert Sunlight

FIGURE 8

P:\GIS\Ironwood\Desert_Sunlight\GenTie_63-69.mxd
5/10/2013

APPENDIX A

REPRESENTATIVE SITE PHOTOGRAPHS

APPENDIX A

REPRESENTATIVE SITE PHOTOGRAPHS

Photograph A-1. Typical sheet flow, part of the Desert Dry Wash Woodland designation, on the gen-tie. This sheet flow is a mixture of single-thread and discontinuous channels, ranging from moderately vegetated arboreal washes to sparsely vegetated channels with primarily upland vegetation.

Photograph A-2. The most vegetated channels in the sheet flow characteristic of both Linear Facilities. Note that ironwood is nearly the sole wash-dependent species due to the poor water availability. Upland species, particularly creosote bush, are dominant in this community here.

Photograph A-3. The more poorly vegetated, generally discontinuous, channels that are part of the sheet flow system characteristic of the Linear Facilities.

Photograph A-4. The incised, arboreal wash that crosses the gen-tie next to the RBS. This large wash Is well-vegetated with multiple wash-dependent species other than ironwood.

Photograph A-5. Well-developed desert pavement on the Linear Facilities.

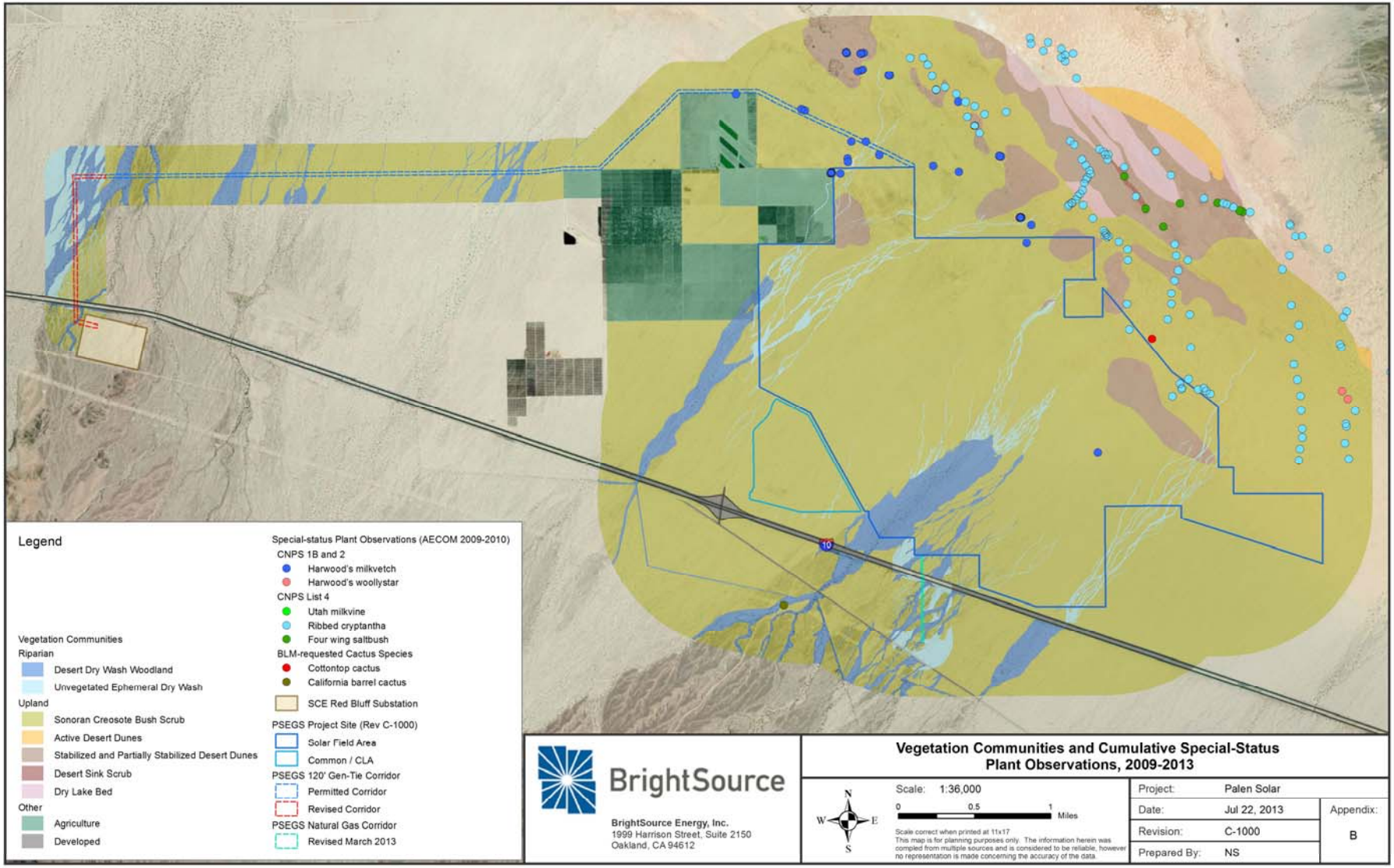
Photograph A-6. Dead and dying ironwood north of I-10, where the flow from upslope was severed by construction of I-10.

Photograph A-7. Box culvert I-10 underpass west of the modified gen-tie.

Photograph A-8. Natural wash I-10 underpass. This wash is approximately 0.25 miles west of the modified gen-tie.

APPENDIX B

VEGETATION COMMUNITIES ON THE MODIFIED PROJECT



Path: C:\WORKSPACE\BrightSource\CA_Palen\2013 Bio Survey\7-19-2013 Update\Appendix B.mxd

APPENDIX C

REPRESENTATIVE PHOTOGRAPHS OF CHANNEL TYPES AND FIELD DATA SHEETS FOR THE 2013 STATE JURISDICTIONAL WATERS ASSESSMENT ON THE PSEGS MODIFIED LINEAR FACILITIES

APPENDIX C.1

REPRESENTATIVE PHOTOGRAPHS OF THE CHANNEL TYPES AT PSEGS

Primary Channels:

Photograph C-1. A primary channel and DDWW. This channel is several meters deep, is a main tributary, and has multiple wash-dependent tree and shrub species.

Photograph C-2. Another example of a primary wash and DDWW at PSEGS. This channel has a distinct bed and bank, even though shallow, two wash-dependent species and is dominated by a riparian tree species (*Olneya tesota*).

Secondary Channels:

Photograph C-3. Small, shallowly incised wash dominated by upland vegetation, but ironwood trees, albeit stunted, are common. This wash was categorized as DDWW because of the number of trees, although it is of marginal quality.

Photograph C-4. Very shallow wash dominated by upland shrubs. This wash is not DDWW at this point.. Upslope, this wash diminished completely (discontinous channel). Downslope it ultimately became more defined and ironwood became common (DDWW downslope).

Sheet Flood:

Photograph C-5. DDWW sheet flood. This is a matrix of braided discontinuous and single-thread channels, some of which are secondary and primary channels. Note the scattered ironwood trees and the gravel rills that indicate water flow.

Photograph C-6. DDWW sheet flood on the gas pipeline ROW, north of I-10. Note the many dead and dying ironwood trees resulting from the severing of this sheet flow by the freeway.

Photograph C-7. Sheet flood with only upland species. This sheet has unvegetated ephemeral washes, discontinuous channels and gravel rills indicating water flow throughout the sheet matrix.

Unvegetated Ephemeral Wash:

Photograph C-8. A U_H channel, with high density of shrubs, all upland species. This channel began as a swale upslope on the desert pavement. Note the secondary wash in the right side of the photograph.

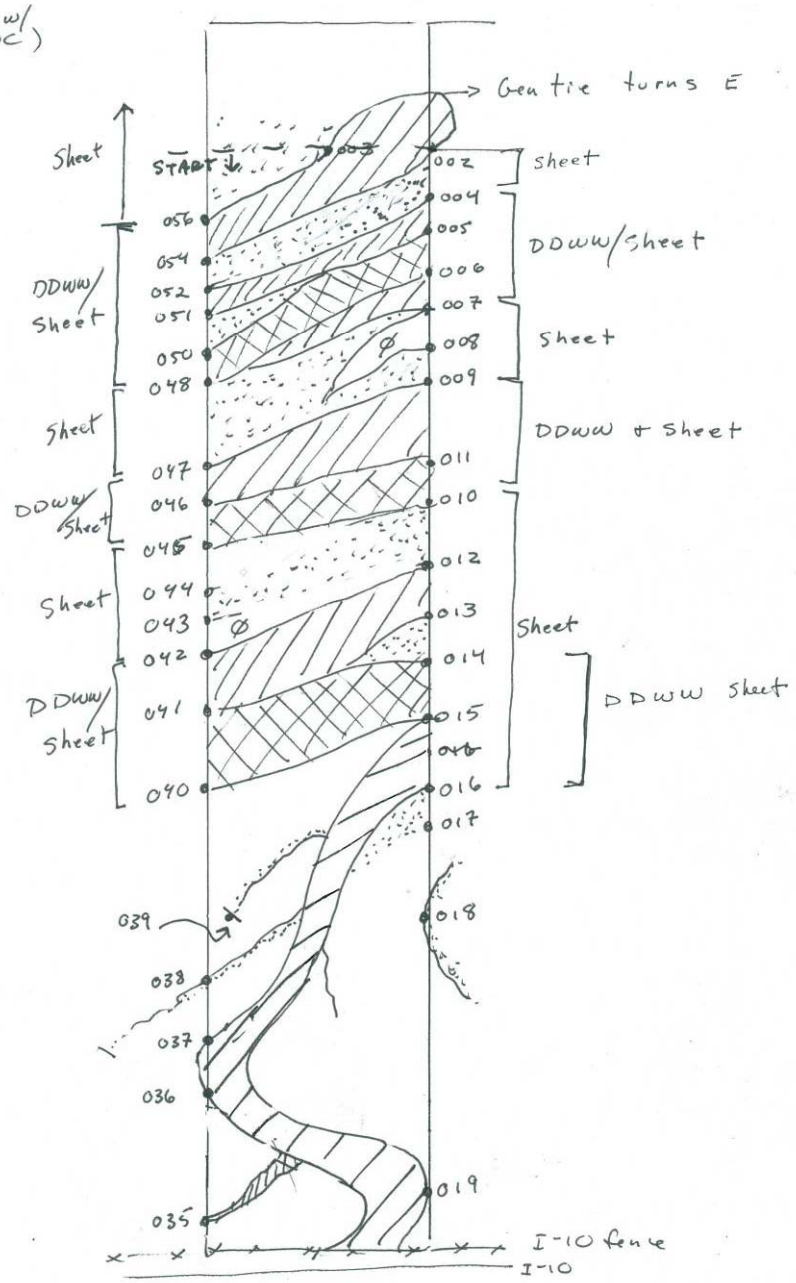
Photograph C-9. A U_L channel, with low density of shrubs, all upland species. This is a discontinuous channel.

APPENDIX C.2

FIELD DATA SHEETS

PROJECT Palen Solar Energy Project- Waters Mapping Page 1 of 4

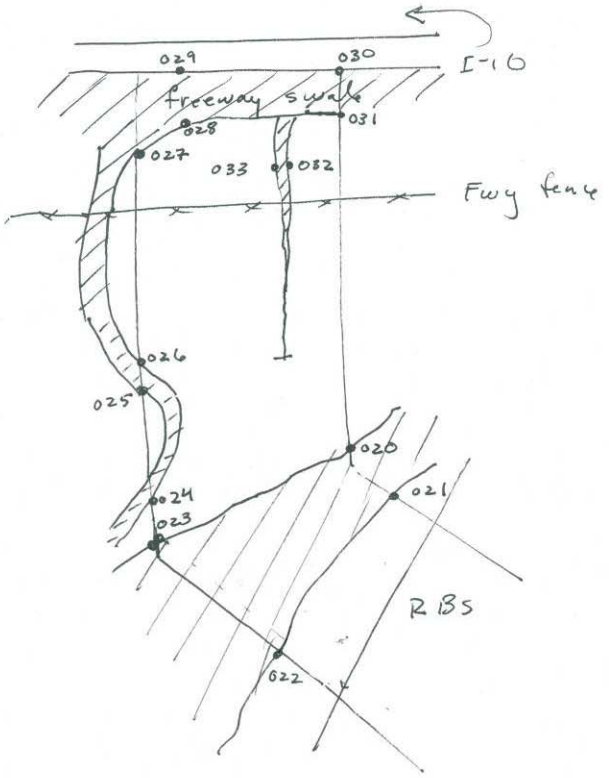
DATE 24 April 2013
LOCATION IN SITE Gentie N of I-10 (N-S portion)
LEGEND:
- U_L
- 2° (usually w/ U_L + DC)
- 1°



PROJECT Palen Solar Energy Project- Waters Mapping Page 2/4

DATE 24 April 2013
LOCATION IN SITE Gen-tie So of I-10
LEGEND:

N



Project: Palen SEGS

Date: 24 April 2013
Project Part: Gen-tie, N-S portion

Page 3/4

Waypoint I.D.	UTMs Easting	UTMs Northing	Channel Type	Channel Depth (cm)	Channel Substrate	Tree/Shrub Layer Vegetation Dominants	Tree/Shrub Layer Vegetation Common	Tree/Shrub Layer Vegetation Occasional	Rip Tree/Shrub Height	Other Observations
002 003	0655971 0655952	3731871 3731779	2° w/ U_L + DC	4-8	Coarse sand	LATR AMDU	OLTE		OLTE - 18-25'	
004 005	0655972 0655977	3731731 3731663	2° w/ U_L + DC	8 9	Coarse sand	LATR AMDU	OLTE		OLTE - 25-30'	
005 006	" 0655975	" 3731629	1°	9	Coarse sand	LATR AMDU	OLTE		OLTE - 25-30'	
006 007	" 0655978	" 3731517	2° w/ U_L + DC	8-9	Sand + light gravel	LATR AMDU	OLTE		OLTE - 22'	
008 009	0655979 0655981	3731492 3731369	U_L (mostly)	7-8	Sand, gravel rills	LATR AMDU				
009 011	" 0655982	" 3731308	2° w/ U_L + DC & small 1° washes	9-10	sand, gravel rills	LATR AMDU	HYSA OLTE		OLTE - 20-22'	
011 010	" 0655984	" 3731287	2°	9-10	sand, gravel rills	LATR AMDU	OLTE		OLTE - 20-25'	
010 012	" 0655984	" 3731222	U_L	7		LATR AMDU				Shrubs are small & sparse
012 013	" 0655988	" 3731219	2°	16	coarse sand	LATR AMDU	OLTE		OLTE - <20'	
013 014	" 0655985	" 3731102	U_L	7	coarse sand	LATR AMDU				sparse shrubs
014 015	" 0655988	" 3731104	1°	52-60	sand w/scatt. cobbles & gravels	OLTE HYSA	LATR AMDU		OLTE - 20-25'	
015 016	" 0655990	" 3730963	2°	7	sand	LATR AMDU	OLTE		OLTE 9-10'	~280 cm wide
016 017	" 0655991	" 3730946	U_L	7	sand	LATR AMDU				sparse
018	0655992	3730778	U_L	19	sand & gravel	LATR		OLTE (downslope)	OLTE - ≤15'	1.5 m wide channel, barely touches ROW
019	0655993	3730518	2° + U_L	110	Sand + gravel	LATR	AMDU			Near I-10 only is LATR/AMDU. Downslope are small OLTE; 6m wide
020 021	0655993 0656019	3730277 3730270	1°	6-7m	Gravel & cobbles over sand	CEFL OLTE ACGR	LATR HYSA			
022 023	0655991 0655962	3730239 3730254	Same wash as 020→021 but other side of ROW							

So side of I-10

Date: 24 April 2013 **Project: Palen SEGS** Page 3/4

Project Part: Gen-tie, N-S portion

South of I-10

West of ridge

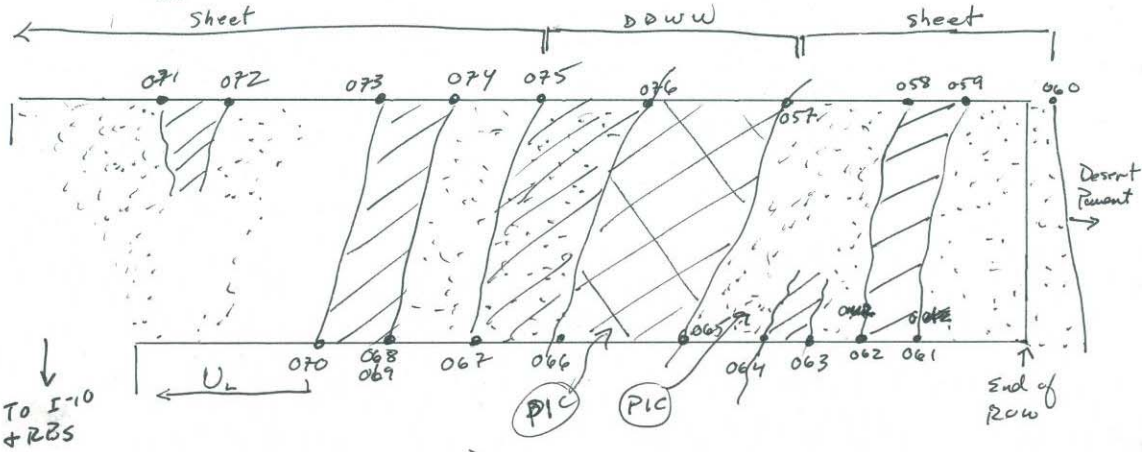
Delete 49

ado - 00053 (deleted)

NOTE: No 055

Waypoint I.D.	UTMs Easting	UTMs Northing	Channel Type	Channel Depth (cm)	Channel Substrate	Tree/Shrub Layer Vegetation Dominants	Tree/Shrub Layer Vegetation Common	Tree/Shrub Layer Vegetation Occasional	Rip Tree/Shrub Height	Other Observations
024	0655970	3730303	2°	3	coarse sand	LATR OLTE	KRER		OLTE - 9-12'	Wash is 4m wide
025	0655964	3730346								
026	0655964	3730353	All is same wash							
027	0655964	3730393								
028	0655976	3730418	1°		30% cobbles and gravel over sand; occa. small boulder	CEFL LATR	OLTE HYSA		CEPL - 20-25'	This is the freeway swale
029	0655972	3730405								
030	0656001	3730415							OLTE - 15-20'	
031	0655999	3730397								
032	0655999	3730395	2°		Sand w/ gravel	LATR HYSA CEPL OLTE			Trees <10'	Ends upslope, in ROW
033	0655985	3730395								
035	0655960	3730545	2° + DC	3	sand + gravel	LATR OLTE			OLTE - 5-9'	<1 m wide
036	0655957	3730666	2°	<1m	sand, gravel	LATR	~~OLTE~~ AMDU	OLTE	OLTE - <10'	Same as wash w/WYPT 19
037	0655956	3730713								
038	0655953	3730787	U_L	3	Sand	LATR	AMDU KRER HYSA			Ends off ROW to W; 1 m wide
039	0655958	3730906	U_L	7		AMDU				90 cm wide. AMDU is sparse
040	0655951	3730928	1°							See 014-015 Main wash
041	0655951	3731074								
041 042	0655947	3731157	2°							See 012-013
043	0655947	3731194	U_L	3-6	Sand	LATR				
044	0655945	3731202								
045	0655945	3731229	2°							See 010-011
046	0655948	3731281								
047	0655943	3731324	U_L							See 008-009
048	0655942	3731407								
050	0655940	3731507	U_L	4-6	Sand	LATR				
051	0655942	3731547								
052	0655941	3731572	U_L + DC							See 004-005
054	0655941	3731640								
054 056	0655937	3731744	2°							See 002-003

DATE 24 April 2013
LOCATION IN SITE Gen tie Na of I-10; E-W portion
LEGEND:
- ~~Desert pavement~~ U_L
- ~~2°~~ 2° wash
- 1° and 2° washes



Descriptions

057 = U_L, sheet. mainly disc. channels (DC) Depths: 4-10cm Floor - Coarse sand w/ rilled gravels
↓ LATR w/ ENPA, AmDU, H4SA; rare OLTE
058-059 = 2° channel. Floor - Coarse sand w/ some rilled gravel
LATR w/ OLTE (OLTE → 18')
059-060 = U_L, sheet
061-062 = 2° channel (see 058 → 059)
062-063 = U_L, sheet (see 057 → 058)
063-064 = 2° channel; H4SA codom, OLTE snags
* Photo NOTE - Most of the trees are upslope in better 2° channels
064-065 = U_L, sheet (see 057 → 058
065-066 = 1° + 2° washes coalesce into @ 1° wash; broader, more distinct washes than to west; more trees.
* Photo NOTE - Pic says 2° but it's 1° here Sandy.
066-067 = Many fewer trees than to east and washes are poorly defined; much disc. channels w/ trees not in channels. Runnels are sandy, to 4cm deep, <<1 to 3m wide.
LATR w/ AmDU; scattered OLTE (25-30' tall)
067-069 = U_L, sheet
069-070 = 2° channel (see 061-062)
070 - west end = U_L, sheet
071-072 = 2° channel, narrow. Floor - sand w/ rilled gravel. LATR w/ ~~occa~~ AmDU+ H4SA; occa. OLTE (→ 25-30' tall)

UTMs

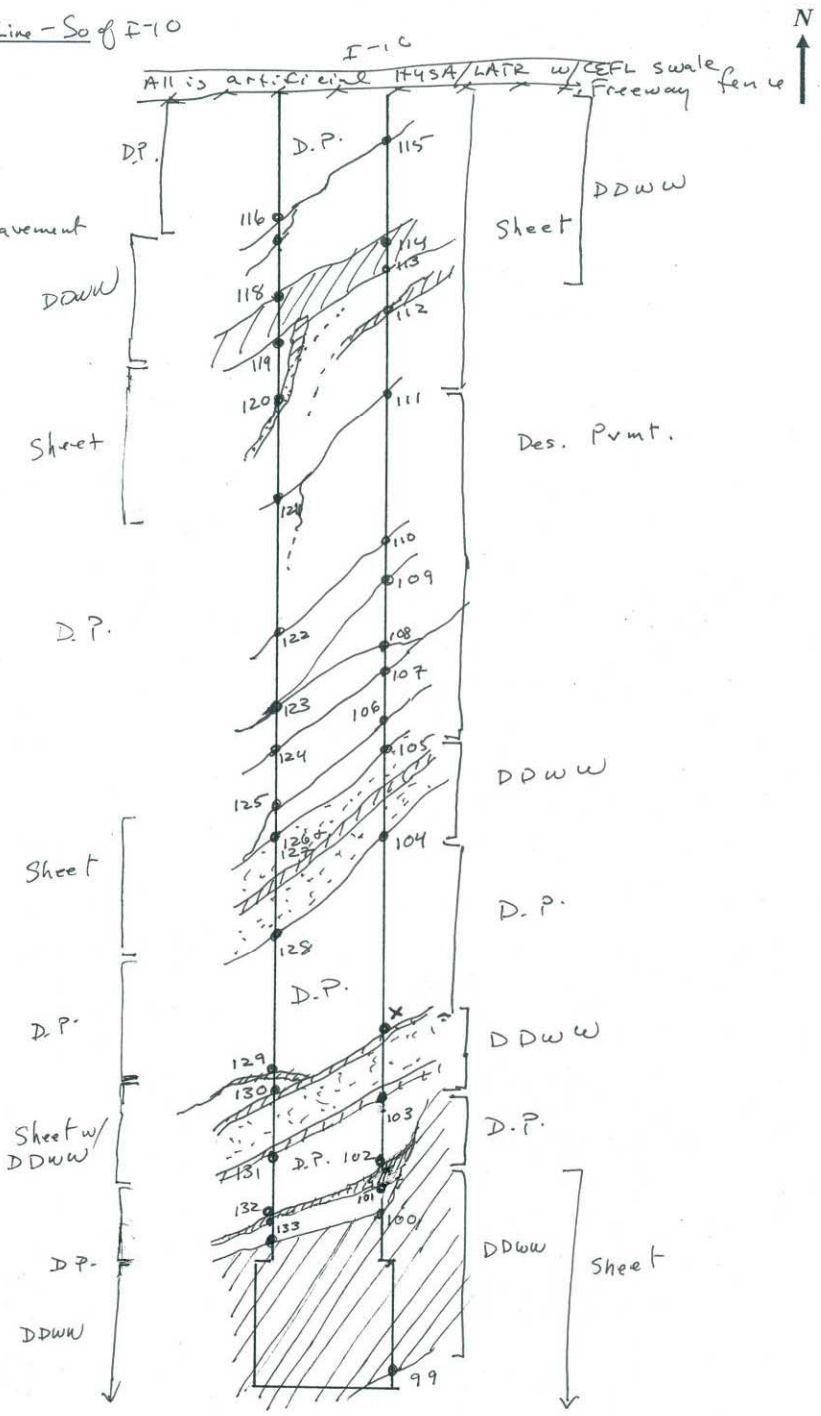
057	0656154	3731821
058	0656239	3731824
059	0656256	3731819
060	0656294	3731~~888~~828
061	0656233	3731788
062	0656217	3731788
063	0656194	3731789
064	0656178	3731789
065	0656150	3731790
066	0656104	3731787
067	0656071	3731786
068 (~~069~~)	~~0656~~0656022	3731788
(069)	0656019	3731786
070	0655999	3731785
071	0655956	3731819
072	0655975	3731817
073	0656013	3731820
074	0656037	3731820
075	0656068	3731823
076	0656126	3731824

PROJECT Palen Solar Energy Project- Waters Mapping **Page** 1/3

DATE 30 April 2013
LOCATION IN SITE Gas Line – So of I-10
LEGEND:

- U_L
- 2°
- 1°

DP = Desert pavement



Date: 30 April 2013 **Project: Palen SEGS** Page 2/3

Project Part: Gas Line – S. of I-10

Waypoint I.D.	UTMs Easting	UTMs Northing	Channel Type	Channel Depth	Channel Substrate	Tree/Shrub Layer Vegetation Dominants	Common	Occasional	Tree/Shrub Height (Rip)	Other Observations
E side of ROW										
99	0664968	3726941	2°, but large, wash	1m	Sandy w/gravel bars	OLTE LATR			OLTE →25'	
100	0664961	3726999								
101	0664962	3726807	2°	2m	Sandy	LATR		OLTE	OLTE ≤10'	Meets main channel (99-100), 4m floor (wide), 1m top edge's
102	0664962	3727016								
103	0664966	3727054	Densely filled sheet; all DC and UL exc. both edges are distinct channels		Sand, filled gravels	LATR		AmDU		Sparse LATR (<4 & cover)
X	0664951	3727123								
	The 2 channels in this sheet	(103 ⇒ X)	2° ↑	1m ↓	sand w/ gravel + cobbles	OLTE LATR			OLTE 25-30' LATR 1-4m	Floors are 0.5–3m wide
104	0664968	3727194	UL + DC Same as X central	w/2° channels 103 – above, w/ 1 main channel		LATR		AmDU		Sparse
105	0664962	3727254								
	The main channel in 104 → 105		2°	0.4m		LATR OLTE			OLTE – 25-30'	
106	0664959	3727271	2°	4-30 cm	Sandy	LATR		OLTE	OLTE – ≤10'	
107	0664959	3727314	2°	4-30 cm	Sandy	LATR		OLTE	OLTE – ≤10'	
108	0664957	3727325	U_L	3cm	Sandy	LATR AmDU		OLTE upslope	Stunted	U_H downslope (more LATR) Floor – 1.2m wide
109	0664955	3727342	U_L	3 cm	Sand	LATR AmDU		OLTE upslope	Stunted	U_H downslope (more LATR) Floor – 1-2m wide
110	0664958	3727380	U_L (DC upslope)	4-20 cm	Gravel over Sand	LATR AmDU				U_H downslope (LATR) Floor – 40cm wide
111	0664954	3727420	Sheet – many DC + U_L							
113	0664959	3727493								
112	0664954	3727460	2°	0.4–0.6	Sand, gravel	OLTE + LATR			OLTE are small	Floor – 1m wide
113	see above		1°	0.6	Sand	OLTE	LATR	AmDU 174SA	OLTE – 30'	3m wide (floor)
114	0664955	3727501								
115	0664953	3727519	2°	1-1.8m	Sandy w/gravel	OLTE	LATR	ACGR (rare)	OLTE – 10-15' + scrubby	Floor – 1m wide Channel – 4m wide
116	0664938	3727515	See 115							Connects to waypt 115
117	0664940	3727504	2°	30cm	Sand w/gravel	LATR		OLTE	OLTE scrubby	Connects to 116 → 115 wash
118	0664940	3727487	Connects to 113 → 114							
119	0664940	3727478								

ROW E side ↑ ↓ W side

Project: Palen SEGS

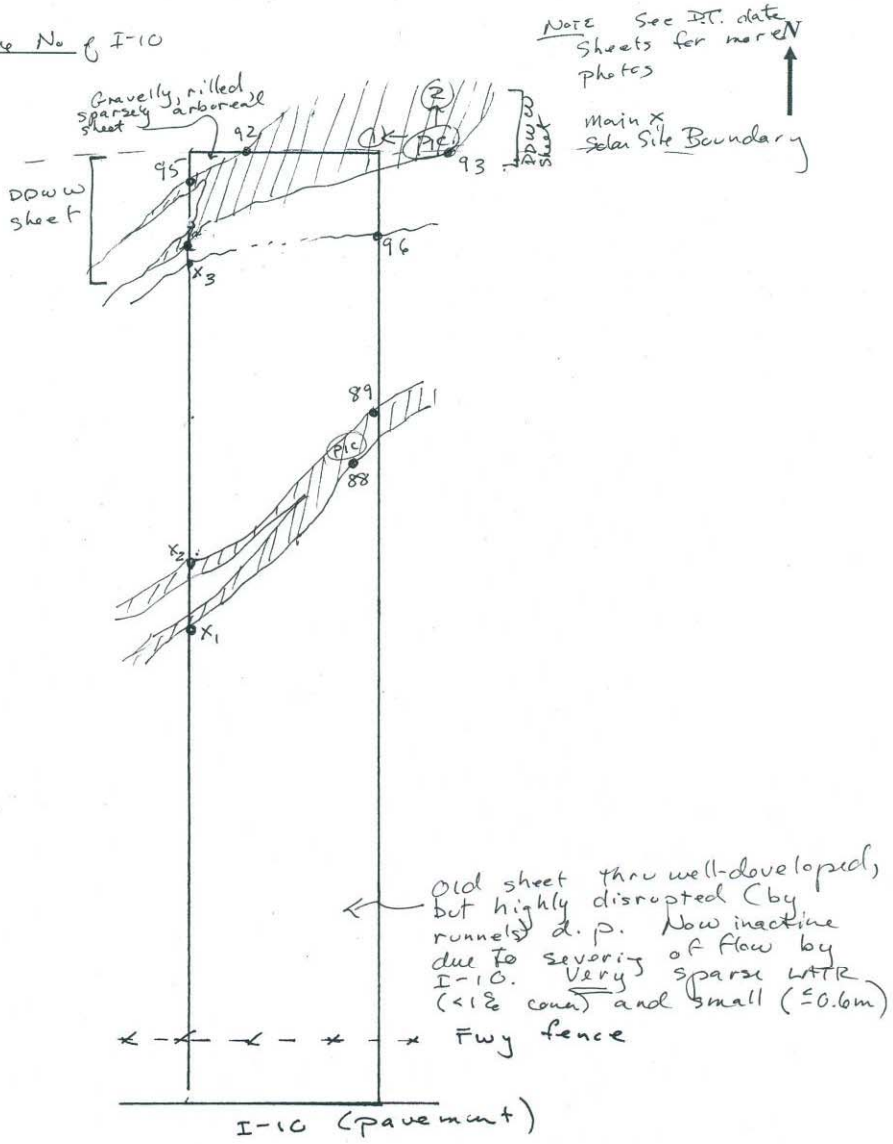
Date: 30 April 2013 Page 3/13

Project Part: GAS LINE - So. of I-10

Waypoint I.D.	UTMs Easting	UTMs Northing	Channel Type	Channel Depth	Channel Substrate	Tree/Shrub Layer Vegetation Dominants	Common	Occasional	Tree/Shrub Height	Other Observations
120	0664940	3727471	UL	0.3m	sand	LATR				2° wash ~200m upslope, LATR is sparse
121	0664943	3727406	UL; edge of sheet	<30 cm	sand	LATR				Channel is 4 m wide; Connects to 111 Sparse LATR
122	0664943	3727361	See	110						Connects to 110
123	0664943	3727319	See	108 + 109						Connects to 108 + 109
124	0664942	3727299	See	107						Connects to 107
125	0664943	3727251	See	106						Connects to 106
(127 =) 126	0664943	3727239	See	104 + 105						Same sheet wash as 104-105
128	0664942	3727163								
129	0664946	3727126	DC but a 2° runnel	2cm	sand	OLTE, LATR, AMDU		MYSA	OLTE - 10'	Flow is <1→ 2m wide
130	0664946	3727113	See	103 - X						Same sheet as 103 ⇒ X
131	0664946	3727093								
132	0664942	3727001	2° wash ind.p.	1.8m	sand	LATR	OLTE		OLTE - small ≤10'	Flow - 0.5m wide
133	0664949	3726973	2° - connects to			100				See 99-100

PROJECT Palen Solar Energy Project- Waters Mapping **Page** 1/2

DATE 29 April 2013
LOCATION IN SITE Gas Line No 6 I-10
LEGEND:



Date: 29 April 2013 **Project: Palen SEGS** Page 2 / 2

Project Part: Gas Line N. of I-10

Waypoint I.D.	UTMs Easting	UTMs Northing	Channel Type	Channel Depth	Channel Substrate	Tree/Shrub Layer Vegetation Dominants	Common	Occasional	Tree/Shrub Height	Other Observations
88	0664950	3727758	2°	≤1m	Coarse sand w/ gravel & small rocks	LATR rills	OLTE snags	AMDU HYSA	OLTE small + mostly dead	4m wide
89	0664951	3727772								
92	0664945	3727842	Two 2° channels	6-10cm	Sand and gravel rills	LATR HYSA OLTE			OLTE - to ~25'.	Many OLTE dead or dying. Wash ~35m across
93	0664974	3727841	coalesce into a broad sheeting area, which is also 2°. Many shallow runnels and courses w/ gravel rills and gravelly islands.							
94	0664937	3727822	2°	40cm	sand	AMDU OLTE			OLTE <20'	Floor ≤1m wide; entire channel width = 2.7m
95	0664936	3727833	2° runnel	3-6cm	Sand	AMDU OLTE			OLTE - <20'	Floor ~1m wide
X1	0664938	3727734	Continuation of runnel (DC) to waypt 96							
X2	0664938	3727754	Continuation of 2° wash to 88-89 wash							
X3	0664937	3727818	Continues to 88-89 wash							

APPENDIX D

SAMPLE DATA SHEETS FOR DESERT TORTOISE, WILDLIFE AND BURROWING OWL SURVEYS; and KEY TO SIGN CLASSES

PROJECT Palen Solar Electric Generating System
2013 SPECIAL-STATUS SPECIES SURVEYS

DATE 7 April 2013
TIME: Start 0820
End 1047

SURVEYORS: Navigator Karl, M.
~~GPS~~ P. Frank
~~Data~~

LINEAR I.D. T. Line ROW

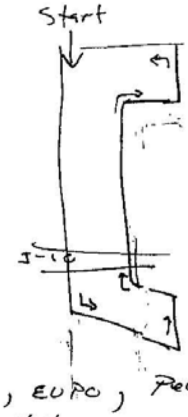
WEATHER:

	Ta	Tg	Cloud Cover	Wind
Start	22.4 (TS 22.3)	23.5	30% cirrus	N - 8
End	27.0 (TS 30.2)	35.8	100% cirro-stratus	N - 4

Location relative to I-10 N → S side
Northern UTMs 0655935 E 3731818 N
Southern UTM ended @ Red Bluff Substa. N
(NAD 83)
TOTAL TRANSECT WIDTH 20 m (2 people)
~~(note FT or~~ M)

Recent Weather: Clear, warm

GENERAL SITE DESCRIPTION:
VEGETATION SHRUB LAYER AND BUNCH GRASSES)



Aspect Dominants LATR AMDU OLTE

Common Species OPEC HYSA

Occasional Species PARFLO (the big wash only/mostly) Justicia BEJU

% Cover 7%
Avg. Height of Dominant Shrub Species LATR - ~1 to 1.6 m

UNDERSTORY
Abundant Species Dinene., CHACAR, CRAN, EREROT, EUPO, Pecto spp MAGL FKOV LUPARI (washes) CHBR CHRI ++
Exotics (Map concentrations and describe here relative to population size and geographic breadth.)
Not obvious

TOPOGRAPHY
Landform Lower bajada

Drainage Type Sheet flow mostly w/ good woodland. Near fwy & south of fwy, the washes (all are ephemeral) are separated (no sheet) and ~1-1.5 m deep east of the route, the one wash is ~5 m deep, crossing ~~to S of~~ on S side of fwy crosses ROW
Elevation (state meters or feet)
680'

SUBSTRATE
Color Pale tan → dark, mottled grays
Coarse Particles (Type, % Cover) In sheet flow is lightly rilled lg. gravel / interspersed w/ 90-100% fine & very fine gravel; scattered coarse gravel. well-developed, mod-broad (40+ m) patches, mostly in S and near fwy.
Soil Texture and Consistence soft fine sandy loam.

PRESENCE OF PREDATORS: Ravens - # Detected 0 # Nests
Coyotes - # Detected 0 Scat? Scat Piles

HUMAN-RELATED DISTURBANCES (Onsite and Adjacent) Current: T. line being built (Des. Sunlight) & residence (part-time, trailer) N NE of NE corner of ROW. One dirt rd (not graded) runs E-W just N of ROW. Also, SRBS @ south end of I-10. Old - 2 very faint old roads cross the ROW and deep wash near I-10.

SITE PICTURE: Photographer KARL
A - Form ☑ (+ Pic 1)
B – From end (identify) See diagram for habitat. → [ ] ← N
C – From other end (identify)
D – Other

COMMENTS
No bat sign in culvert - Culvert is entirely a cement box, ~200' long

Map Sign and Habitat

Show: Direction of Travel
Origin

N

Sign #	Waypoint I.D.	UTM (NAD 83)	DESERT TORTOISE						
			Sign Type	Class	Size Width (sc, bur, tr) MCL (shell, tort)	Burrow Location	In/Out Burrow? Visible?	Live Tortoise Evidence of Disease?	Photo who's camera
01	PTC 01	0655947 3731802	Shell remains	>4	Ad.	Prob old 9 (very thin)		3-4 fragmented marginals & plates	

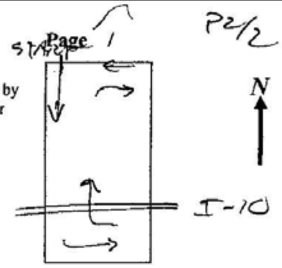
Sign #	Waypoint I.D.	UTM (NAD 83)	OTHER SPECIES			
			Species	Sign Type	Sign Condition	Comments

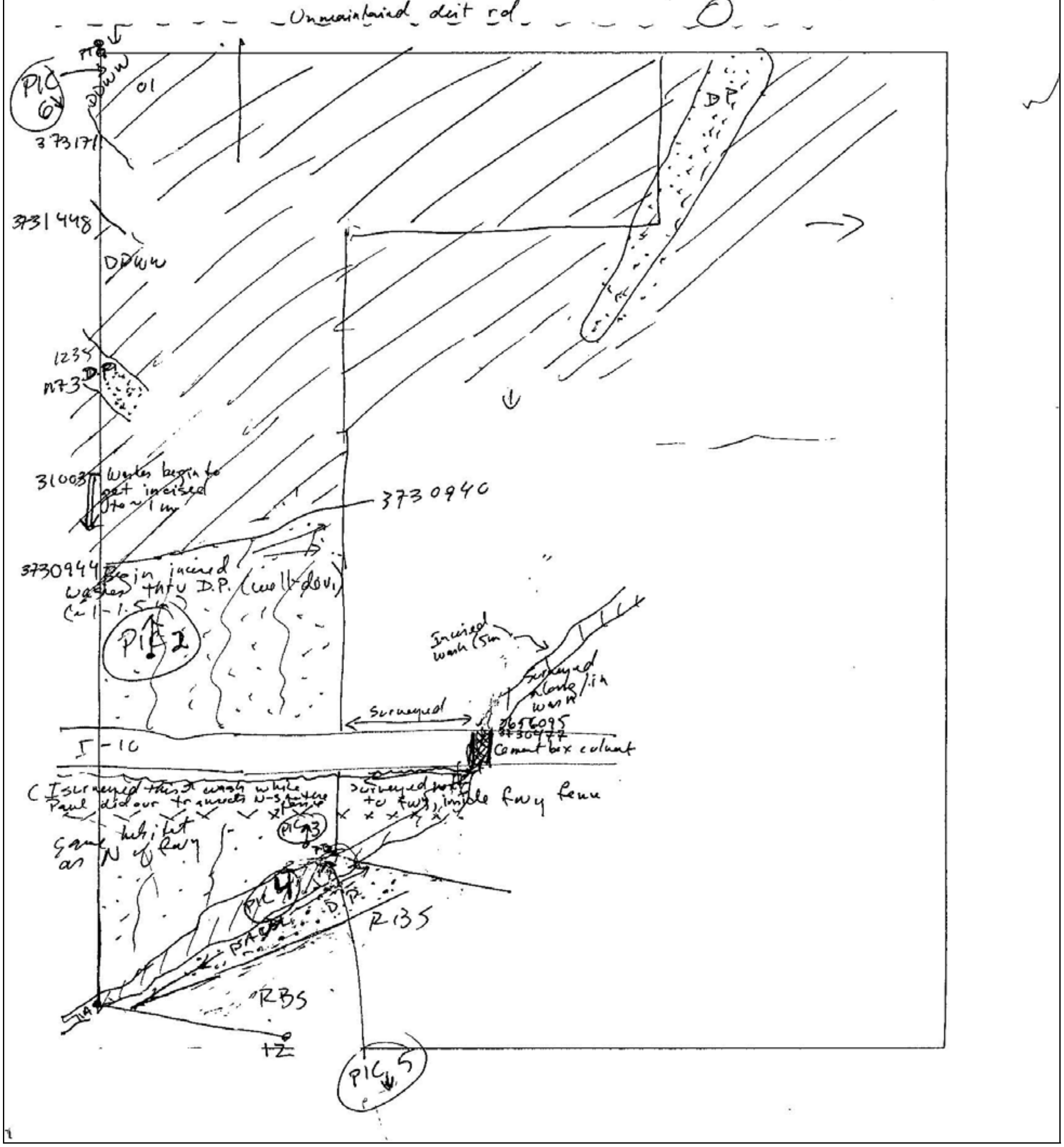
PROJECT **Palen Solar Electric Generating System** Page 1 P2/2

DATE 7 Apr 1 2013
LINEAR OR OTHER I.D. T-line
MAP LEGEND:

/// = DDWW
∴ = Well-developed desert pvmt.

Transect,s: show start, and end by direction and transect number or UTM





PROJECT Palen SEGS
BURROWING OWL PHASE 3 SURVEY

Page 1

DATE May 05 2013
TIME: Start 0553
End 1105

OBSERVER: A. Karl
General Area in Project: Gen-tie

(Draw map of survey on back of form)

WEATHER:

	Ta	Cloud Cover	Wind
Start	20.4	Sl. overcast 90% com; sunny by 0618	SW 0-2
End	27.3	90% overcast but sl. shadow	SW 1-3

Note - Sl. cloudy this A.m.; @0540 still a little dark to see burrows activity. Sunrise - 0559 (own Palens)

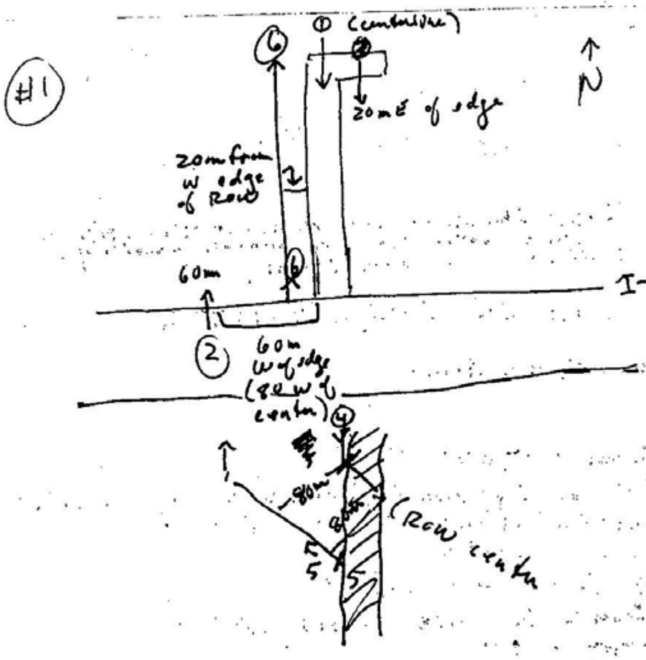
(Note: Civil Twilight is ~1940h)

Note: mostly remained ± overcast, sl. shadow, all A.M.

	Time	Species	Observations
①↓	0553	ATFL	Heard - ~200' N
#12	0621	LOSH ~0655918 3731582 200' SW	Juv begging; heard; then saw, w/ adult
#13	0628	LOSH ~0656022 3731523	Perched on OLTE - 300' NE
	0628	ATFL	Heard, ~200' N
	0632	ATFL	Heard - W ~ 200-300'
	0635	Verdin	2 Indiv. in OLTE (wash), 150' S
	0655	WIL WARB	Foraging - 80'
	0700	ATFL	Heard - 250 - 300' NW
2↑	0715	ATFL	Heard - 200-300' N
	0719	ATFL	Heard, then saw 175' W
	0728	LOSH	Heard then glassed - 180 m N (same as ...)
	0743	MODO	Flying, 100' SW
↓3	08	ATFL	Heard ~ 300-400' W
#14	0851	LOSH ~0656039 3731373	Heard ~ 100 m E
#15	0903	LOSH ~0655958 3731052	2, heard then saw, perched. 180' W
	0853	Noticeable increase in bee foraging @ OLTE	
	0913	Wil Warb + 1 unid. warb.	3, foraging in OLTE
	0930	ATFL	Heard ~ 250-300' S
	0938	BTSP	3 foraging ~100' ENE
W. Road,	0954	Verdin, BTGN, Lark Sparrow	CEFL wash
S. Tr. 10	1001	WIWA + BTSP	~100 m W of ROW, foraging
Tr. 4	Ø		
Tr 5↑	Ø		
6↑N	1026	Started Path 6, north.	Ø @ start
	1034	WIL WAR	Heard ~ 200-250' W
	1034	BTGN	Heard ~ 300' SW
	1036	BTGN	Heard ~ 200' NW
	1050	LOSH (Prob same as LOSH @0628h; same loc.)	Heard. ~ 180-200 m E; then saw - 2 indiv.

NOTE - D. Sunlight poles are ~285 m apart
NOTE - Higher quality washes & shrubs (more incised, many more wash spp of indiv. of these spp.) w/in 100 m W of ROW - (MUSA, BESU, Hyptis, occa HIRI + CEFL)
KRBR

P2/2



Note Re: Path #6 - It's 20m W of ROW edge, but only about 3m from D. Sunlight ~~plots~~ poles. So goes thru (bladed) construction area.

KEY TO SIGN CLASSES

BURROWS

1 – DEFINITELY TORTOISE – FRESH (TRACKS, TORTOISE INSIDE, FRESHLY DISTURBED SOIL ON MOUND/RUNWAY)

2 – DEFINITELY TORTOISE – USED THIS SEASON (CLEARED OF ANNUALS, BUT NO FRESHLY DISTURBED SOIL)

3 – DEFINITELY TORTOISE – NOT USED THIS SEASON (PROBABLY HAS ANNUALS GROWING IN RUNWAY)

4 – POSSIBLY TORTOISE – IN GOOD CONDITION BUT UNSURE OF SPECIES USING BURROW

5 – DEFINITELY TORTOISE – DETERIORATED SUCH THAT IT WOULD REQUIRE SUBSTANTIAL REMODELING TO BE USABLE

6 – POSSIBLY TORTOISE – DETERIORATED

SCAT

TY (This Year) 1 - T OR FRESH DARK, ODORIFEROUS

TY2 – DRIED, POSSIBLE GLAZE ON PART; UNEXPOSED SURFACES DARK BROWN; SLIGHT ODOR

TY3 – DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; VERY SLIGHT ODOR

NTY (Not This Year) 3 – DRIED, NO GLAZE; AT LEAST PARTIALLY FADED ON EXTERIOR; NO ODOR (DISTINGUISHES FROM TY3)

NTY4 – DRIED, LOOSENING, PALE OR BLEACHED

CARCASSES – GENERAL INDICATORS FOR TIME SINCE DEATH

<1 YR – UNEXPOSED SCUTES NORMAL COLOR AND SHEEN, ADHERE TIGHTLY. EXPOSED SCUTES PALING AND MAY BE LIFTING OR OFF. UNEXPOSED BONE WAXY AND SOLID.

1–2 YRS – UNEXPOSED SCUTES NORMAL COLOR WITH SLIGHT SHEEN, MOSTLY TIGHTLY ATTACHED. EXPOSED SCUTES SLIGHTLY PALE WITH NO SHEEN AND NO TO SLIGHT GROWTH RING PEELING. NO ODOR. UNEXPOSED BONE SILKY.

2–3 YRS – UNEXPOSED SCUTES PALE AND WITHOUT SHEEN BUT NO GROWTH RING PEELING. EXPOSED SCUTES PALE WITH SLIGHT PEELING, SCUTES LOOSE, OFF AND/OR TIGHT. BONE SUTURES GENERALLY TIGHT.

4 YRS – UNEXPOSED SCUTES NORMAL COLOR TO SLIGHTLY PALE, NO SHEEN, NO PEELING. EXPOSED SCUTES LOOSE, PALE, DULL, WITH MODERATE PEELING. SUTURES SEPARATING AND BONE SURFACE IS FISSURED, EDGES ARE ROUGHENED (FISSURED UNDER HAND LENS) AND CHIP FAIRLY EASILY.

>4 YRS – DISARTICULATED AND DISARTICULATING. BONE EDGES CHIP AND CRUMBLE EASILY. SCUTES ARE PEELING AND CURLED.

APPENDIX E

SPECIES OBSERVED ON THE MODIFIED LINEAR FACILITIES IN SPRING 2013

Taxon	Species		Modified Linear Facility	
PLANTS	**Common Name**	**Latin Name**	**Gen-tie**	**Gas Line**
Acanthaceae	belloperone	*Justicia californica*	X	
Amaranthaceae	Arizona honeysweet	*Tidestromia oblongifolia*	X	
Asteraceae	white burr sage	*Ambrosia dumosa*	X	X
	cheesebush	*Ambrosia salsola*	X	X
	gravel-ghost	*Atrichoseris platyphylla*	X	
	chuckwalla bush	*Bebbia juncea*	X	
	white tackstem	*Calycoseris wrightii*	X	
	pincushion	*Chaenactis carphoclinia*	X	X
	pincushion	*Chaenactis stevioides*	X	X
	brittlebush	*Encelia farinosa*	X	
	desert sunflower	*Geraea canescens*	X	X
	desert dandelion	*Malacothrix glabrata*	X	X
	monoptilon	*Monoptilon bellioides*		X
	Spanish needle	*Palafoxia arida*	X	
	Emory rock daisy	*Perityle emoryi*	X	
	odora	*Porophyllum gracile*		X
	desert chicory	*Rafinesquia neomexicana*	X	
	Mojave ragwort	*Senecio mohavensis*	X	
	Yellow-head	*Trichoptilium incisum*	X	
Boraginaceae	fiddleneck	*Amsinckia tessellata*	X	
	narrow-leaved forget-me-not	*Cryptantha angustifolia*	X	X
	bearded forget-me-not	*Cryptantha barbigera*	X	
	white-haired forget-me-not	*Cryptantha maritima*	X	X
	Nevada forget-me-not	*Cryptantha nevadensis*	X	X
	wing-nut forget-me-not	*Cryptantha pterocarya*	X	
	hairy-leaved comb-bur	*Pectocarya heterocarpa*	X	X
	broad-nutted comb bur	*Pectocarya platycarpa*	X	X
	Jones' popcorn flower	*Plagiobothrys jonesii*	X	X
Brassicaceae	Sahara mustard	*Brassica tournefortii*	X	X
	California mustard	*Caulanthus* (=*Guillenia*) *lasiophylla*	X	X
	peppergrass	*Lepidium lasiocarpum*	X	X
Cactaceae	silver cholla	*Cylindropuntia echinocarpa*	X	Nearby
	pencil cholla	*Cylindropuntia ramosissima*	X	X
	fishhook cactus	*Mammillaria tetrancistra*	X	X
Campanulaceae	nemacladus	*Nemacladus orientalis*	X	X
	nemacladus	*Nemacladus tenuis* var. *aliformis*	X	
Caryophyllaceae	frost mat	*Achyronychia cooperi*	X	
Cuscutaceae	dodder	*Cuscuta cf denticulata*		X
Euphorbiaceae	lance-leaf ditaxis	*Ditaxis lanceolata*	X	
	ditaxis	*Ditaxis neomexicana*	X	
	spurge	*Euphorbia polycarpa*	X	X
	spurge	*Euphorbia setiloba*	X	
Fabaceae	silk dalea	*Dalea mollis*		X
	silk dalea	*Dalea mollissima*	X	X
	hairy lotus	*Acmispon strigosus*		X

	lupine	*Lupinus arizonica*	X	X
	parry dalea	*Marina parryi*	X	
	ironwood	*Olneya tesota*	X	X
	palo verde	*Parkinsonia florida*	X	
	catclaw acacia	*Senegalia greggii*	X	
Geraniaceae	storksbill	*Erodium texanum*	X	X
Hydrophyllaceae	fiesta flower	*Eucrypta micrantha*	X	
	purple mat	*Nama demissum*	X	
	notchleaf phacelia	*Phacelia crenulata* var. *ambigua*	X	X
	fat-leaved phacelia	*Phacelia distans*	X	
	lacy phacelia	*Phacelia tanacetifolia*	X	
Krameriaceae	white rhatany	*Krameria bicolor*	X	
Loasaceae	white-stemmed blazing star	*Mentzelia albicaulis*	X	
	sand blazing star	*Mentzelia involucrata*	X	
Malvaceae	five-spot	*Eremalche rotundifolia*	X	X
	hibiscus	*Hibiscus denudatus*	X	
	globemallow	*Sphaeralcea ambigua*	X	
Nyctaginaceae	windmills	*Allionia incarnata*	X	
	spiderling	*Boerhavia* sp. (dry [summer-blooming species])	X	
Onagraceae	yellow-cups	*Chylismia (=Camissonia) brevipes*	X	
	brown-eyed primrose	*Chylismia* (=*Camissonia*) *claviformis aurantiaca*	X	X
	bottlebrush primrose	*Eremothera (=Camissonia) boothii condensata*	X	X
	narrow-leaved primrose	*Eremothera (=Camissonia) refracta*	X	
Papaveraceae	small-flowered gold poppy	*Eschscholzia minutiflora*	X	X
Plantaginaceae	plantain	*Plantago ovata*	X	X
Poaceae	three-awn	*Aristida adscensionis*		X
	needle grama	*Bouteloua aristidoides*	X	
	big galleta grass	*Hilaria rigida*	X	
	Mediterranean grass	*Schismus barbatus*	X	
Polemoniaceae	broad-leaved phlox	*Gilia latifolia*	X	
	star gilia	*Gilia stellata*	X	
	Jones' linanthus	*Linanthus jonesii*	X	X
Polygonaceae	brittle spineflower	*Chorizanthe brevicornu*	X	X
	spineflower	*Chorizanthe corrugata*		X
	rigid spiny-herb	*Chorizanthe rigida*	X	X
	Thomas' buckwheat	*Eriogonum thomasii*	X	X
	little trumpet	*Eriogonum trichopes*	X	
Resedaceae	mignonette	*Oligomeris linifolia*	X	X
Scophulariaceae	ghost flower	*Mohavea confertiflora*	Nearby	
Solanaceae	jimson weed	*Datura discolor*	X	
	Anderson's boxthorn	*Lycium andersonii*	X	
	Cooper's boxthorn	*Lycium cooperi*	X	
Zygophyllaceae	California fagonbush	*Fagonia laevis*	X	
	fagonbush	*Fagonia pachyacantha*		X
	creosote bush	*Larrea tridentata*	X	X

ANIMALS

Reptiles

Testudinidae	desert tortoise	*Gopherus agassizii*	X	X
Iguanidae	zebra-tailed lizard	*Callisaurus draconoides*	X	X
	side-blotched lizard	*Uta stansburiana*	X	X
Teiidae	western whiptail	*Aspidocelis tigris*	X	X

Birds

Alaudidae	horned lark	*Eremophila campestris*	X	X
Columbidae	morning dove	*Zenaida macroura*	X	
Corvidae	common raven	*Corvus corax*	Buffer (tracks)	
Emberizidae	lark sparrow	*Chondestes grammacus*	X	
	Wilson's warbler	*Wilsonia pusilla*	X	
Laniidae	loggerhead shrike	*Lanius ludovicianus*	X	
Remizidae	verdin	*Auriparus flaviceps*	X	X
Strigidae	burrowing owl	*Athene cunicularia*	Buffer	Buffer
Sylvidae	black-tailed gnatcatcher	*Polioptila melaneura*	X	
Troglodytidae	cactus wren	*Campylorhynchus brunneicapillus*	X	
Tyrannidae	ash-throated flycatcher	*Myiarchus cinerascens*	X	

Mammals

Canidae	coyote	*Canis latrans*	X (digs, scat)	X
	kit fox	*Vulpes macrotis*	X (digs, scat)	X
Cervidae	burro deer	*Odocoileus hemionus*	Buffer (scat, tracks)	Buffer (tracks)

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

PALEN SOLAR ELECTRIC GENERATING SYSTEM AMENDMENT

Docket No. 09-AFC-07C
PROOF OF SERVICE
(Revised 07/09/2013)

SERVICE LIST:

APPLICANT
Palen Solar Holdings, LLC
Clay Jensen
Charlie Turlinski
Amanda McCoy
1999 Harrison Street, Suite 2150
Oakland, CA 94612
cjensen@brightsourceenergy.com
cturlinski@brightsourceenergy.com
amccoy@brightsourceenergy.com

APPLICANT'S CONSULTANT
Centerline
Andrea Grenier
1420 E. Roseville Parkway
Suite 140-377
Roseville, CA 95661
andrea@agrenier.com

APPLICANT'S COUNSEL
Scott Galati, Esq.
Marie Fleming
Galati/Blek, LLP
455 Capitol Mall, Suite 350
Sacramento, CA 95814
sgalati@gb-llp.com
mfleming@gb-llp.com

INTERESTED AGENCY
California ISO
e-recipient@caiso.com

County of Riverside
Office of Riverside County Counsel
Tiffany North
3960 Orange Street, Suite 500
Riverside, CA 92501
tnorth@co.riverside.ca.us

South Coast Air Quality
Management District
Mohsen Nazemi
21865 Copley Drive
Diamond Bar, CA 91765-4178
mnazemi1@aqmd.gov

INTERVENORS
Center for Biological Diversity
Lisa T. Belenky, Senior Attorney
351 California St., Suite 600
San Francisco, CA 94104
lbelenky@biologicaldiversity.org

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

Basin and Range Watch
Kevin Emmerich
Laura Cunningham
P.O. Box 153
Baker, CA 92309
atomictoadranch@netzero.net
bluerockiguana@hughes.net

Californians for Renewable Energy
Alfredo Acosta Figueroa
424 North Carlton Avenue
Blythe, CA 92225
lacunadeaztlan@aol.com

California Unions for Reliable Energy
Tanya A. Gulesserian
Elizabeth Klebaner
Adams Broadwell Joseph & Cardoza
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com
eklebaner@adamsbroadwell.com

Hildeberto Sanchez, Eddie Simmons, and Laborers' International Union of North America, Local Union No. 1184
c/o Richard T. Drury
Christina M. Caro
Lozeau|Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607
richard@lozeaudrury.com
christina@lozeaudrury.com

ENERGY COMMISSION STAFF
Christine Stora
Project Manager
Siting, Transmission and
Environmental Protection Division
1516 Ninth Street, MS-2000
Sacramento, CA 95814-5512
christine.stora@energy.ca.gov

Jennifer Martin-Gallardo
Staff Counsel
Office of the Chief Counsel
1516 Ninth Street, MS-14
Sacramento, CA 95814-5512
jennifer.martin-gallardo@energy.ca.gov

*Indicates change

ENERGY COMMISSION –
PUBLIC ADVISER
*Alana Mathews
Public Adviser
1516 Ninth Street, MS-12
Sacramento, CA 95814-5512
publicadviser@energy.ca.gov

COMMISSION DOCKET UNIT
California Energy Commission
Docket Unit
Attn: Docket No. 09-AFC-07C
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

OTHER ENERGY COMMISSION
PARTICIPANTS (LISTED FOR
CONVENIENCE ONLY):
After docketing, the Docket Unit will provide a copy to the persons listed below. Do not send copies of documents to these persons unless specifically directed to do so.

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Commissioner and Presiding Member

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Adviser to Presiding Member

Jennifer Nelson
Adviser to Presiding Member

Gabriel D. Taylor
Adviser to Associate Member

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Marie Fleming declare that on July 23, 2013, I served and filed copies of the attached PALEN SOLAR HOLDINGS, LLC'S SUPPLEMENTAL SPRING 2013 BIOLOGICAL SURVEYS, dated July, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: http://www.energy.ca.gov/sitingcases/palen/compliance/.

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OR

__X__ Instead of e-mailing the document, I personally delivered it or deposited it in the U.S. mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: July 23, 2013

Marie Fleming