Draft
Environmental Impact Report
Appendices

SCH# 2020079007

Volume 3
Appendix E through Appendix G

Raceway 2.0 Solar Project
By sPower Development Company

SPA 26, Map 231; SPA 27, Map 231; SPA 28, Map 231; SPA 29, Map 231; SPA 30, Map 231; SPA 2, Map 231-20; SPA 1, Map 231-21; SPA 2, Map 231-21; SPA 3, Map 231-28; SPA 4, Map 231-28; ZCC No. 149, Map 231; ZCC No. 150, Map 231; ZCC No. 151, Map 231; ZCC No. 1, Map 231-21; ZCC No. 2, Map 231-28; CUP No. 110, Map 231; CUP No. 111, Map 231; CUP No. 112, Map 231; CUP No. 3, Map 231-20; CUP No. 1, Map 231-21; CUP No. 6, Map 231-28;
Cancellation of a Williamson Act Contract 20-06;
Kern County Franchise Agreement

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March 2021

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March 2021

Appendix E
Biological Resources Reports

Technical Memorandum

To: Dallas Pugh, Permitting Manager, sPower

From: Joseph Carlo, Ecology and Environment, Inc., member WSP

Date: January 17, 2020

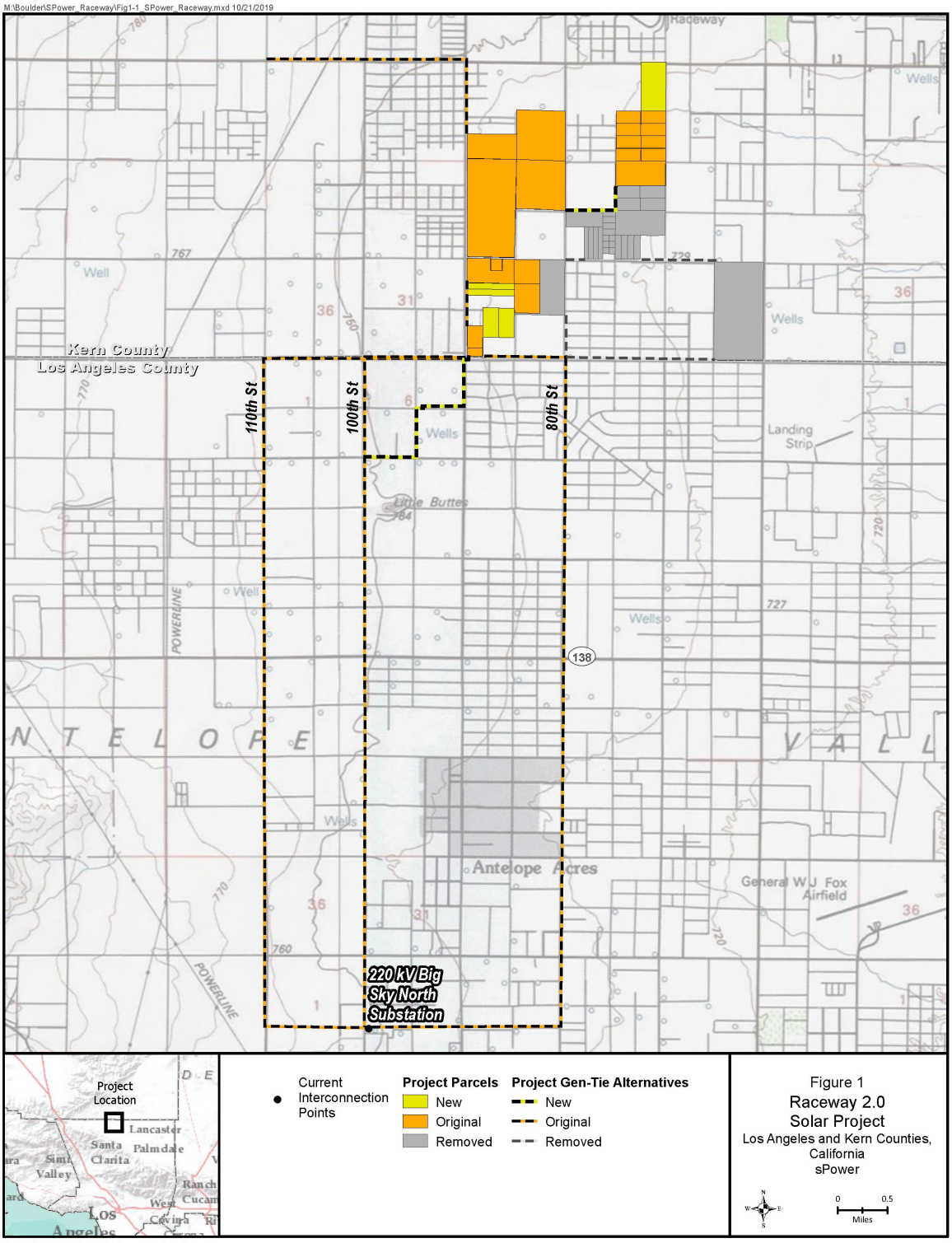
Re: Raceway 2.0 Solar Project: Biological Resources and Wetland Update Technical Memorandum

cc: Sean Fox, Project Manager, Ecology and Environment, Inc., member WSP

Ecology and Environment, Inc., member of WSP (hereafter referred to as E & E) has prepared this technical memorandum to document changes made to the original Raceway Solar Project and update the biological resources and wetland impact analysis contained in the original 2018 Final Biological Resources Report (Attachment 1) and Preliminary Jurisdictional Waters and Wetland Delineation Report (Attachment 2). The revised "Raceway 2.0 Solar Project" (proposed project) would still be constructed by sPower (applicant) on vacant land in unincorporated Kern County, California; however, the site plan has been reduced to minimize impacts on the surrounding community of Rosamond. The following analysis is based on the original 2018 Final Biological Resources Report, a recent desktop analysis and literature review, and a field-based reconnaissance survey conducted on December 9, 2019 of the new sites and generation tie (gen-tie) alternatives to verify the new findings. Information herein will inform Kern County Planning staff for preparation of the proposed project's Environmental Impact Report (EIR).

PROJECT DESCRIPTION

The proposed project is reduced in size from the original proposed project (see Figure 1). The proposed project consists of six sites and would develop photovoltaic (PV) solar facilities and the associated infrastructure necessary to generate a combined total of 291 megawatts (MW) of renewable electrical energy and/or energy storage capacity on approximately 1,311 acres of privately owned land. The proposed project consists of the following sites: Raceway Solar 1, Raceway Solar 2, Raceway Solar 3, Raceway Solar 4, Raceway Solar 5, and Raceway Solar 6.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Kern County
Los Angeles County
110th St
100th St
80th St
Wells
Landing Strip
Little Buttes
POWERLINE
138
Antelope Acres
General WJ Fox Airfield
220 kV Big Sky North Substation
Project Location
Lancaster
Palmdale
Santa Clarita
Simi Valley
Los Angeles
Current Interconnection Points
Project Parcels
New
Original
Removed
Project Gen-Tie Alternatives
New
Original
Removed
Figure 1
Raceway 2.0 Solar Project
Los Angeles and Kern Counties, California
sPower
0
0.5
Miles
Data Sources: USGS Topographic Base

The project applicant proposes that the project either be built at the same time as a single, 291 MW facility or, alternatively, developed as six independent facilities depending upon market conditions. The proposed project includes advanced energy battery storage units.

The power generated by the proposed project would be interconnected to an existing transmission network. The proposed project would interconnect via an approximately 10- to 12-mile 34 kilovolt (kV) and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the project area. Electricity at the previously approved collector substation would ultimately be delivered to the Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster. The proposed project has five interconnection options as further described in the full revised Project Description (Attachment 3). It is expected that one main path would be used for the gen-tie corridor, with deviations from the path as necessary.

A photograph log with representative photographs of new parcels and gen-tie alternatives is included in Attachment 4 of this document.

BIOLOGICAL RESOURCES ASSESSMENT

This technical memorandum provides updated information on the biological resources potentially present within or in the vicinity of the proposed project. Biological resources found on parcels that were removed from the proposed project were also removed from the analysis herein (to the appropriate extent).

E & E conducted a literature and database review to identify historical records of special status plant and wildlife species in the proposed project area, and to determine their potential to occur in the present day. The status and distributions of flora and fauna in the proposed project area were evaluated based on a review of publicly available data using federal and state databases. The following resources were used to update the special status species lists provided in Tables 1 and 2:

- The California Natural Diversity Database (CNDDB; Figure 2) records within a 5-mile radius of the proposed project area (CNDDB 2019);
- The U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (USFWS 2019a);
- The 2013 California Vegetation Map in Support of the Desert Renewable Conservation Plan (Menke et al. 2013);
- The California Native Plant Society (CNPS) online inventory of Rare and Endangered Plants of California (CNPS 2019); and
- The California Department of Fish and Wildlife (CDFW) 2019 Special Animals List (CDFW 2019a).

Species' potential occurrence within the proposed project area was initially determined based on desktop assessment of habitat types (Menke et al. 2013), vegetative cover (using aerial imagery),

the species' known range, and any observational data collected during the 2017 field reconnaissance within and in the vicinity of the proposed project area. On December 9, 2019, two qualified biologists familiar with the region conducted reconnaissance surveys of the new parcels and gen-tie alternatives to confirm or refute the findings of the desktop assessment.

For the purposes of this updated technical memorandum, special status species are restricted to federal- and state-listed threatened and/or endangered species, plant species on CNPS lists 1 and 2, and wildlife species designated by CDFW as California Species of Special Concern.

Potential to occur designations were defined as follows (maintaining the designations utilized within the 2018 Report):

- **Low:** The proposed project area or immediate region does not support suitable habitat, and/or the known range of the species is outside of the proposed project area or immediate region.
- **Moderate:** The proposed project area and immediate region support suitable habitat for the species.
- **High:** The proposed project area and immediate region support favored or high value habitat for the species and it is known to occur in the area.
- **Present:** The species was observed within the proposed project area during November 2017 and/or December 2019 field surveys and it is presumed that habitats supporting these species are still present within the proposed project area.

SUMMARY OF REPORT UPDATES - SPECIAL STATUS PLANTS AND WILDLIFE

Resources identified above were reviewed for changes since the 2018 Final Biological Resources Report was issued; listing status for special status species relevant to the project area remained unchanged. One species, the crotch bumble bee (*Bombus crotchii*), has since been identified as a candidate for listing under the California Endangered Species Act (CESA) and has been identified as occurring in the vicinity of the proposed project area. This species is discussed in greater detail below.

Using October 2019 data from the CNDDB database, six plant species have a record of occurrence within 5 miles of the proposed project area. Habitat type within the proposed project area and species' range was considered in addition to historical occurrence data to determine the likelihood of species occurrence within the proposed project area. Table 1 provides a list of plant species that could potentially occur within or in the vicinity of the proposed project area, as well as the likelihood of their occurrence.

Compared with the February 2018 Final Biological Resources Report, there were no changes in special status plant species with potential to occur within or in the vicinity of the proposed project area. However, the CNDDB identified one small area near the northeastern corner of the newly added northeastern parcel (APN 374-011-07) where alkali mariposa lily (*Calochortus striatus*) has been recorded on three separate dates: May 14, 2010; April 25, 2016; and May 17, 2017. No additional sighting data is present for this population after 2017. Soils in this area belong to the Rosamond soil series, which is classified as a moderately alkaline soil (USDA NRCS SSURGO 2019), and, thus, they are conducive soil conditions for this species.

Additionally, habitat in this area is identified as annual grasses and forbs; furthermore, based on aerial imagery, this portion of the proposed project area appears to be sparsely vegetated. Based on these habitat conditions, habitat in this region would be considered suitable for this species. On December 9, 2019 this northernmost parcel was investigated for potentially suitable habitat for sensitive species, with special attention for alkali mariposa lily. Habitat within the parcel is defined as desert scrub dominated by spiny hopsage (*Grayia spinosa*) and cheatgrass (*Bromus tectorum*). It was determined that habitat in this parcel was not conducive for special status species. Future species-specific surveys are planned for 2020, which will occur during the proper survey windows to confirm presence/absence of special status species, including Alkali mariposa lily.

Based on CDFW species' habitat and range review and the CNDDB database review, 26 wildlife species have a record of occurrence within 5 miles of the proposed project area. Table 2 provides a list of animal species that could potentially occur within or in the vicinity of the proposed project area as well as the likelihood of their occurrence.

Compared with the 2018 Final Biological Resources Report, one new wildlife species was identified as potentially occurring within or in the vicinity of the proposed project since 2018, based on CNDDB database review—the crotch bumble bee (which is discussed in greater detail below). Results of the literature and database review also indicated that the new southernmost parcels (APNs 374-020-47 and 374-020-48) overlap an area where Swainson's hawk (*Buteo swainsoni*) has been previously observed or detected. During the December 9, 2019 field-based reconnaissance surveys of these parcels, this previously known nest was identified and appeared to remain active. Evidence of sensitive species was not encountered outside of the known Swainson's hawk nesting location (discussed above).

Habitats across these new parcels and gen-tie alternatives were composed of desert scrub and fallow agricultural fields (see Attachment 4 for representative habitat photos). Potentially suitable habitat was identified for only 3 of the 26 species identified during the desktop assessment: Swainson's hawk, burrowing owl, and crotch bumble bee. Though no nests were present during the reconnaissance survey, several tamarisks were observed on the northernmost new parcel (APN 374-011-07), which could act as nesting substrate for Swainson's hawk in the future. While no burrows of suitable size were observed throughout the parcels, the habitat throughout the parcels is conducive for burrowing owl foraging and future burrow sites. Habitat for crotch bumble bee is broad and includes flowering plants, which are ubiquitous throughout the region; as such, habitat for this species occurs within the project area.

Crotch Bumble Bee
The crotch bumble bee was listed as a candidate for listing under the CESA (along with three other bee species) on July 16, 2019 (CDFW 2019b). The CDFW has 12 months to review the petition and evaluate available information and report back to the Fish and Game Commission about whether the petitioned actions (listing the crotch bumble bee under the CESA) are warranted.

The crotch bumble bee is a generalist forager that has been reported occurring on a variety of flowering plant species in California. This species requires flowering plants in open grassland and scrub habitats, and it occurs primarily in California, specifically in the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills throughout most of southwestern California (Williams et al. 2014). Based on information from the CNDDB, this species has no record of occurrence within the proposed project area but does have recorded occurrence near the southeastern edge of the 5-mile project buffer (Figure 2). Habitat requirements for this species are broad and not well understood at this time; however, this species does require flowering plants and the proposed project area is within the known range of this species. Habitat along the nearest proposed project components, the gen-tie alternatives, and the proposed project area, include annual grasses and forbs and agriculture, which generally include flowering plants. Based on the single CNDDB sighting of this species from 1971, as well as this species' broad and relatively poorly understood habitat requirements, it is difficult to determine the likelihood of occurrence within the proposed project area, but likely has moderate potential to occur. Based on the December 9, 2019 reconnaissance survey, flowering shrubs and forbs are present within all new parcels and gen-tie locations. While flowering plants necessary for pollinators are present within the propose project area, these flowering plants are ubiquitous throughout the entire region.

SUMMARY OF REPORT UPDATES - HABITAT/VEGETATION

Based on the desktop assessment, the proposed project area is composed of annual grasses and forbs (2,289.1 acres) and agricultural (1,565.2 acres) vegetation types (Figures 3a and 3b; Table 3). Table 3 identifies habitat types by proposed project components: solar sites and gen-tie alternatives.

The proposed project's solar sites are generally composed of agricultural (878.6 acres) and annual grasses and forbs (367.5 acres) vegetation types. Similarly, vegetation adjacent to the gen-tie and interconnection routes are primarily composed of annual grasses and forbs (1,921.6 acres), agriculture (686.7 acres), and rabbitbrush (570.6 acres) vegetation types.

During the field reconnaissance surveys, each of the new parcels and gen-tie alternatives were investigated; the results of the December 9, 2019 field reconnaissance surveys were consistent with the desktop analysis. The northernmost new parcel (APN 374-011-07) is characterized as desert scrub dominated by spiny hopsage and cheatgrass. The southwestern portion of this parcel has some hummocks present, where small rodent burrows were identified; however, none of the burrows showed evidence of use by sensitive species, such as Mohave ground squirrel (*Xerospermophilus mohavensis*), desert kit fox (*Vulpes macrotis*), American badger (*Taxidea taxus*), and burrowing owl (*Athene cunicularia*).

The southernmost new parcels (APNs 374-250-09, 374-250-08, 374-020-47, and 374-020-48) are characterized as sparsely vegetated feral fields with tumbleweeds and cheatgrass present. No burrows were identified in these fields and habitat is not suitable for sensitive species.

The new gen-tie alternatives were investigated and were primarily composed of general desert scrub shrub habitat dominated by tumbleweeds, and rabbitbrush (*Ericameria nauseosa*), as well

as cheatgrass, halogeton (*Halogeton glomeratus*) and various other grasses. Habitats for the gen-tie alternative locations are not suitable for sensitive species.

SUMMARY OF REPORT UPDATES - CRITICAL HABITAT AND SENSITIVE NATURAL COMMUNITIES

The USFWS still does not identify critical habitat for any species within or near the proposed project area (USFWS 2019b).

Three sensitive natural communities were identified by the CNDDB as occurring within 5 miles of the proposed project area. These sensitive natural communities include valley needlegrass, southern willow scrub, and wildflower fields (Figure 2). Based on the field surveys in 2017 and 2019, none of these natural communities occur within the proposed project area. Joshua tree woodland occurs adjacent to the interconnection options; however, impacts on this vegetation community would be avoided during construction; as such, no impacts to these communities would be anticipated.

SUMMARY OF REPORT UPDATES - WATERSHED AND FLOOD ZONE

The proposed project area is within the Antelope-Fremont Valley Watershed (Hydrologic Unit Code 18090206). Much of the proposed project area remains within a Zone A Special Flood Hazard Area with the exception of the gen-tie alternatives south of Rosamond Boulevard and approximately half of the northernmost parcel in the proposed project area (Figure 4; FEMA 2019). The Special Flood Hazard Area is subject to inundation by the 1 percent annual chance of a flood (i.e., 100-year flood).

SUMMARY OF REPORT UPDATES - WETLANDS AND WATERBODIES

Based on National Wetland Inventory (NWI) mapping, one potential new intermittent stream feature was identified in the northeastern parcel (APN 374-011-07) of the proposed project area. Based on NWI mapping, the stream potentially crosses approximately 950 linear feet of the proposed project area. One other potential stream feature was identified on the NWI as occurring just south of the southernmost gen-tie alternative location along W Avenue B; based on the NWI mapping, this feature appears to briefly cross the proposed gen-tie alternative line (Figures 5a through 5d).

The Soil Survey Geographic Database (SSURGO) data identifies alkali soils present within the northeastern parcel (Figure 6), which can be indicative of hydric soils, one of the necessary parameters to identify wetland features in the field. However, desktop review of the SSURGO soil data and aerial imagery is not a definitive determination as to whether wetlands and/or waterbodies are present within the new parcels for the proposed project area.

On December 9, 2019, E & E biologists familiar with the proposed project and experienced in performing wetland delineations investigated the new parcels and gen-tie alternatives for presence of wetlands and/or waterbodies. During the field-based assessment, no wetlands or waterbodies were identified on any of the new project's solar site areas or new gen-tie alternative areas, including those identified by the NWI and SSURGO databases. One NHD-mapped stream

was identified in the northernmost parcel (APN 374-011-07) during the desktop assessment, which was investigated during the reconnaissance survey. This area contained no defined bed or bank and lack any indicators of hydrologic flow (see Attachment 4; P-3 and P-4). It is suspected that this area may be a remnant stream from a period of time prior to development of roadways in the region, which significantly altered hydrologic flow in Antelope Valley. The second NHD-mapped stream identified just south of the southernmost gen-tie alternative area was not identified during the reconnaissance survey; this area, south of W Avenue B, had a gentle slope present. However, no defined bed or bank were present and there was no sign of hydrologic flow (see Attachment 4; P-12).

CONCLUSIONS AND RECOMMENDATIONS

Based on a review of changes made to the proposed project area, no new significant issues have been identified. Coordination with the CDFW is recommended concerning any recent occurrences of sensitive species. Adhering to the recommended avoidance and minimization measures identified in Chapter 6 of the Final Biological Resources Report (Attachments 1 and 2) would assist in minimizing impacts to biological resources as a result of construction activities.

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Tables

Table 1 Special Status Plant Species with Potential to Occur in the Raceway 2.0 Solar Project Area

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
alkali mariposa lily	*Calochortus striatus*	1B.2	Found on silt or caked mud in open spaces between shrubs and on edges of salt pans and alkali playas. Associated with annual grasses, fourwing saltbush, rubber rabbitbrush, inland saltgrass, and California goldfields.	Low potential to occur on site due to lack of suitable habitat.
Clokey's cryptantha	*Cryptantha clokeyi*	1B.2	Found in valley grasslands and creosote bush scrub in sandy soil dominated by redstem stork's bill, California poppy, cream cups, bluegrass, pincushion flower, and linanthus.	Low potential to occur on site due to lack of suitable habitat.
Horn's milk-vetch	*Astragalus hornii*	1B.1	Found in alkaline meadows and seeps along lake margins.	Low potential to occur on site due to lack of suitable habitat.
Rosamond eriastrum	*Eriastrum rosamondense*	1B.1	Occurs in chenopod scrub and vernal pools (edges); alkaline hummocks, often sandy.	Low potential to occur on site due to lack of vernal pool and alkaline hummock habitats.
sagebrush loeflingia	*Loeflingia squarrosa var. artemisiarum*	2B.2	Occurs in sandy areas in sagebrush and creosote bush scrub between 3,500 and 4,000 feet elevation.	Low potential to occur on site. Proposed project is outside the recognized elevation range for this species.
short-joint beavertail	*Opuntia basilaris var. brachyclada*	1B.1	Occurs in chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodlands.	Low potential to occur on site due to lack of suitable habitat.

Source: CNDDB 2019
Key:
Status
E = Federal or State-listed Endangered
T = Federal or State-listed Threatened
California Rare Plant Ranks (formerly known as CNPS Lists)
1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
2A: Plants Presumed Extirpated in California, But Common Elsewhere
2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3: Plants About Which More Information is Needed - A Review List
4: Plants of Limited Distribution - A Watch List
0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2-Moderately threatened in California (20–80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway 2.0 Solar Project Site

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
Reptiles				
coast horned lizard	*Phrynosoma coronatum*	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low potential to occur on site due to lack of suitable habitat.
desert tortoise	*Gopherus agassizii*	FT, ST	Occurs in desert alluvial fans, washes, canyon bottoms, and hillsides.	Low potential to occur on site due to lack of suitable habitat.
silvery (Northern California) legless lizard	*Anniella pulchra*	SSC	Occurs on the desert side of the Tehachapi Mountains in moist, warm, loose soil with sparse plant cover.	Low potential to occur on site due to lack of suitable habitat.
Birds				
burrowing owl (nesting and some wintering sites)	*Athene cunicularia*	SSC	Inhabits open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals—most notably, the California ground squirrel.	High potential to occur on site. Observed potentially suitable burrows on site in November 2017.
California condor	*Gymnops californianus*	FE, SE	Nests in caves and on cliff faces in rocky, forested areas. Forages in shrublands, coniferous forests, and oak savannahs.	Low potential to forage on site. Critical habitat for this species is present 14 miles west of the proposed project site in the Tehachapi Mountains. No suitable nesting habitat occurs on site.
ferruginous hawk (wintering)	*Buteo regalis*	Watch List	A rare to uncommon transient and winter visitor in southern California. Typically requires extensive grasslands, sparsely vegetated rolling hills and agricultural fields for foraging habitat. Roosts in open areas, usually in a lone tree or utility pole.	Moderate potential to forage on site during wintering and migration periods. No potential to breed on site because this species does not breed in southern California.
golden eagle (nesting and wintering)	*Aquila chrysaetos*	FP	Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons and large trees in open areas provide nesting habitat.	Low potential to breed on site due to lack of suitable habitat. Moderate potential to forage on site during wintering and migration periods.
Le Conte's thrasher	*Toxostoma lecontei*	SSC	Habitat includes sparsely vegetated desert flats, dunes, and alluvial fans usually with a high proportion of saltbush and/or cholla cactus.	Low to moderate potential to forage on site. Suitable nesting habitat is low to moderate and occurs on adjacent lands.

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway 2.0 Solar Project Site

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
loggerhead shrike (nesting)	*Lanius ludovicianus*	SSC	A rare to uncommon breeding resident in southern California, with an influx into the region during winter. Prefers open terrain, with short vegetation, including rangeland, agricultural fields, open brushlands, etc. Was once more common and widely distributed in North America.	High potential to forage on site. Suitable nesting habitat occurs along periphery of site. Individuals were heard and observed during previous field efforts.
merlin (wintering)	*Falco columbarius*	Watch List	Breeds in far northern U.S. and Canada but can be found in open forests, grasslands, and coastal areas during winter and migration periods.	Moderate potential to forage on site in non-breeding season. No potential to breed on site this species does not breed in southern California.
mountain plover (wintering)	*Charadrius montanus*	SSC	Breeds on open plains at moderate elevations and winters in shortgrass prairie, plowed fields, and sandy deserts.	Low to Moderate potential to forage on site in non-breeding season. The species does not breed in the region of the proposed project area.
northern harrier (nesting)	*Circus cyaneus*	SSC	Most common in undisturbed wetlands and grasslands, but also found in agricultural areas. Nest on the ground in low, thick vegetation.	Moderate potential to nest and forage on site.
prairie falcon (nesting)	*Falco mexicanus*	Watch List	Occurs in grasslands, shrub-steppe, deserts, and other open areas of the West up to about 10,000 feet elevation. During the winter, they also reside in cultivated fields, lakeshores, desert scrub, as well as feedlots where European starlings may provide a steady food source.	Low potential to nest on site due to lack of suitable nesting habitat.
Swainson's hawk (nesting)	*Buteo swainsoni*	ST	Forages over a variety of open habitats, including grasslands, rangeland, and agricultural fields.	High potential. Suitable nesting habitat occurs in proposed project vicinity and suitable foraging habitat occurs on site.
tricolored blackbird (nesting colony)	*Agelaius tricolor*	CS, SSC	Nests in colonies in freshwater marshes.	Low potential to occur on site due to lack of suitable habitat.
Mammals				
American badger	*Taxidea taxus*	SSC	Occurs in grasslands and scrublands with sparse cover. Excavates burrows for dens and breeding. Forages primarily on burrowing rodents, but also eats small birds, insects, and reptiles.	High potential to occur on site.
Mohave ground squirrel	*Spermophilus mohavensis*	ST	Found in the western Mojave Desert in Inyo, Kern, Los Angeles, and San Bernardino Counties in desert scrub habitats.	Low potential to occur on site. Outside the current known range for this species.

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway 2.0 Solar Project Site

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC	Inhabits mines, caves, and vacant buildings and requires a vertical surface for roosting. Highly sensitive to disturbance. Feeds on flying insects.	Low potential to occur on site. No suitable roosting habitat is present on any of the three solar facilities. Suitable foraging habitat is present on site.
desert kit fox	*Macrotis mutica arsipus*	--	Inhabits creosote bush scrub and dry grassland habitats throughout the Mojave Desert.	High potential to occur on site. Observed inactive escape den on site.
Invertebrates				
crotch bumble bee	*Bombus crotchii*	CS	Generalist forager in open grassland and scrub habitats.	Moderate potential to occur on site. CNDDB indicates this species has potential occurrence well outside of the proposed project area. Habitats in the proposed project area include flowering plants within scrub habitats

Source: CNDDB 2019
Key:
Status
FT = listed as threatened under the federal Endangered Species Act.
ST = listed as threatened under the California Endangered Species Act.
CS = candidate for listing under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.

Table 3 Acreage of Vegetation Types on the Raceway 2.0 Solar Project and Interconnection Routes

Vegetation Type	Acreage	
	Solar Sites	Gen-tie Lines
Agriculture	878.56	686.65
Alkaline mixed scrub	50.91	334.60
Annual grasses and forbs	367.50	1,921.60
Creosote bush	0.00	1.93
Joshua tree woodland	0.00	2.01
Rabbitbrush	0.38	570.63
Saltbush	0.19	4.25
Shadscale	0.00	6.18
Developed	13.42	344.77
Total	**1,310.96**	**3,872.62**

Source: Menke et al. 2013

Figures

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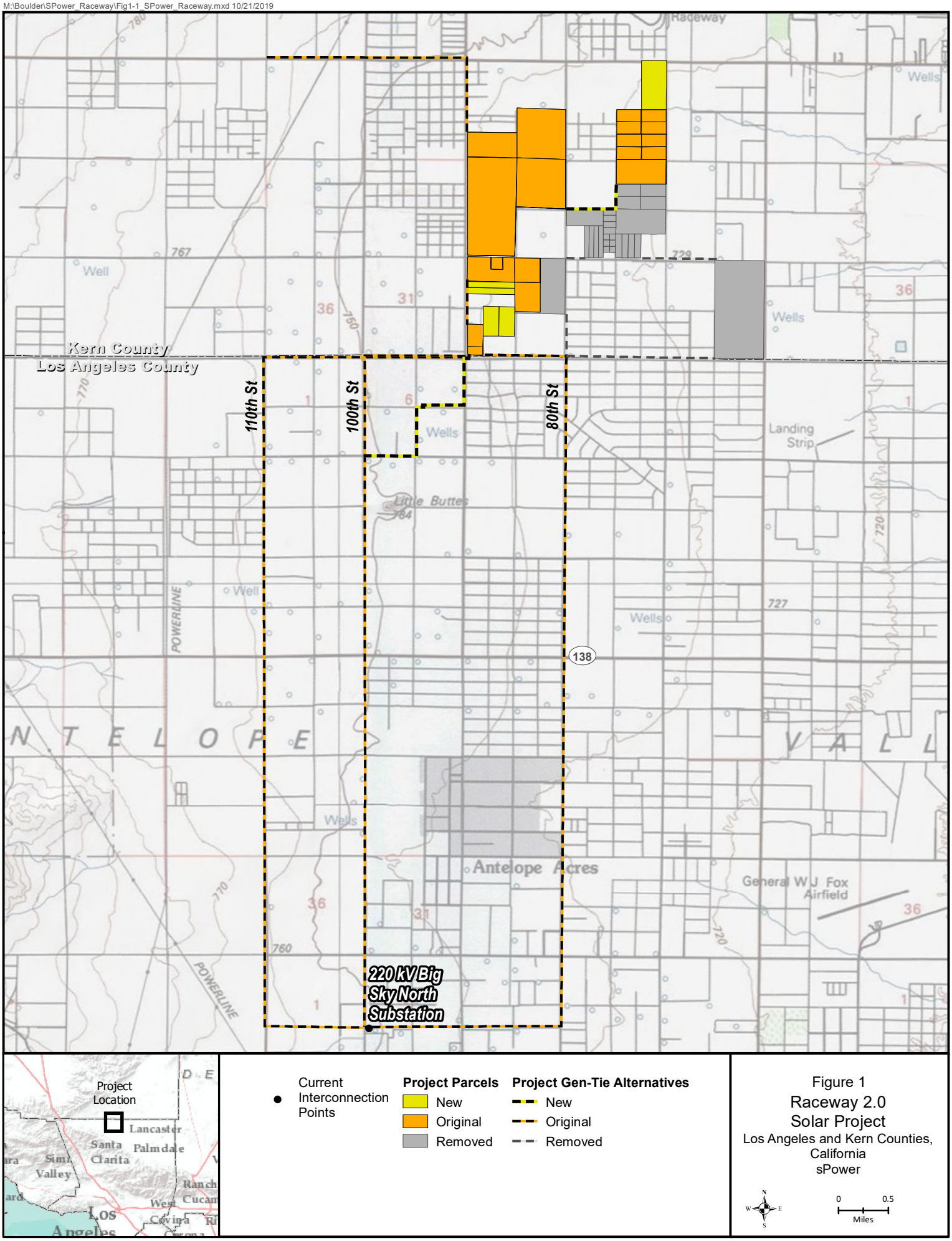

Data Sources: USGS Topographic Base

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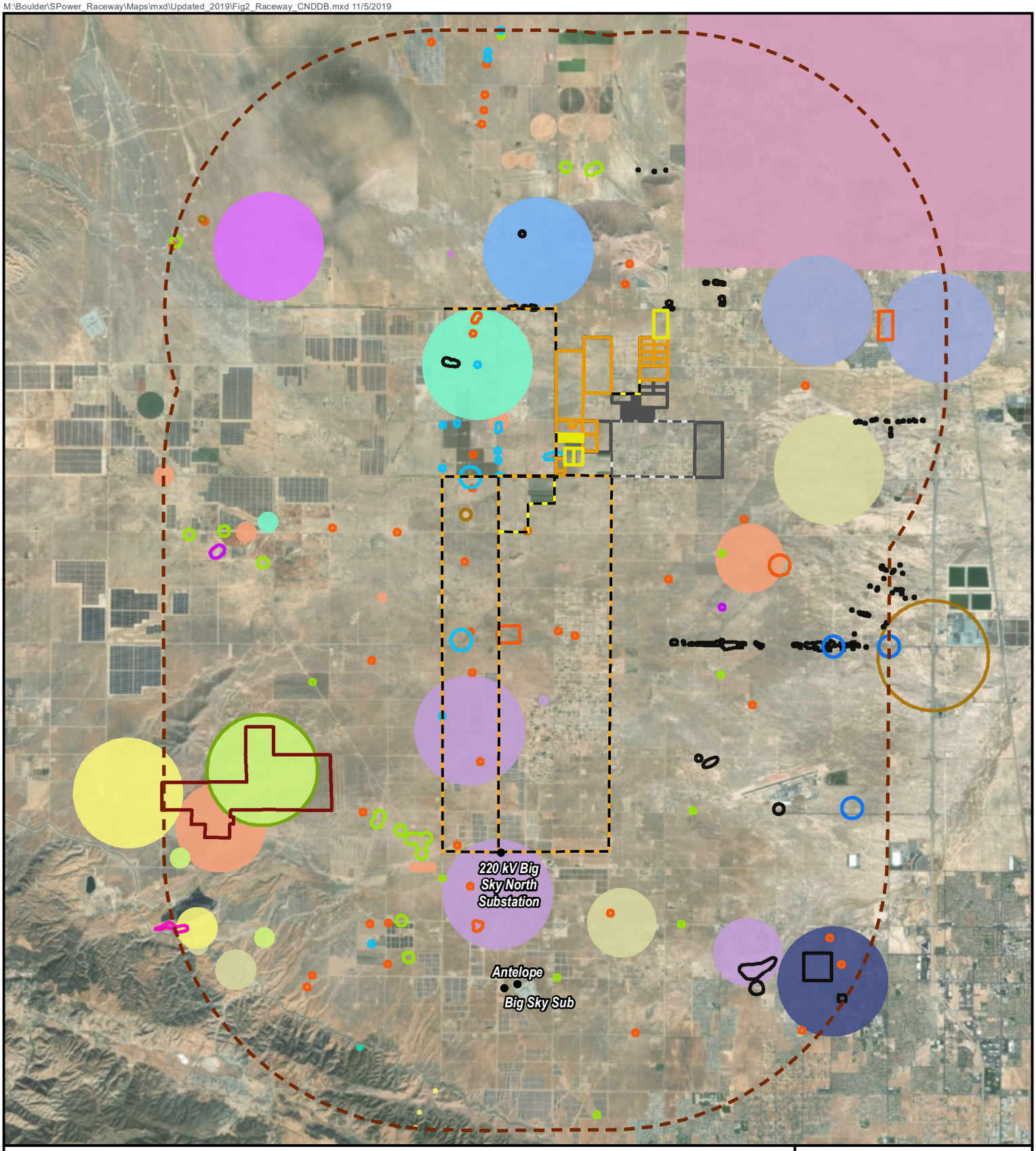

- Current Interconnection Points
- 5-mile buffer of Project Features

Project Gen-Tie Alternatives
- New
- Original
- Removed

Project Parcels
- New
- Original
- Removed

CNDDB Observations
- short-joint beavertail
- loggerhead shrike
- Southern Willow Scrub
- merlin
- Rosamond eriastrum
- Swainson's hawk
- ferruginous hawk
- burrowing owl
- alkali mariposa-lily
- Clokey's cryptantha
- sagebrush loeflingia
- Wildflower Field
- Le Conte's thrasher
- Crotch bumble bee
- Horn's milk-vetch
- golden eagle
- Valley Needlegrass Grassland
- coast horned lizard
- mountain plover
- tricolored blackbird
- American badger
- Townsend's big-eared bat
- northern California legless lizard
- prairie falcon

Figure 2
Raceway 2.0 Solar Project
CNDDB Within 5 Miles
Los Angeles and Kern Counties, California
sPower

0 0.5 1 2
Miles

Data Sources: DigitalGlobe 2018, CNDDB 10/01/2019

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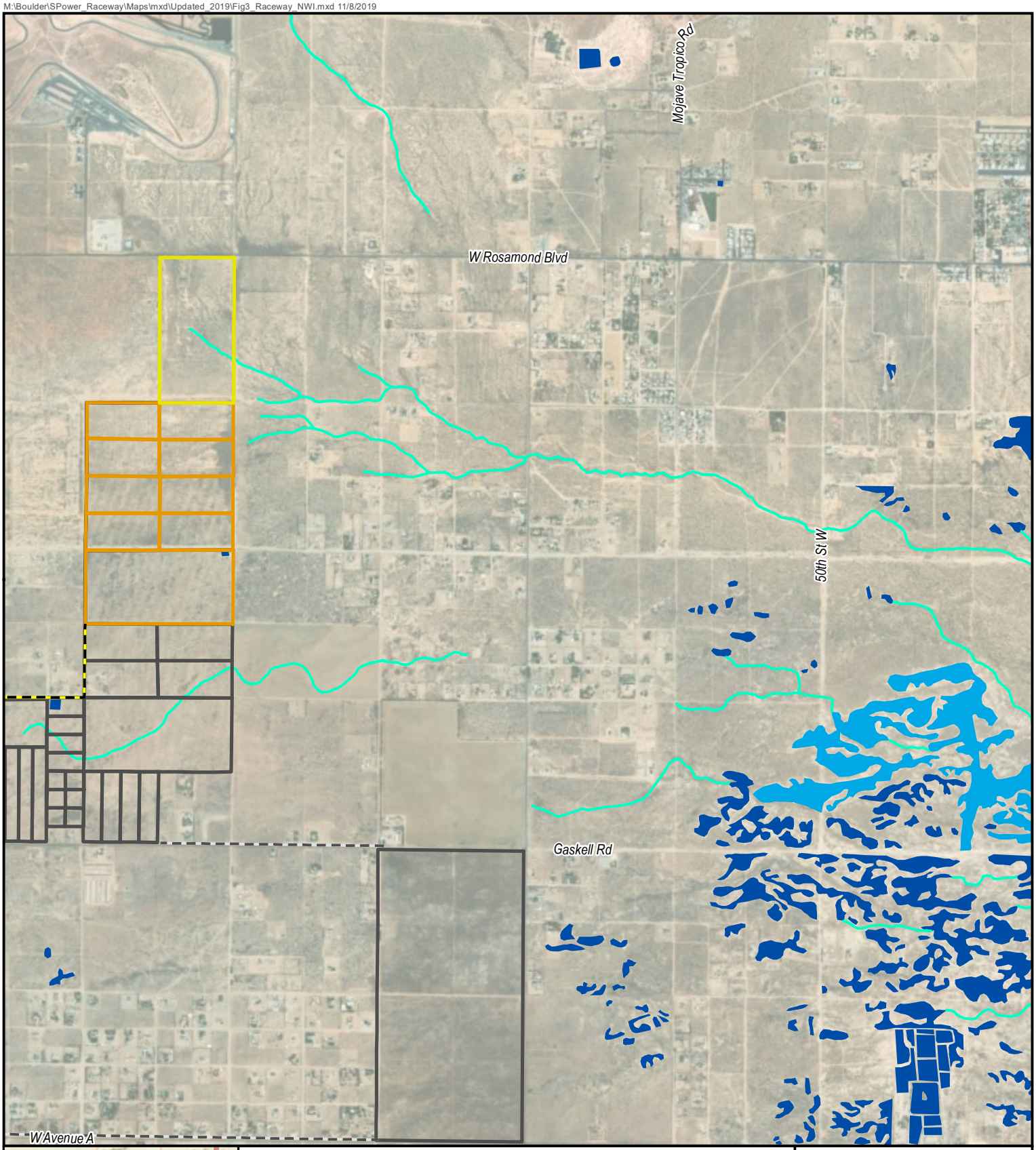

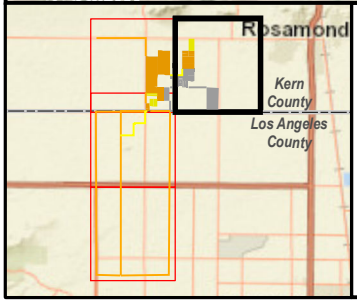

Project Gen-Tie Alternatives
- New
- Removed

Project Parcels
- New
- Original
- Removed

National Wetland Inventory
- Freshwater Pond
- Lake
- Riverine

Figure 3
Raceway 2.0 Solar Project
NWI
Page 1 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: USFWS 2012

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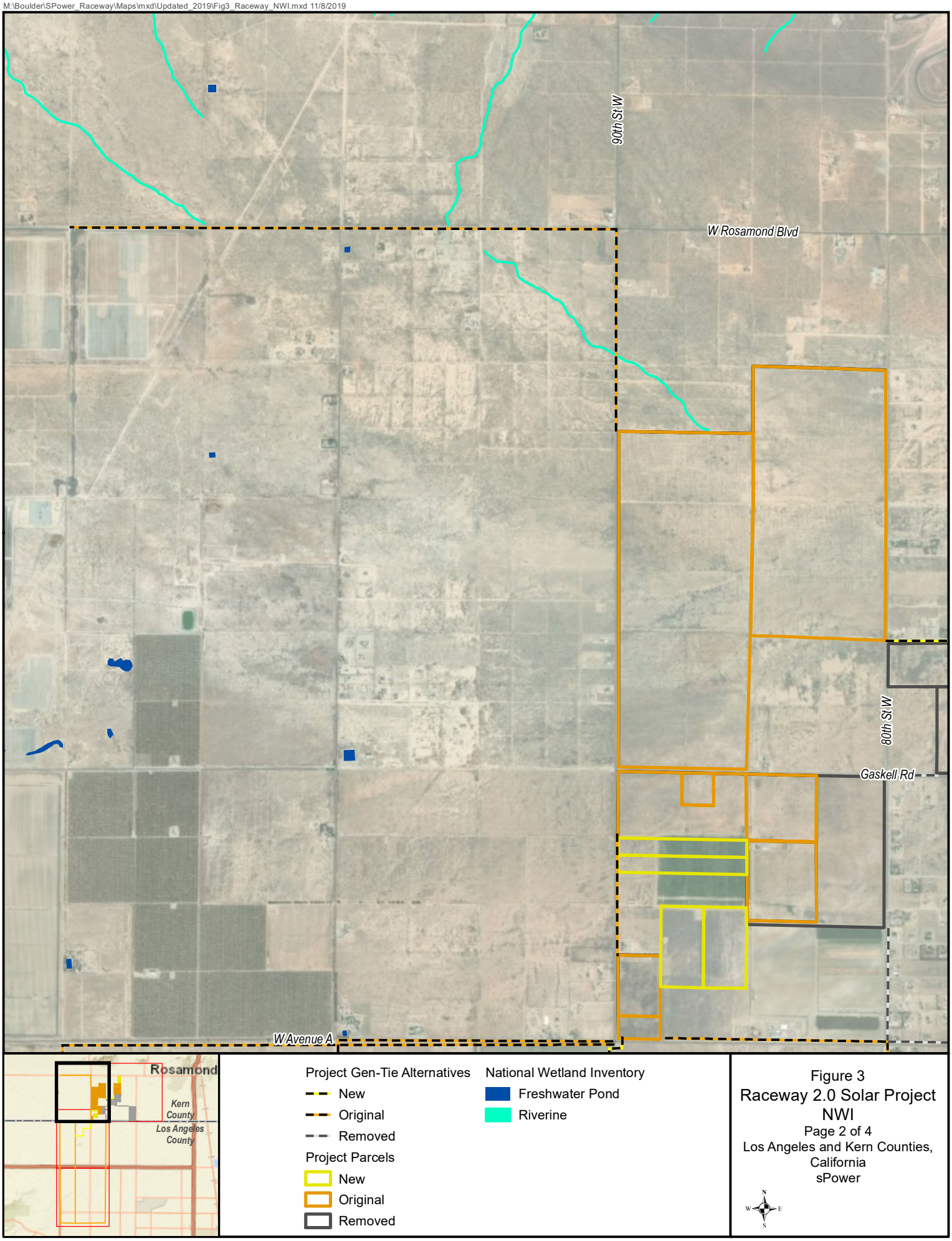

Figure 3
Raceway 2.0 Solar Project
NWI
Page 2 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: USFWS 2012

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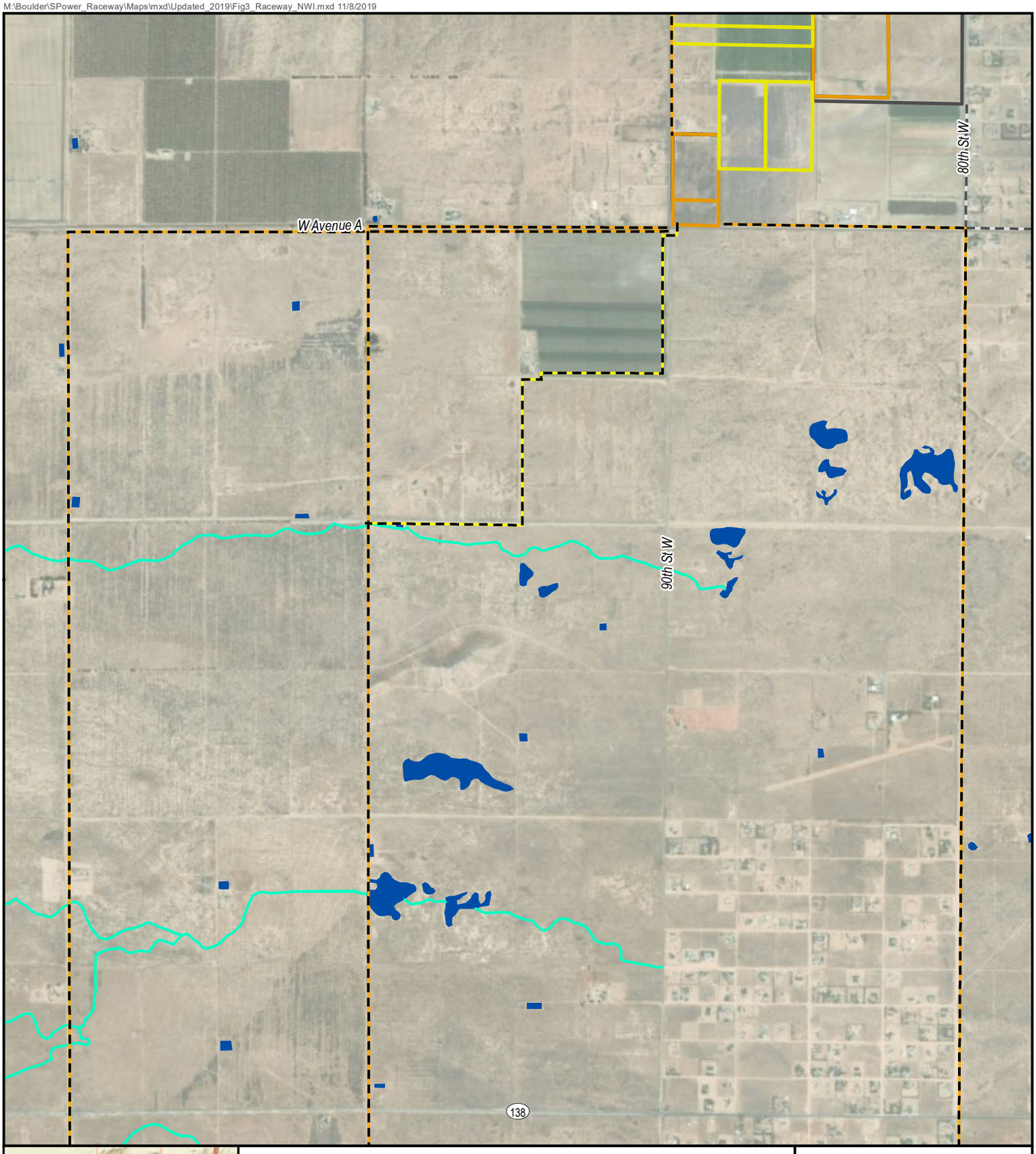

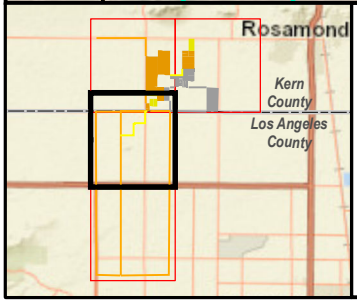

Project Gen-Tie Alternatives
- New
- Original
- Removed

Project Parcels
- New
- Original
- Removed

National Wetland Inventory
- Freshwater Pond
- Riverine

Figure 3
Raceway 2.0 Solar Project
NWI
Page 3 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: USFWS 2012

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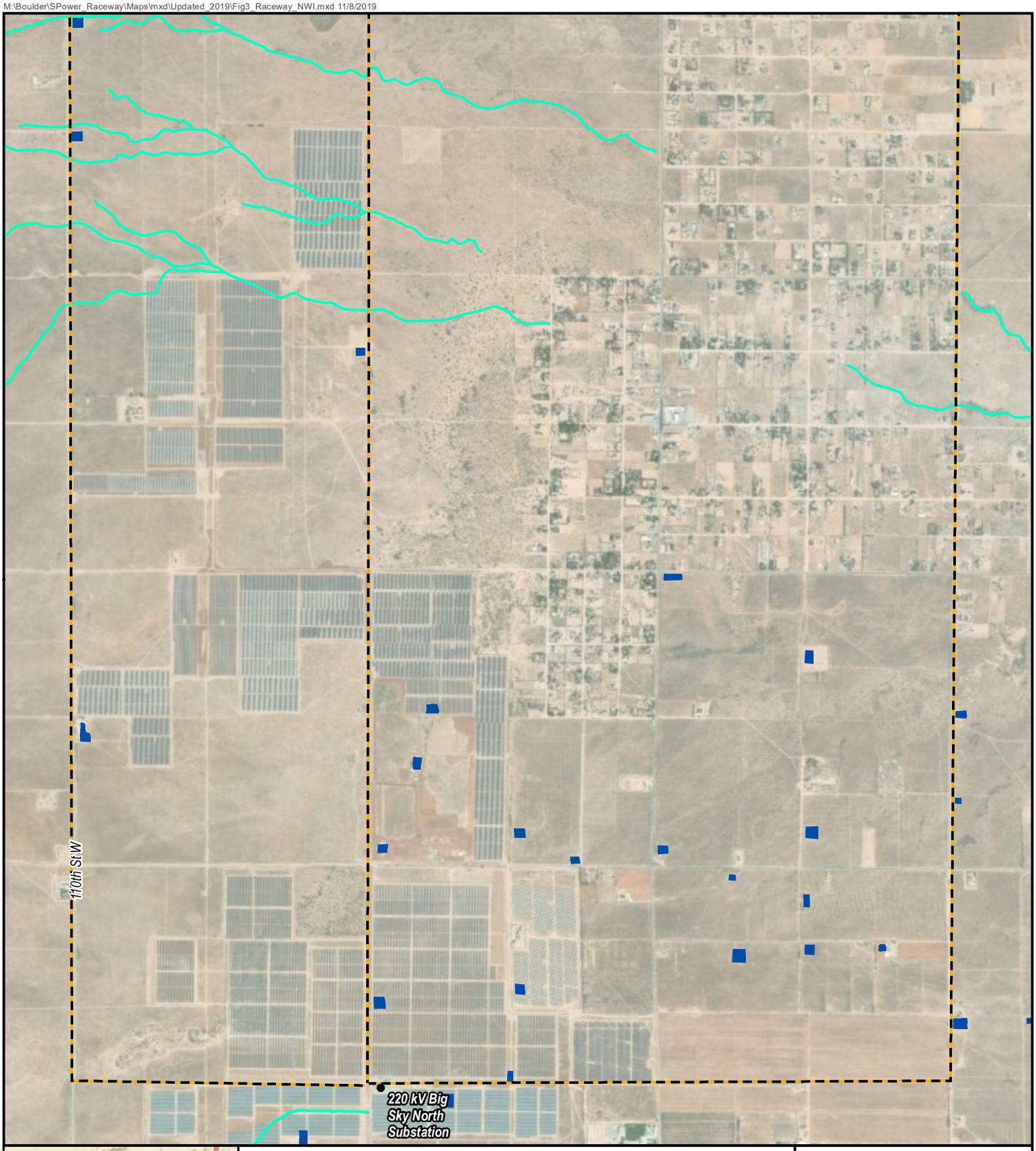

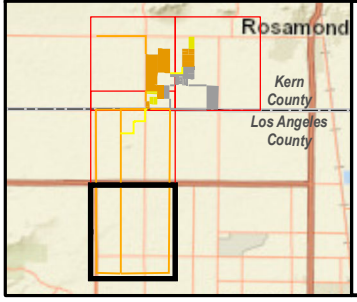

Current Interconnection Points

Project Gen-Tie Alternatives

Original

National Wetland Inventory

Freshwater Pond

Riverine

Figure 3
Raceway 2.0 Solar Project
NWI
Page 4 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: USFWS 2012

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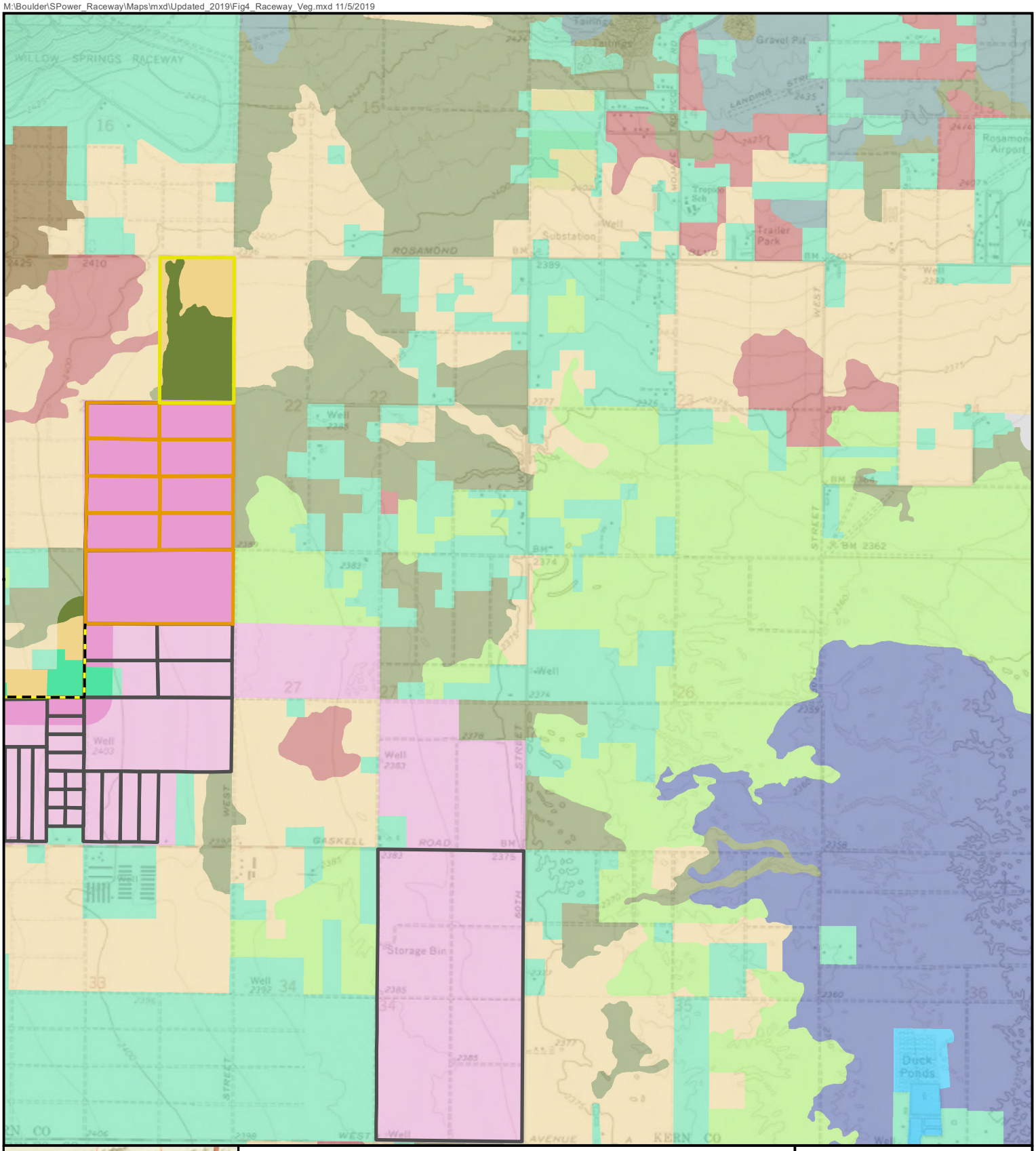

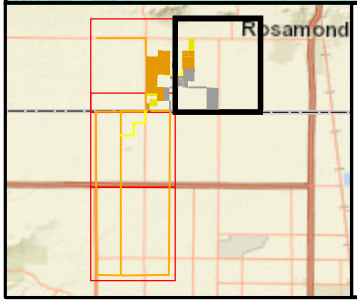

Project Gen-Tie Alternatives
- New

Project Parcels
- New
- Original
- Removed

Vegetation Type
- Alkaline Mixed Scrub
- Annual Grasses and Forbs
- Cheesebush, Desert Mixed Scrub
- Creosote Bush
- Developed Water Features
- Pastures and Crop Agriculture
- Rabbitbrush
- Saltbush
- Shadscale
- Urban - Related Bare Soil
- Urban or Developed

Figure 4
Raceway 2.0 Solar Project
Vegetation
Page 1 of 4
Los Angeles and Kern Counties, California
sPower

N W E S
0 0.25 0.5
Miles

Data Sources: ESRI 2019, Menke 2013

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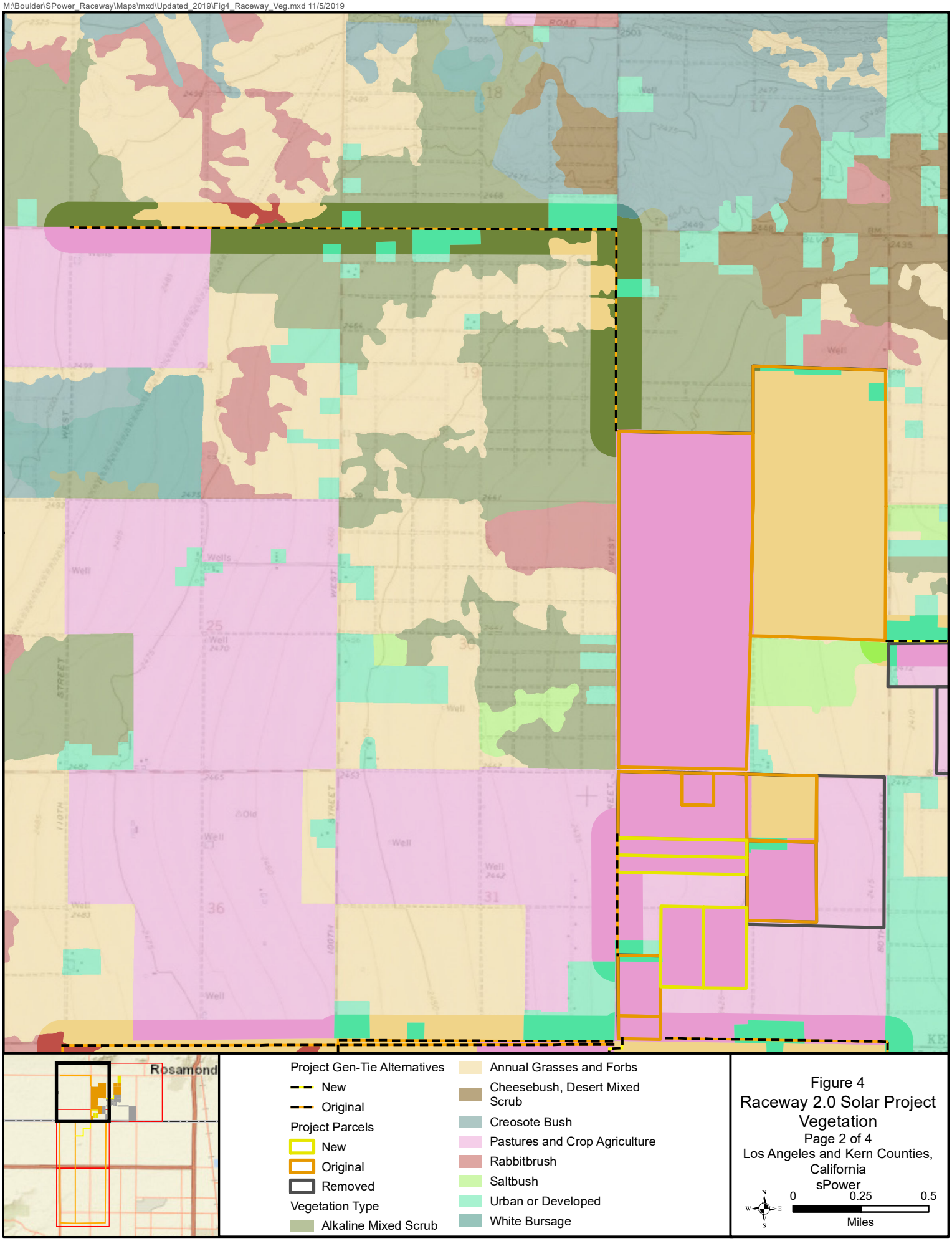

Data Sources: ESRI 2019, Menke 2013

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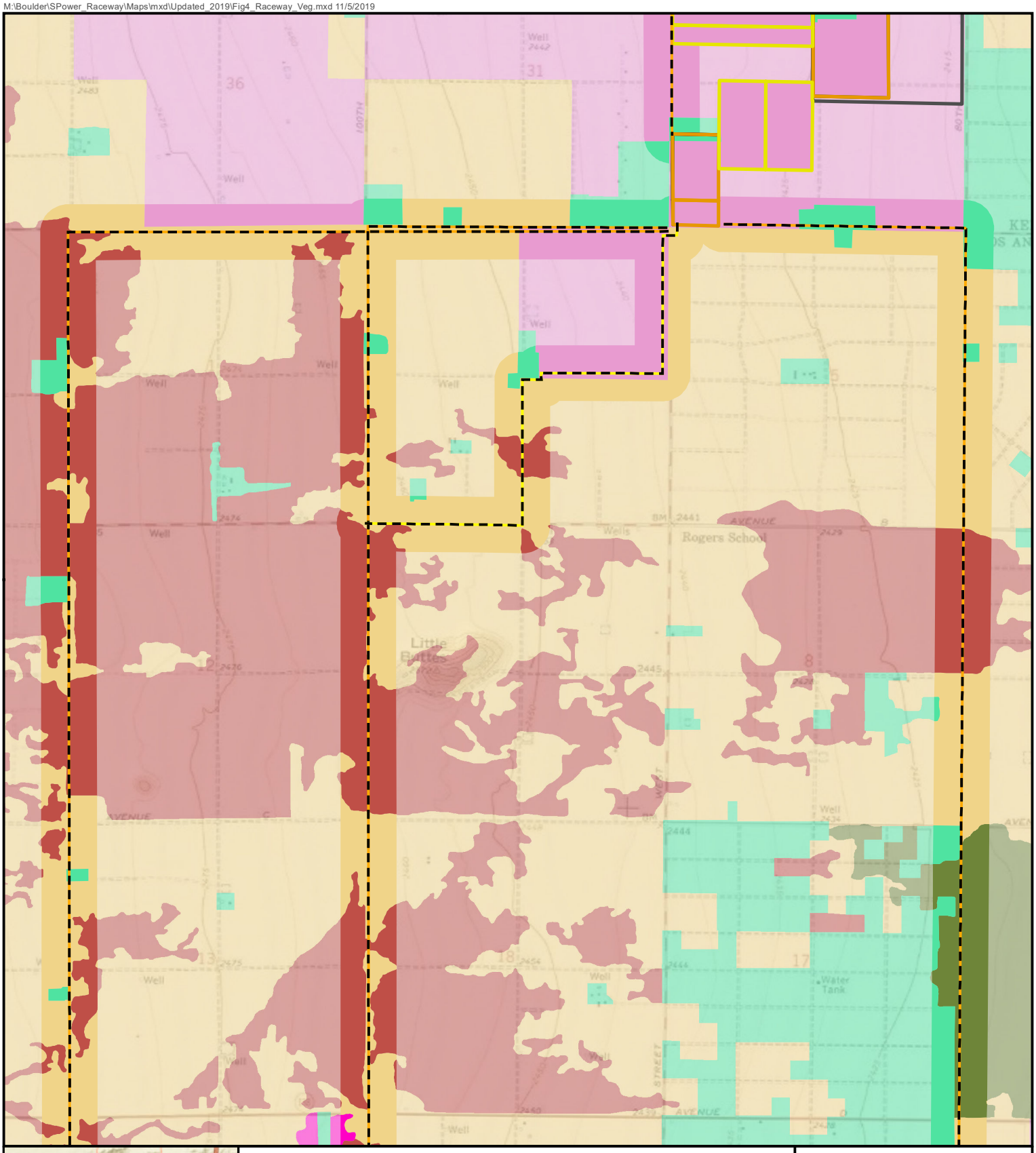

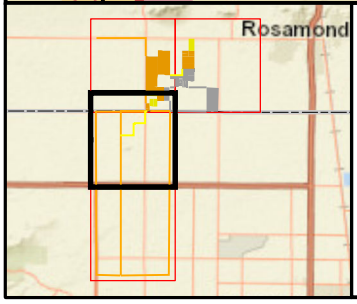

Project Gen-Tie Alternatives
- New
- Original

Project Parcels
- New
- Original
- Removed

Vegetation Type
- Alkaline Mixed Scrub
- Annual Grasses and Forbs
- Joshua Tree
- Pastures and Crop Agriculture
- Rabbitbrush
- Urban or Developed

Figure 4
Raceway 2.0 Solar Project
Vegetation
Page 3 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, Menke 2013

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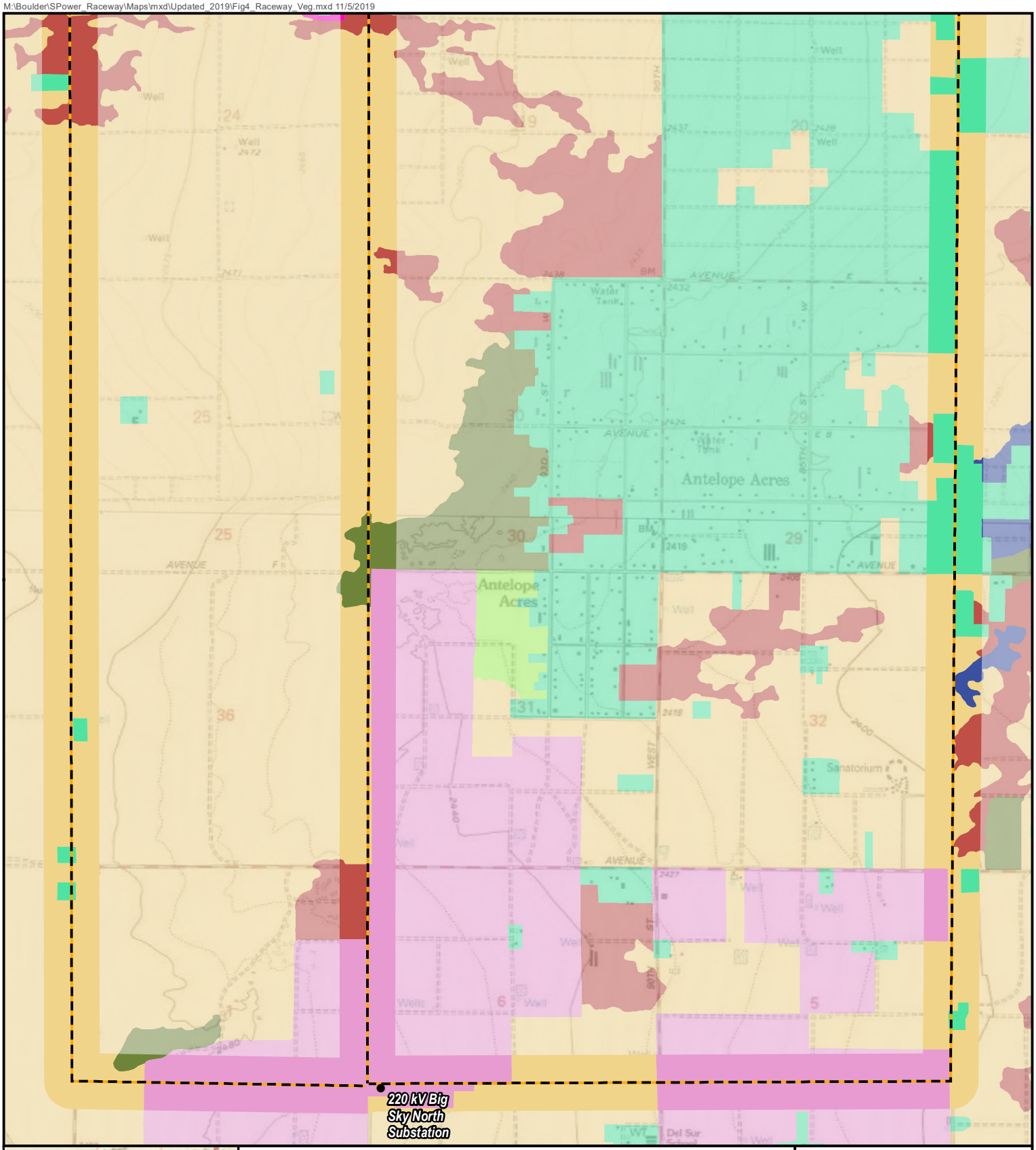

Figure 4
Raceway 2.0 Solar Project
Vegetation
Page 4 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: ESRI 2019, Menke 2013

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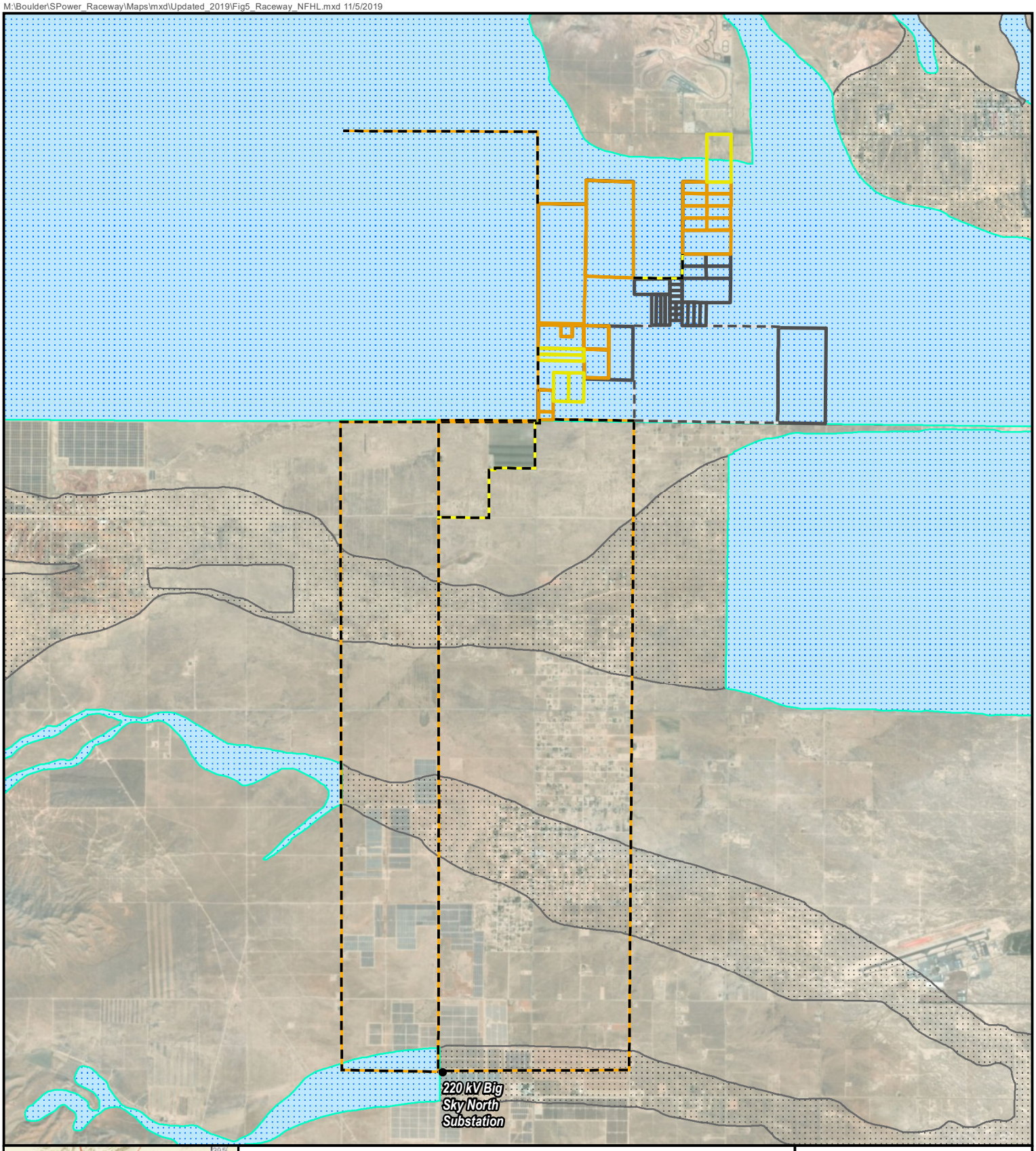

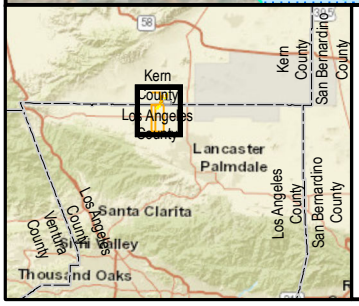

- Current Interconnection Points

Project Gen-Tie Alternatives
- New
- Original
- Removed

Project Parcels
- New
- Original
- Removed

Flood Hazard Areas
- A, Subject to Inundation by the 1% Annual Chance Flood (No Base Flood Elevations determined)
- X, 0.2% Annual Chance Flood Hazard
- X, Area of Minimal Flood Hazard

Figure 5
Raceway 2.0 Solar Project
Flood Hazard Areas
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5 1 1.5
Miles

Data Sources: FEMA 2017

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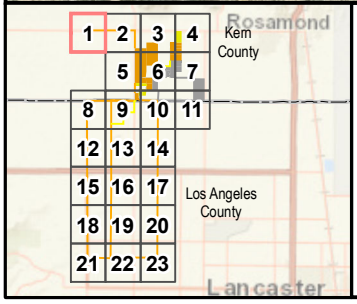

Project Gen-Tie Alternatives
- Original
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 1 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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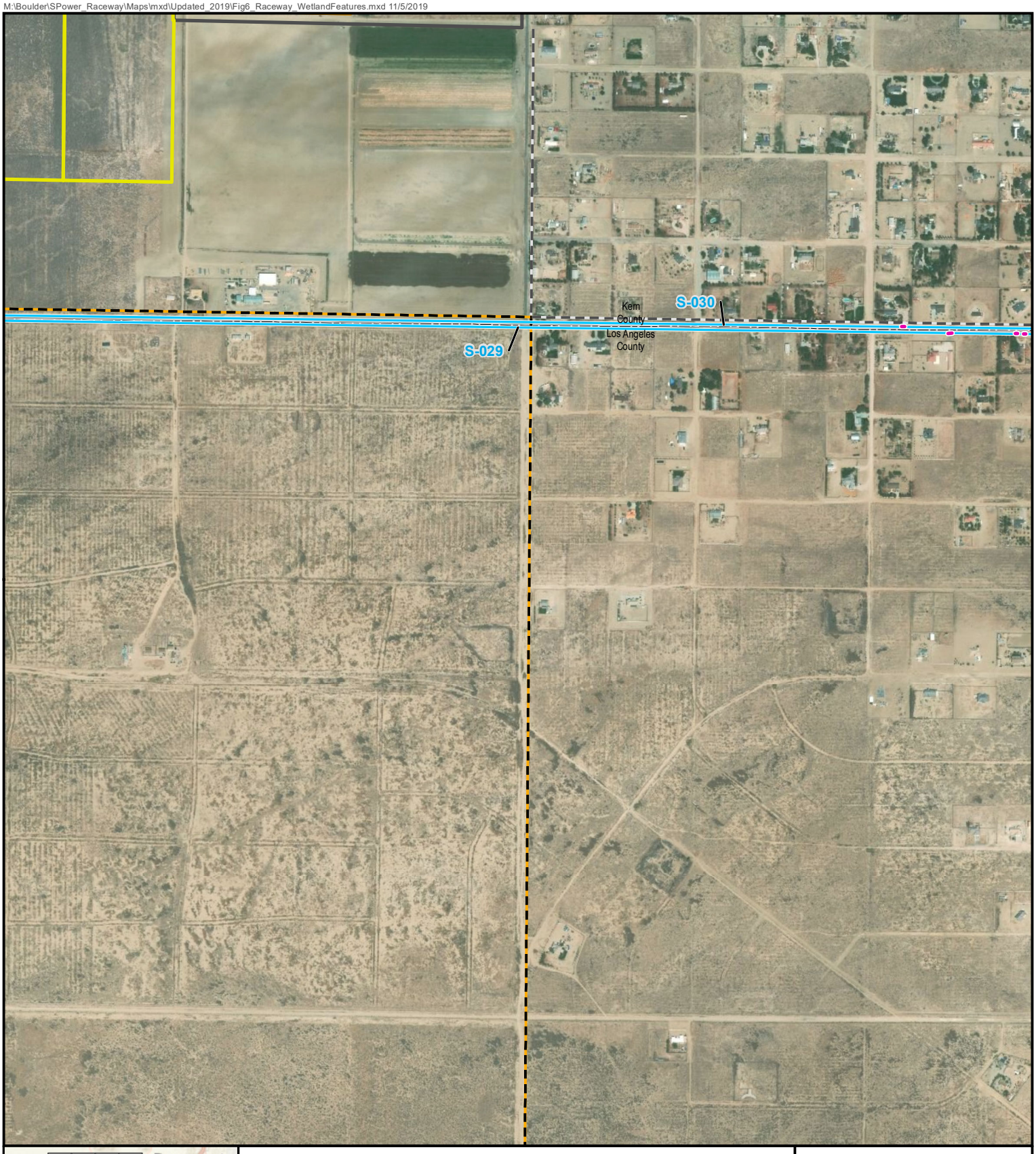

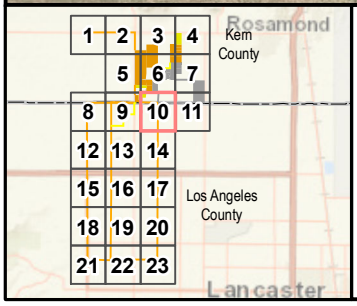

Project Gen-Tie Alternatives
- Original
- Removed

Project Parcels
- New
- Original
- Removed
- Culvert

Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 2 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower



0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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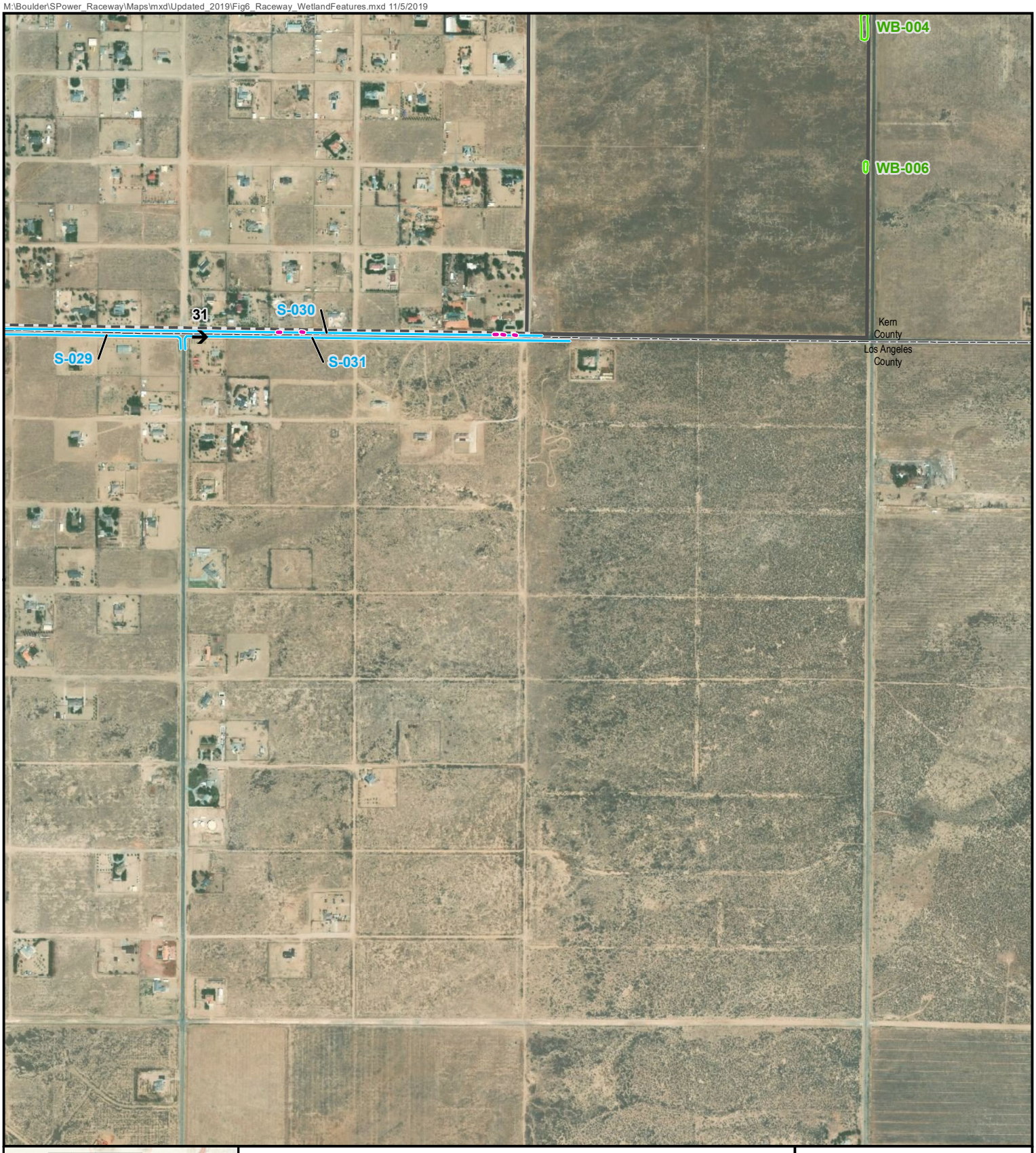

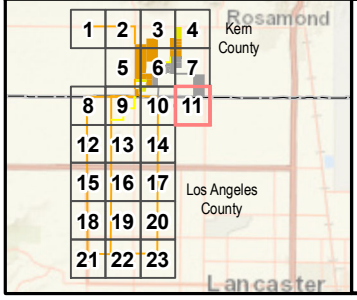

Project Gen-Tie Alternatives
- Removed
- Removed
- Photo Location
- Culvert
- Stream (ditch)
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 3 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

N W E S
0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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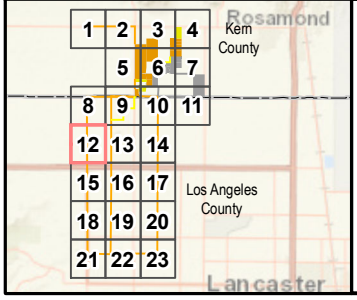

Project Gen-Tie Alternatives
- Original
- Photo Location
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 4 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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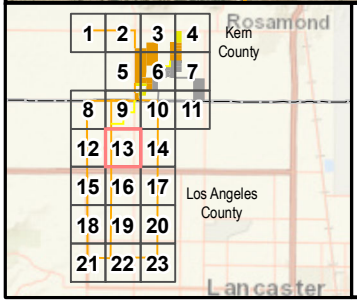

Project Gen-Tie Alternatives
- Original
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 5 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

N W E S
0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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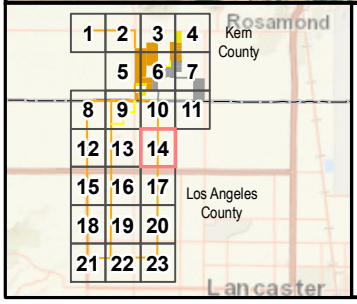

Project Gen-Tie Alternatives

Original

Figure 6
Raceway 2.0 Solar Project
Page 6 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower



0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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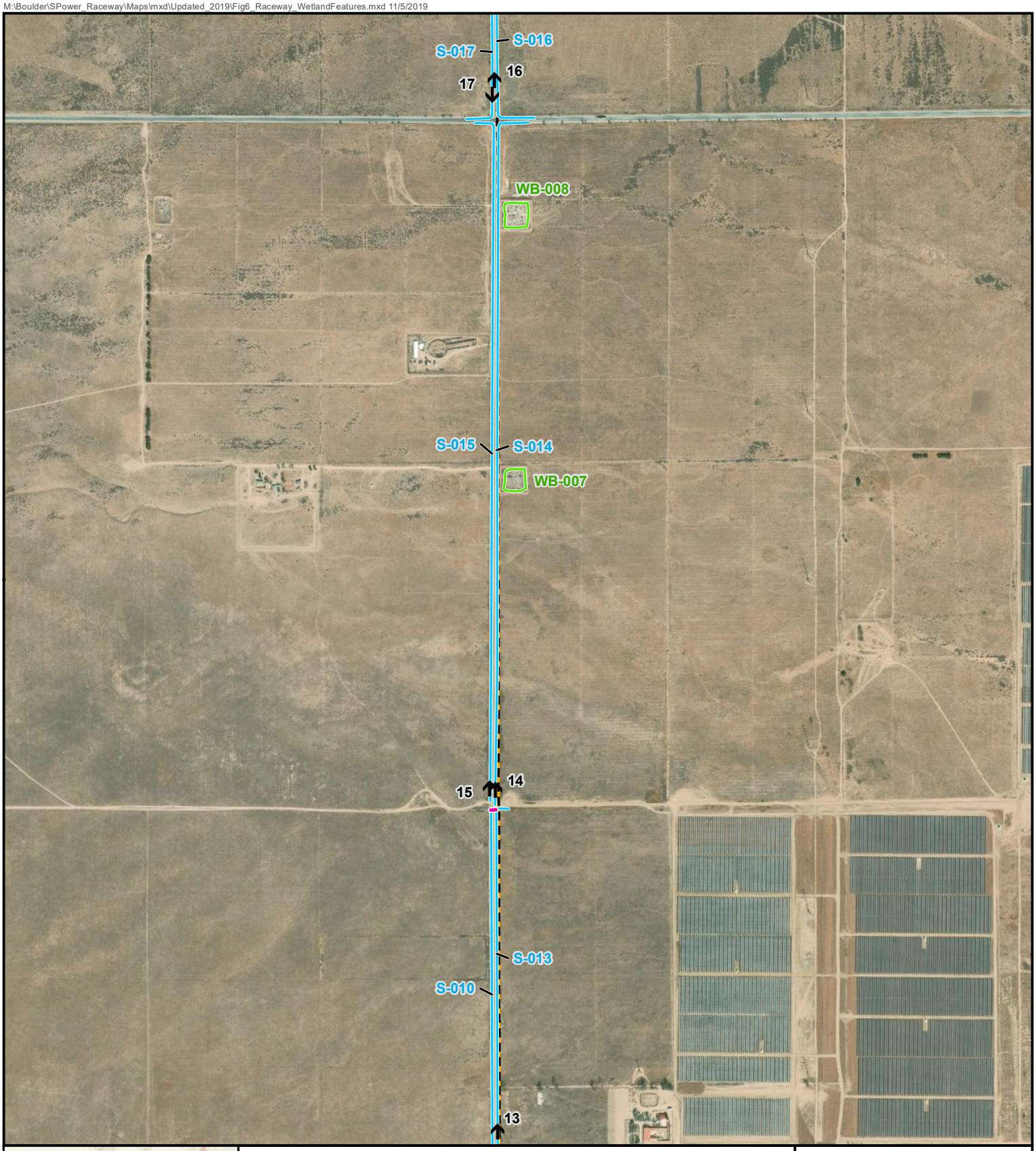

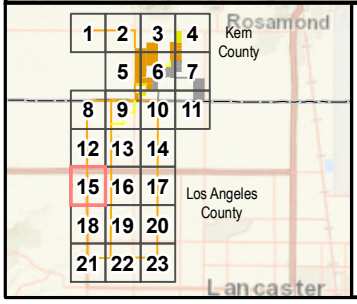

Project Gen-Tie Alternatives
- Original
- Photo Location
- Culvert
- Stream (ditch)
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 7 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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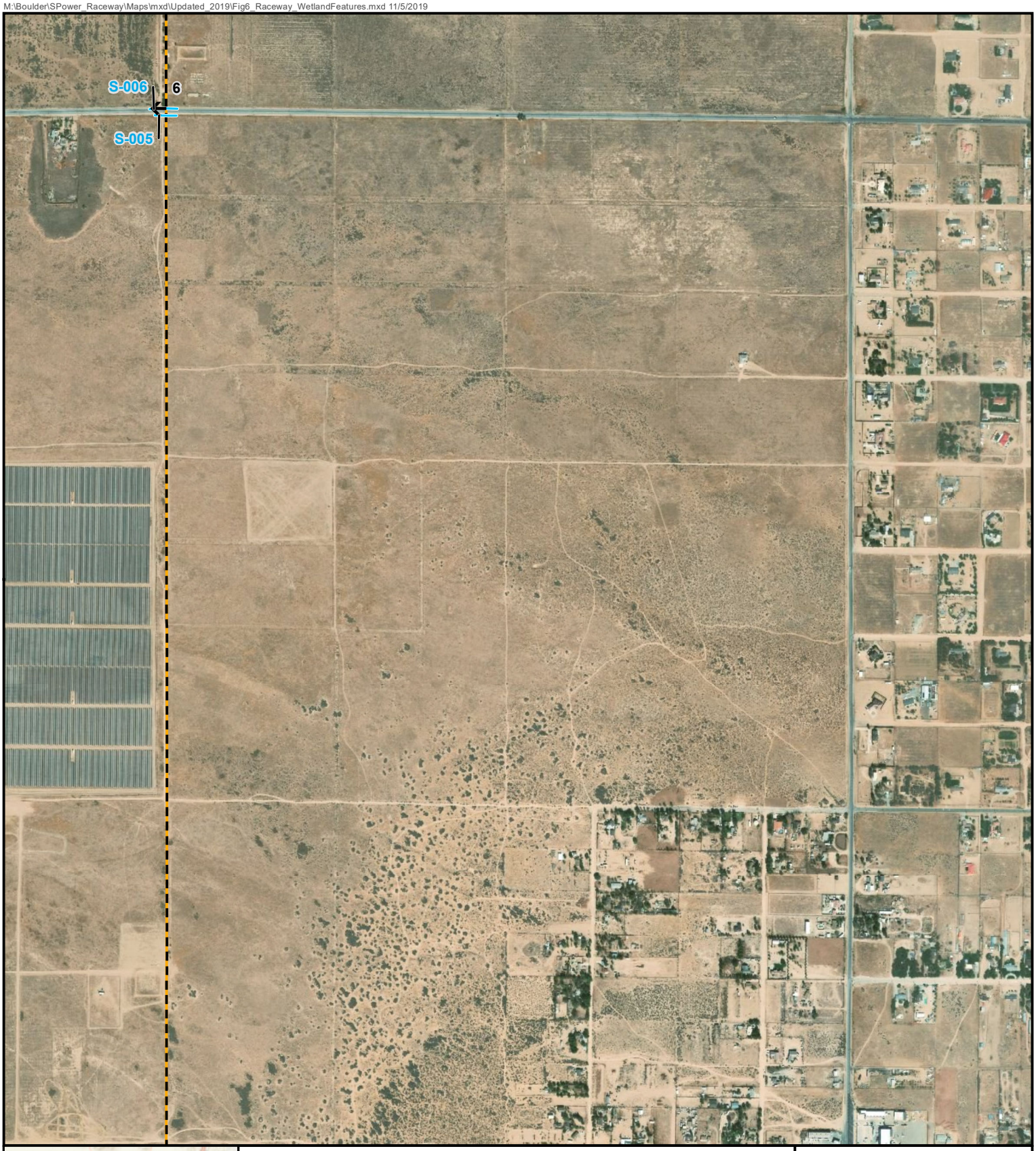

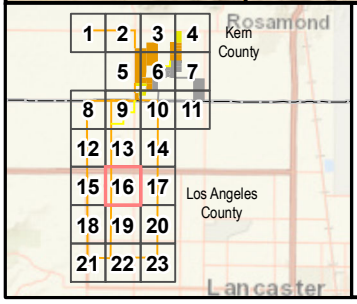

Project Gen-Tie Alternatives
- Original
- Photo Location
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 8 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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E
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0
1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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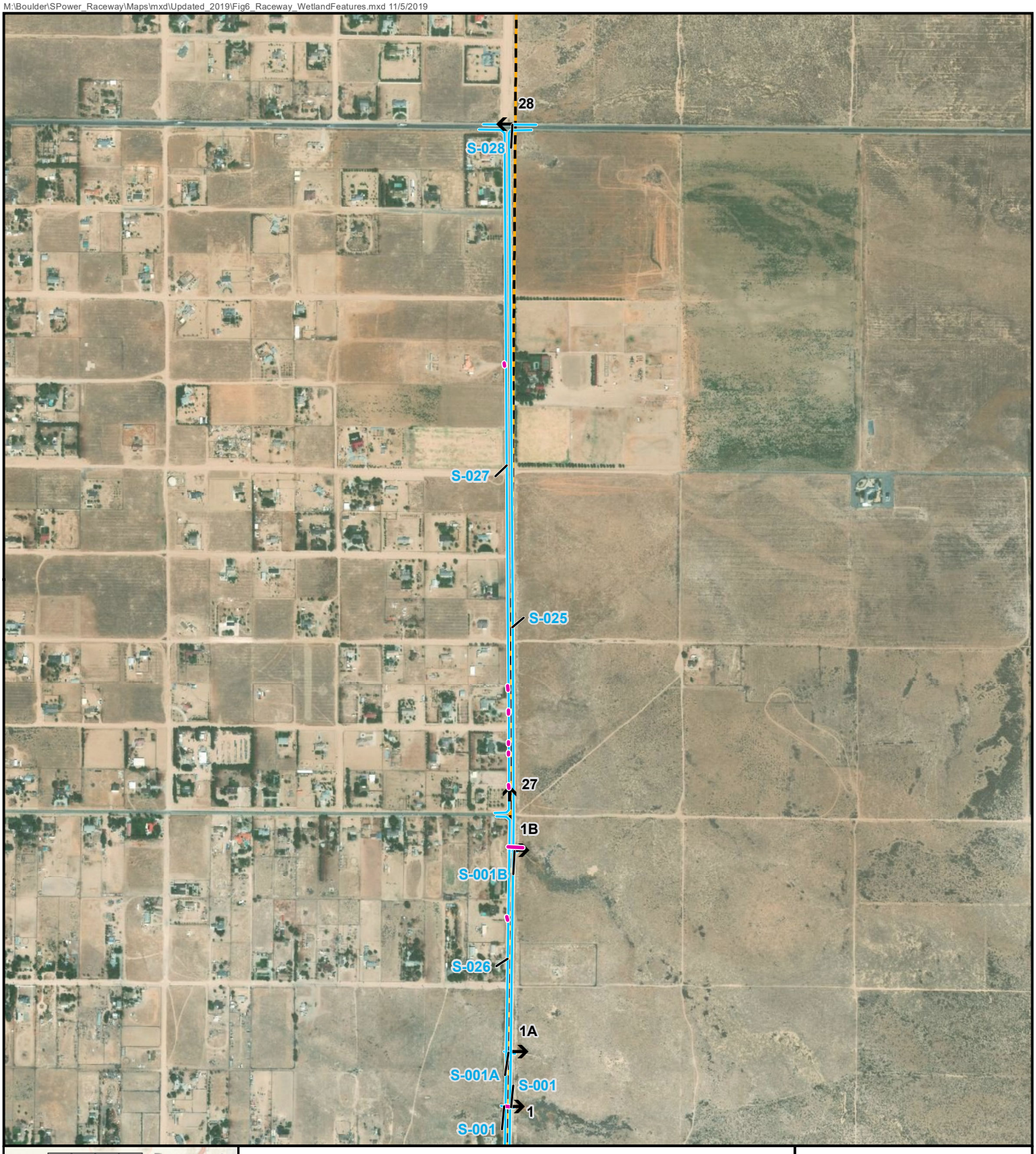

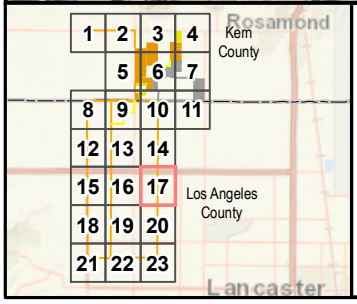

Project Gen-Tie Alternatives
- Original
- Photo Location
- Culvert
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 9 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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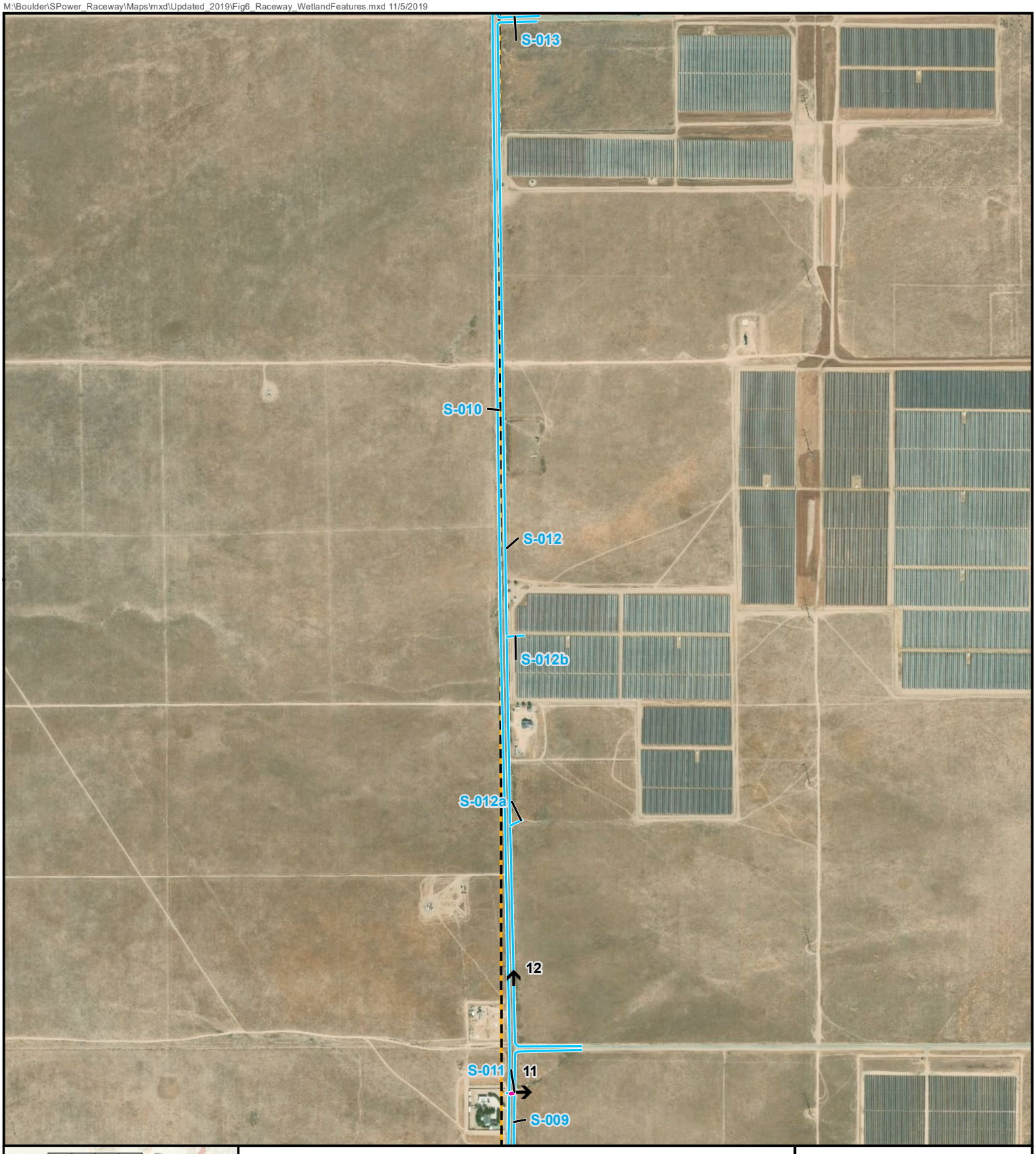

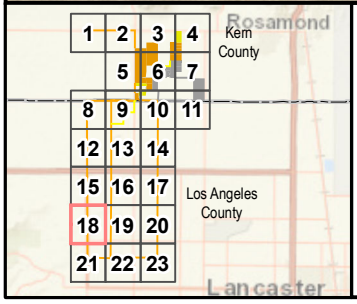

Project Gen-Tie Alternatives
- Original
- Photo Location
- Culvert
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 10 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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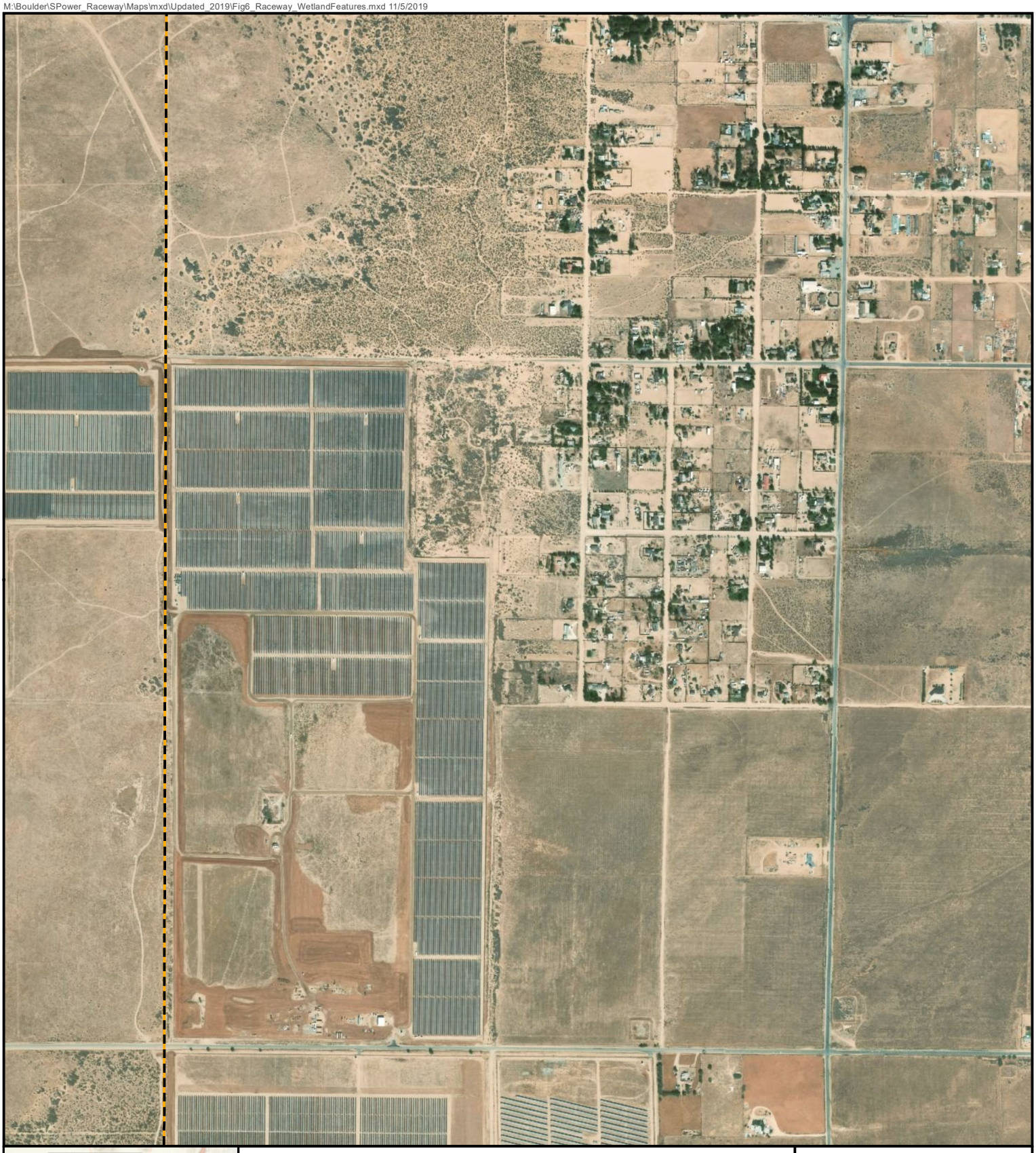

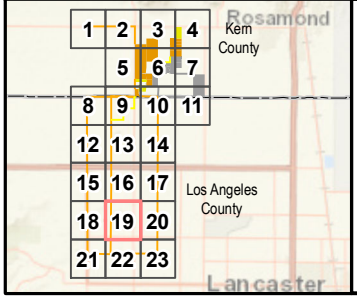

Project Gen-Tie Alternatives

Original

Figure 6
Raceway 2.0 Solar Project
Page 11 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

N
W
E
S
0
1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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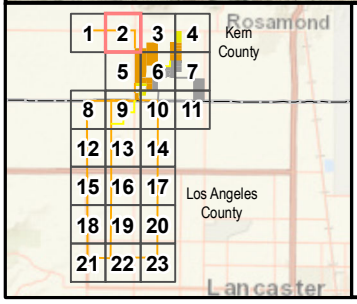

Project Gen-Tie Alternatives
- Original
- Original
- Removed
- Photo Location
- Culvert
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 12 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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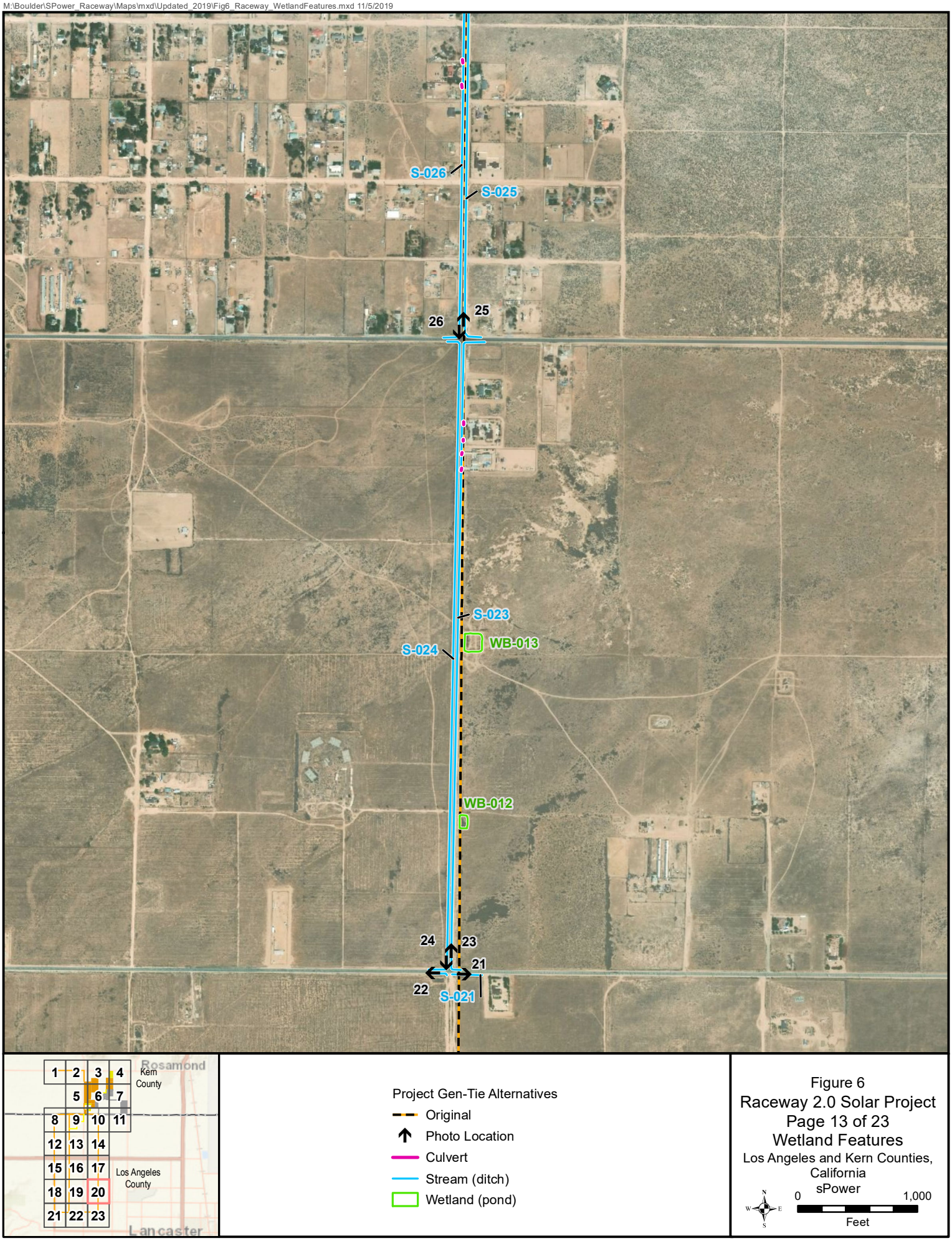

Figure 6
Raceway 2.0 Solar Project
Page 13 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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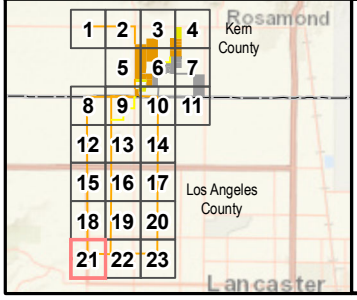

Project Gen-Tie Alternatives
- Original
- Photo Location
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 14 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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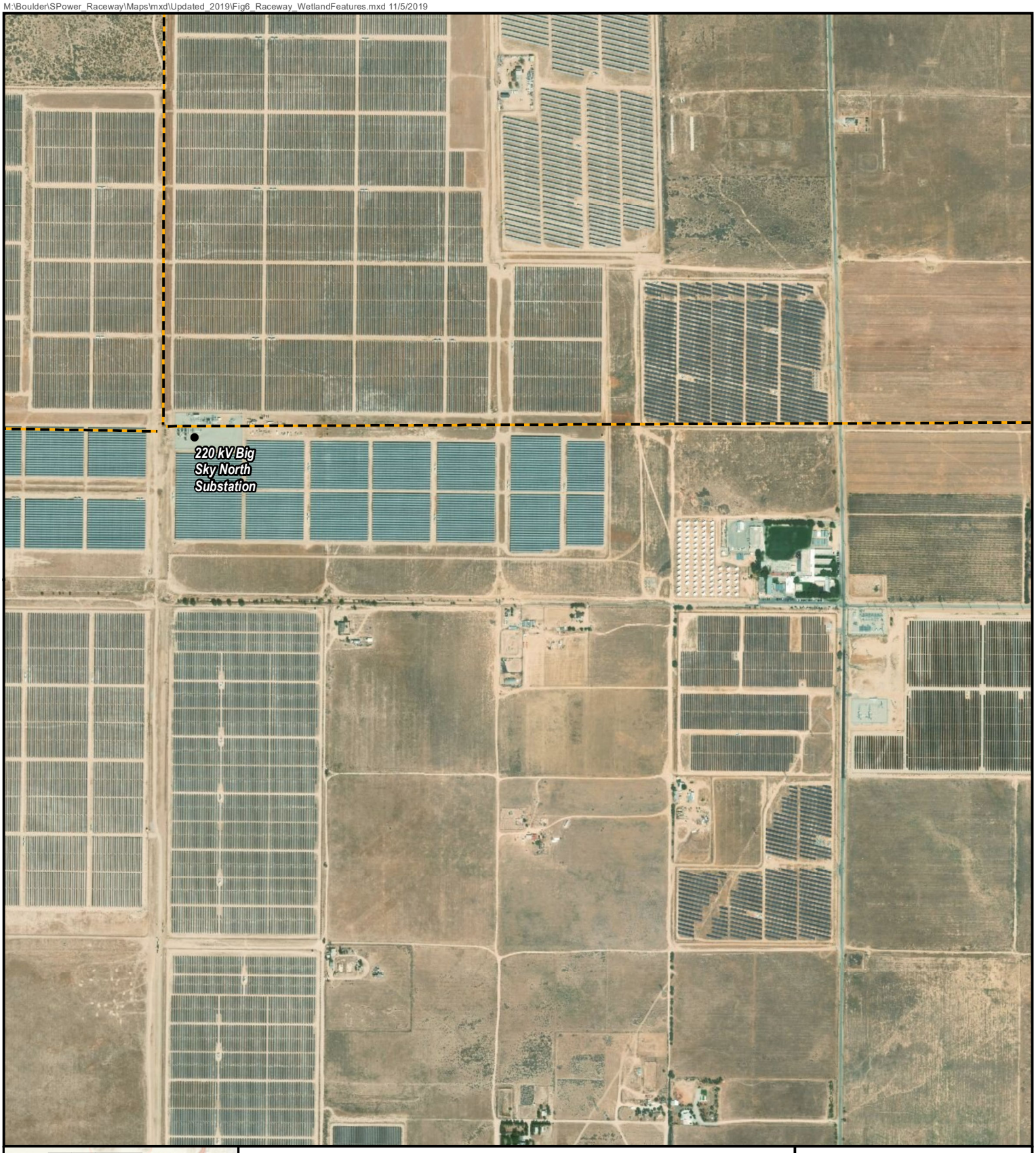

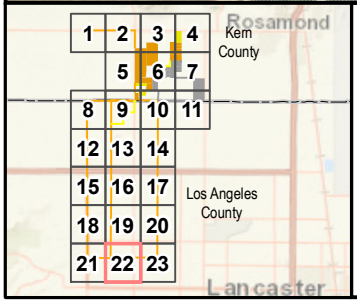

● Current Interconnection Points

Project Gen-Tie Alternatives

Original

Figure 6
Raceway 2.0 Solar Project
Page 15 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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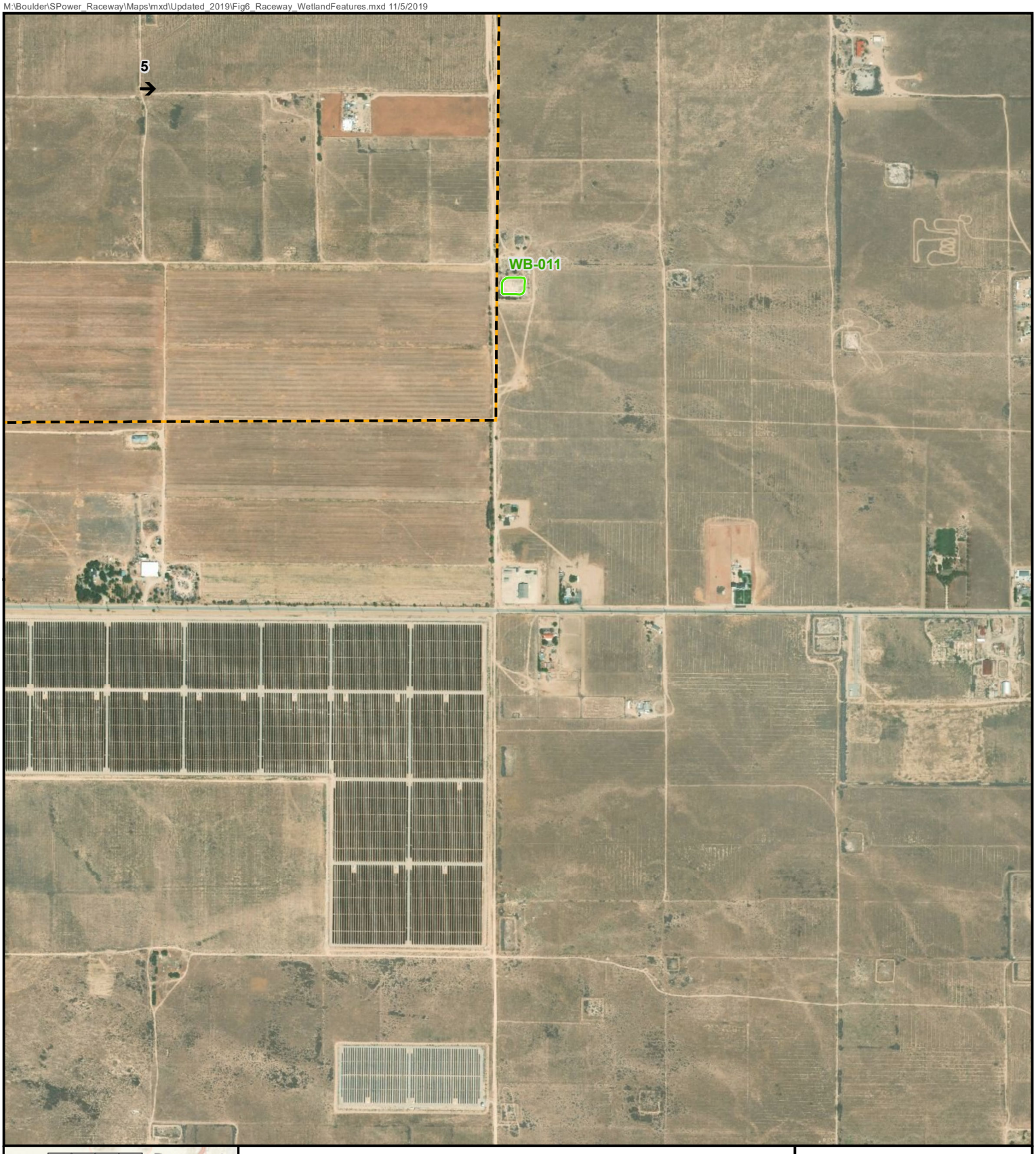

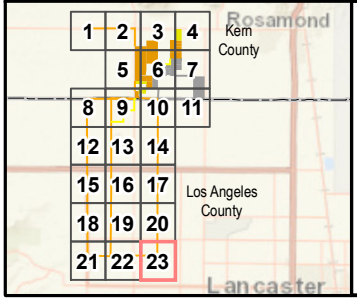

Project Gen-Tie Alternatives
- Original
- Photo Location
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 16 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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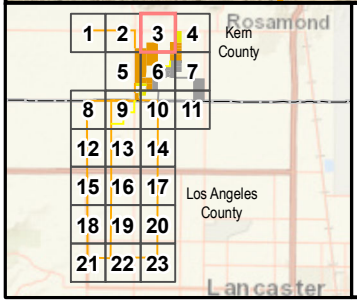

Original
Removed

Figure 6
Raceway 2.0 Solar Project
Page 17 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower



0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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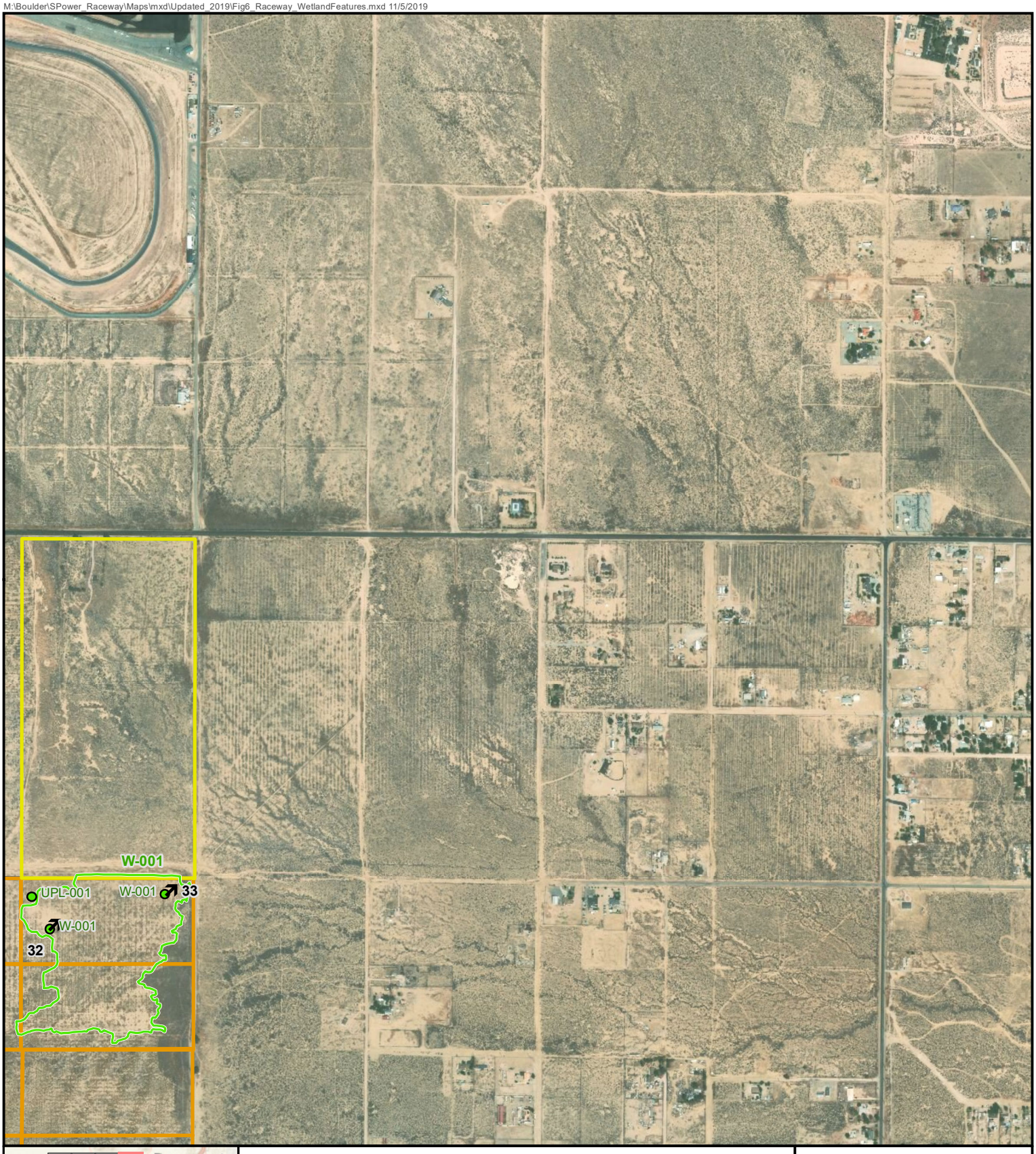

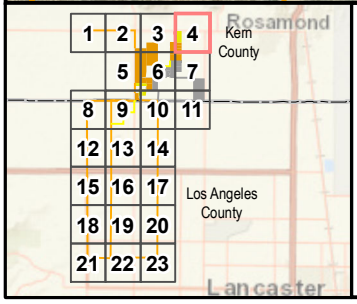

Project Parcels
- New
- Original
- Removed
- Photo Location
- Wetland Data Point
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 18 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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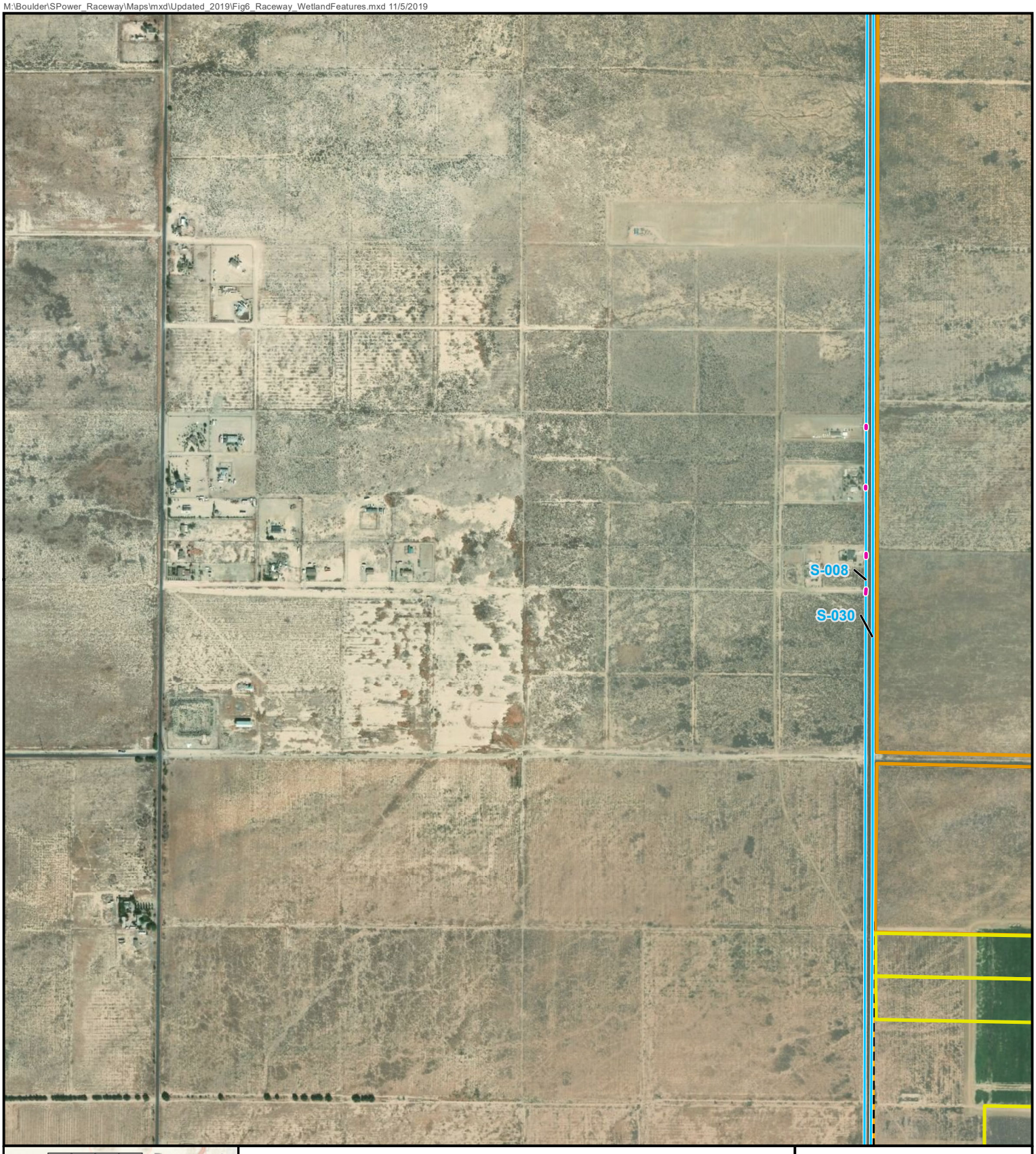

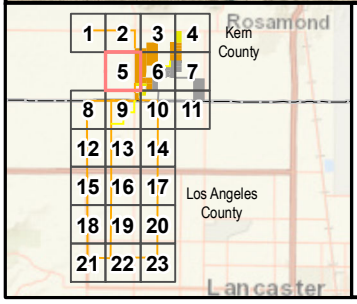

Project Gen-Tie Alternatives
- Original

Project Parcels
- New
- Original
- Removed
- Culvert
- Stream (ditch)

Figure 6
Raceway 2.0 Solar Project
Page 19 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower



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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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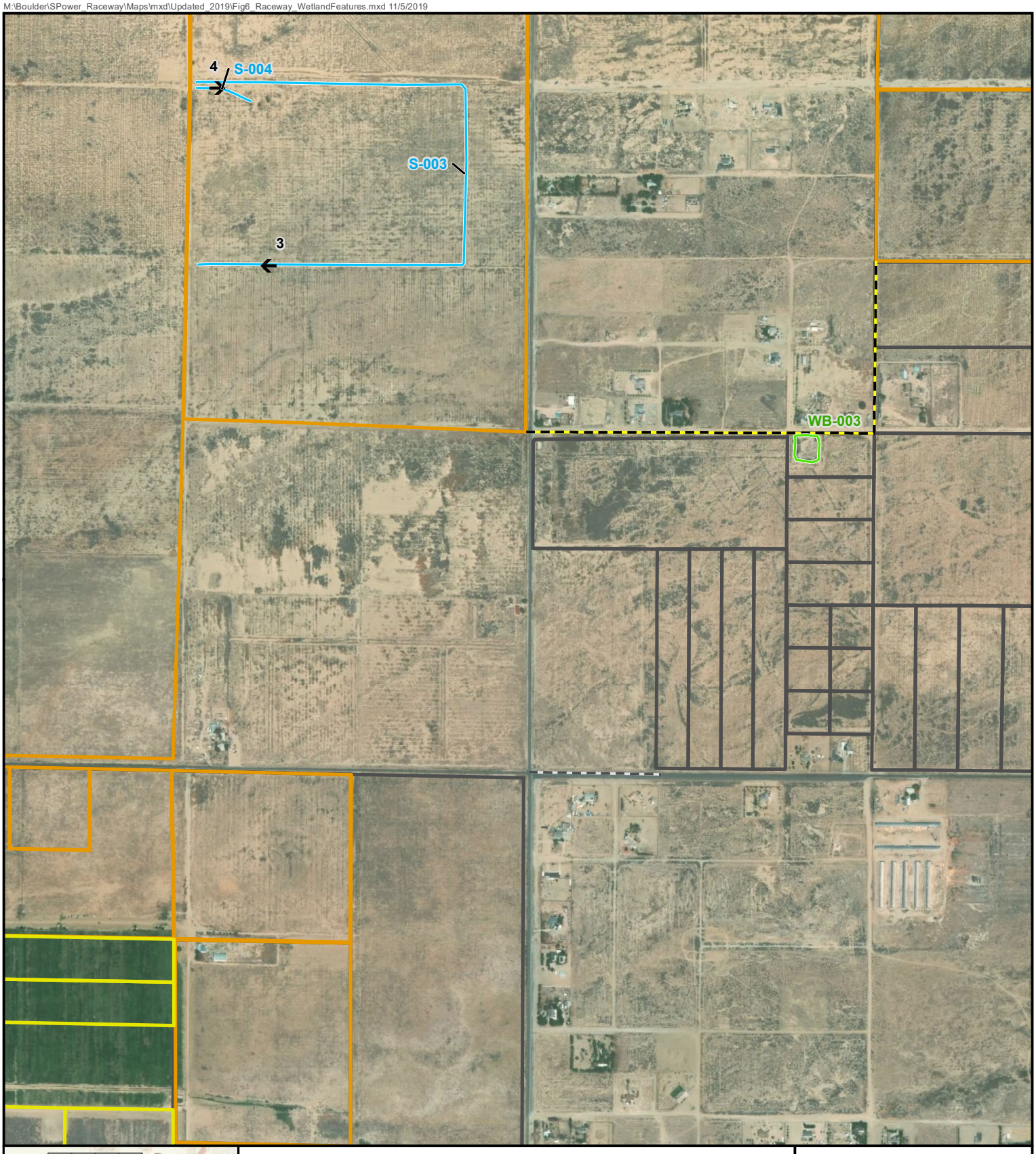

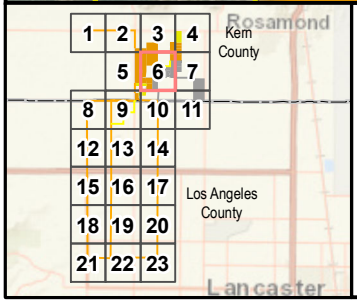

Project Gen-Tie Alternatives
- New
- Removed

Project Parcels
- New
- Original
- Removed
- Photo Location

- Stream (ditch)
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 20 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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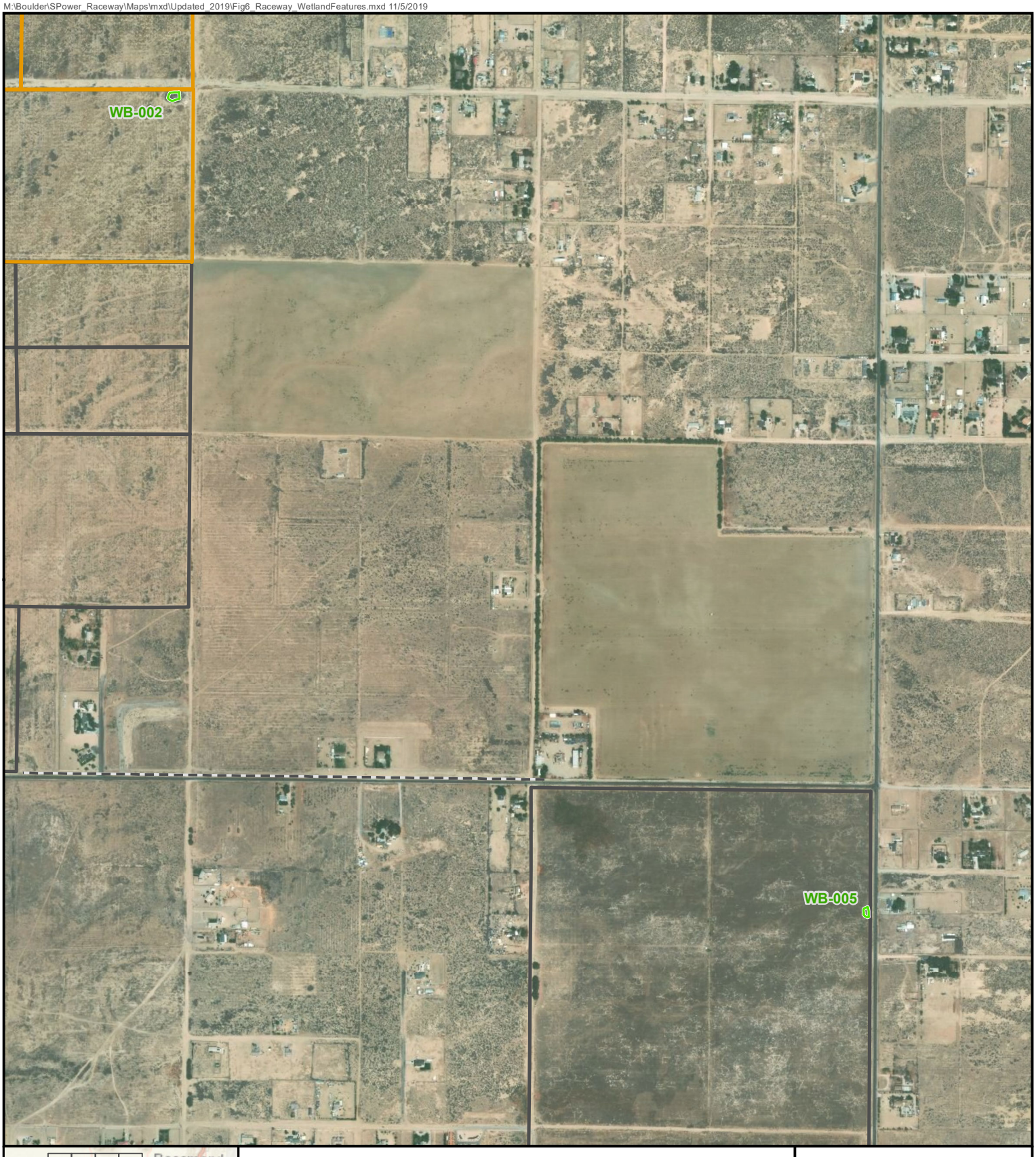

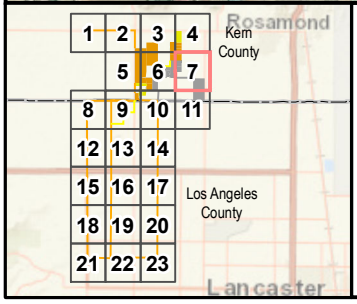

Project Gen-Tie Alternatives
- Removed
- Original
- Removed
- Wetland (pond)

Figure 6
Raceway 2.0 Solar Project
Page 21 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

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Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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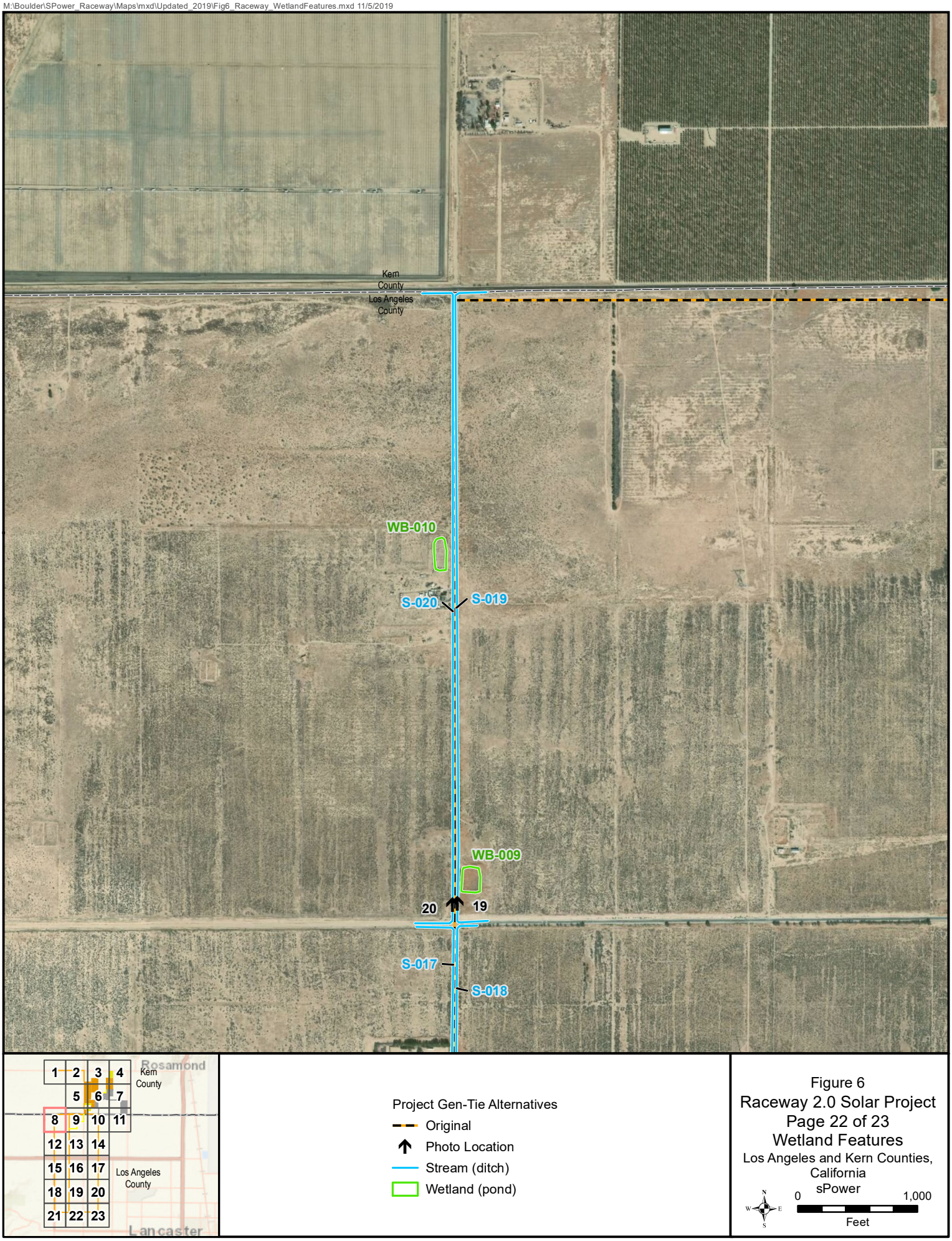

Figure 6
Raceway 2.0 Solar Project
Page 22 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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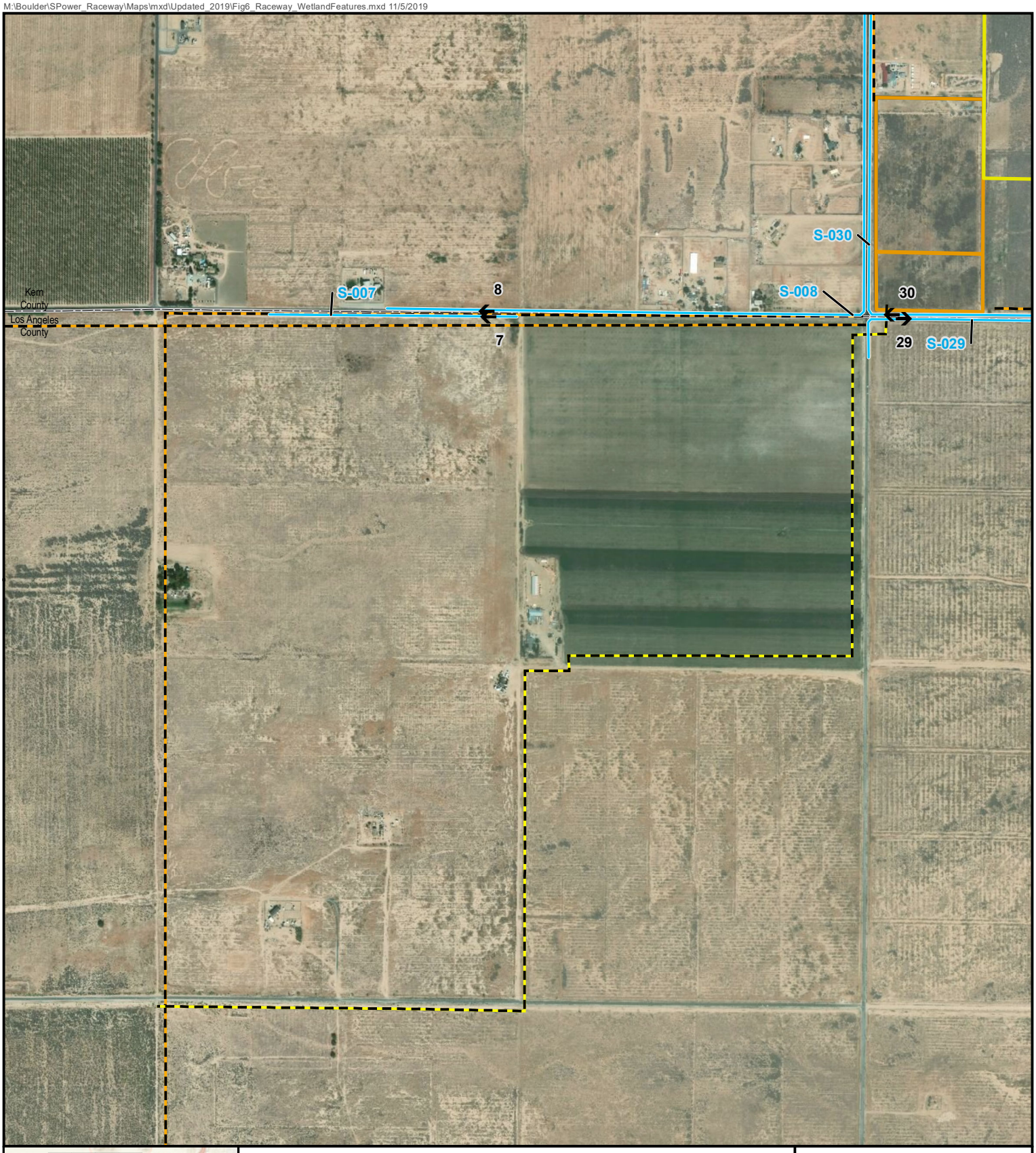

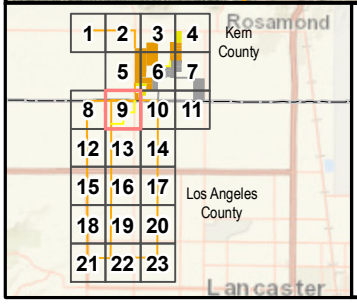

Project Gen-Tie Alternatives
- New
- Original

Project Parcels
- New
- Original
- Removed

Stream (ditch)

Photo Location

Figure 6
Raceway 2.0 Solar Project
Page 23 of 23
Wetland Features
Los Angeles and Kern Counties, California
sPower

0 1,000
Feet

Data Sources: DigitalGlobe 2018, E & E Field Data 2017

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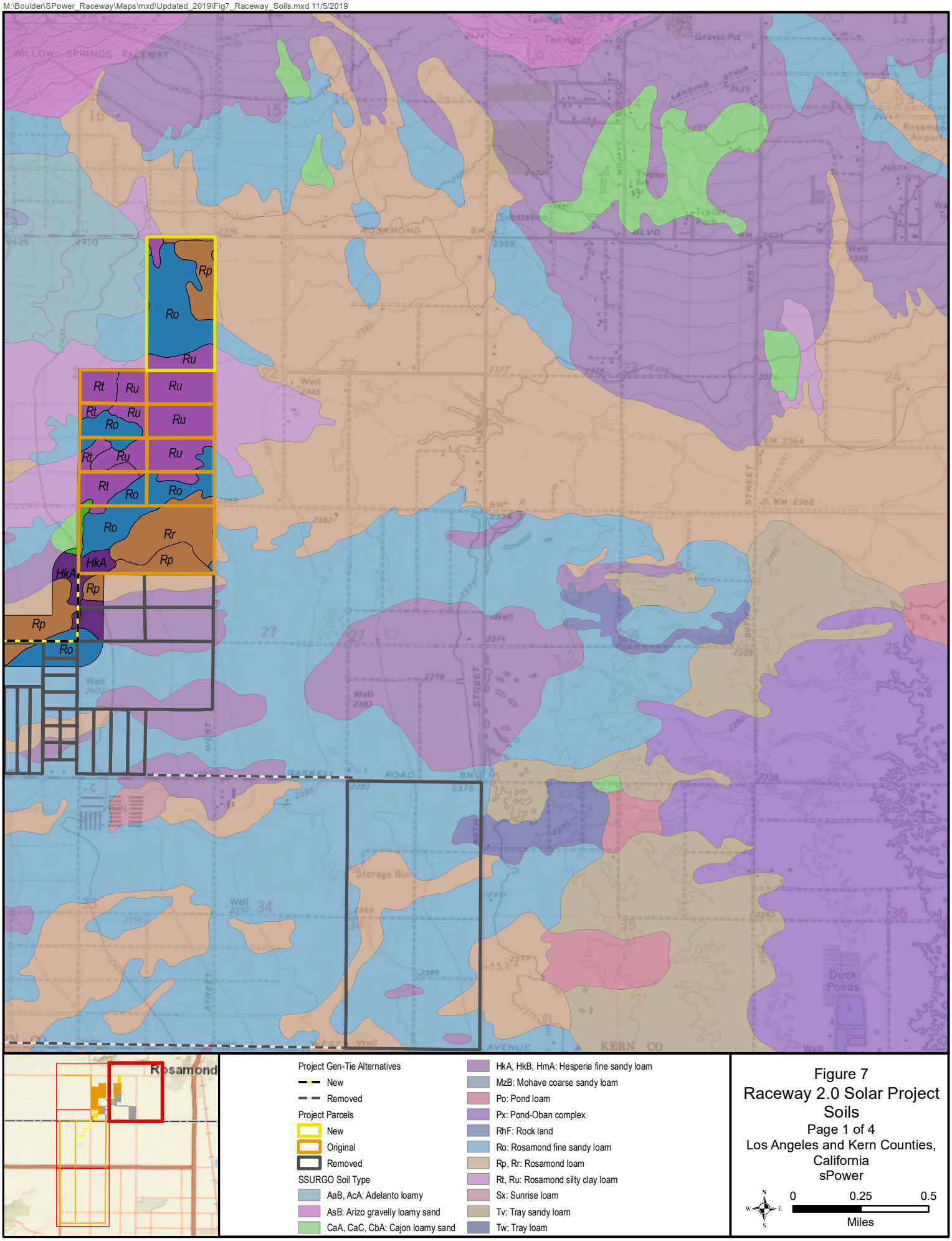

Figure 7
Raceway 2.0 Solar Project
Soils
Page 1 of 4
Los Angeles and Kern Counties, California
sPower

Data Sources: ESRI 2019, USDA SSURGO 2019

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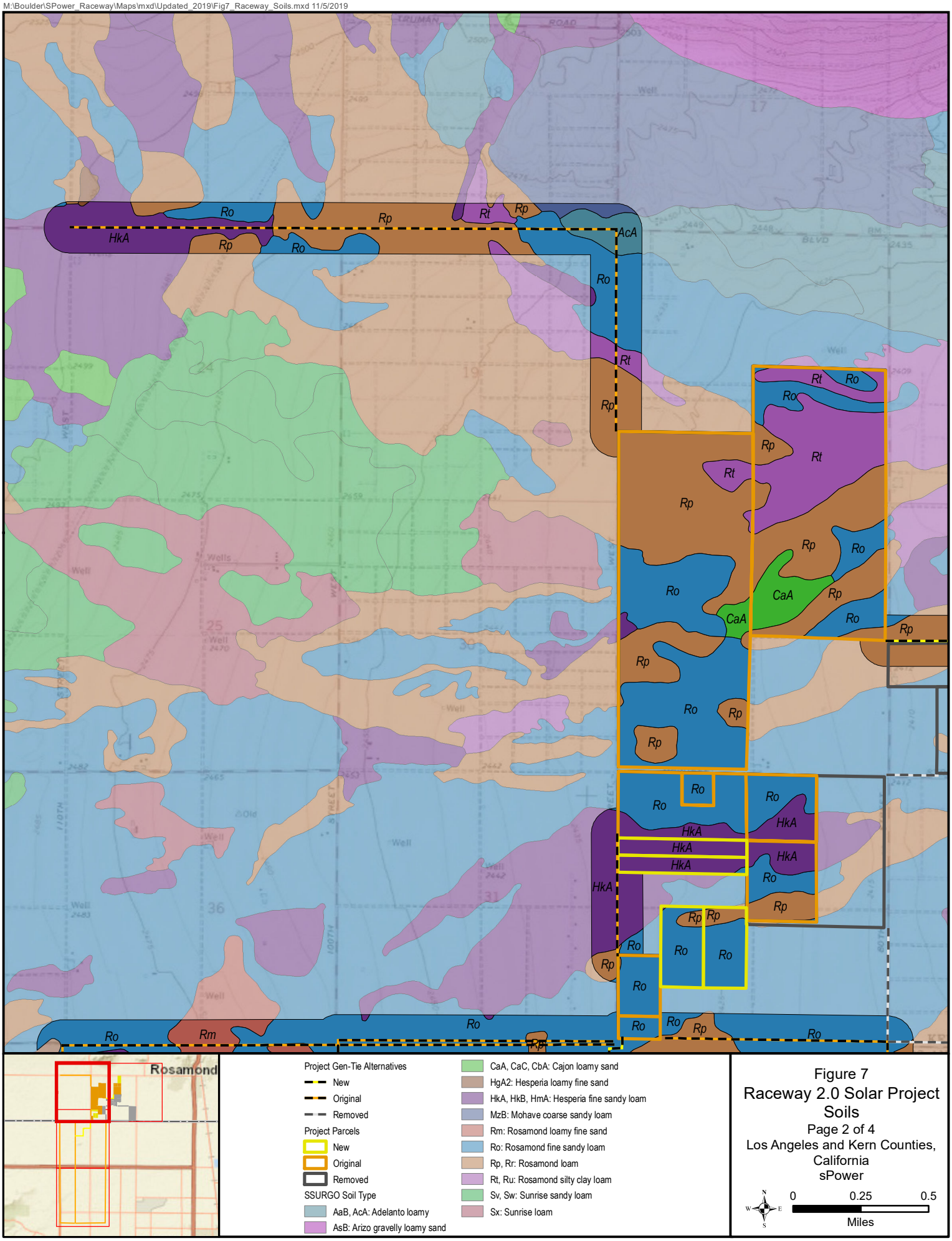

Figure 7
Raceway 2.0 Solar Project
Soils
Page 2 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

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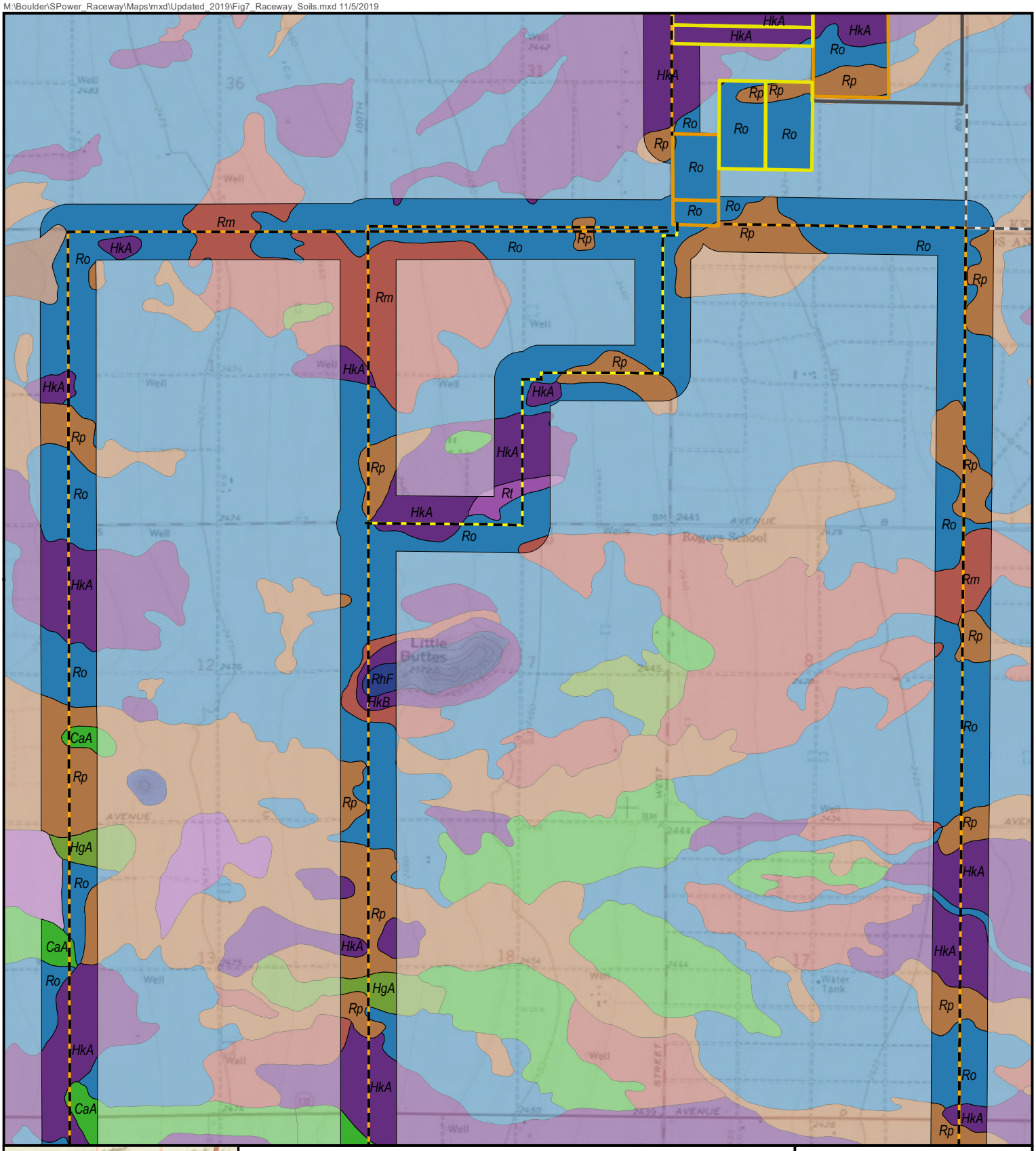

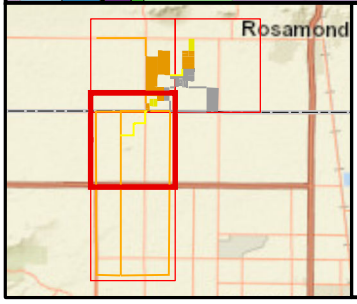

Project Gen-Tie Alternatives
- New
- Original
- Removed

Project Parcels
- New
- Original
- Removed

SSURGO Soil Type
- CaA, CaC, CbA: Cajon loamy sand
- HgA2: Hesperia loamy fine sand
- HgA: Hesperia loamy fine sand, 0 to 2 percent slopes
- HkA, HkB, HmA: Hesperia fine sandy loam
- RhF: Rock land
- Rm: Rosamond loamy fine sand
- Ro: Rosamond fine sandy loam
- Rp, Rr: Rosamond loam
- Rt, Ru: Rosamond silty clay loam
- Sx: Sunrise loam

Figure 7
Raceway 2.0 Solar Project
Soils
Page 3 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

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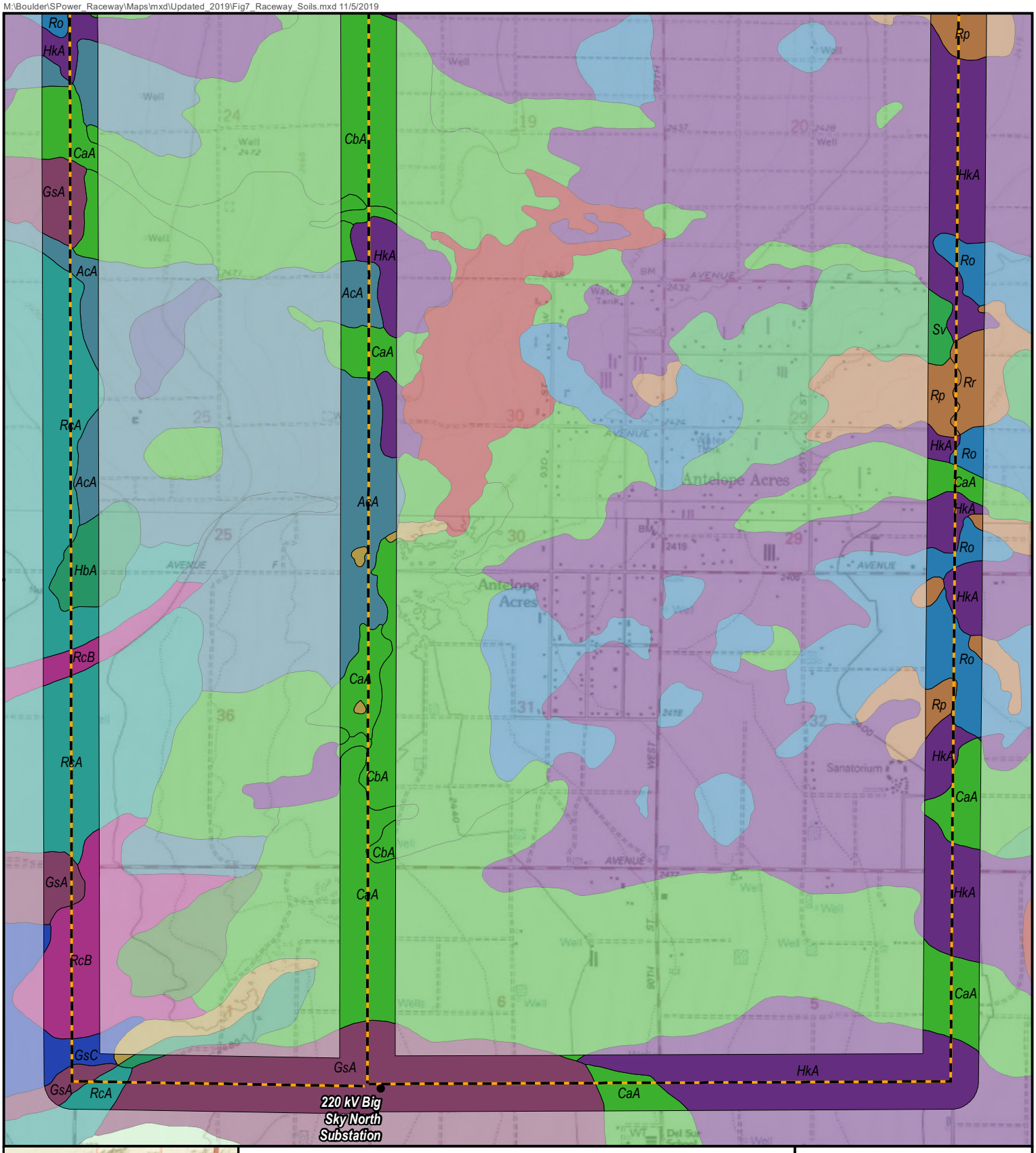

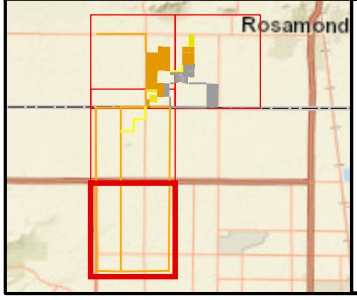

- Current Interconnection Points
- Project Gen-Tie Alternatives
  - Original
  - <all other values>
- SSURGO Soil Type
  - AaB, AcA: Adelanto loamy
  - CaA, CaC, CbA: Cajon loamy sand
  - CcA2: Cajon loamy fine sand, 0 to 2 percent slopes, hummocky
  - DuD: Dune land
  - GsA: Greenfield sandy loam, 0 to 2 percent slopes
  - GsC: Greenfield sandy loam, 2 to 9 percent slopes
  - HbA: Hanford coarse sandy loam, 0 to 2 percent slopes
  - HkA, HkB, HmA: Hesperia fine sandy loam
  - MzB: Mohave coarse sandy loam
  - RcA: Ramona coarse sandy loam, 0 to 2 percent slopes
  - RcB: Ramona coarse sandy loam, 2 to 5 percent slopes
  - RfB: Ramona loam, 2 to 5 percent slopes
  - Ro: Rosamond fine sandy loam
  - Rp, Rr: Rosamond loam
  - Sv, Sw: Sunrise sandy loam

Figure 7
Raceway 2.0 Solar Project
Soils
Page 4 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

Attachment 1

2018 Final Biological Resources Report

ecology and environment, inc.
Global Environmental Specialists
7440 S. Creek Road, Suite 400
Sandy, UT 84093
Tel: (801) 561-1036, Fax: (888) 852-4650

MEMORANDUM

Date: February 7, 2018

To: Nancy Hsu
sPower

From: Janice Gardner
Ecology & Environment, Inc.

Subject: Raceway Solar Project Peer Review of Biological Resources Report – Response to Comments.

Ecology and Environment, Inc, has reviewed the peer review comments on the Raceway Solar Project Biological Resources Report and has provided the following responses.

Comment: Environmental Science Associates (ESA) has completed a review of the Biological Resources Report submitted for the Raceway Solar Project, and has submitted a request for additional data as described below.

All requested changes/clarifications listed below are to be made to the text and/or figures referenced in the specified study. The full revised study shall then be resubmitted to the County in two ways: (1) As a Microsoft Word-version of the study, with all changes/revisions shown in "track-change" for County review; and, (2) As a PDF-version of the clean "Final" study which reflects the revised submittal date and with all changes accepted. The PDF study shall be labeled as "Final" and shall not state "Revised" or "Addendum." Should you have any questions regarding this submittal format or process, please do not hesitate to contact Staff for further discussion. Note: Within this or future Data Requests, some instances may occur where necessary revisions are minor or where an additional appendix is appropriate in lieu of a fully revised Study. Please contact Staff directly to discuss these types of resubmittals

Response: Noted.

Biological Resources Report

Background. Our County Consultant reviewed the Biological Resources Report prepared by Ecology and Environment, Inc. and dated December 2017. Please make the following changes/clarifications to this Technical Report:

Comment: DR 1. In Section 4.2 (page 14) of the report, "iodinebush (*Allenrolfia occidentalis*)" should be spelled correctly as "iodinebush (*Allenrolfea occidentalis*)."

Response: Noted and updated.

Comment: DR 2. In Section 4.2 (page 14) of the report, "bud sagebrush (*Picrothamnus desertorum*)" should be reclassified as "bud sagebrush (*Artemisia spinescens*)."

Response: Noted and updated.

Comment: DR 3. In Table B-1 of Attachment B (page 40) of the report, "California ground squirrel (*Spermophilus beecheyi*)" should be reclassified as "California ground squirrel (*Otospermophilus beecheyi*)."

Response: Noted and updated.

Comment: DR 4. In general, the report does not mention jurisdictional waters. The presence or absence of jurisdictional waters on the project site should be stated, or a statement should be included in the report that a separate jurisdictional delineation survey and report are being conducted and prepared.

Response: This content was included in the Biological Resources Report as the last sentence under Section 1.1. No update necessary.

Thank you,

ECOLOGY AND ENVIRONMENT, INC.



Janice Gardner

Ecology and Environment, Inc.

Final Biological Resources Report

Raceway Solar Project

Kern County, California

For:



Sustainable Power Group, LLC

2180 South 1300 East
Suite 600
Salt Lake City, UT 84106-2749

By:



7440 South Creek Road
Suite 400
Sandy, Utah 84093

February 2018

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°F	degrees Fahrenheit
BLM	Bureau of Land Management
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFG	California Fish and Game
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
DRECP	Desert Renewable Energy Conservation Plan
E & E	Ecology and Environment, Inc.
ESA	federal Endangered Species Act
gen-tie	generation power tie
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
MBTA	Migratory Bird Treaty Act
MW	megawatts
T&E	threatened or endangered
U.S.C.	U.S. Code
USFWS	United States Fish and Wildlife Service

Chapter 1
Introduction and Overview

1.1 Introduction

On behalf of Sustainable Power Group, LLC (sPower, or the applicant) Ecology & Environment, Inc. (E & E), completed a biological resources report for the Raceway Solar Project (Project) in the Antelope Valley, approximately 5 miles west of Rosamond, in unincorporated Kern County, California (Figures 1 and 2). The Project would involve construction of seven solar photovoltaic (PV) power generating facilities connected by generation power tie (gen-tie) lines. The seven sites include the 30-acre Site 1, 180-acre Site 2, 466-acre Site 3, 315-acre Site 4, 310-acre Site 5, 240-acre Site 6, and 313-acre Site 7. The Project would deliver power to the grid along one of three alternative routes through a previously approved collector substation to an existing substation and/or to a substation that has currently been approved but not completed. This report describes the results of a desktop and reconnaissance-level biological survey for various Project components and the anticipated potential impacts related to biological resources as defined by the impact criteria described in Appendix G of the California Environmental Quality Act (CEQA). Discussion of wetlands and waters are included in a separate wetland and waters report.

1.2 Project Overview

The Project would involve the construction, operation, and eventual decommissioning of a solar PV power generating project with an energy storage system. The Project would be capable of producing up to approximately 400 megawatts of renewable electricity and storing up to 2,000 megawatt hours of electricity. The Project would be located on approximately 1,854 acres of private land in southeastern Kern County, California, and would comprise seven separate sites (Sites 1–7, Attachment A Photos 1–7). Raceway Solar 1, 2, 3, 5, 6, and 7 are zoned Estate 2.5 Acres (E 2.5), and Raceway Solar 4 is zoned Agriculture. The Project would be located approximately 5 miles west of the community of Rosamond, within the Willow Springs community. All solar arrays would be located within Kern County, and some associated gen-tie lines would extend south across the county line into Los Angeles County.

Major components of each facility would include PV modules mounted on single-axis or dual-axis tracker systems, electrical collection systems, data monitoring equipment, an energy storage system, a meteorological data collection system, private access roads, fencing, and a 34 kilovolt (kV) and/or 230 kV gen-tie line. There are four potential routes for interconnections to nearby substations. The Project may interconnect to sPower's previously approved collector substation via three proposed 10- to 12-mile 34 kV and/or 230 kV gen-tie lines originating at a direct current collection system located at the southwestern portion of the Project area, or to a planned Los Angeles Department of Water and Power (LADWP) substation northwest of the Project area via an additional proposed gen-tie route. Potential interconnection routes would be as follows:

- 100th Street West and Avenue G-12;
- 110th Street West and Avenue G-12;
- 80th Street and Avenue G-12; and
- Rosamond Boulevard to the proposed LADWP Substation.

PV system installation would include earthwork, grading, and erosion control, as well as erection of the PV modules, supports, and associated electrical equipment. The energy storage system would be modular and fully enclosed and would employ telecommunication systems to charge and discharge the battery according to power delivery needs. Typical modular energy storage systems are approximately 102 inches in height and 20 to 40 feet in length. The energy storage system would be located near inverter stations or switchgear. Cables would be installed in underground ducts, utilizing standard trenching techniques, electrical routing, backfilling, and compaction. The energy storage system could also be located on a centralized battery on site.

Construction is expected to be completed in approximately 10 to 12 months. Upon commissioning, the Project would enter the operational phase. For the duration of the operational phase, the Project would be operated on an unstaffed basis and monitored remotely, with regular on-site personnel visitations for security, maintenance, and system monitoring.

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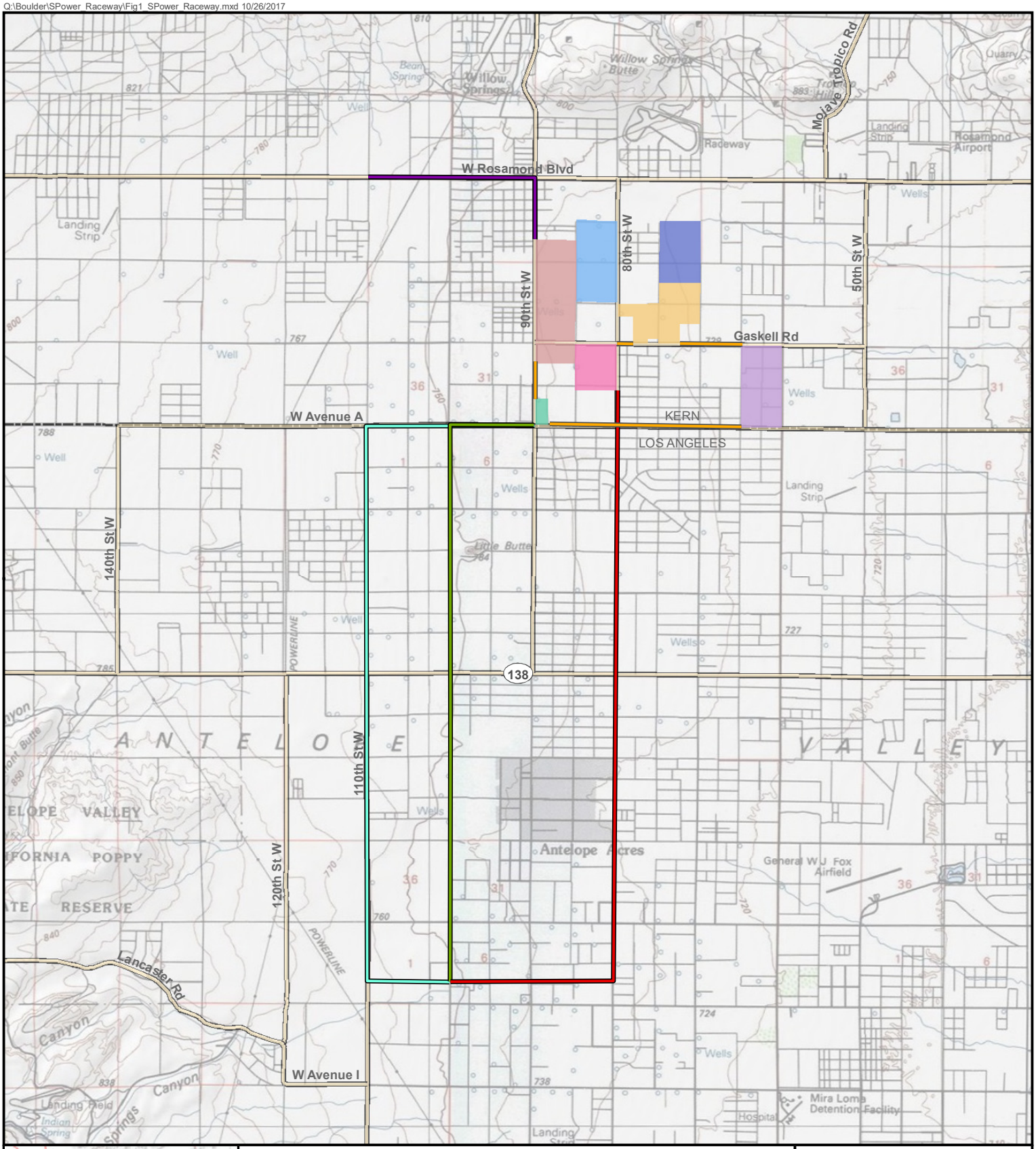
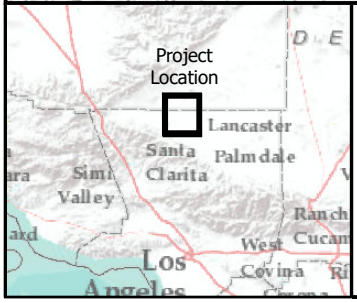




Interconnection Alternatives
- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Raceway Solar Projects
- Site 1
- Site 2
- Site 3
- Site 4
- Site 5
- Site 6
- Site 7

- Major Road
- County Boundary

Figure 1
Raceway Solar Project
Los Angeles and Kern Counties, California
sPower

0 0.5 1 Miles

Data Sources: USGS Topographic Base

Chapter 2
Regulatory Setting

This section summarizes federal, state, and local regulations and policies that are applicable to biological resources known to occur in the Project vicinity. Regulations related to wetlands and waters are included in the Project's wetland and waters report.

2.1 Federal

Federal Endangered Species Act (ESA)

The ESA was enacted to protect threatened and endangered species from extinction throughout all or a portion of their known ranges. In addition to other provisions, the ESA makes it unlawful for any governmental agency to harm a species listed as threatened or endangered (T&E) by organizing, funding, or performing actions that may affect the species itself or its known habitat. Doing so would be considered "take" (i.e., harming, harassing, or wanton killing) of a listed species without permit. The U.S. Fish and Wildlife Service (USFWS) maintains the national list of protected species and acts as regulator and consultant. Provisions under the ESA allow for the authorized "incidental" take of listed species under certain terms and conditions while conducting otherwise lawful activities.

Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 U.S. Code [U.S.C.] 703–712) provides protection for the majority of bird species occurring in the U.S., as it applies to nearly all migratory species. The MBTA implements treaties with several other nations and was enacted in response to the decline of migratory bird populations from uncontrolled commercial uses. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, possess, or sell birds listed under the MBTA without appropriate permits. Exotic species are not covered under the MBTA, including the European starling (*Sturna vulgaris*), house sparrow (*Passer domesticus*), and rock pigeon (*Columba livia*), as are non-migratory species such as the wild turkey (*Meleagris gallopavo*). The statute does not discriminate between live or dead birds and grants full protection to any bird parts, including feathers, eggs, and nests, regardless of conservation status.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d, 54 Stat. 250) was enacted in 1940 to preserve eagle populations from wanton killing and population declines. This act makes it illegal to take bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) or to trade in eagle parts, eggs, or feathers. Take has been broadly interpreted to include altering or disturbing nesting habitat. Additionally, this act prohibits disturbance. Rule changes made on December 14, 2016, finalized permit regulations to authorize limited take associated with otherwise lawful activities. These new regulations establish permit provisions for intentional take of eagle nests under particular limited circumstances.

2.2 State

California Endangered Species Act (CESA)

The CESA (California Fish and Game [CFG] Code Section 2050 *et seq*.) established legal protection for plant and wildlife species listed as T&E in California. The CDFW administers the CESA and also identifies Species of Concern as those that may become listed as T&E due to loss of habitat, limited distributions, and diminishing population sizes, or because the species is deemed to have scientific,

recreational, or educational value. CFG Code Section 2081 provides a permit process for incidental take of species listed as T&E pursuant to CESA when certain permit conditions are met.

CFG Code, Sections 3503, 3503.5, and 3511

These sections of the CFG Code prohibit activities that would result in the take, possession, or destruction of any birds, including birds of prey and species listed as "fully protected," or their nests or eggs; the take or possession of any migratory nongame bird as designated in the MBTA; the take, possession, or needless destruction of the nest or eggs of any bird; or the take of any nongame bird pursuant to CFG Code Section 3800.

According to CFG Code Section 1802, the CDFW has jurisdiction over the conservation, protection, and management of all California wildlife, fish, native plants (including state-listed T&E and other special status species), and their habitats necessary to maintain biologically sustainable populations. CFG Code Section 3503 specifies the following general provision for birds: "it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds of prey, including eagles, hawks, falcons, and owls) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season that results in the incidental loss of fertile eggs or nestlings or otherwise leads to nest abandonment is considered take. The CDFW also considers disturbance that causes nest abandonment or loss of reproductive effort to be take. CFG Code Sections 3511 and 5050 prohibit the taking and possession without a permit of birds and reptiles listed as "fully protected."

California Environmental Quality Act (CEQA) Guidelines Section 15380

In addition to species included on the federal and state lists of protected species, CEQA Guidelines Section 15380(d) provides that a species shall be considered endangered, rare, or threatened if it can be shown to meet certain specified criteria. For the purposes of CEQA, a species may be considered "endangered" when its survival and reproduction in the wild are immediately threatened. A species may be considered "rare" when it exists in such small numbers or in only a small portion of its range so that it may become endangered if the conditions of its habitat worsen. A species may be considered "threatened" if it meets the federal ESA criteria.

Species not listed as T&E that may be considered under CEQA include, but are not limited to, plants categorized by the California Native Plan Society (CNPS) as rare or endangered (including species considered rare and endangered only within California) or any plants considered locally or regionally significant by local governments or agencies. Because CEQA does not limit the discussion of impacts on species listed as T&E by either the federal or state governments, biological impacts are assessed and mitigation measures are assigned on a case-by-case basis, accounting for the scope of the project, the specifics of the site, and the individual species in question, among other factors.

Kern County Willow Springs Specific Plan

The Willow Springs Specific Plan outlines protective measures for Joshua tree woodlands (KCDPDS 1992). Displacement and destruction of Joshua tree habitat and woodlands is discouraged, and a Joshua Tree Preservation and Transportation Plan may be required by the Kern County Agricultural Commissioner. While the Willow Springs Specific Plan does not provide the definition of a Joshua tree

woodland, an area must contain at least 1 percent cover of evenly distributed Joshua trees in order to be considered a woodland (Menke et al. 2013; Sawyer et al. 2009).

3.1 Methods

On November 9 through 12, 2017, biologists with E & E conducted a reconnaissance-level biological field survey during on-site wetland delineations to document the presence of special status plant and wildlife species and their habitats within the Project area. No protocol-level survey methods were conducted during the reconnaissance-level field survey. The field surveys focused on special status species that had a potential to occur within the Project area and region, based on the results of a literature review.

3.1.1 Literature Review

Prior to conducting biological resource surveys within the Project area, E & E conducted a literature review to identify the known or potential presence and extent of special status plant and wildlife species habitat in the Project area. The status and distributions of plant and animal species in the Project area were evaluated based on a review of reasonably attainable literature, survey reports from nearby projects, and federal and state databases, including the California Natural Diversity Database (CNDDB; Figure 2). The following resources were used to develop the special status species lists provided in Tables 1 and 2:

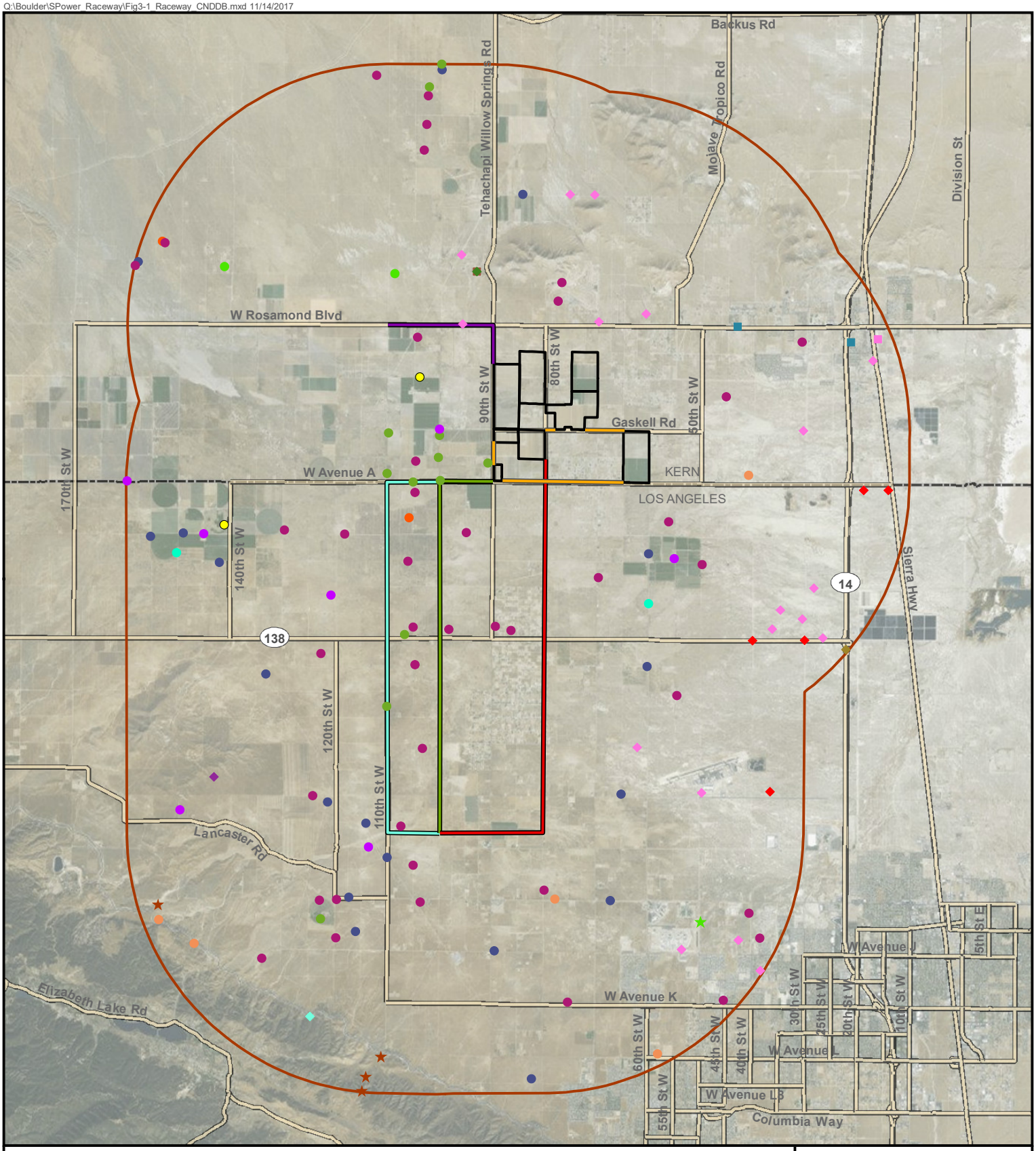
- The CNPS online inventory of Rare and Endangered Plants of California (CNPS 2017a);
- The 2013 California Vegetation Map in Support of the DRECP (Menke et al. 2013);
- CNDDB records within a 5-mile radius of the Project area (CNDDB 2017);
- The CDFW 2017 Special Animals List (CDFW 2017); and
- The USFWS Environmental Conservation Online System (USFWS 2017).

For the purposes of this document, special status species are restricted to federally or state-listed species, plant species listed on CNPS lists 1 and 2, and wildlife species designated as California Species of Special Concern.

Potential to occur designations were defined as follows:

- **Low**: The Project area or immediate region does not support suitable habitat, and the known range of the species is outside of the Project area or immediate region.
- **Moderate**: The Project area and immediate region support suitable habitat for the species.
- **High**: The Project area and immediate region support favored or high value habitat for the species and it is known to occur in the area.
- **Present**: The species was observed within the Project area.

The literature review, records search, past project experience, and professional biologists' judgment indicate that 39 special status species are known to occur, or have some potential to occur in the Project area. Tables 1 and 2 below list these species with a summary of each and a determination as to its potential to occur on site.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Backus Rd
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Mojave Tropico Rd
Division St
W Rosamond Blvd
90th St W
80th St W
50th St W
Gaskell Rd
170th St W
W Avenue A
KERN
LOS ANGELES
140th St W
Sierra Hwy
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120th St W
110th St W
Lancaster Rd
Elizabeth Lake Rd
W Avenue K
W Avenue J
W Avenue L
W Avenue L8
Columbia Way
60th St W
55th St W
45th St W
40th St W
30th St W
25th St W
20th St W
10th St W
5th St E
Burrowing owl
Ferruginous hawk
Golden eagle
Le Conte's thrasher
Loggerhead shrike
Merlin
Mountain plover
Swainson's hawk
Tricolored blackbird
Alkali mariposa-lily
Clokey's cryptantha
Horn's milk-vetch
Rosamond eriastrum
Sagebrush loeflingia
Short-joint beavertail
American badger
Mohave ground squirrel
Townsend's big-eared bat
Coast horned lizard
Northern California legless lizard
5-mile Buffer
Raceway Solar Sites
Major Road
County Boundary
Interconnection Alternatives
80th Street
Rosamond Blvd
100th Street
110th Street
Gen-tie
Figure 2
Raceway Solar Project
CNDDB Within 5 Miles
Los Angeles and Kern Counties, California
sPower
N
W
E
S
0 0.5 1 2
Miles
Data Sources: CNDDB 2017

Table 1 Special Status Plant Species with Potential to Occur in the Raceway Solar Project Area

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
alkali mariposa lily	*Calochortus striatus*	1B.2	Found on silt or caked mud in open spaces between shrubs and on edges of salt pans and alkali playas. Associated with annual grasses, fourwing saltbush, rubber rabbitbrush, inland saltgrass, and California goldfields.	Low potential to occur on site due to lack of suitable habitat.
Clokey's cryptantha	*Cryptantha clokeyi*	1B.2	Found in valley grasslands and creosote bush scrub in sandy soil dominated by redstem stork's bill, California poppy, cream cups, bluegrass, pincushion flower, and linanthus.	Low potential to occur on site due to lack of suitable habitat.
Horn's milk-vetch	*Astragalus hornii*	1B.1	Found in alkaline meadows and seeps along lake margins.	Low potential to occur on site due to lack of suitable habitat.
Rosamond eriastrum	*Eriastrum rosamondense*	1B.1	Occurs in chenopod scrub and vernal pools (edges); alkaline hummocks, often sandy.	Low potential to occur on site.
sagebrush loeflingia	*Loeflingia squarrosa var. artemisiarum*	2B.2	Occurs in sandy areas in sagebrush and creosote bush scrub between 3,500 and 4,000 feet elevation.	Low potential to occur on site. Project is outside the recognized elevation range for this species.
short-joint beavertail	*Opuntia basilaris var. brachyclada*	1B.1	Occurs in chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodlands.	Low potential to occur on site due to lack of suitable habitat.

Source: CNDDB 2017
Key:
Status
E = Federal or State-listed Endangered
T = Federal or State-listed Threatened
California Rare Plant Ranks (formerly known as CNPS Lists)
1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
2A: Plants Presumed Extirpated in California, But Common Elsewhere
2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3: Plants About Which More Information is Needed - A Review List
4: Plants of Limited Distribution - A Watch List
0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2-Moderately threatened in California (20–80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway Solar Project Site.

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
Reptiles				
coast horned lizard	*Phrynosoma coronatum*	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low potential to occur on site due to lack of suitable habitat.
desert tortoise	*Gopherus agassizii*	FT, ST	Occurs in desert alluvial fans, washes, canyon bottoms, and hillsides.	Low potential to occur on site due to lack of suitable habitat.
silvery (Northern California) legless lizard	*Anniella pulchra*	SSC	Occurs on the desert side of the Tehachapi Mountains in moist, warm, loose soil with sparse plant cover.	Low potential to occur on site due to lack of suitable habitat.
Birds				
burrowing owl (nesting and some wintering sites)	*Athene cunicularia*	SSC	Inhabits open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals—most notably, the California ground squirrel.	High potential to occur on site. Observed potentially suitable burrows on site.
California condor	*Gymnops californianus*	FE, SE	Nests in caves and on cliff faces in rocky, forested areas. Forages in shrublands, coniferous forests, and oak savannahs.	Low potential to forage on site. Critical habitat for this species is present 14 miles west of the Project site in the Tehachapi Mountains. No suitable nesting habitat occurs on site.
ferruginous hawk (wintering)	*Buteo regalis*	Watch List	A rare to uncommon transient and winter visitor in southern California. Typically requires extensive grasslands, sparsely vegetated rolling hills and agricultural fields for foraging habitat. Roosts in open areas, usually in a lone tree or utility pole.	Moderate potential to forage on site during wintering and migration periods. No potential to breed on site because this species does not breed in southern California.
golden eagle (nesting and wintering)	*Aquila chrysaetos*	FP	Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons and large trees in open areas provide nesting habitat.	Low potential to breed on site due to lack of suitable habitat. Moderate potential to forage on site during wintering and migration periods.
Le Conte's thrasher	*Toxostoma lecontei*	SSC	Habitat includes sparsely vegetated desert flats, dunes, and alluvial fans usually with a high proportion of saltbush and/or cholla cactus.	Low to moderate potential to forage on site. Suitable nesting habitat is low to moderate and occurs on adjacent lands.
loggerhead shrike (nesting)	*Lanius ludovicianus*	SSC	A rare to uncommon breeding resident in southern California,	Moderate to high potential to forage on site. Suitable

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway Solar Project Site.

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
			with an influx into the region during winter. Prefers open terrain, with short vegetation, including rangeland, agricultural fields, open brushlands, etc. Was once more common and widely distributed in North America.	nesting habitat occurs along periphery of site.
merlin (wintering)	*Falco columbarius*	Watch List	Breeds in far northern U.S. and Canada but can be found in open forests, grasslands, and coastal areas during winter and migration periods.	Moderate potential to forage on site in non-breeding season. No potential to breed on site this species does not breed in southern California.
mountain plover (wintering)	*Charadrius montanus*	SSC	Breeds on open plains at moderate elevations and winters in shortgrass prairie, plowed fields, and sandy deserts.	Low to Moderate potential to forage on site in non-breeding season. The species does not breed in the region of the Project area.
northern harrier (nesting)	*Circus cyaneus*	SSC	Most common in undisturbed wetlands and grasslands, but also found in agricultural areas. Nest on the ground in low, thick vegetation.	Moderate potential to nest and forage on site.
prairie falcon (nesting)	*Falco mexicanus*	Watch List	Occurs in grasslands, shrub-steppe, deserts, and other open areas of the West up to about 10,000 feet elevation. During the winter, they also reside in cultivated fields, lakeshores, desert scrub, as well as feedlots where European starlings may provide a steady food source.	Low potential to nest on site due to lack of suitable nesting habitat.
Swainson's hawk (nesting)	*Buteo swainsoni*	ST	Forages over a variety of open habitats, including grasslands, rangeland, and agricultural fields.	High potential. Suitable nesting habitat occurs in project vicinity and suitable foraging habitat occurs on site.
tricolored blackbird (nesting colony)	*Agelaius tricolor*	CS, SSC	Nests in colonies in freshwater marshes.	Low potential to occur on site due to lack of suitable habitat.
Mammals				
American badger	*Taxidea taxus*	SSC	Occurs in grasslands and scrublands with sparse cover. Excavates burrows for dens and breeding. Forages primarily on burrowing rodents, but also eats small birds, insects, and reptiles.	High potential to occur on site.
Mohave ground squirrel	*Spermophilus mohavensis*	ST	Found in the western Mojave Desert in Inyo, Kern, Los Angeles, and San Bernardino Counties in desert scrub habitats.	Low potential to occur on site. Outside the current known range for this species.
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC	Inhabits mines, caves, and vacant buildings and requires a vertical	Low potential to occur on site. No suitable roosting

Table 2 Special Status Wildlife Species with Potential to Occur on the Raceway Solar Project Site.

Common Name	Scientific Name	Status	Habitat Description	Potential to Occur
			surface for roosting. Highly sensitive to disturbance. Feeds on flying insects.	habitat is present on any of the three solar facilities. Suitable foraging habitat is present on site.
desert kit fox	*Macrotis mutica arsipus*	--	Inhabits creosote bush scrub and dry grassland habitats throughout the Mojave Desert.	High potential to occur on site. Observed inactive escape den on site.

Source: CNDDB 2017
Key:
Status
FT = listed as threatened under the federal Endangered Species Act.
ST = listed as threatened under the California Endangered Species Act.
CS = candidate for listing under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.

4.1 Existing Site Conditions

The Project would be located in the western portion of the Antelope Valley. The Antelope Valley is within the western portion of the Mojave Desert and is bounded by the Tehachapi Mountains to the northwest and the San Gabriel Mountains to the southwest. Land uses in the Antelope Valley and Project area include undeveloped desert (i.e., Mojave Basins; Griffith et al. 2016), fallow and active agriculture, low-density residences, and energy development (e.g., solar and wind).

The Antelope Valley is high desert, characterized by an arid climate. Temperatures in the valley vary greatly, from over 100 degrees Fahrenheit (°F) in the summer to below freezing in the winter. Winds in this area are generally strong, with an average speed of approximately 10 miles per hour. The Project area elevation is approximately 2,400 feet. Annual average precipitation in the town of Mojave is approximately 6 inches, with January, February, and March receiving nearly half the annual rainfall (WRCC 2017). The average low temperature is 32°F in December, and the average high temperature is 97°F in July.

The Antelope Valley is within the South Lahontan Basin, which is considered an isolated watershed (i.e., it is not hydrologically connected to other wetlands or water bodies). Soils in the Project area are generally well drained sandy loams and loamy sands with negligible to moderate runoff rates. The Project area comprises a mix of desert scrub communities, dominated by fallow fields, active agriculture, and developed lands that support a variety of wildlife species. Native habitats in the region (i.e., creosote bush [*Larrea tridentata*]–white bursage [*Ambrosa dumosa*] community, and Joshua trees [*Yucca brevifolia*]) are uncommon and patchy in distribution.

The Project region has experienced considerable growth in renewable energy projects in recent years. Large-scale wind and solar projects have become interspersed with desert scrub and agricultural land uses. The Project area consists largely of later-stage fallow agricultural and grazing land (Figure 2). The Project area is surrounded by vacant/undeveloped land (i.e., fallow agricultural, grazing, and desert shrub), commercial-scale solar development, and rural residences. To the east of the Project area are undeveloped lands. To the west of the Project area are undeveloped lands and the operational Solar Star 1 and 2 solar projects. To the south of the Project area are undeveloped lands, rural residences, and the Del Mar Solar Project. To the north of the Project area are undeveloped lands, rural residences, and the Willow Springs International Motorsports Park.

4.2 Vegetation

The Project area consists of a mix of vegetation types but is mainly agriculture and annual grasses and forbs (Figure 3a,b,c; Table 3). In general, the Project's solar sites are characterized as active or fallow agricultural and grazing lands that are dominated by weedy species such as tumble mustard (*Sisymbrium altissimum*) and Russian thistle (*Salsola tragus*). Vegetation adjacent to the gen-tie and interconnection routes were found to contain the following vegetation communities: alkaline mixed scrub, creosote bush, Joshua tree woodland, annual grasses and forbs, agriculture, rabbitbrush, saltbush (*Atriplex* spp.), and developed.

The vegetation types represented on the Project area are described in detail below.

Table 3 Acreage of Vegetation Types on the Raceway Solar Project and Interconnection Routes

Vegetation Type	Acreage
Agriculture	1,987.8
Alkaline mixed scrub	344.5
Annual grasses and forbs	2,134.8
Creosote bush	1.9
Joshua tree woodland	2.0
Rabbitbrush	564.2
Saltbush	7.9
Shadscale	6.2
Developed	769.5
Total	**5,818.9**

Source: Menke 2013

Agriculture

Croplands include cultivated, in crop, harvested, fallow, and temporarily idle land. Most field and row crops in the Antelope Valley are irrigated. Fields lie fallow for at least one season within the year. Fallow fields that have remained inactive for over two years may contain a sparse shrub cover, including such species as allscale saltbush (*Atriplex polycarpa*) or rubber rabbitbrush (*Ericameria nauseosa*), both of which are rapid colonizers in recently cleared or farmed land (Menke 2013).

Alkaline Mixed Scrub

The alkaline mixed scrub community is defined as having no single dominant genus and occurs within drainage basins where precipitation evaporates quickly, leaving saline or alkaline salt deposits that make this habitat ideal for more salt-tolerant scrub species (USDA 2009). This vegetation community is composed of saltbush, iodinebush (*Allenrolfea occidentalis*), horsebrush (*Tetramydia* spp.), *Kochia*, bud sagebrush (*Artemisia spinescens*), and spiny hopsage (*Grayia spinosa*), and generally lacks cactus species (USDA 2009).

Annual Grasses and Forbs

The annual grasses and forbs vegetation type is characterized by mostly annual grasses and forbs, particularly native herbs, though non-native forbs and grasses may be dominant. Cover and composition vary year to year, but primary species include fiddleneck (*Amsinckia* spp.), California poppy (*Eschscholzia californica*), goldfields (*Lasthenia* spp.), daisy (*Monolopia* spp.), tidy tips (*Layia* spp.), tickseed (*Coreopsis* spp.), foothill plaintain (*Plantago erecta*), and small fescue (*Vulpia microstachys*) (Menke 2013).

Creosote Bush Scrub

Creosote bush scrub is a community that is most commonly associated with alluvial fans, bajadas, upland slopes, and intermittent washes. Creosote bush is dominant in this community, with at least 2 percent cover. The shrub layer generally does not exceed 9 feet in height, and the canopy is open, with an intermittent herbaceous layer. Other common non-dominant plant species associated with this vegetation community include Shockley's goldenhead (*Acamptopappus shockleyi)*, rayless goldenhead

(*Acamptopappus sphaerocephalus)*, white bursage, cheesebush (*Ambrosia salsola)*, shadscale saltbush (*Atriplex confertifolia)*, desert holly (*Atriplex hymenelytra)*, cattle saltbush (*Atriplex polycarpa)*, woolly brickellbush (*Brickellia incana)*, brittlebush (*Encelia farinosa)*, California ephedra (*Ephedra californica)*, Nevada jointfir (*Ephedra nevadensis)*, and Anderson's desert thorn (*Lycium andersonii)*. Additionally, Joshua tree may also be present in lower densities (CNPS 2017b).

Joshua Tree Woodland

Joshua tree woodland is found in alluvial fans, ridges, and gentle to moderate slopes. Soils are coarse sands, very fine silts, gravel, or sandy loams. This vegetation community is an emergent small tree over a shrub or grass layer with white bursage, cheesebush, big sagebrush (*Artemisia tridentata*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), blackbrush (*Coleogyne ramosissima*), buckhorn cholla (*Cylindropuntia acanthocarpa*), nevada jointfir (*Ephedra nevadensis*), California buckwheat (*Eriogonum fasciculatum*), creosote, and Anderson's desert thorn (*Lycium andersonii*) (CNPS 2017c).

Rabbitbrush

In this vegetation type, Mojave rabbitbrush (*Ericameria paniculata*) is dominant or co-dominant in the shrub canopy. The rabbitbrush vegetation type is widespread throughout a broad elevation range in much of the mapping area on the edges and terraces of relatively large, recently active washes (Menke 2013).

Saltbrush

In this vegetation type, fourwing saltbush (*Atriplex canescens*) generally has the highest cover, though white bursage and allscale saltbush may have similar cover. Some stands contain joshua trees. This vegetation type occurs in sandy substrates and in sandy washes (Menke 2013).

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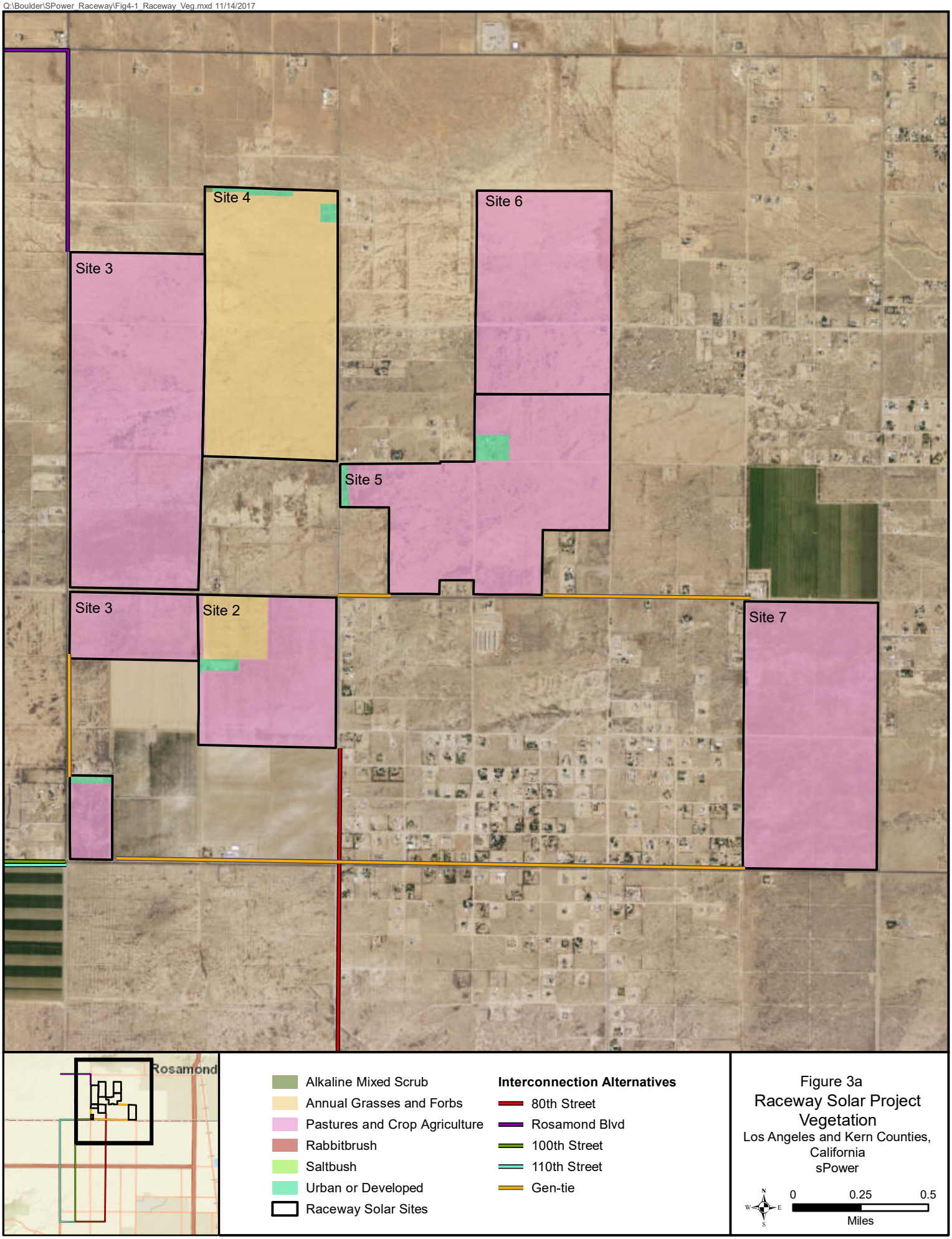

Figure 3a
Raceway Solar Project
Vegetation
Los Angeles and Kern Counties, California
sPower

Data Sources: Menke 2013

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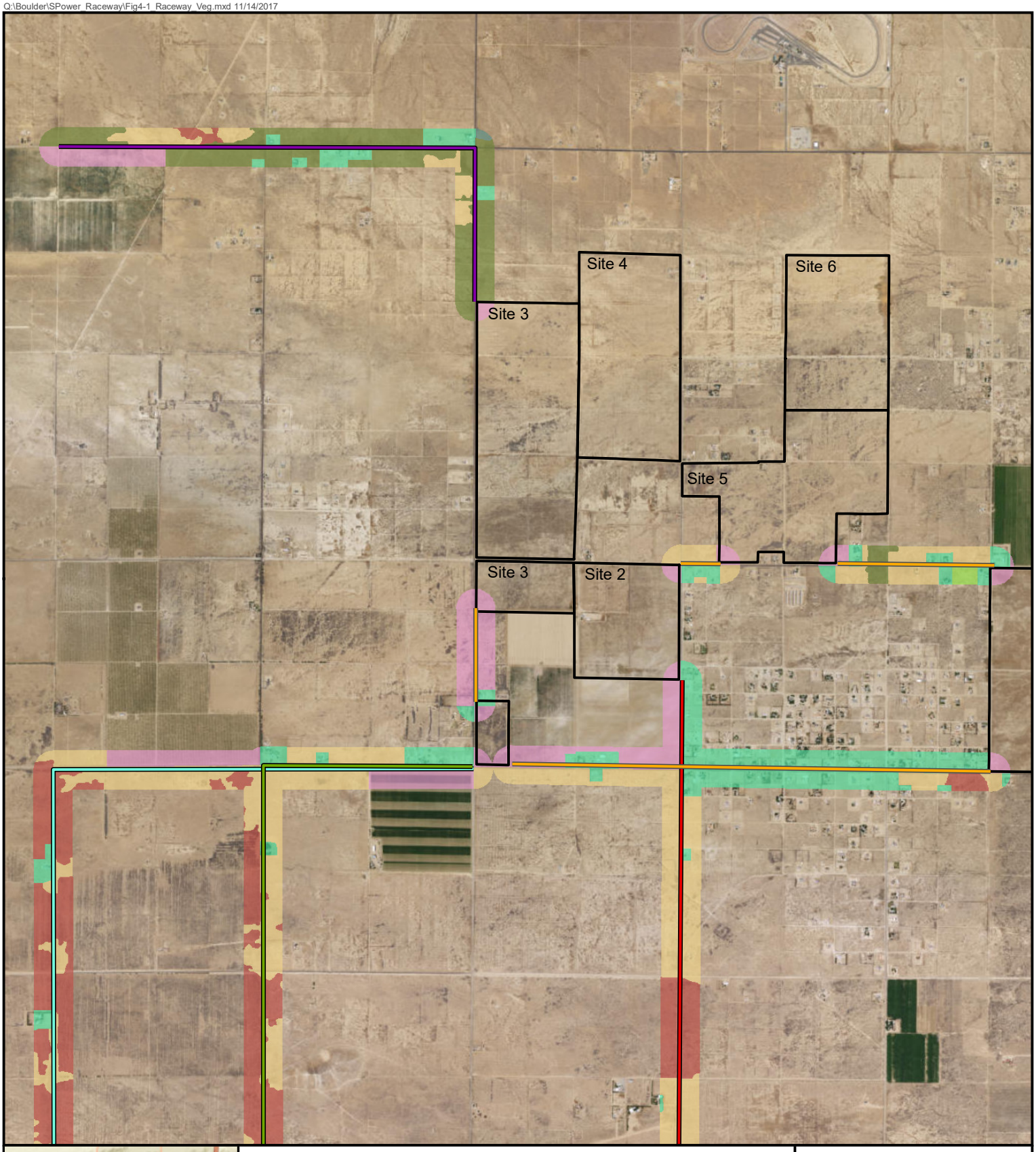

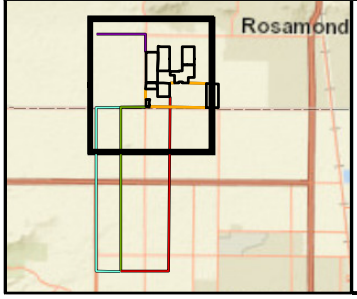

Alkaline Mixed Scrub
Annual Grasses and Forbs
Creosote Bush
Pastures and Crop Agriculture
Rabbitbrush
Saltbush
Urban or Developed
Raceway Solar Sites

Interconnection Alternatives
80th Street
Rosamond Blvd
100th Street
110th Street
Gen-tie

Figure 3b
Raceway Solar Project
Vegetation
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: Menke 2013

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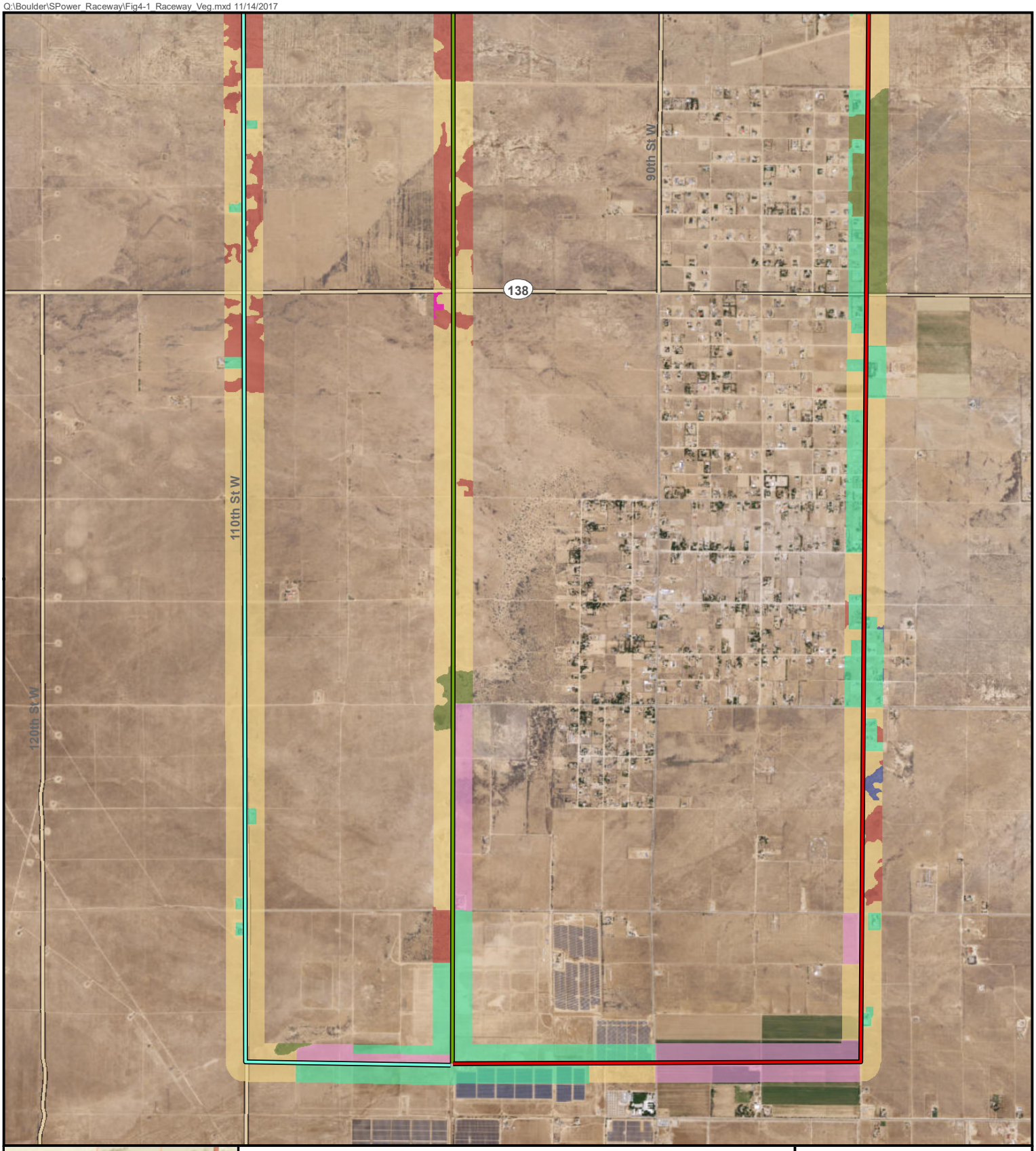

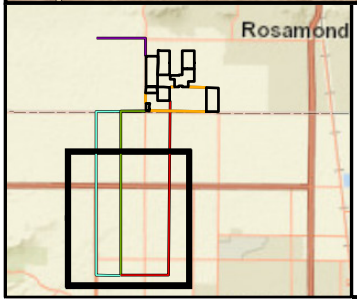

Alkaline Mixed Scrub
Annual Grasses and Forbs
Joshua Tree
Pastures and Crop Agriculture
Rabbitbrush
Shadscale
Urban or Developed
Major Road

County Boundary

Interconnection Alternatives

80th Street
100th Street
110th Street

Figure 3c
Raceway Solar Project
Vegetation
Los Angeles and Kern Counties, California
sPower

N
W
E
S

0 0.25 0.5
Miles

Data Sources: Menke 2013

4.3 Special Status Species

This section discusses special status species that were observed in the Project area, have a high to moderate potential to occur, or merit further discussion solely due to unique or particular conservation concerns (i.e., federally listed).

4.3.1 Special Status Plants

A complete list of plant species observed is provided in Attachment B.

Alkali Mariposa Lily

Alkali mariposa lily (*Calachortus striatus*) is included in the CNPS Inventory of Rare and Endangered Plants on list 1B.2 (rare, threatened, or endangered in California and elsewhere). Alkali mariposa lilies are perennial lilies that bloom from April to June. In southern California, this species occurs in Los Angeles, Kern, and San Bernardino Counties in chaparral and shadscale scrub habitats (CNPS 2017d). This species is known to occur in the Project vicinity (Ironwood Consulting 2011a). No suitable habitat for this species is present in the Project area.

Joshua Tree Woodland

One Joshua tree was observed in the Project area and does not represent a Joshua tree woodland. Vegetation mapping (Figure 3c) identified one area (2.0 acres) of Joshua tree woodland adjacent to the 100th Street interconnection route.

4.3.2 Special Status Wildlife

A complete list of wildlife species that were observed during surveys is provided in Attachment B.

Desert Tortoise

The desert tortoise (*Gopherus agassizii*) is listed as threatened under the CESA and the ESA. The Project area falls within the historic range of the Mojave Desert population of the desert tortoise and within the Western Mojave Recovery Unit (USFWS 2011). Habitat characteristics include gentle slopes with sparse, woody vegetation and sandy to gravelly soils below 5,500 feet (Germano et al. 1994; USFWS 1994). Lower elevation habitat areas are dominated by creosote bush and white bursage, and higher elevation habitats are dominated by blackbrush and juniper woodlands (USFWS 2009). No desert tortoises were observed during desert tortoise surveys for the Solar Star 1 and 2 Projects, southeast of the Project area (AECOM 2010); the Willow Springs Project (Ironwood Consulting 2011a); or the Rosamond Solar Array Projects (Ironwood Consulting 2011b).

The Project area does not represent suitable habitat for desert tortoise, and no suitable desert tortoise burrows, tortoise sign, or tortoises were observed during surveys. The most recent and closest CNDDB occurrence for desert tortoise is a single 2006 observation of an adult tortoise crossing Tehachapi Willow Springs Road approximately 2.75 miles northeast of the Project area. Because of the lack of suitable habitat, desert tortoise has a low potential to occur in the Project area.

Burrowing Owl

Nesting and wintering burrowing owl (*Athene cunicularia*) are a CDFW Species of Special Concern. The burrowing owl's breeding range in the western U.S. extends from southern Canada to Baja California and

central Mexico (Klute et al. 2003). Some burrowing owls remain in California year round, while others migrate to California to winter (Shuford and Gardali 2008). The burrowing owl uses a variety of open, arid to semi-arid habitat types, including prairies, open scrublands, agricultural fields, airports, and golf courses (Dechant et al. 2002; Klute et al. 2003). Burrowing owls generally do not create their own burrows, but instead occupy burrows excavated by ground squirrels, American badgers (*Taxidea taxus*), foxes, or coyotes (*Canis latrans*). They may also use natural cavities in rocks and openings in human-made structures such as pipes. In southern California, the burrowing owl most commonly uses California ground squirrel burrows (Trulio 1997). Burrowing owls are known to occur in the Project area. Suitable burrowing owl habitat is present on all seven Project sites in the form of fallow agricultural lands, grazing lands, and grassland. Surveyors observed burrows suitable for burrowing owl occupancy in two locations within the Project area (Figure 4; Attachment A, Photos 8-9). However, no burrowing owls or burrowing owl sign were observed at these burrows.

California Condor

The California condor (*Gymnogyps californianus*) is listed as endangered under the ESA and CESA. California condors are scavengers and forage opportunistically on carrion. They forage in open grasslands where thermals facilitate soaring. Condors have large home ranges that average 220 square miles (Rivers et al. 2014; Birds of North America 2015). The species nests primarily in natural cavities or cliffs (Birds of North America 2015). In California, suitable nesting habitat occurs throughout the interior mountains in the central and southern portions of the state (USFWS 1996). In southern California, nesting locations occur in Santa Barbara, Ventura, Los Angeles, and Tulare Counties. California condor critical habitat is present 14 miles west of the Project area in the Tehachapi Mountains (USFWS 2017). No suitable foraging or nesting habitat for this species exists in the Project area.

Ferruginous Hawk

Wintering ferruginous hawk (*Buteo regalis*) are a CDFW Watch List species. Ferruginous hawks are a migratory raptor that winter in grassland and shrub habitats the southwestern U.S., including California (Birds of North America 2015). In the region of the Project area, ferruginous hawks are known to occur in the winter (eBird 2017).

Golden Eagle

Golden eagles are protected by the federal Bald and Golden Eagle Protection Act and by the MBTA. In California, nesting and wintering golden eagles are fully protected. Golden eagles are found throughout the western U.S. in a range of open habitats, including tundra, shrubland, and coniferous forests (Birds of North America 2015). In southern California, golden eagles may occur year round as residents or as transients during migration, and breed on cliffs or in large trees from late January through August (Katzner et al. 2012). In the Mojave Desert, breeding ranges vary from 24 to 1,556 square miles (Katzner et al. 2012). Golden eagles may forage in the Project area. However, no suitable nesting habitat for this species exists in the Project area.

LeConte's Thrasher

LeConte's thrasher (*Toxostoma lecontei*) is a CDFW Species of Special Concern. LeConte's thrashers are non-migratory and are sparsely distributed in southern California, western Arizona, southern Nevada, and southwestern Utah. LeConte's thrashers inhabit sparsely vegetated desert flats, dunes, alluvial fans, and gently rolling hills with a high proportion of saltbush or shadscale (Birds of North America 2015). This species nests in cacti, saltbushes, yuccas, and mesquites (Weigand and Fitton 2008). It is known to occur in the Project area (eBird 2017), and suitable nesting habitat occurs in the Project area.

Loggerhead Shrike

Nesting loggerhead shrike (*Lanius ludovicianus*) are a CDFW Species of Special Concern and is widely distributed across the western U.S. Loggerhead shrikes occur in California year round as both residents and migrants (Shuford and Gardali 2008). This species is found in a variety of habitats, including thinly wooded or shrubby areas with clearings, meadows, pastures, old orchards, and roadside thickets (Terres 1980). Historically common and widespread throughout southern California, loggerhead shrike populations are now declining, especially in coastal areas (Shuford and Gardali 2008). This species was observed foraging on site during reconnaissance surveys and suitable nesting habitat occurs in the Project area.

Merlin

Wintering merlin (*Falco columbarius*) are a CDFW Watch List species. In California, merlin winter in a variety of habitats including woodlands, open deserts, and grasslands (Birds of North America 2015). Merlin are known to occur in region of the Project area and were observed during reconnaissance surveys (eBird 2017).

Mountain Plover

Wintering mountain plover (*Charadrius montanus*) are a CDFW Species of Special Concern. The mountain plover is a migratory shorebird that breeds in grassland habitats east of the Rocky Mountains and winters in agricultural fields in Southern California from September through mid-March (Knopf 1996). This species does not breed in the region of the Project area but may forage on site during migration.

Northern Harrier

Nesting northern harriers (*Circus cyaneus*) are a CDFW Species of Special Concern. Northern harriers forage in a variety of open grasslands (Shuford and Gardali 2008) and marsh habitats and nest on the ground in dense vegetation. Northern harriers are not known to nest in eastern Kern County (Shuford and Gardali 2008). This species is expected to forage in the Project area and were observed during reconnaissance surveys. However, suitable nesting habitat does not occur in the Project area.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsonii*) is listed as threatened under the CESA. Swainson's hawks in California nest in two populations (Woodbridge 1998): the Central Valley population, and the Antelope Valley population. These hawks nest in Joshua trees and roadside and windrow trees, and forage mostly on small mammals in open grasslands, shrublands, and agricultural fields (e.g., alfalfa, irrigated pastures, and dryland pastures). Swainson's hawks are known to nest in the Project area, and four historic Swainson's hawk nests were observed within 5 miles of the Project area during 2014 Swainson's hawk surveys for the Willow Springs Solar Project (Ironwood Consulting 2014).

The first Swainson's hawk nest is located approximately 275 feet west of Site 1 in a windrow tree near several residences (Figure 4). A second Swainson's hawk nest is located along West Avenue A adjacent to the 110th Street interconnection option (Figure 4). A third nest was located in a Joshua tree approximately 4.5 miles north of the Rosamond Boulevard interconnection option (Figure 4). A fourth nest was located in a windrow tree approximately 4.6 miles north of Site 4 (Figure 4). Suitable foraging habitat for Swainson's hawk is present throughout the Project area, and nesting habitat is available

primarily along the proposed interconnection and gen-tie lines, in roadside trees. While limited within the solar sites, some trees are present that may be suitable nesting habitat for this species.

Nesting Birds

Species likely to nest in the Project area include common raven (*Corvus corax*), western meadowlark (*Sturnella neglecta*), and red-tailed hawk (*Buteo jamaicensis*). Inactive stick nests observed in the vicinity of the Project area were likely built by common ravens. The nests were located in manmade structures (e.g., transmission line towers) and trees within the sites. Additional nesting habitat exists along the extent of proposed interconnection and gen-tie locations. Other species of migratory birds that were observed during surveys that have the potential to nest in the project vicinity include horned lark (*Eremophila alpestris*), California quail (*Callipepla californica*), western kingbird (*Tyrannus verticalis*), and northern mockingbird (*Mimus polyglottos*). Non-native, disturbance-tolerant species such as the house sparrow and European starling are also expected to nest on the solar project, once built.

American Badger

The American badger is a CDFW Species of Special Concern. In California, this species is found in a wide variety of habitats, from mountains to deserts (Williams 1986). American badgers are highly adapted for digging and spend much of their time underground in burrows. They feed primarily on rodents and ground squirrels. American badgers have large home range sizes—over 100 square miles—and can disperse great distances (Apps et al. 2002). Suitable denning and foraging habitat occurs in the Project area.

Mohave Ground Squirrel

The Mohave ground squirrel (*Xerospermophilus mohavensis*) is listed as threatened under CESA. Mohave ground squirrels occur in the western Mojave Desert in portions of Inyo, Kern, Los Angeles, and San Bernardino Counties (Gustafson 1993). This species prefers flat to moderately sloping desert scrub habitats with sandy and alluvial soils (Gustafson 1993; Wessman 1977; Laabs 1998). Mohave ground squirrels are generally active from mid-March through the late summer and fall. They hibernate or aestivate in their underground burrows for the remainder of the year (Leitner and Leitner 1998). The Project area is outside of the currently accepted range for the Mohave ground squirrel (Leitner 2008), but this species was included in this analysis because it is of heightened conservation concern in the Antelope Valley. No Mohave ground squirrels were observed during 2010 trapping surveys for the Willow Springs (Ironwood Consulting 2011a) or Rosamond Solar Array Projects (Ironwood Consulting 2011b) immediately adjacent to the Project area. This species is not expected to occur in the Project area due to lack of suitable habitat.

Townsend's Big-eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) is a CDFW Species of Special Concern. Townsend's big-eared bats roost and hibernate in caves and cave-like manmade structures (e.g., abandoned mines) in dry, upland coniferous and deciduous forests (Kunz and Martin 1982; Pierson and Rainey 1998). Suitable roosts and hibernacula have vertical or horizontal entrances that allow for air flow and must be free of human disturbance. The Townsend's big-eared bat distribution in California is not well understood (Pierson and Rainey 1998). A review of roost sites in California by Pierson and Rainey (1998) shows only one hibernation roost in northern Kern County. No suitable roosts or hibernacula (e.g., large, open caves) for this species occurs on site, and the Project area represents marginal foraging habitat.

Desert Kit Fox

Desert kit fox (*Vulpes macrotis*) is protected by the CFG Code as a furbearing mammal but is not protected under the ESA or CESA. This species is found in a wide range of arid climates within chaparral, desert scrub, and grassland habitats. Desert kit foxes are mainly nocturnal, spending much of the day in underground burrows and emerging after sunset to prey on rodents, rabbits, small reptiles, and birds. Desert kit foxes may utilize many dens throughout their home range and give birth in larger, natal den complexes in March and April. Desert kit foxes are known to breed in the Project area, and suitable denning habitat is present on site.

One inactive escape den was observed on Site 4 in a buried pipe (Figure 4; Attachment A, Photo 10). This den was classified as inactive because it showed no recent sign of use. However, old scat was present near the entrance.

4.4 Critical Habitat

The USFWS does not identify critical habitat for any species on or in close proximity to the Project area (USFWS 2017).

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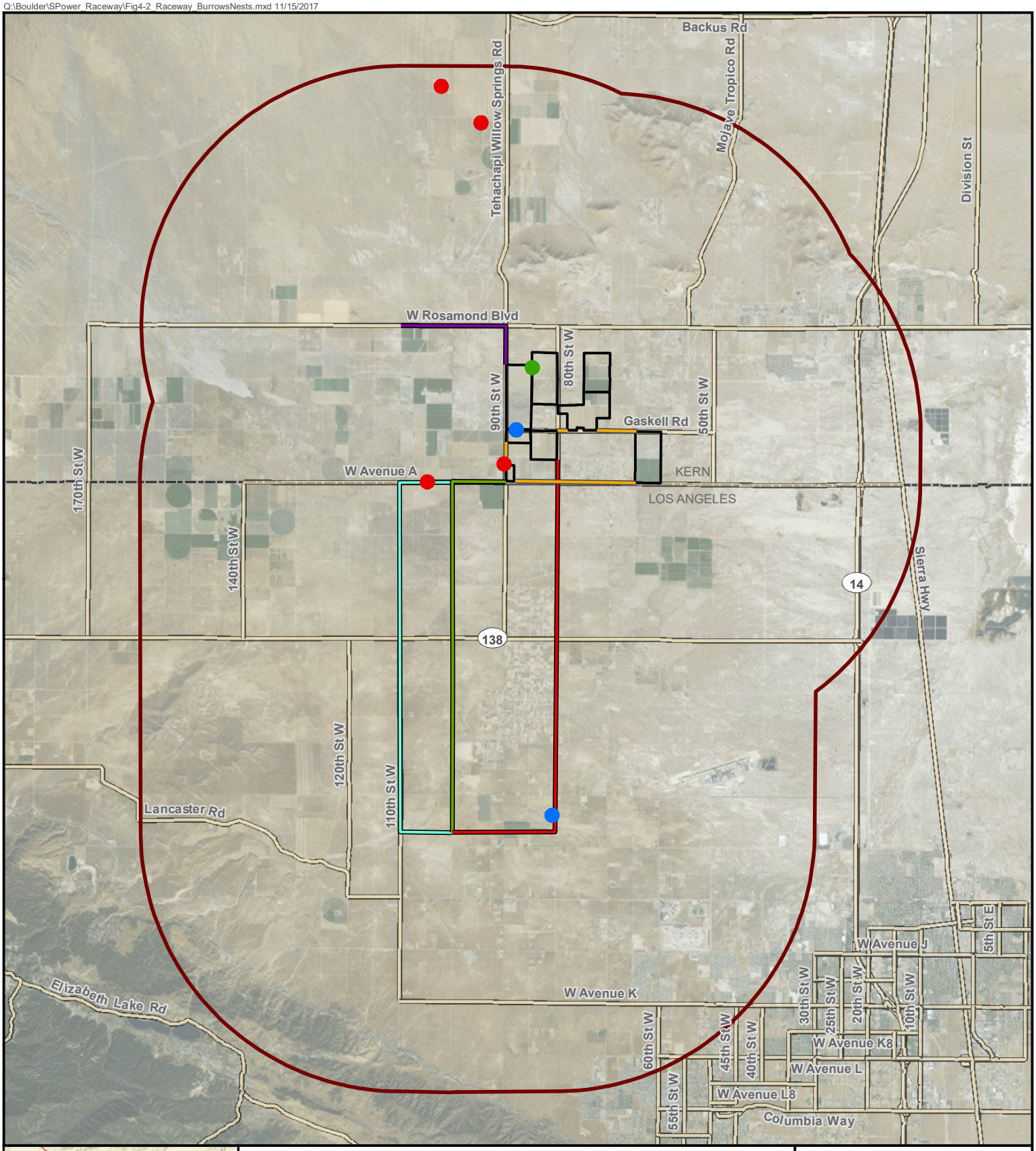



- Inactive Burrowing Owl Burrow
- Desert Kit Fox Escape Burrow
- Historic Swainson's Hawk Nest
- Raceway Solar Sites
- 5 Mile Buffer
- Major Road
- County Boundary

Interconnection Alternatives

- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Figure 4
Raceway Solar Project
Burrow and Historic Swainson's Hawk Nest Locations
Los Angeles and Kern Counties, California
sPower

0 0.5 1 2
Miles

Data Sources: E & E Field Data 2017; Ironwood Consulting 2014

This section discusses potential impacts to special status species. Section 6.1 outlines recommended avoidance and minimization measures to reduce impacts.

5.1 Special Status Natural Communities and Rare Plants

The Project area consists primarily of agricultural and grassland vegetation types. No Special Status Natural Communities occur on site. Joshua tree woodland occurs adjacent to the interconnection options; however, impacts on this vegetation community would be avoided during construction. Therefore, there are no impacts on these communities and no mitigation would be required.

No rare plants are expected to occur on site because of lack of suitable habitat. Additionally, protocol-level special status plant surveys would be conducted prior to construction to ensure that no rare plants are impacted. With implementation of this measure, potential impacts on rare plants would be reduced to less than significant.

5.2 Special Status Wildlife Species

Based on the results of the desktop and field surveys, seven special status wildlife species have a moderate to high potential to occur within the Project area: burrowing owl, Swainson's hawk, LeConte's thrasher, loggerhead shrike, mountain plover, American badger, and desert kit fox. Additionally, a number of bird species protected by the MBTA and CFG code may nest within the Project area.

5.2.1 Burrowing Owl

Burrows suitable for burrowing owl were observed in the Project area, and the Project area contains suitable habitat for this species. Potential direct impacts on this species resulting from Project construction include mortality of adults, eggs, and chicks. Potential indirect impacts include loss of burrows and foraging and nesting habitat.

Prior to construction, surveys would be undertaken in accordance with the CDFW (2012) Staff Report on Burrowing Owl Mitigation. With implementation of this measure, potential impacts on burrowing owl would be reduced to less than significant.

5.2.2 Swainson's Hawk

Swainson's hawk nests are known to be present within 5 miles of the Project area, and suitable foraging habitat for this species occurs on site. Suitable nesting habitat occurs on site, and suitable nest trees are present immediately adjacent to the Project. Should Swainson's hawks nest on or adjacent to the Project area during construction, potential direct impacts on Swainson's hawk could include mortality of adults, eggs, or chicks. Indirect impacts that could occur as a result of construction include loss of foraging habitat and increased habitat fragmentation.

Prior to construction, surveys would be undertaken in accordance with the CDFW recommendations and avoidance measures would be implemented, as necessary. With implementation of these measures, potential impacts on Swainson's hawk would be reduced to less than significant.

5.2.3 Loggerhead Shrike and LeConte's Thrashers

Suitable nesting habitat for loggerhead shrikes or LeConte's thrashers occur on site, and these species may be impacted during construction if nests are destroyed or disturbed.

Preconstruction surveys would be undertaken prior to the start of construction and avoidance measures would be implemented, as necessary. With implementation of these measures, potential impacts on nesting birds would be reduced to less than significant.

5.2.4 Mountain Plover

Mountain plover has the potential to use the Project area as migratory stopover habitat. Migratory stopover habitat is not limited in the region and therefore, impacts on mountain plover would be less than significant.

5.2.5 Ferruginous Hawk and Merlin

Ferruginous hawk and merlin have the potential to use the Project area as migratory and wintering habitat. Migratory and wintering habitat is not limited in the region and therefore, impacts on ferruginous hawk and merlin would be less than significant.

5.2.6 Nesting Birds

Numerous bird species have the potential to nest in the Project vicinity, and suitable nesting habitat for ground-nesting species occurs on site. Potential impacts on nesting birds resulting from construction include mortality of adults, eggs, and chicks.

Preconstruction surveys would be undertaken prior to the start of construction and avoidance measures would be implemented, as necessary. With implementation of these measures, potential impacts on nesting birds would be reduced to less than significant.

5.2.7 Desert Fit Fox and American Badger

One potentially active desert kit fox escape den was observed on site during surveys, and suitable habitat for this species occurs throughout the Project area. No potential American badger dens were observed on site during surveys. However, the Project area contains suitable habitat for American badger. Potential impacts on both species resulting from Project construction include mortality of adults or young and loss of burrows.

Prior to construction, preconstruction surveys will be undertaken to identify active desert kit fox or American badger burrows on the Project site and avoidance measures would be implemented, as necessary. With implementation of these measures, potential impacts on desert kit fox and American badger would be reduced to less than significant.

5.4 Cumulative Impacts

The western Mojave Desert, and especially the Antelope Valley, has experienced an increase in renewable energy development in the past five years. As a result, impacts on biological resources in the region are increasing cumulatively. Several solar and wind energy projects are currently under development or proposed for development within the Antelope Valley, including three adjacent to the Project. Numerous special status species are known to be present in the Project region, and many of these same species could utilize habitat nearby that is proposed for future development. Implementation of the Project in addition to those planned for or currently under development in the Antelope Valley could further impact local wildlife.

The habitat in the Project area and in the Project vicinity supports wildlife species, including special status species such as Swainson's hawk, burrowing owl, desert kit fox, and American badger. These species are expected to utilize habitats within the Project boundaries on a transient or seasonal basis, and the avoidance and minimization measures outlined in Section 6.1 of this report would reduce project-level impacts on these species. However, when combined with other past, present, and reasonably foreseeable future projects in the vicinity of the Project, project construction and operation could contribute to a cumulative loss of foraging and nesting habitat for Swainson's hawks burrowing owls, and other special status species.

Direct impacts (i.e., injury or mortality) on Swainson's hawks, desert kit foxes, American badgers, and burrowing owls could result from the Project's development. However, implementation of preconstruction surveys and protective buffers would reduce these impacts. In addition, development of the Project could contribute to a cumulative loss of foraging and breeding habitat for these species, because the Project area contains suitable foraging habitat for Swainson's hawks and suitable foraging and breeding habitat for burrowing owl, desert kit fox, and American badger.

Chapter 6
Recommended Avoidance and Minimization Measures

This section discusses general avoidance and minimization measures.

Special Status Plant Mitigation. Protocol-level special status plant surveys would be conducted prior to construction to ensure that no special status plants are impacted. Prior to construction, special status plant surveys would be performed to identify any locations of special status plants.

Nesting Birds and Raptors

- Burrowng Owl Mitigation. Prior to construction, surveys would be performed in accordance with the CDFW (2012) Staff Report on Burrowing Owl Mitigation. Should active burrowing owl burrows be observed, disturbance buffers would be established around the burrows. If avoidance is not feasible, passive relocation of burrowing owls during the non-nesting may be possible, following the development of a burrowing owl relocation plan.
- Swainson's Hawk Mitigation. Prior to construction, surveys would be performed in accordance with CDFW recommendations. Construction within 0.5 mile of active Swainson's hawk nests should be avoided. The prescribed buffer may be adjusted by the biologist based on existing conditions around the nest, planned construction activities, tolerance of the species, and other pertinent factors. The biologist shall conduct monitoring of the nest to determine success/failure and to ensure that project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The biologist shall be responsible for documenting the results of the surveys, nest buffers implemented, and the results of ongoing monitoring.
- Loggerhead Shrike, LeConte's Thrasher, and Nesting Birds. Preconstruction surveys would be performed prior to the start of construction in any new work area between March 1 and August 30 to identify active bird nests. Should nests be identified, a biological monitor should be consulted to establish a buffer of sufficient size to prevent disturbance. The buffer should remain in place until the nest is no longer active, and the nest would be monitored throughout construction. The prescribed buffer may be adjusted by the biologist based on existing conditions around the nest, planned construction activities, tolerance of the species, and other pertinent factors. The biologist should conduct monitoring of the nest to determine success/failure and to ensure that project activities are not conducted within the buffer(s) until the nesting cycled is complete or the nest fails. The biologist would be responsible for documenting the results of the surveys, nest buffers implemented, and the results of ongoing monitoring.

American Badger and Desert Kit Fox Mitigation. Prior to construction, preconstruction surveys would be performed to identify active desert kit fox or American badger burrows in the Project area. If no active desert kit fox or American badger burrows are present, no further mitigation is required. Should active burrows be identified, no construction activities would occur within 100 feet of active dens or 500 feet of active natal dens.

If avoidance of potential dens is not possible, the following measures are recommended to avoid potential adverse effects to American badger and desert kit fox:

- If the qualified biologist determines that potential dens are inactive, the biologist shall excavate these dens by hand with a shovel to prevent desert kit foxes from re-using them during construction. If the qualified biologist determines that potential dens may be active, an on- site passive relocation program shall be implemented. This program shall consist of excluding desert kit foxes from occupied burrows by installation of one way doors at burrow entrances, monitoring of the burrow for one week to confirm usage has been discontinued, and excavation and collapse of the burrow to prevent reoccupation. After the qualified biologist determines that American badgers and desert kit foxes have stopped using active dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use during construction.

Worker Environmental Awareness Program. Worker Environmental Awareness Program training would be conducted for all on-site construction personnel and staff.

Protection of Biological Resources

- Best management practices would be utilized to prevent and control erosion in accordance with the Project's eventual Storm Water Pollution Prevention Program and/or Erosion Control Plan.
- To prevent entrapment of wildlife during construction, all excavated, steep-walled holes or trenches would be covered or ramped at the close of each working day and inspected for wildlife prior to backfilling. Stored pipes would be inspected before moving or burying.
- Cross-country vehicle and equipment use outside designated work areas shall be prohibited.
- Trash and food items would be contained in closed containers
- Workers would be prohibited from bringing pets and firearms to the Project area and from feeding wildlife.

7
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Attachment A
Site Photos



Photo 1. Representative photo of Site 1, aspect north.



Photo 2. Representative photo of Site 2, aspect northeast.



Photo 3. Representative photo of Site 3, aspect northwest.



Photo 4. Representative photo of Site 4, aspect south.



Photo 5. Representative photo of Site 5, aspect north

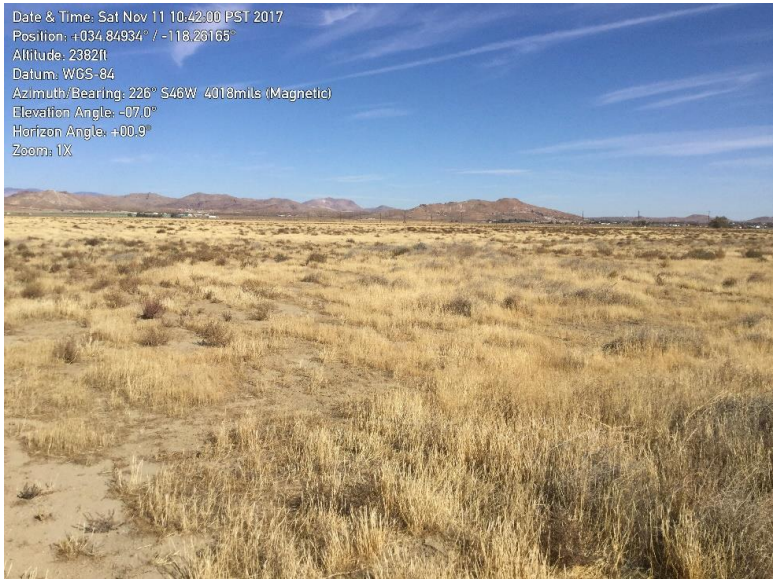

Photo 6. Representative photo of Site 6, aspect north.



Photo 7. Representative photo of Site 7, aspect southeast.



Photo 8. Habitat surrounding burrow complex suitable for burrowing owls adjacent to 80th Street interconnection option (located with

binoculars on inaccessible land).



Photo 9. Burrow suitable for burrowing owl on Site 3.



Photo 10. Inactive desert kit fox burrow on Site 4 (pipe).

Attachment B
Species Observed During Surveys

Table B-1 Plants Observed in the Raceway Solar Project Area

Common Name	Scientific Name
Asparagaceae	
Joshua tree	*Yucca brevifolia*
Asteraceae	
white bursage	*Ambrosia dumosa*
rabbitbrush	*Chrysothamnus nauseosus*
sunflower	*Helianthus* spp.
Amaranthaceae	
Russian thistle (tumbleweed)	*Salsola tragus*
Anacardiaceae	
fragrant sumac	*Rhus aromatica*
Boraginaceae	
fiddleneck	Amsinckia spp.
Brassicaceae	
tumble mustard	*Sisymbrium altissimum*
Bromus	
cheatgrass	*Bromus tectorum*
foxtail chess	*Bromus madritensis* ssp. *rubens*
Chenopodiacae	
four wing saltbush	*Atriplex canescens*
cattle saltbush	*Atriplex polycarpa*
winterfat	*Krascheninnikovia lanata*
Mojave seablite	*Suaeda moquinii*
Geraniaceae	
redstem filaree	*Erodium cicutarium*
Lamiaceae	
thistle sage	*Salvia carduacea*
Salicaceae	
cottonwood	*Populus fremontii*
narrowleaf willow	*Salix exigua*
Solanaceae	
purple nightshade	*Solanum elaeagnifolium*
Tamaricaceae	
saltcedar	*Tamarix ramosissima*

Table B-2 Wildlife Observed in the Raceway Solar Project Area

Common Name	Scientific Name
Birds	
red-tailed hawk	*Buteo jamaicensis*
California quail	*Calipepla californica*
house finch	*Carpodacus mexicanus*
northern harrier	*Circus cyaneus*
northern flicker	*Colaptes auratus*
common raven	*Corvus corax*
horned lark	*Eremophila alpestris*
American kestrel	*Falco americanus*
merlin	*Falco columbarius*
prairie falcon	*Falco mexicanus*
peregrine falcon	*Falco peregrinus*
loggerhead shrike	*Lanius ludovicianus*
northern mockingbird	*Mimus polyglottos*
house sparrow	*Passer domesticus*
savannah sparrow	*Passerculus sandwichensis*
Say's phoebe	*Sayornis saya*
mountain bluebird	*Sialia currucoides*
Brewer's sparrow	*Spizella breweri*
Eurasian collared dove	*Streptopelia decaocto*
western meadowlark	*Sturnella neglecta*
European starling	*Sturnus vulgaris*
mourning dove	*Zenaida macroura*
white-crowned sparrow	*Zonotrichia leucophrys*
Mammals	
white-tailed antelope squirrel	*Ammospermophilus leucurus*
coyote (sign only)	*Canis latrans*
black-tailed jackrabbit	*Lepus californicus*
California ground squirrel	*Otospermophilus beecheyi*
desert cottontail	*Sylvilagus audubonii*
desert kit fox (sign only)	*Vulpis macrotis arsipus*

Attachment 2

Preliminary Jurisdictional Waters and Wetland Delineation Report

Preliminary Jurisdictional Waters and Wetland Delineation

Raceway Solar Project

Kern County, California

For:

Sustainable Power Group, LLC

2180 South 1300 East
Suite 600
Salt Lake City, UT 84106-2749

By:

7440 South Creek Road
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January 2018

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°F	Fahrenheit
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
E & E	Ecology and Environment, Inc.
EIR	Environmental Impact Report
gen-tie	generation power tie
GPS	Global Positioning System
kV	Kilovolt
MESA	Mapping Episodic Stream Activity
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OBL	Obligate Wetland Plant
OHWM	Ordinary High Water Mark
RWQCB	Regional Water Quality Control Board
SWRCB	California State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOS	Waters of the State of California
WOUS	Waters of the United States

Chapter 1
Introduction and Project Overview

1.1 Introduction

On behalf of Sustainable Power Group, LLC (sPower, or the applicant) Ecology & Environment, Inc. (E & E), completed a jurisdictional delineation report for the Raceway Solar Project (Project) in the Antelope Valley, approximately 5 miles west of Rosamond, in unincorporated Kern County, California (Figures 1-1 and 1-2). The Project would involve construction of seven solar photovoltaic (PV) power generating facilities connected by generation power tie (gen-tie) lines. The seven sites include the 30-acre Site 1, 180-acre Site 2, 466-acre Site 3, 315-acre Site 4, 310-acre Site 5, 240-acre Site 6, and 313-acre Site 7. The Project would deliver power to the grid along one of three alternative routes through a previously approved collector substation to an existing substation and/or to a substation that has currently been approved but not completed. This report describes the results of a wetland delineation for various Project components and the anticipated potential impacts related to wetlands and waters as defined by the impact criteria described in Appendix G of the California Environmental Quality Act (CEQA).

1.2 Project Overview

The Raceway Solar Project (Project) would involve the construction, operation, and eventual decommissioning of a solar PV power generating Project with an energy storage system. The Project would be capable of producing up to approximately 400 megawatts of renewable electricity and storing up to 2,000 megawatt hours of electricity. The Project would be located on approximately 1,854 acres of private land in southeastern Kern County, California, and would consist of seven separate sites. Raceway Solar 1, 2, 3, 5, 6, and 7 are zoned Estate 2.5 Acres (E 2.5), and Raceway Solar 4 is zoned Agriculture. The Project would be located approximately 5 miles west of the community of Rosamond, within the Willow Springs community. All solar arrays would be located within Kern County, and some associated gen-tie lines would extend south across the county line into Los Angeles County.

Major components of each facility would include PV modules mounted on single-axis or dual-axis tracker systems, electrical collection systems, data monitoring equipment, an energy storage system, a meteorological data collection system, private access roads, fencing, and a 34 kilovolt (kV) and/or 230 kV gen-tie line. There are four potential routes for interconnections to nearby substations. The Project may interconnect to sPower's previously approved collector substation via three proposed 10- to 12-mile 34 kV and/or 230 kV gen-tie lines originating at a direct current collection system located at the southwestern portion of the Project area, or to a planned Los Angeles Department of Water and Power (LADWP) substation northwest of the Project via an additional proposed gen-tie route. Potential interconnection routes would be as follows:

- 100th Street West and Avenue G-12;
- 110th Street West and Avenue G-12;
- 80th Street and Avenue G-12; and
- Rosamond Boulevard to the proposed LADWP Substation.

PV system installation would include earthwork, grading, and erosion control, as well as erection of the PV modules, supports, and associated electrical equipment. The energy storage system would be modular and fully enclosed and would employ telecommunication systems to charge and discharge the battery

according to power delivery needs. Typical modular energy storage systems are approximately 102 inches in height and 20 to 40 feet in length. The energy storage system would be located near inverter stations or switchgear. Cables would be installed in underground ducts, utilizing standard trenching techniques, electrical routing, backfilling, and compaction. The energy storage system could also be located on a centralized battery on site.

Construction is expected to be completed in approximately 10 to 12 months. Upon commissioning, the Project would enter the operational phase. For the duration of the operational phase, the Project would be operated on an unstaffed basis and monitored remotely, with regular on-site personnel visitations for security, maintenance, and system monitoring.

1.3 Purpose of Study

A survey was conducted to identify aquatic features that meet the physical criteria and regulatory definitions of "Waters of the United States" (WOUS) and "Waters of the State of California" (WOS). The California State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) maintain regulatory responsibility for WOS and may review wetland delineations in concert with the United States Army Corps of Engineers (USACE). Wetland delineation must follow the USACE's multi-parameter approach as outlined in the (1987) Wetlands Delineation Manual and (2008a) Arid West Regional Supplement. Additionally, the California Fish and Wildlife Department (CDFW) has jurisdiction over drainages under the California Fish and Game Code Section 1600 and applies to perennial, intermittent, and ephemeral streams or watercourses.

1.4 Project

The Project would be located approximately 5 miles west of Rosamond, California, along West Avenue A between 90th Street West and 60th Street West. The Project would consist of seven different sites, four interconnection alternatives, and two gen-tie lines (Figures 1-1 and 1-2).

The Project area is within the Little Buttes, Rosamond, and Del Sur 7.5 minute U.S. Geological Survey (USGS) topographic quadrangles. Table 1 lists the townships, sections, and ranges in the Project area. The elevation in the Project area is approximately 2,410 feet above mean sea level.

Table 1-1 Township, Range, and Section Information for the Raceway Solar Project

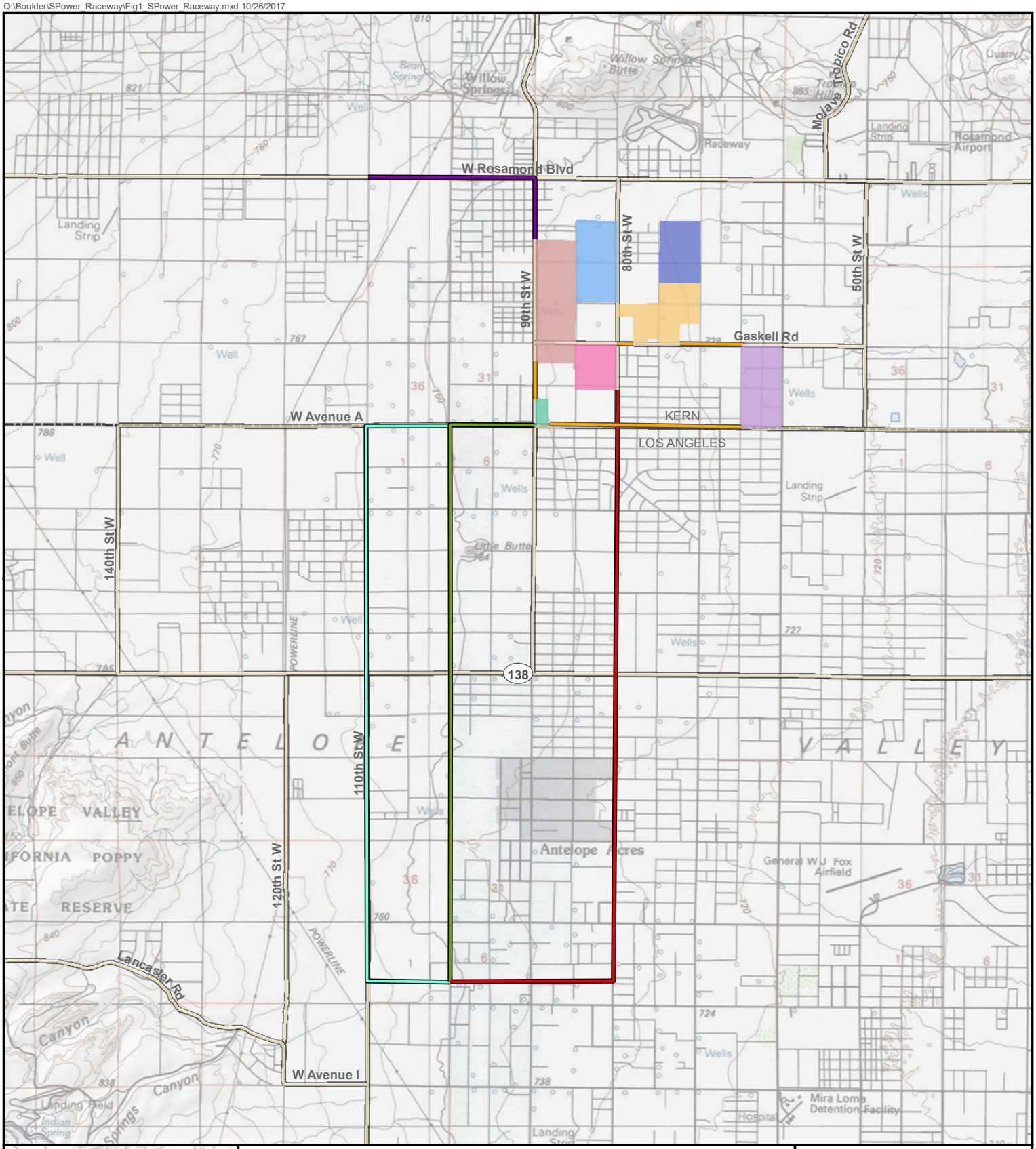
Township	Range	Section
7 North	13 West	4-6
	14 West	1-2
8 North	13 West	3-9, 16-21, 28-33
	14 West	1-2, 11-14, 23-26, 35-36
9 North	13 West	17-22, 27-34
	14 West	13-14, 23-24, 35-36

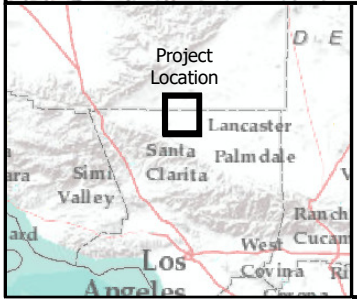
The Project region is extensively developed for agricultural use, both active and abandoned. The region contains dispersed rural residences. Native plant communities in the region are uncommon and patchy in distribution. These communities are typically either creosote bush (*Larrea tridentata*)–white bursage (*Ambrosa dumosa*) scrub or Joshua tree (*Yucca brevifolia*) woodland. The Project consists largely of

later-stage fallow agricultural and grazing land.

The Project area is surrounded by vacant/undeveloped land (i.e., fallow agricultural, grazing, and desert shrub), commercial-scale solar development, and rural residences. To the east of the Project are undeveloped lands. To the west of the Project are undeveloped lands and the operational Solar Star 1 and 2 solar projects. To the south of the Project are undeveloped lands, rural residences, and the Del Mar Solar Project. To the north of the Project are undeveloped lands, rural residences, and the Willow Springs International Motorsports Park.

Q:\Boulder\SPower_Raceway\Fig1_SPower_Raceway.mxd 10/26/2017





Interconnection Alternatives
- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Raceway Solar Projects
- Site 1
- Site 2
- Site 3
- Site 4
- Site 5
- Site 6
- Site 7

- Major Road
- County Boundary

Figure 1
Raceway Solar Project
Los Angeles and Kern Counties, California
sPower

0 0.5 1 Miles

Data Sources: USGS Topographic Base

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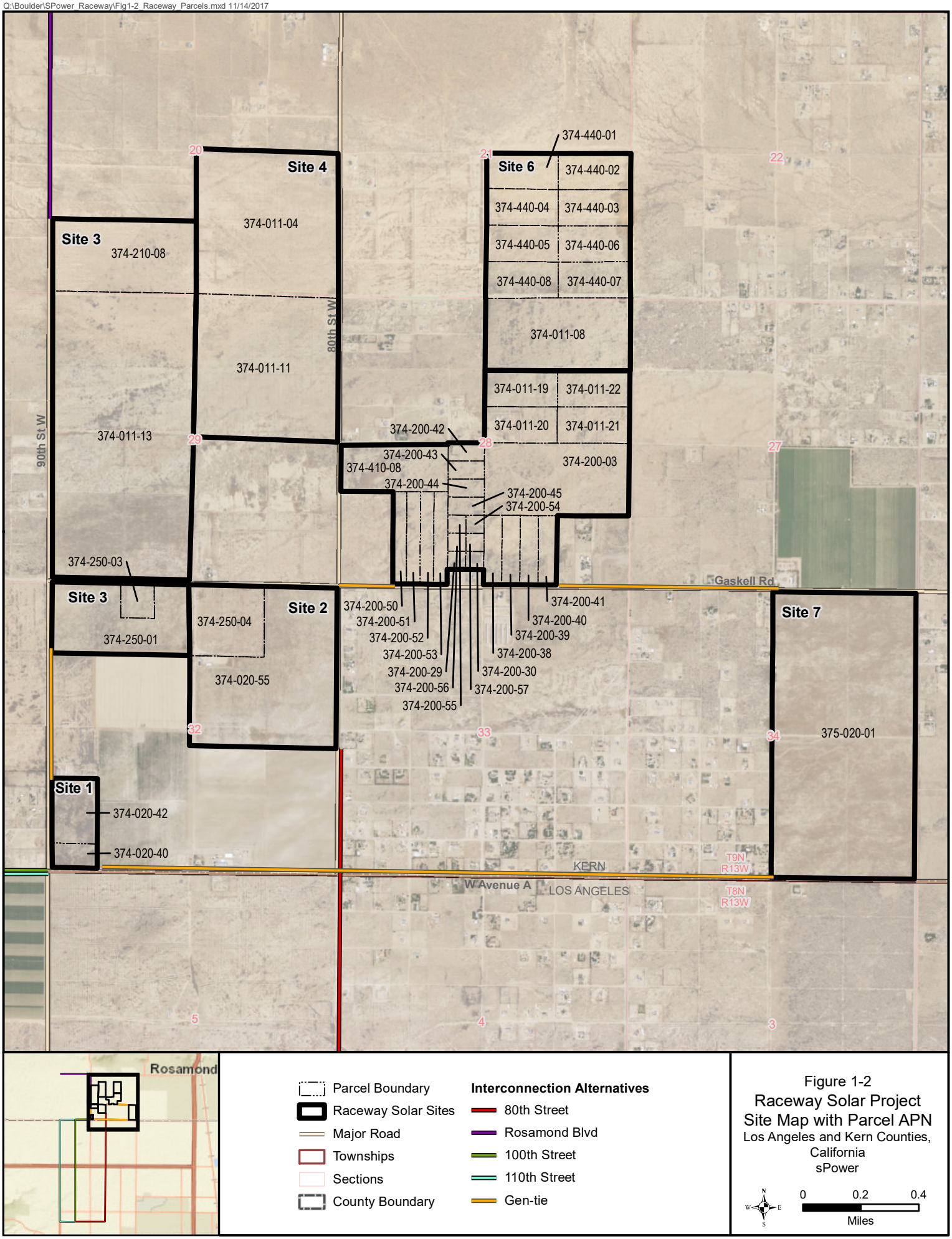

Parcel Boundary
Raceway Solar Sites
Major Road
Townships
Sections
County Boundary

Interconnection Alternatives
80th Street
Rosamond Blvd
100th Street
110th Street
Gen-tie

Figure 1-2
Raceway Solar Project
Site Map with Parcel APN
Los Angeles and Kern Counties, California
sPower

0 0.2 0.4
Miles

Data Sources: KCESPS 2017

2.1 Wetland and Waterbody Delineation Regulations and Criteria

2.1.1 Federal Jurisdiction

WOUS include aquatic systems that fall under the regulatory jurisdiction of the Clean Water Act (CWA) (Section 404) or the Rivers and Harbors Act (Section 10), including deep-water aquatic habitats and special aquatic sites such as wetlands and mudflats (USACE 1987). WOUS include the territorial sea, coastal and inland waters, lakes, rivers, and streams.

Wetlands are defined by federal regulations as:

> "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (40 Code of Federal Regulations 230.3(t)).

The wetland delineation methods used in this study are described in the USACE Wetlands Delineation Manual. According to this manual, an area must exhibit evidence of at least one positive wetland indicator of each of the following parameters to be defined as a wetland (USACE 1987):

- **Soils** – The substrate is predominately un-drained hydric soil, or the soils possess characteristics associated with reducing soil conditions.
- **Hydrology** – The area is inundated either permanently or periodically at a mean water depth of less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.
- **Vegetation** – The land supports predominantly hydrophytes. Hydrophytes are macrophytic plants with the ability to grow in water or on a substrate that is at least periodically deficient in oxygen.

The USACE (2008a) Arid West Regional Supplement provides procedures and technical guidance for identification and delineation of wetlands potentially subject to Section 404 of the CWA or Section 10 of the Rivers and Harbors Act in California (USACE 2008a). Data sheets from the Arid West Regional Supplement were used for the wetland delineation. The USACE has prepared a revised list of plants able to tolerate saturated soil conditions (Lichvar 2012) and continually updates this list (Lichvar et al. 2014).

For aquatic systems other than wetlands, the extent of the USACE's jurisdiction is defined by the ordinary high water mark (OHWM). For non-tidal rivers, the OHWM is the line on a shore or bank established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding areas. Methodology described in two USACE guidance documents were followed to determine the OHWM during this survey (USACE 2008b; Curtis and Lichvar 2010).

Stream characteristics were gathered for the drainages intersecting the Project area boundary. The lengths of drainages (or portions of drainages) were calculated from global positioning system (GPS) data collected in the field, and widths of drainages were measured by surveyors on site.

2.1.2 Regional Water Quality Control Board

WOS are defined in Section 13050 of the California Water Code as "any surface water or groundwater, including saline waters, within the boundaries of the state." Surface waters are non-tidal wetlands, rivers, streams, lakes, estuarine wetlands, estuarine waters, and coastal waters, and include waters in both natural and artificial channels.

In California, activities involving placement of fill in WOUS are also regulated by the SWRCB under the State Water Quality Certification Program in accordance with Section 401 of the CWA. The SWRCB has the authority to grant or deny CWA Section 401 certification of a project requiring a federal permit for the discharge of dredge or fill materials under CWA Section 404. In addition, the SWRCB regulates fill activities in WOS via the Porter-Cologne Water Quality Control Act.

The SWRCB delegates regulatory authority to nine RWQCBs. The Lahontan RWQCB, Region 6, has jurisdiction for the Project's region. According to Section 401 of the CWA, the RWQCB may require any permit issued by the USACE to meet state water quality standards, as well as avoid and minimize project effects. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to WOS, the water boards have the option to regulate those activities under state authority in the form of Waste Discharge Requirements.

The water boards protect all WOS but have special responsibility for wetlands, riparian areas, and headwaters, as these systems usually have high resource value and are vulnerable to filling activities. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the USACE under Section 404 of the CWA.

2.1.3 California Department of Fish and Wildlife

California Fish and Game Code Section 1602 applies to perennial, intermittent, and ephemeral rivers, streams, or lakes that supports fish or wildlife in the state. CDFW defines a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." "Streambed" is the bed, banks, and channel of any intermittent or ephemeral stream and includes the upland edge of riparian vegetation.

The CDFW requires notification for any activity that will:

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

In addition to the definitions of CDFW-jurisdictional features provided by California Fish and Game Code, the MESA – Mapping Episodic Stream Activity (Mesa Guide; Vyverberg and Brady 2014) and Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants (Brady and Vyverberrg 2014) were used as guidelines.

2.2 Pre-Field Evaluation

Prior to engaging in field work, E & E reviewed background reference materials to familiarize personnel with the Project and determine potential wetland, waterbody, and drainage features. These materials included historic and current aerial photographs (National Agricultural Imagery Program 2016; Google Earth 2017); Little Buttes, Rosamond, and Del Sur USGS 7.5 topographic maps; the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey (NRCS 2017a); the National Hydrography Dataset (NHD) (USGS 2017); and the National Wetland Inventory (NWI) (USFWS 2017).

NWI and NHD datasets provide representation of potential wetlands and other surface water features that may be present or were historically present in an area (Figure 2-1a,b,c). Regional and local climate data were compiled from Wetlands (WETS) weather stations (NRCS 2017b). Database records are compiled from historic and contemporary data collection efforts, and thus they are a good starting point for indications of surface hydrology and soils; however, the data must be field-verified, as on-the-ground conditions are usually undergoing continuous anthropogenic modifications and aquatic features can be lost or highly altered.

Wetland delineators field-verified the presence of all current surface water features within the survey area, including vetting the NWI and NHD data. Hydrologic connectivity among these features was also assessed to accurately identify and visually represent the flow of water within the watershed.

2.3 Field Evaluation

On November 9 to 11, 2017, two E & E biologists conducted a preliminary wetland and waterbody delineation of the Project area to help verify the presence of a wetland and its boundaries. During the field investigation, E & E used a Bad Elf GPS Pro Receiver BE-GPS-2200 (sub-meter accuracy) and ArcGIS® Collector software an iPad (iOS 11.0.3) to map aquatic community boundaries, as needed. All GPS coordinates were accurate to within 1 meter. Information was exported to a database format using ArcGIS software and edited before linking with a geographic information system.

The E & E wetland delineation team established plots in areas mapped as wetland by the NWI, in mapped hydric soil units, and in areas that exhibited indicators of potential wetland presence. All potential waters identified by the NWI and NHD were investigated by E & E where access was permitted. The team noted and applied aerial photo signatures (e.g., characteristics including color and texture) of wetland and upland communities during the on-site GPS marking.

Wetland plots were paired with plots established in adjacent uplands. Upland plots were placed in sufficient proximity to their paired wetland plots to substantiate wetland/upland boundaries. E & E identified vascular plants to species in each plot with nomenclature used by the Biota of North American Program (BONAP) database (Kartesz 2015). They determined the wetland indicator status of each plant species using The National Wetland Plant List (Lichvar et al. 2014).

Soil pits were dug with a shovel to a depth of approximately 12 to 24 inches, or until clay or other restrictive layers were reached, to determine the presence of hydric soils and the boundaries of wetlands.

The depth to saturation or the water table was recorded, if present. A soil profile was described using the standard classification system (USDA 1993), and soil color was described using Munsell Color charts (Munsell Color 2013).

All identified wetlands were classified according to the U.S. Fish and Wildlife Service hierarchical classification system developed by Cowardin et al. (1979), and their functions and values were assessed. Results of this survey were compared with those of available publications, including the NRCS web soil survey (NRCS 2017a). Plant nomenclature used in this report follows that used in the USDA Plant and Wetland databases (USDA 2017a,b).

2.3.1 Access Limitations

All portions of Raceway Solar sites 1-7 were field surveyed. The gen-tie and interconnection routes were surveyed up to approximately 50 feet on both sides of the roadways and/or within the road and utility right of way.

Portions of the interconnection line were not surveyed because they overlap with the existing and operational Del Sur Solar Project.

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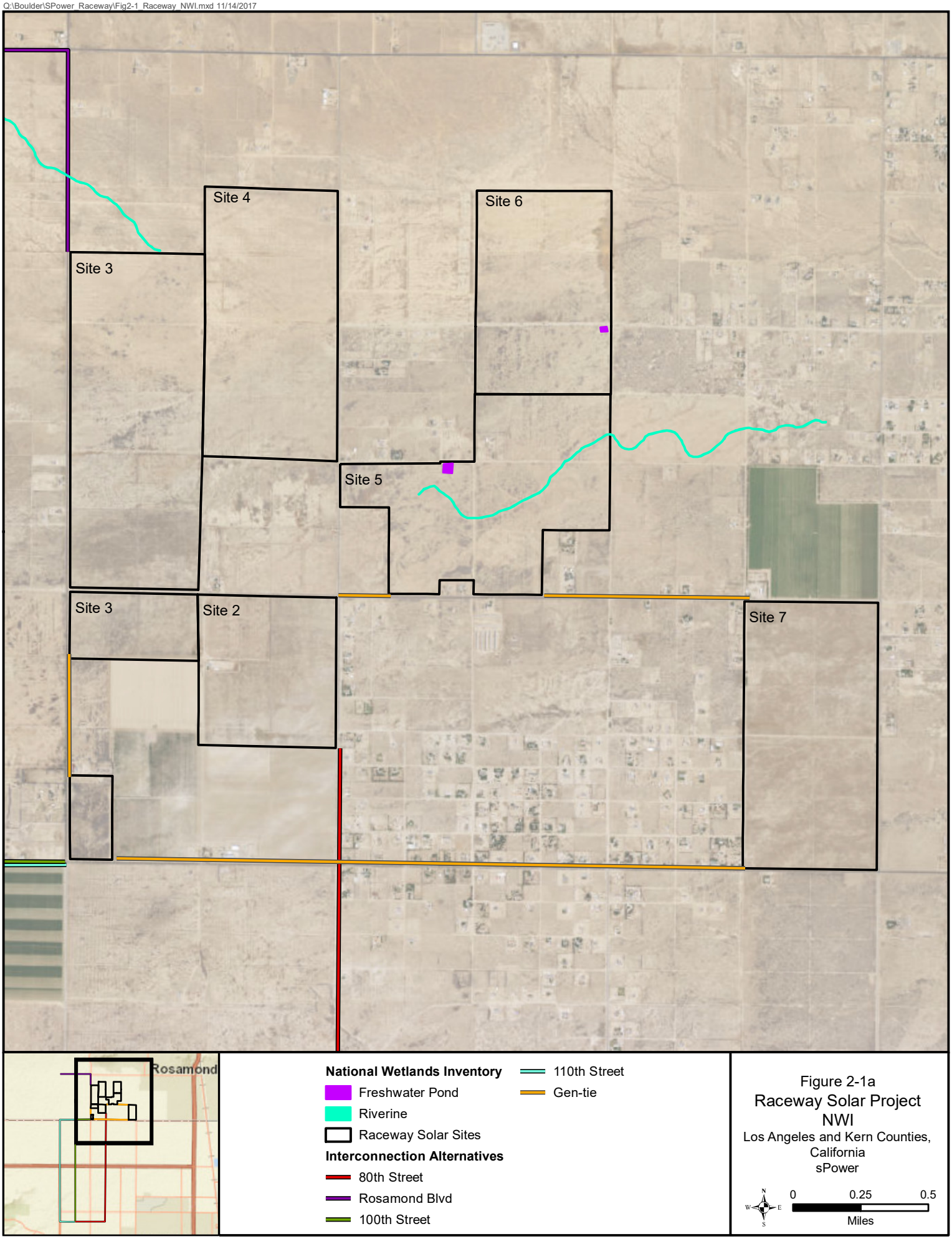

Figure 2-1a
Raceway Solar Project
NWI
Los Angeles and Kern Counties, California
sPower

Data Sources: USFWS 2015

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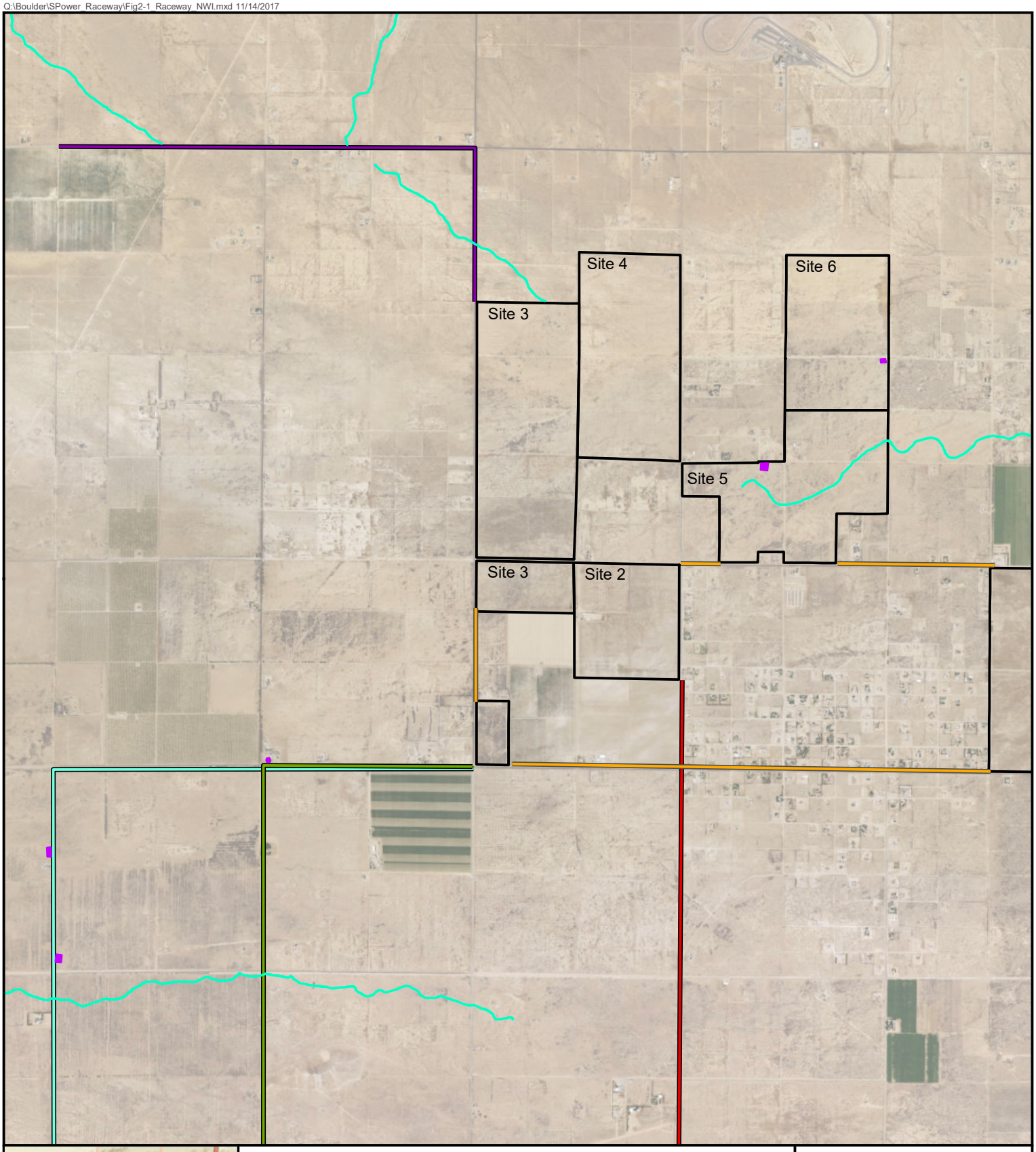

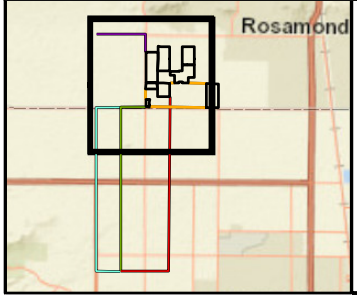

National Wetlands Inventory
- Freshwater Pond
- Riverine
- Raceway Solar Sites

Interconnection Alternatives
- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Figure 2-1b
Raceway Solar Project
NWI
Los Angeles and Kern Counties, California
sPower

N W E S

0 0.25 0.5
Miles

Data Sources: USFWS 2015

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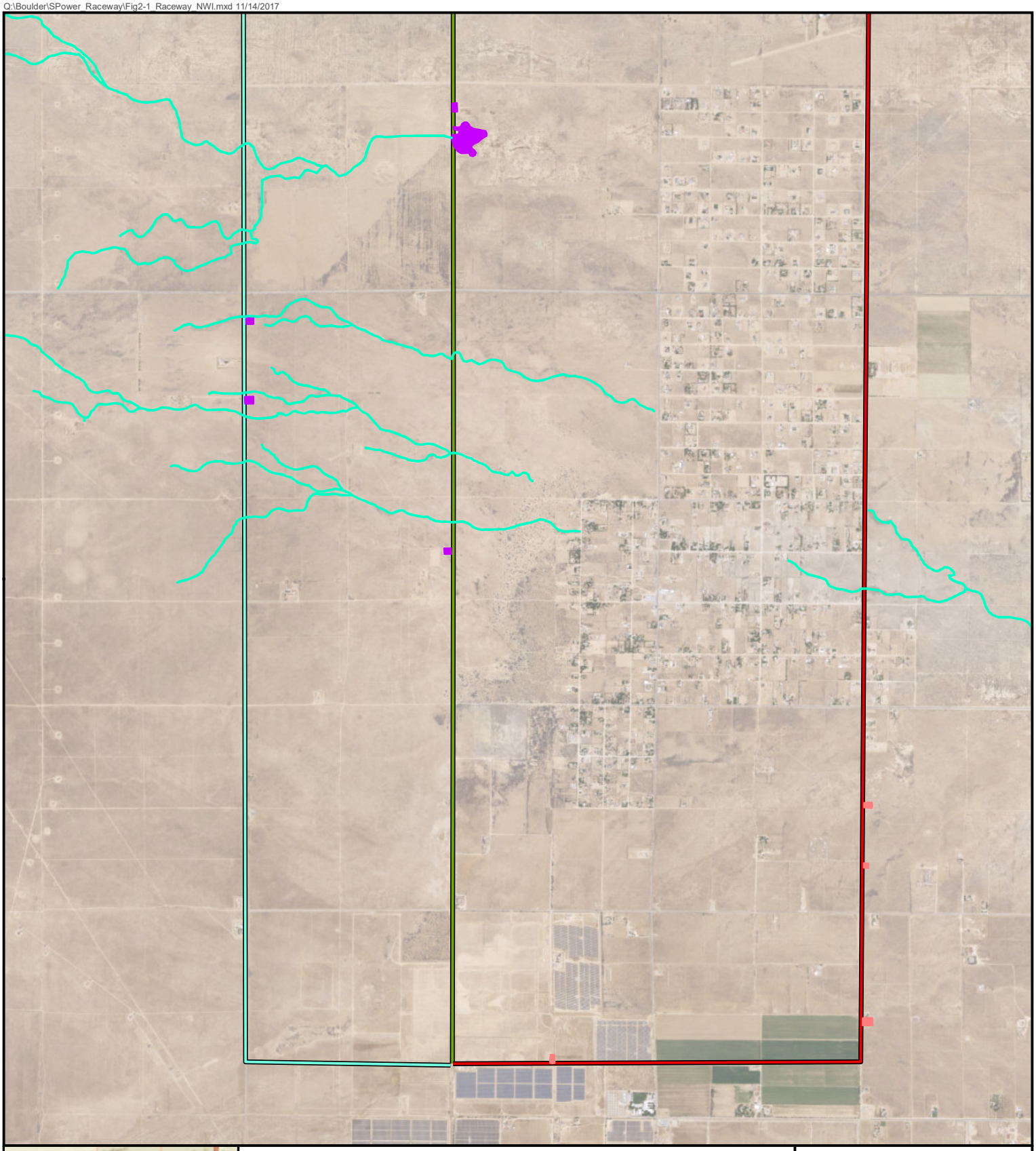

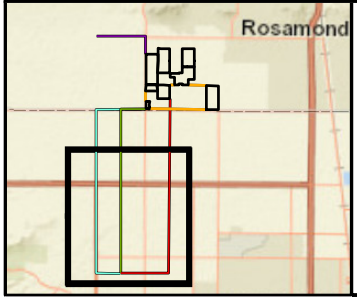

National Wetlands Inventory

- Freshwater Pond
- Riverine
- Other

Interconnection Alternatives

- 80th Street
- 100th Street
- 110th Street

Figure 2-1c
Raceway Solar Project
NWI
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: USFWS 2015

Chapter 3
Results

3.1 Desktop Review

This section includes the results of the desktop review.

3.1.1 Climate

The WETS Mojave Station and Mojave National Test Pilot School are the nearest gauges to record historic precipitation and temperatures for the survey area (NRCS 2017b). At the Mojave Station, annual average precipitation (1971 to 2000) was approximately 6.09 inches, with January and February averaging 1.34 and 1.41 inches, respectively. The annual average temperature is 62.8 degrees Fahrenheit (°F), the average low temperature is 45.1°F in the month of December, and the average high temperature is 82.7°F in the month of July. Despite a strong El Niño pattern that brought significant rainfall to the region, the drought in southern California and the southwestern states persists (U.S. Drought Monitor 2017).

The Mojave Station was used to characterize the growing season in the Project area, defined as occurring when soil temperatures are 32°F or higher. There is a 50 percent chance of the growing season occurring between March 19 and November 10 (236 days) and a 70 percent chance of it occurring between March 11 and November 18 (252 days). In the Arid West Regional Supplement, the second criterion for determining the growing season is when soil temperature reaches 41°F or higher at a depth of 12 inches (USACE 2008a). The growing season, as defined in this report, represents the most restrictive dates for which reliable indicator information is available.

3.1.2 Watershed and Flood Zone

The Project area is within the Antelope-Fremont Valley Watershed (Hydrologic Unit Code 18090206). All seven solar sites and the Rosamond Boulevard interconnection option are within a Zone A Special Flood Hazard Area (Figure 3-1; Federal Emergency Management Agency 2017). The Special Flood Hazard area is subject to inundation by the 1 percent annual chance of a flood (i.e., 100-year flood). The 100th Street, 100th Street, and 80th Street interconnection options are within Flood Zone A (as described above) and Zone X Special Flood Hazard Area, which is subject to a 0.2 percent annual chance of a flood. A No base flood elevations have been determined for the Project area.

3.1.3 Aerial Photography and USGS Topographic Quadrangle

Within the Project area, no standing water or flow was observed from the aerial imagery. The aerial images contained some areas that lacked vegetation. There were no drainage or water features on the USGS topographic map or NHD map, although the NHD map showed numerous point features in the Project area characterized as “pond/lake” or “other” (USGS 2017).

3.1.4 National Wetland Inventory

The NWI shows 24 features in the Project area (Figures 2-1a,b,c). The NWI shows a single “riverine” feature is present within Site 5, and “freshwater ponds” are present on Sites 5 and 6. In addition, a

“riverine” feature is present just outside the boundary of Site 3. Numerous “riverine” features occur along the Rosamond Boulevard, 80th Street, 100th Street, and 110th Street interconnection options. “Freshwater ponds” occur along the 100th Street and 110th Street interconnection options. In addition, features classified as “other” occur along the 80th Street interconnection option. The “freshwater ponds” and “other” features are classified as Palustrine Unconsolidated Shore, Intermittently Flooded. The “riverine” features are all classified as Intermittent, Streambed, and Temporarily Flooded.

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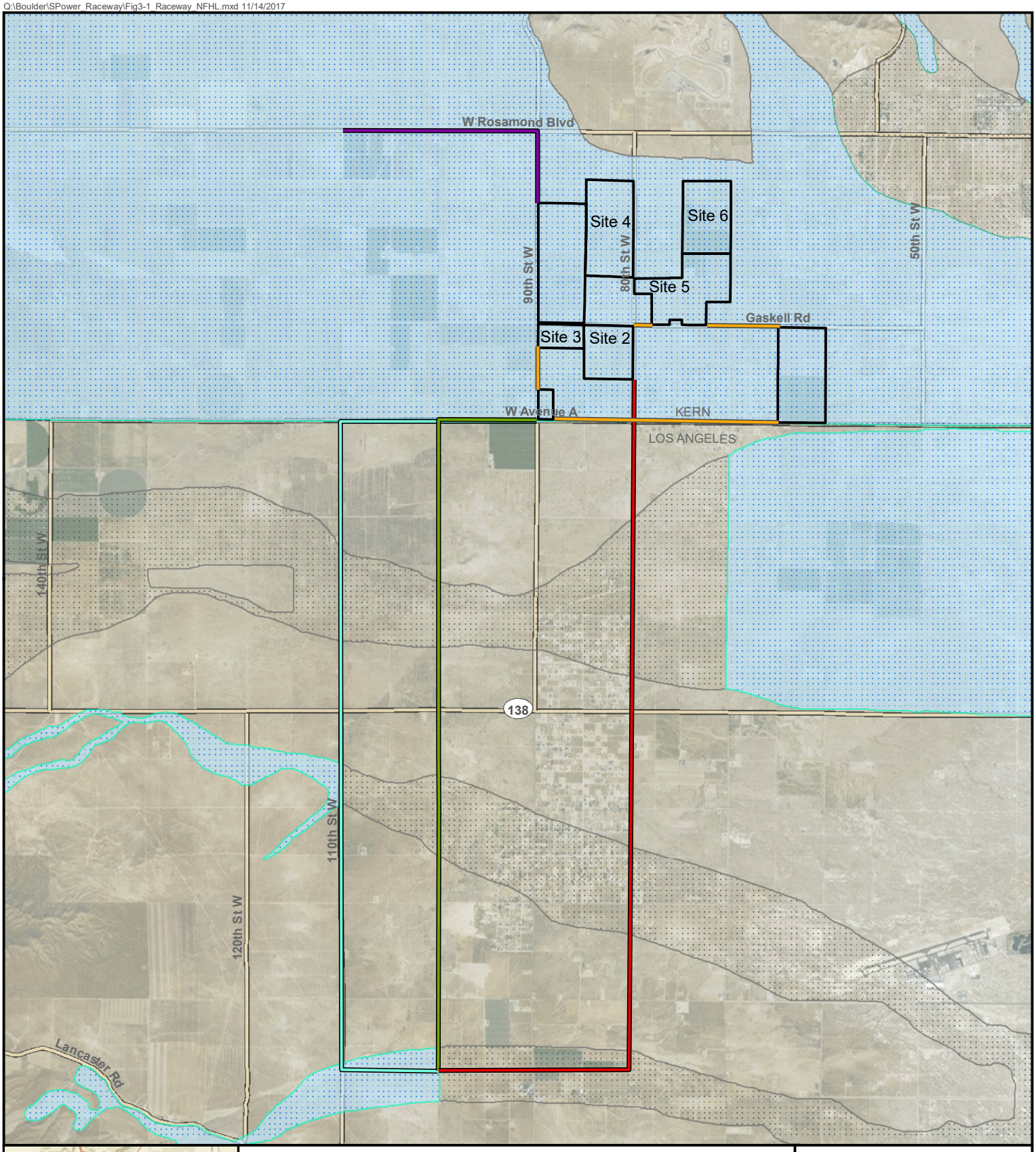



Raceway Solar Sites
Major Road
County Boundary

Interconnection Alternatives

80th Street
Rosamond Blvd
100th Street
110th Street
Gen-tie

Flood Hazard Areas

A, Subject to Inundation by the 1% Annual Chance Flood (No Base Flood Elevations determined)
X, 0.2% Annual Chance Flood Hazard
X, Area of Minimal Flood Hazard

Figure 3-1
Raceway Solar Project
Flood Hazard Areas
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5 1 1.5
Miles

Data Sources: FEMA 2017

3.1.5 Soils

The Project is characterized by nine soil types that primarily consist of loamy sands (Figure 3-2a,b,c; Attachment A). None of the soil types are classified as a hydric or partially hydric soil on the National Hydric Soils List (NRCS 2017c). Brief descriptions of each soil type are as follows:

- **Cajon loamy sand, 0 to 2 percent slopes (CaA).** Cajon loamy sand is found on alluvial fans and derived from granite alluvium. These soils are excessively drained and runoff is classified as negligible. The depth to the water is greater than 72 inches. These soils are unsuitable for farming even if irrigated. These soils are not hydric.
- **Hesperia fine sandy loam, 0 to 2 percent slopes (HkA)**. Hesperia fine sandy loam is found on alluvial fans and derived from granite alluvium. These soils are well drained, and runoff is classified as very low. The depth to the water table is greater than 80 inches. These soils are prime farmland, if irrigated. These soils are not hydric.
- **Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes (HmA).** Hesperia fine sandy loam is found on alluvial fans and derived from granite alluvium. These soils are well drained and runoff is classified as very low. The depth to the water is greater than 72 inches. These soils are unsuitable for farming without irrigation, but with irrigation, they have only moderate crop restrictions. These soils are not hydric.
- **Rosamond fine sandy loam (Ro)**. Rosamond fine sandy loam is found on alluvial fans and derived from granite alluvium. These soils are well drained, and runoff is classified as low. The depth to the water is greater than 80 inches. These soils are prime farmland, if irrigated. These soils are not hydric.
- **Rosamond loam (Rp)**. Rosamond loam is found on alluvial fans and derived from granite alluvium. These soils are well drained and runoff is classified as low. The depth to the water is greater than 80 inches. These soils are prime farmland, if irrigated. These soils are not hydric.
- **Rosamond loam, saline-alkali (Rr).** Rosamond loam is found on alluvial fans and derived from granite alluvium. These soils are well drained and runoff is classified as moderately high. The depth to the water is greater than 72 inches. These soils are unsuitable for farming without irrigation, but with irrigation, they have only slight crop restrictions. These soils are not hydric.
- **Rosamond silty clay loam (Rt).** Rosamond loam is found on alluvial fans and derived from granite alluvium. These soils are well drained and runoff is classified as low. The depth to the water is greater than 72 inches. These soils are unsuitable for farming without irrigation, but with irrigation, they have only slight crop restrictions. These soils are not hydric.
- **Rosamond silty clay loam, saline alkali (Ru).** Rosamond silty clay loam is found on alluvial fans and derived from granite alluvium. These soils are well drained and runoff is classified as medium. The depth to the water is greater than 72 inches. These soils have severe limitations that make them unsuitable for farming. These soils are not hydric and have a moderately saline horizon within 30 inches of the soil surface.
- **Tray loam, saline-alkali (Tw).** Tray loam is found on alluvial fans and derived from granite alluvium. These soils are moderately well drained and runoff is classified as low. The depth to the water is greater than 72 inches. These soils have severe limitations that make them unsuitable for farming. These soils are not hydric and have a slightly saline horizon within 30 inches of the soil surface.

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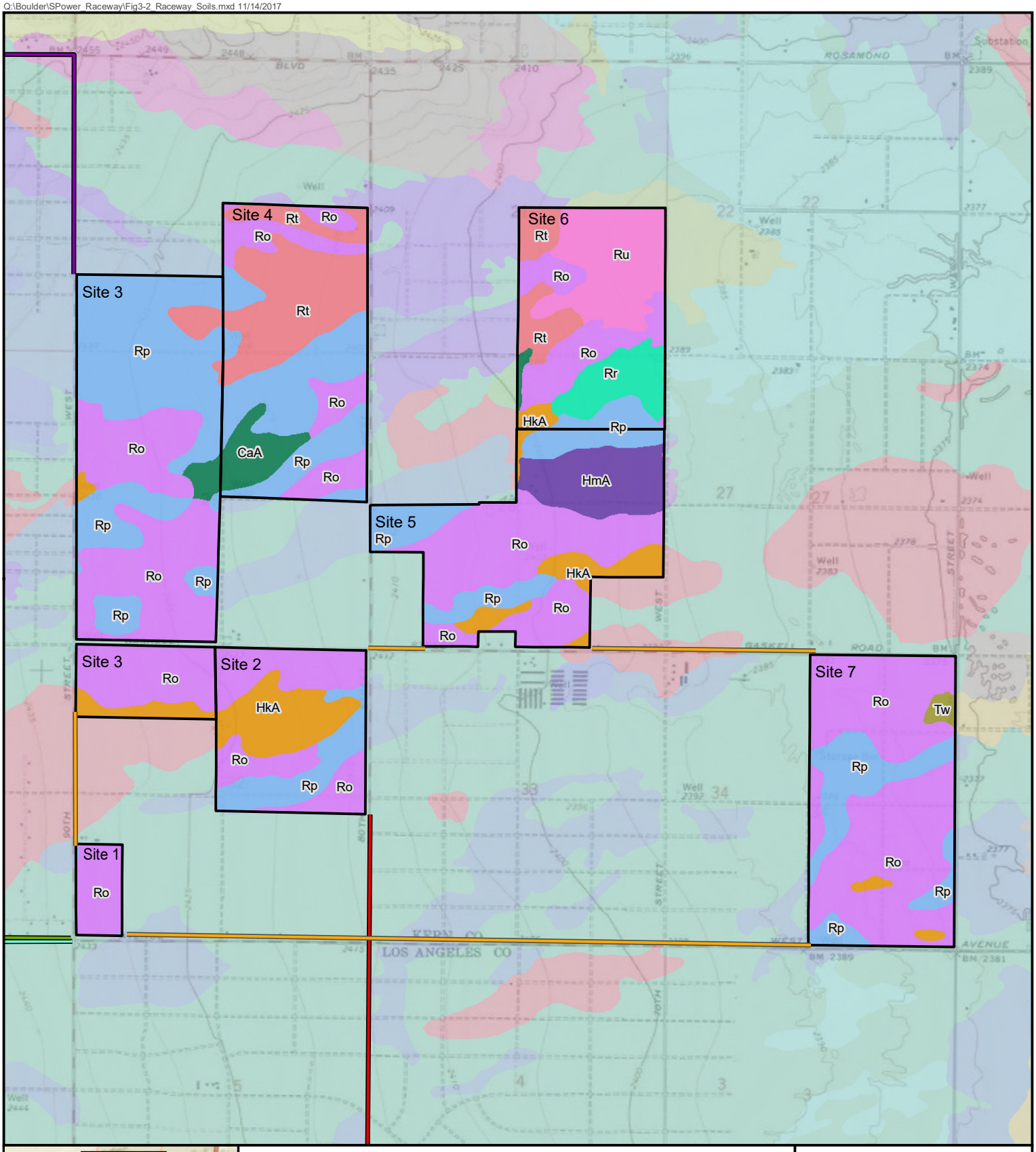

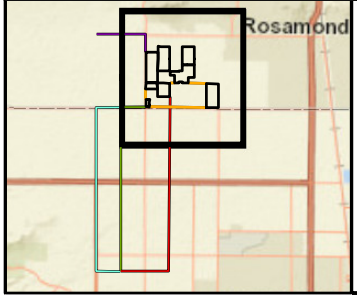

- CaA; Cajon loamy sand, 0 to 2 percent slopes
- HkA; Hesperia fine sandy loam, 0 to 2 percent slopes
- HmA; Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes
- Ro; Rosamond fine sandy loam
- Rp; Rosamond loam
- Rr; Rosamond loam, saline-alkali
- Rt; Rosamond silty clay loam
- Ru; Rosamond silty clay loam, saline-alkali
- Tw; Tray loam, saline-alkali
- Raceway Solar Sites

Interconnection Alternatives

- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Figure 3-2a
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: NRCS 2016

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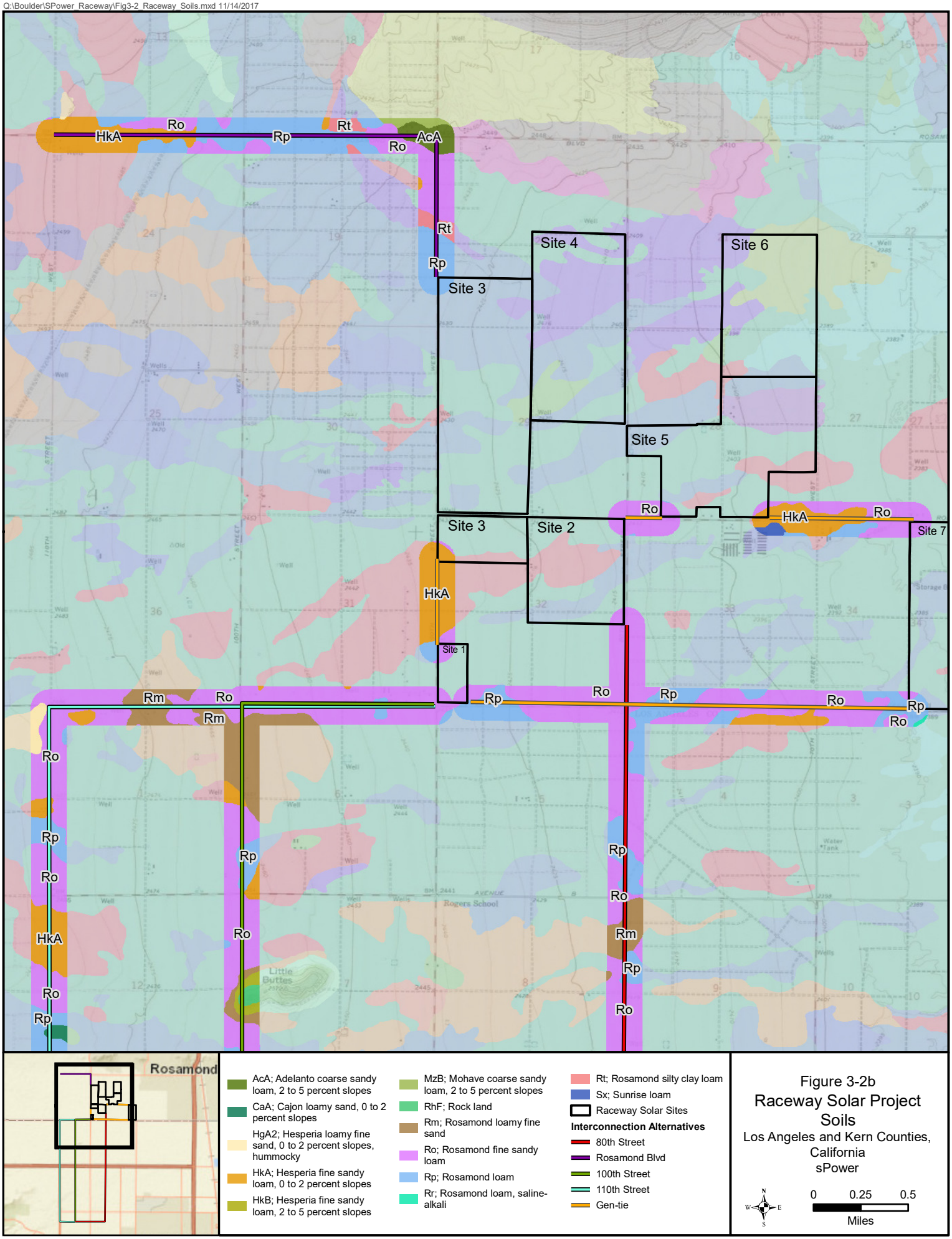

Figure 3-2b
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

Data Sources: NRCS 2016

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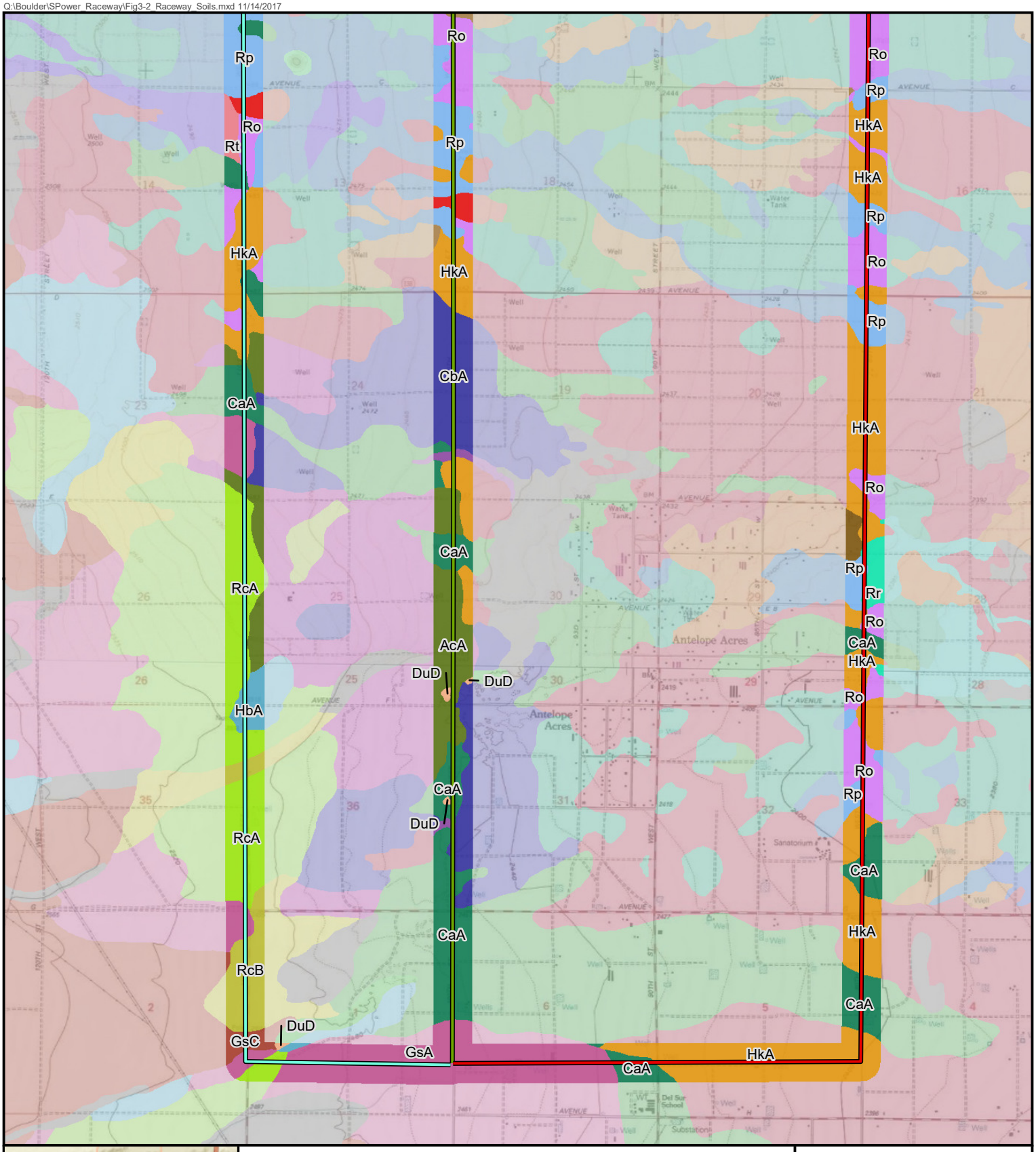

AcA; Adelanto coarse sandy loam, 2 to 5 percent slopes
CaA; Cajon loamy sand, 0 to 2 percent slopes
CaC; Cajon loamy sand, 2 to 9 percent slopes
CbA; Cajon loamy sand, loamy substratum, 0 to 2 percent slopes
DuD; Dune land
GsA; Greenfield sandy loam, 0 to 2 percent slopes
GsC; Greenfield sandy loam, 2 to 9 percent slopes
HbA; Hanford coarse sandy loam, 0 to 2 percent slopes
HgA; Hesperia loamy fine sand, 0 to 2 percent slopes
HkA; Hesperia fine sandy loam, 0 to 2 percent slopes
RcA; Ramona coarse sandy loam, 0 to 2 percent slopes
RcB; Ramona coarse sandy loam, 2 to 5 percent slopes
Rm; Rosamond loamy fine sand
Ro; Rosamond fine sandy loam
Rp; Rosamond loam
Rr; Rosamond loam, saline-alkali
Rt; Rosamond silty clay loam
Sv; Sunrise sandy loam

Interconnection Alternatives

80th Street
100th Street
110th Street

Figure 3-2c
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: NRCS 2016

3.2 Field Results

This section includes the results of the field survey.

3.2.1 Vegetation

The vegetation community in the Project area is fallow agricultural land that undergoes periodic grazing by domestic livestock. Common plants observed within Project boundaries included fiddleneck (*Amsinckia* spp.), foxtail chess (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), common rabbitbrush *(Chrysothamnus nauseosus*), redstem filaree (*Erodium cicutarium*), and Russian thistle (tumbleweed, *Salsola tragus*) (Table 3-1, Attachment B Photo 1).

Table 3-1 Plants Observed in the Raceway Solar Project Area

Common Name	Scientific Name
Asparagaceae	
Joshua tree	*Yucca brevifolia*
Asteraceae	
white bursage	*Ambrosia dumosa*
rabbitbrush	*Chrysothamnus nauseosus*
sunflower	*Helianthus* spp.
Amaranthaceae	
Russian thistle (tumbleweed)	*Salsola tragus*
Anacardiaceae	
fragrant sumac	*Rhus aromatica*
Boraginaceae	
fiddleneck	Amsinckia spp.
Brassicaceae	
tumble mustard	*Sisymbrium altissimum*
Bromus	
cheatgrass	*Bromus tectorum*
foxtail chess	*Bromus madritensis* ssp. *rubens*
Chenopodiacae	
four wing saltbush	*Atriplex canescens*
cattle saltbush	*Atriplex polycarpa*
winterfat	*Krascheninnikovia lanata*
Mojave seablite	*Suaeda moquinii*
Geraniaceae	
redstem filaree	*Erodium cicutarium*
Lamiaceae	
thistle sage	*Salvia carduacea*
Salicaceae	
cottonwood	*Populus fremontii*
narrowleaf willow	*Salix exigua*
Solanaceae	
purple nightshade	*Solanum elaeagnifolium*
Tamaricaceae	
saltcedar	*Tamarix ramosissima*

3.2.2 Water Features

Retention Ponds

Numerous retention ponds are scattered throughout the Project area and many were depicted in NWI datasets as "freshwater ponds" and "other" (Figure 2-1, Attachment B Photo 2). Retention ponds were characterized as manmade retention ponds built for agricultural purposes. At the time of the site visit, the ponds were dry, were fully or partially bermed, and showed no hydric indicators. Based on the field survey, it was determined these retention ponds do not contain aquatic or riparian habitat.

Drainages

The Project area contains numerous roadside ditches, agricultural ditches, and ephemeral drainage features (Attachment B Photo 3). Of these drainages, one ephemeral drainage showed signs of an OHWM (S-001, Attachment B Photos 4 - 6, Attachment C). The feature corresponds to an unnamed "riverine" feature on the NWI. The ephemeral drainage feature was observed to be up to 6 feet in width and located perpendicular to 80th Street West. No waters were present during the field survey. The feature is culverted across the road and appeared to disperse into upland habitat. The density of vegetation in the feature was lower where flow appeared to occur and species of plants in the feature was similar to the adjacent upland areas. The feature showed signs of recent disturbance, such as scraping.

3.2.3 Wetland Features

No wetland features were observed during the field study.

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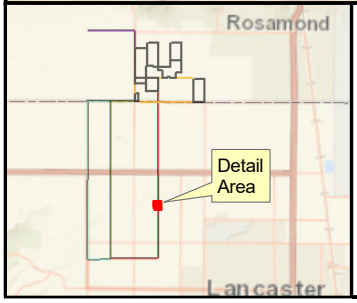

Survey Area

Potentially Jurisdictional Feature: State

Culvert

Road

Interconnection Alternatives

80th Street

Figure 3-3
Raceway Solar Project
Wetland Feature S-001
Los Angeles and Kern Counties, California
sPower

N
W E
S

0 100
Feet

Data Sources: E & E Field Data 2017

This report represents E & E's best professional effort at determining the jurisdictional boundaries. The final jurisdictional determination within the Project site is at the regulatory agencies' discretion.

4.1 Waters of the U.S.

The Project is located entirely within 10-digit Hydrologic Unit Code watersheds in which there are no WOUS as defined by 33 Code of Federal Regulations 328 (USACE Los Angeles District, File Number SPL-2011-01084-SLP). In the Antelope Valley, all tributaries to Rosamond Lake, Buckhorn Lake, and Rogers Lake are considered non-jurisdictional WOUS. Portions of the Antelope Valley that drain into Lake Palmdale are potentially jurisdictional; however the Project area is downgradient of Lake Palmdale and therefore, does not drain into Lake Palmdale.

As such, any wetland and water features within the Project area are not under the jurisdictional requirements of the CWA. However the RWQCB and/or CDFW may take jurisdiction over state waters and this is detailed in Section 4.2, below.

4.2 Waters of the State

4.1.1 Regional Water Quality Control Board

One ephemeral drainage (S-001) identified along the 80th Street Interconnection is potentially subject to the jurisdiction of the RWQCB. S-001 is 0.01 acres (Table 4-1).

Project activities within RWQCB jurisdictional features may require CWA Section 401 Certification and permitting under the Porter Cologne Water Quality Control Act from the RWQCB. RWQCB certifications can be avoided if the placement of transmission poles span or avoid state jurisdictional features through micrositing of the gen-tie infrastructure, and/or directional drilling under the hydrological feature.

Table 4-1 Potential Waters of the State within the Project Area.

Feature ID	Type	Width (feet)	Size (Acres)
Sites 1 - 7			
n/a		n/a	n/a
		Array Area Total	**0.00**
Interconnection and Gen-Tie			
S-001	Ephemeral Drainage (Natural)	6	0.01
		Interconnection and Gen-Tie Total	**0.01**

4.1.2 California Department of Fish and Wildlife

One ephemeral drainage (S-001) identified along the 80th Street Interconnection is potentially subject to the jurisdiction of the CDFW. S-001 is 0.01 acres (Table 4-1). S-001 does not contain any riparian habitat outside of the feature's banks and therefore only the drainage itself may be potentially subject to CDFW jurisdiction.

Project activities within CDFW jurisdictional features may require a Streambed Alteration Agreement. CDFW approvals can be avoided if the placement of transmission poles span or avoid state jurisdictional features through micrositing of the gen-tie infrastructure, and/or directional drilling under the hydrological feature.

Chapter 5
References

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Attachment A
NRCS Soil Report

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

[Minor map unit components are excluded from this report]

Map unit: AcA - Adelanto coarse sandy loam, 2 to 5 percent slopes

Component: Adelanto (85%)

The Adelanto component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Map unit: CaA - Cajon loamy sand, 0 to 2 percent slopes

Component: Cajon (85%)

The Cajon component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map unit: CaC - Cajon loamy sand, 2 to 9 percent slopes

Component: Cajon (85%)

The Cajon component makes up 85 percent of the map unit. Slopes are 2 to 9 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: CbA - Cajon loamy sand, loamy substratum, 0 to 2 percent slopes

Component: Cajon (85%)

The Cajon component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Map unit: DuD - Dune land

Component: Dune land (90%)

Generated brief soil descriptions are created for major soil components. The Dune land is a miscellaneous area.

Map unit: GsA - Greenfield sandy loam, 0 to 2 percent slopes

Component: Greenfield (85%)

The Greenfield component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on terraces, alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R019XD064CA Loamy 9-20" ecological site. Nonirrigated land capability classification is 4c. Irrigated land capability classification is 1 This soil does not meet hydric criteria.

Map unit: GsC - Greenfield sandy loam, 2 to 9 percent slopes

Component: Greenfield (85%)

The Greenfield component makes up 85 percent of the map unit. Slopes are 2 to 9 percent. This component is on terraces, alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R019XD064CA Loamy 9-20" ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: HbA - Hanford coarse sandy loam, 0 to 2 percent slopes

Component: Hanford (85%)

The Hanford component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R019XD064CA Loamy 9-20" ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 2s. This soil does not meet hydric criteria.

Map unit: HgA - Hesperia loamy fine sand, 0 to 2 percent slopes

Component: Hesperia (85%)

The Hesperia component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map unit: HgA2 - Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky

Component: Hesperia (85%)

The Hesperia component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: HkA - Hesperia fine sandy loam, 0 to 2 percent slopes

Component: Hesperia (85%)

The Hesperia component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map unit: HkB - Hesperia fine sandy loam, 2 to 5 percent slopes

Component: Hesperia (85%)

The Hesperia component makes up 85 percent of the map unit. Slopes are 2 to 5 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map unit: HmA - Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes

Component: Hesperia (85%)

The Hesperia component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent. There are no saline horizons within 30 inches of the soil surface.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: MzB - Mohave coarse sandy loam, 2 to 5 percent slopes

Component: Mojave (85%)

The Mojave component makes up 85 percent of the map unit. Slopes are 2 to 5 percent. This component is on terraces. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. There are no saline horizons within 30 inches of the soil surface.

Map unit: RcA - Ramona coarse sandy loam, 0 to 2 percent slopes

Component: Ramona (85%)

The Ramona component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on terraces. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R019XD064CA Loamy 9-20" ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 1 This soil does not meet hydric criteria.

Map unit: RcB - Ramona coarse sandy loam, 2 to 5 percent slopes

Component: Ramona (85%)

The Ramona component makes up 85 percent of the map unit. Slopes are 2 to 5 percent. This component is on terraces. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R019XD064CA Loamy 9-20" ecological site. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map unit: RhF - Rock land

Component: Rock land (80%)

Generated brief soil descriptions are created for major soil components. The Rock land is a miscellaneous area.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: Rm - Rosamond loamy fine sand

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG022CA Sandy 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Map unit: Ro - Rosamond fine sandy loam

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Map unit: Rp - Rosamond loam

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. There are no saline horizons within 30 inches of the soil surface.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: Rr - Rosamond loam, saline-alkali

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG020CA Alkali Flats 4-9" ecological site. Nonirrigated land capability classification is 7s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 8 within 30 inches of the soil surface.

Map unit: Rt - Rosamond silty clay loam

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG021CA Loamy 4-9" ecological site. Nonirrigated land capability classification is 7c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5 percent. The soil has a slightly saline horizon within 30 inches of the soil surface.

Map unit: Ru - Rosamond silty clay loam, saline-alkali

Component: Rosamond (85%)

The Rosamond component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG020CA Alkali Flats 4-9" ecological site. Nonirrigated land capability classification is 7s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 8 within 30 inches of the soil surface.

Map Unit Description (Brief, Generated)

Antelope Valley Area, California

Map unit: Sv - Sunrise sandy loam

Component: Sunrise (85%)

The Sunrise component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on basin floors. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer, petrocalcic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG020CA Alkali Flats 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 13 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Map unit: Sx - Sunrise loam

Component: Sunrise (85%)

The Sunrise component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on basin floors. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer, petrocalcic, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. This component is in the R030XG020CA Alkali Flats 4-9" ecological site. Nonirrigated land capability classification is 7e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 13 percent. The soil has a very slightly saline horizon within 30 inches of the soil surface.

Map unit: Tw - Tray loam, saline-alkali

Component: Tray (85%)

The Tray component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on basin floors. The parent material consists of alluvium derived from granite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R030XG020CA Alkali Flats 4-9" ecological site. Nonirrigated land capability classification is 7s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 8 within 30 inches of the soil surface.

Attachment B
Photographs



Photo 1. Representative site photo showing common vegetation including foxtail chess (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*).



Photo 2. Representative site photo showing retention pond along 100th Street Interconnection.



Photo 3. Representative photo of a roadside ditch along 100th Street Interconnection.



Photo 4. S-001, aspect east.



Photo 5: S-001, aspect west looking at culvert.



Photo 6. S-001, aspect south.

Attachment C
Datasheets

Stream ID: S-001 Stream Name: _____ Tributary of: _____ Stream Datasheet 1/3

Project: Spower - Raceway
Observers: J. Carlo; d. schultz
Location: 80st W
Date: 9Nov 17
5th Field Hydrologic Unit Code (HUC):

Project Feature:
- ☐ Right-of-way ☐ Project Facility
- ☐ Access Road ☐ Staging/Storage Area
- ☒ Other: Transmission Corridor

Channel: ☐ natural ☐ artificial (e.g., ditch/canal) ☒ altered
Notes: _____
Flow: ☐ perennial ☐ intermittent ☒ ephemeral
Document presence of riparian vegetation &/or aquatic invertebrates ☐ yes ☒ no
☐ Other: _____

Ordinary High Water Mark (OHWM) Indicators
- ☐ natural line impressed on bank
- ☐ changes in character of soil ☐ shelving
- ☐ scour ☐ sediment deposition
- ☐ sediment sorting ☐ water staining
- ☒ vegetation matted down, bent or absent
- ☒ abrupt change in plant community
- ☐ presence of litter and debris
- ☒ leaf litter disturbed or washed away
- ☐ presence of wrack line (tidal streams only)
- ☐ other: _____

OHWM continuous through survey section? ☐ yes ☒ no
Average Width of OHWM (ft): 6'
Notes: 80th st W roadway culvert

Photo-point: ☒ left bank ☒ right bank
Photo direction and identification:
- ☐ downstream: ESE ☐ across: N & S
- ☐ upstream: W ☐ other: _____

Longitudinal gradient (%): ☐ 0-1 ☒ 1-2 ☐ 2-4 ☐ 4-6 ☐ 6-10 ☐ >10
Sinuosity: ☒ 1.0 (straight) ☐ 1.0-1.2 (low) ☐ 1.2-1.5 (moderate) ☐ >1.5 (high)
Presence of: ☐ runs ☐ pools ☐ riffles

Bed Substrate (%)
Bedrock ____
Boulder ____
Cobble ____
Gravel X
Sand X
Silt ____
Clay ____
Other _____

Thalweg Water Depth(s) (ft)
☒ 0 – 0.5 ☐ 0.5 – 1
☐ 1 – 2 ☐ 2 – 3
☐ >3

Average Wetted Width (ft): _____

Flow Rate (cfs):
☐ 0 – 0.1 ☐ 0.1 – 0.5
☐ 0.5 – 1 ☐ 1 – 5
☐ 5-10 ☐ >10

Water Clarity
☐ Clear
☐ Slightly Turbid
☐ Moderately Turbid
☐ Extremely Turbid
☐ Other: _____

BANK CHARACTERISTICS

Left Bank	Right Bank
OHW Height (ft): 6"	OHW Height (ft): 6"
BF[1] Height (ft): 12"	BF[1] Height (ft): 12"
☒ 0-5	☒ 0-5
☐ 5-20	☐ 5-20
☐ 20-50	☐ 20-50
☐ 50-75	☐ 50-75
☐ 75-100	☐ 75-100

Percent of bank from BF[1] to OHWM with erosion:
Describe evidence (undercutting, cracking, coarsening, etc), severity, and apparent cause of bank erosion:

[1] BF = Bankfull

Number of Large Woody Debris (LWD[2]) pieces at least partly below OHW: 0
[2] LWD = >0.1m diameter and >1.0m length

HABITAT
Width of riparian corridor (from OHW): 2'
left bank (ft): 6" right bank (ft): 6"

Riparian Vegetation:

Dominant species	% cover
Helianthus spp	10%
Chrysothamnus	20%
Tumbleweed	40%
Bromus tectorum	30%

Notes: ERCI

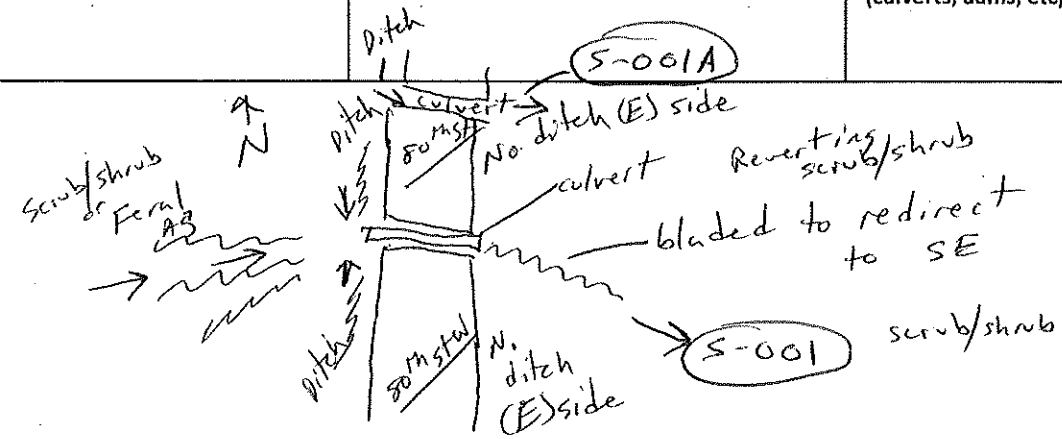
Aquatic Vegetation (abundance of rooted and unrooted species): N/A

ORGANISMS
Aquatic invertebrate (taxonomic orders and abundance):

Other aquatics (species and abundance):

Potential for fish?
☐ high ☐ limited ☒ none
Describe fish passage barriers (culverts, dams, etc):

Notes:



Episodic Stream Indicator Data Sheet

Site ID: SPower Raceway	Stream ID: S-001	Date: 9Nov17
Nearest Town:		County:
Investigators: S. Carloj d. schultz		

Base Map

Aerial Photo #:	Date:	Topographic Map Name:	Date:

GPS Data

GPS Name:	Datum:	Transect Elevation:	Zone 10 / 11	GPS Error: ± ft / m
GPS co-ords start of transect:		GPS co-ords end of transect:		

Geomorphic Province (✓ one)	X	Mojave		Sonoran/Colorado		Great Basin	Other:		

Landform (✓ all that apply)

	Headwater		Upper fan		Middle fan		Lower fan		Alluvial plain	X	Axial valley		Playa

Channel Form (✓ one)

	Single thread		Braided		Compound		Distributary	X	Discontinuous	Other:

Transect was selected to:

	Document fluvial activity & boundaries		Document channel elevations & boundaries
X	Document habitat associations		Document a change in watercourse morphology
	Other:		

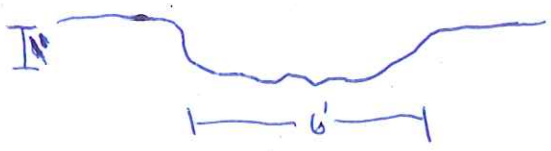
Date of most recent runoff event (if known): Unknown

Physical Setting: Briefly describe geomorphic processes and surficial materials and conditions, including the degree of disturbance relative to an intact dryland stream ecosystem, and any anthropogenic influences on the channel form and function:

Largely influenced by presence of roadside ditch & flooding. Evidence of maintenance present.

Summary Site Description and Cross-section Sketch: View across the channel from watercourse-edge to watercourse-edge. Identify channel(s), banks, islands, interfluves, floodplains, terraces, and uplands where present. Note approximate width and elevation differences between features indicated.

Left ——— Right



Site ID: Shower Raceway	Stream ID: S-001	page 2 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of the representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for indicators not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

UPLAND

Terrestrial Indicators

	Av soil horizon		Relict bars & swales		**Substrate Particle Size**	
	Biotic soil crusts		Rock fractured in place		Estimated percentages	
	Bioturbation		Rock varnish		% Bedrock / Cemented substrate	
	Caliche: coatings / layers / rubble		Rock weathering	10	% Boulder	≥ 256 mm
	Carbonate etching		Rubified rock undersides	30	% Cobble	≥ 64 – 256mm
	Coppice dunes: active / relict		Soil development		% Pebble	≥ 4 – 64 mm
	Deflated surface		Surface rounding of landform	60	% Granule	≥ 2 – 4 mm
X	Pavement		Woody debris in place		% Sand	≤ 2 mm
	Other: Roadside ditch				% Silt/Clay	Fines

Fluvial Indicators

	Bars: sand / gravel		Mud: cracks / curls / drapes		Sediment tails: sand / gravel
	Cut banks		Organic drift	X	Vegetation-channel alignment
	Drainage swales		Overturned rocks		Water-cut benches
	Exposed roots		Scour		Wrack
	First-order streams		Sediment ramps: sand / gravel		Wrinkle marks
	Flow lineations		Sediment sorting		
	Other:				

Vegetation

Estimated % total vegetative cover (perennial & shrub species combined):	Dominant and co-dominant species (if known) and % of total vegetative cover of each:	Representative height and width of dominant and co-dominant species:
UPL: 75%	Tumbleweed: 30% cheatgrass: 40%	Tumbleweed: 14" cheatgrass: 6"

Differences in total shrub/perennial density (total #shrubs/perennial plants) between upland & fluvially active units or watercourse complex? (describe and qualify the differences):

Tumbleweed: 0% in stream
cheatgrass: 10% in stream

Are there plant species that are present in (or absent from) the uplands when compared to fluvially active units or the watercourse complex? (describe differences):

no, lacking diversity

Are there plant species that are more abundant (or less abundant) in the uplands when compared to the fluvially active units or the watercourse complex? (describe and qualify differences)

sunflower spp. - present in stream, absent in UPL.

Site ID: S Power Raceway	Stream ID: S-001	page 3 of 4

Note presence or absence of each indicator within a minimum distance of 50 feet upstream and 50 feet downstream of a representative channel cross section. Mark each box with a plus (+) for those indicators observed, and a minus (–) for those not observed. For examples see the Photo Atlas in MESA ~ Mapping Episodic Stream Indicators.

WATERCOURSE or WATERCOURSE COMPLEX

Transportation, Deposition & Flow Transition Indicators

	Bars: sand / gravel		Secondary channels		
	Bifurcated flow		Sediment plastering		
	Drainage divides		Sediment plumes: sand / gravel		
	Flow lineations		Sediment sheets: sand / gravel		
X	Imbricated rocks		Sediment splays		
	Levee ridges: (sand) / gravel		Sediment tails: sand / gravel		
	Mid-channel bars: sand / gravel		Vegetation shapes: streamlined		
	Organic drift		Wrack		
	Overturned rocks		Wrack marks		
	Out-of-channel flow: Lateral floodplain / Terminal floodplain				
	Ripples				
	Other:				

Substrate Particle Size

Estimated percentages		
	% Bedrock / Cemented substrate	
	% Boulder	≥ 256 mm
	% Cobble	≥ 64 – 256 mm
	% Pebble	≥ 4 – 64 mm
20	% Granule	≥ 2 – 4 mm
80	% Sand	≤ 2 mm
/	% Silt/Clay	Fines

Erosion Indicators

Cut banks	Rills	Water cut channels
Exposed roots	Scour	Water level mark
Gullies	Sediment pillows	
Other:		

Seasonal clean out of roadside ditch

Vegetation

Estimated % total vegetative cover (perennial & shrub species combined):	Dominant and co-dominant species (if known) and % of total vegetative cover of each:	Representative height and width of dominant and co-dominant species:
70% perenial 20% Shrub 10% Bare	BRTE 40% TW 30%	

Differences in total shrub/perennial density (total #shrubs/perennial plants) between the low-flow channel(s) and the adjacent floodplain? (describe and qualify the differences):

Are there plant species that are present in (or absent from) the low-flow channel(s) when compared to the adjacent floodplain? (describe differences):

BRTE

Are there plant species that are more abundant (or less abundant) on the low-flow channel(s) and the adjacent floodplain? (describe and qualify differences)

Halianthus

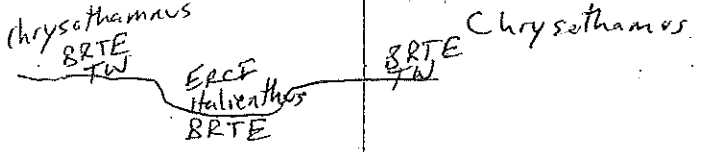
Site ID S-001 Raceway	Stream ID S-001	page 4 of 4

INDICATORS of PONDING & EVAPORATION and EOLIAN TRANSPORT & DEPOSITION

	Algal crusts	X	Sand-filled channels		
	Beach ridges		Salinity		
	Coppice dunes: active / relict		Substrate staining		
	Crusts: carbonate / salt / soda		Vegetation-landscape alignments		
	Mud: cracks / curls / polygons				
	Other				

Additional Diagrams and Notes

Vegetation cross-section diagram: Draw a cross-section that identifies the approximate locations along the transect or diagram of geomorphic units (see page 1 of data sheet) where there are changes in vegetation characteristics, as summarized in the vegetation subsections under "Upland" and "Watercourse Complex".



ERCI = cranesbill
Halienthus = sunflower spp
BRTE = Bromus tectorum cheatgrass
TW = Tumbleweed
Chrysothamnus = rabbitbrush

Photographs

Photographs should document the representative landscape units, vegetation, and the presence or absence of representative stream indicators.

Photo #	Description	GPS Location		
P-6	upstream	S-001		
P-7	downstream	|		
P-8	L → R	|		
P-9	R → L	|		
P-11	upstream	S-001A		
P-12	downstream	|		
P-13	L → R	|		
P-14	R → L	|		
P-16	upstream	S-001B		
P-17	downstream	|		
P-18	L - R	|		
P-19	R - L	|		
P-10	West side Rd	S-001		
P-15	westside Rd	S-001A		
P-20	west side Rd	S-001B		

Attachment 3

Revised Project Description

1. Project Description

1.1 Project Location

The proposed Raceway 2.0 Solar Project (proposed project) consists of six (6) sites and would develop photovoltaic (PV) solar facilities and the associated infrastructure necessary to generate a combined total of 291 megawatts (MW) of renewable electrical energy and/or energy storage capacity on approximately 1,311 acres of privately owned land. The proposed project consists of the following sites: Raceway Solar 1, Raceway Solar 2, Raceway Solar 3, Raceway Solar 4, Raceway Solar 5, and Raceway Solar 6.

The project proponent proposes the project be built at the same time as a single, 291-MW facility or, alternatively, developed as six independent facilities (**Table 1***, Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage*), depending upon market conditions. The proposed project includes advanced energy battery storage units.

The proposed project is located within the southern half of Township S 9 N, Range N 13 W of the San Bernardino Meridian and is contained by but does not fully occupy sections W 20, W 21, W 28, W 29, W 32. The proposed project is in the eastern high desert region of unincorporated Kern County and within the jurisdictional boundaries of the Willow Springs Specific Plan and the Kern County Zoning Ordinance. The proposed project is in the western extent of the Mojave Desert near Rosamond, California between Rosamond Boulevard and Avenue A, and between 70th Street West and 90th Street West.

Land uses in the region include a mix of undeveloped land, agriculture, residential, recreational and renewable energy projects (solar and wind). Desert vegetation dominates the project site and region. Topography across the project site is relatively flat as the site is located on the bajada of the Tehachapi Mountains, which is an overlapping of alluvial fans with southern trending slope. The major north-south route in the region is SR 14, a four-lane highway located approximately 4 miles east of the proposed project. The major east-west route near the proposed project is SR 58, which is also a four-lane highway, located approximately 14 miles north of the proposed project. Paved and unpaved roadways, generally following section lines, are found throughout the area.

The Assessor Parcel Numbers (APNs) are summarized in Table 1, *Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage*. **Table 2,** *Kern County APNs for Generation Tie Lines*, summarizes the APNs for the four generation tie line options.

The power generated by the proposed project would be interconnected to an existing transmission network. The project has five interconnection options as further described in Section 1.3. It is expected that one main path would be used for the gen-tie corridor, with deviations from the path as necessary. Kern County gen-tie assessor's parcels are detailed in **Table 2**.

Tables 3 through **5** below, detail the Los Angeles County assessor's parcel numbers for property where the generation tie line route shall be installed, should the project be connected to the Big Sky North Substation near the City of Lancaster in Los Angeles County or a future LADWP (Los Angeles Department of Water and Power) substation.

Table 1. Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage

	Megawatts (MW)	APNs	Willow Springs Specific Plan Map Code Designation	Zoning	Acres
Raceway Solar 1	15	374-020-42, 374-020-40, 370-020-47, 370-020-48	7.1/4.4	E (2.5) RS MH FPS	92
Raceway Solar 2	20	374-250-04, western third of 374-020-55	7.1 /4.4	E (2.5) RS FPS and E (2.5) RS MH FPS	90
Raceway Solar 3	106	374-210-08, 374-011-13, 374-250-03, 374-250-01, 374-250-09, 374-250-08	5.6; 5.6/2.85; 7.1/4.4	E (2.5) RS FPS	494
Raceway Solar 4	70	374-011-04, 374-011-11	5.5; 5.6/2.85	A FPS	315
Raceway Solar 5	60	374-440-01, 374-440-02, 374-440-03, 374-440-04, 374-440-05, 374-440-06, 374-440-07, 374-440-08, 374-011-08	5.3/4.4	E (2.5) RS FPS and E (2.5) RS MH FPS	240
Raceway Solar 6	20	374-011-07	5.3/4.4	OS, E 2.5 RS, FPS	80
Total Megawatts	**291**	**Proposed Solar Project Total Acreage**			**1,311**

Willow Springs Specific Plan Map Code Designations

5.3 = Residential, Maximum 10 units/net acre
5.5 = Residential, Maximum 1 units/net acre
5.6 = Residential, Maximum 2.5 gross acres/unit
7.1 = Light Industrial
7.2 = Service Industrial
4.4 = Comprehensive Plan Required

Physical Constraints Overlay

2.8 = Military Flight Operations
2.85 = Noise Management Area

Kern County Zone Districts

A = (Exclusive Agriculture)
E (2.5) = Estate (2.5 acre minimum)
RS = Residential Suburban Combining
MH = Mobile Home Combining
FPS = Floodplain Combining

Table 2. Kern County APNs for Generation Tie Lines						
90th Street West and Rosamond Blvd.			**80th Street West**	**100th Street West &Ave A**	**110th Street West &Ave A**	**West Ave A**
252-152-25	374-051-14	374-042-39	374-020-53	374-020-40	359-032-08	374-020-38
252-152-26	374-051-15	374-051-01	374-020-55	374-020-46	359-032-13	374-020-49
252-152-27	374-052-15	374-071-23	374-121-01	374-290-01	359-032-14	374-020-50
252-152-28	374-052-16	374-071-25	374-121-16	374-303-01	359-032-17	374-020-53
252-152-29	374-061-01	374-071-28	374-121-17	374-303-02	359-032-27	374-122-25
252-152-30	374-061-02	374-082-03	374-121-32	374-321-05	359-032-28	374-122-26
252-152-31	374-061-03	374-082-08	374-122-01	374-321-06	374-020-40	374-122-27
252-152-32	374-061-04	374-210-01	374-122-16	374-322-01	374-020-46	374-122-28
252-331-15	374-061-05	374-210-04	374-122-17	374-322-04	374-290-01	374-122-29
252-352-05	374-061-07	374-210-08	374-122-32	374-322-05	374-303-01	374-122-30
252-352-22	374-061-08	374-210-12		374-322-08	374-303-02	374-122-31
252-352-23	374-061-09	374-210-14		374-450-08	374-321-05	374-122-32
252-352-24	374-061-10			374-450-09	374-321-06	374-132-25
252-352-33	374-061-12			374-450-13	374-322-01	374-132-26
358-030-21	374-061-14				374-322-04	374-132-27
359-051-22	374-061-16				374-322-05	374-132-28
359-051-24	374-061-17				374-322-08	374-132-29
359-051-25	374-061-18				374-450-08	374-132-30
359-051-26	374-061-19				374-450-09	374-132-31
359-051-27	374-061-21				374-450-13	374-132-32
359-051-28	374-062-01					374-142-25
359-051-29	374-062-03					374-142-26
359-051-31	374-062-21					374-142-27
374-041-32	374-062-22					374-142-28
374-041-33	374-071-01					374-142-29
374-041-34	374-071-05					374-142-30
374-041-35	374-071-08					374-142-31
374-042-01	374-071-14					374-142-32
374-042-02	374-071-16					375-020-01
374-042-03	374-071-17					
374-042-04	374-071-18					
374-042-07						
374-042-08						

Table 3. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 80th Street West							
3268001001	3268019099	3219015001	3220007070	3220015054	3233002047	3233015017	3229009010
3268001004	3268019086	3220001028	3220007127	3220022040	3233002042	3233015032	3229007026
3268001006	3219009011	3220001024	3220007146	3220022043	3233002037	3233013022	3229008031
3268003025	3219009010	3220001025	3220007157	3220022041	3233002049	3233013024	3229006006
3268001005	3219010012	3220001027	3220007158	3220022042	3233002048	3233018001	3229006016
3268001036	3219010013	3220004036	3220011008	3229008029	3233005007	3233018032	3229008013
3268003010	3219009014	3220004037	3220011009	3229006012	3233005008	3233018016	3229014002
3268003020	3219010016	3220004038	3220011001	3229006013	3233005009	3233019019	3229014003
3268003021	3268019099	3220004035	3220011032	3229006014	3233004025	3233019018	3233002019
3268003030	3268019086	3220005035	3220011024	3229009009	3233004026	3233018017	3233004036
3268005002	3219009011	3220005036	3220011025	3229008012	3233005006	3233019001	3233012026
3268007001	3219009010	3220005037	3220012001	3229006015	3233008004	3233019034	3233019002
3268007002	3219010012	3220006025	3220012002	3229008030	3233008002	3233022001	3219017022
3268007003	3219010013	3220006026	3220011036	3229009026	3233008001	3233022017	3219011012
3268017002	3219009014	3220006024	3220011035	3229010012	3233008003	3233022016	3219011013
3268017039	3219010016	3220005038	3220012043	3229010013	3233009008	3233022032	3219026001
3268017013	3268019099	3220006027	3220012045	3229010024	3233009009	3219009009	3265024007
3268017040	3268019086	3220007004	3220012052	3229010025	3233009024	3268005001	3265024004
3268017003	3219009011	3220007048	3220012044	3229011010	3233009025	3268001034	
3268017005	3219009010	3220007052	3220012040	3229012010	3233012010	3268001003	
3268017023	3219010012	3219015001	3220012051	3229011009	3233012025	3220016006	
3268018006	3219010013	3220001028	3220012042	3229012002	3233012034	3220011016	
3268018007	3219009014	3220001024	3220012039	3229012007	3233013023	3220015043	
3268018900	3219010016	3220005038	3220015046	3229012021	3233013026	3229009025	
3268018039	3219013002	3220006027	3220015042	3229012008	3233013028		
3268018017	3219013007	3220007004	3220015017	3229012009	3233013025		
3268018022	3219012007	3220007048	3220015041	3229012003	3233015001		
3268019030	3219013004	3220007052	3220016005	3233002021	3233013027		
3268019046	3219013003	3220007057	3220017019	3233002022	3233013029		
3268019087	3219010015	3220007061	3220017020	3233002038	3233015016		

Table 4. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 100th Street West and Ave A			
3262001007	3262012001	3262025008	3265003049
3262001029	3262012002	3262025025	3265003033
3262001020	3262012003	3262025024	3265003051
3262001025	3262012004	3262024025	3265004063
3262001044	3262015002	3262025009	3265004062
3262001038	3262015003	3264001008	3265004032
3262001022	3262015001	3264001011	3265004088
3262001031	3262016001	3264001018	3265004091
3262001039	3262016002	3264001053	3265004093
3262001048	3262016007	3264001048	3265004065
3262001071	3262016003	3264002016	3265005006
3262001081	3262018019	3264001026	3265004075
3262001070	3262016006	3264001049	3265005013
3262001078	3262018053	3264003032	3265005014
3262001072	3262018056	3264003017	3219001027
3262001069	3262016004	3264003016	3219001054
3262001075	3262018054	3264003001	3219001055
3262001077	3262018055	3264006016	3219027022
3262001082	3262019034	3264006001	3219027033
3262001084	3262019078	3264006032	3219027034
3262004003	3262019038	3264007001	3219027049
3262004002	3262019061	3264006017	3219001042
3262004001	3262019073	3264007008	3219001043
3262004004	3262019110	3264007009	3264014002
3262004008	3262019125	3264008001	3264018010
3262004007	3262019126	3264007016	3264018011
3262004009	3262019079	3264008002	3264018012
3262004005	3262019222	3264013021	3219027021
3262004006	3262019221	3264013022	3265005005
3262004025	3262020029	3264013027	3265024007
3262005001	3262020115	3264013028	3265024005
3262004024	3262020153	3264015002	3265024006
3262005013	3262020220	3264015001	
3262007001	3262020233	3264015003	
3262005014	3262020154	3264015004	3229001001 **
3262006002	3262021029	3264016001	3262009001 **
3262005027	3262020232	3264013025	3262009002 **
3262007021	3262021027	3264016003	3262001007 **
3262007022	3262020230	3264017004	3262013008 **
3262007020	3262021026	3264017003	
3262008002	3262020236	3264017001	
3262008001	3262021028	3264018013	
3262005015	3262020235	3264017002	
3262008022	3262021018	3264016002	
3262011002	3262020234	3264016004	
3262011004	3262021039	3265003031	
3262011003	3262022001	3265003030	
3262011001	3262024009	3265003027	
3262011005	3262024008	3265003023	
3262008023	3262024024	3265003015	

** Option B: Alternate route to 100th Street West via 90th Street to Avenue A-8 to 95th Street to Avenue B

Table 5. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 110th Street West and Ave A				
3261017009	3262001064	3263006029	3264022049	3265015013
3261017024	3262001065	3263006900	3264021010	3264020005
3261017008	3262002025	3263006019	3264022005	3263020001
3261017025	3262002017	3263006023	3264022055	3264020002
3261018009	3262004003	3263007020	3264022050	3264020004
3261018024	3262004002	3263008008	3264022004	3263006032
3261019009	3262004001	3263007019	3264022059	3263020023
3261019024	3262001053	3263006031	3265001026	3261034017
3261019008	3262001058	3263007021	3265001047	3263020025
3261019025	3262004004	3263008024	3265001067	3263020024
3261018008	3262002018	3263008009	3265001088	3263020010
3261018025	3262004008	3263007023	3265001058	3265002045
3261020008	3262004007	3263008025	3265001036	3265001059
3261020009	3262004005	3263009016	3265001057	3265007030
3261020031	3262004006	3263009042	3265002044	3265007007
3261020032	3262006002	3263009012	3265002043	3265024007
3261032003	3262017005	3263009046	3265002055	3265024003
3261032002	3262018001	3263009015	3265002080	
3261033001	3262017021	3263009006	3265003002	
3261032072	3262017020	3263009054	3265003006	
3261032069	3262017036	3263009073	3265002138	
3261032070	3262019044	3263020008	3265003005	
3261032071	3262019085	3263020009	3265003009	
3261033081	3262019045	3264002027	3265003008	
3261036005	3262019077	3264001031	3265002075	
3261034015	3262019084	3264001037	3265002163	
3261036009	3262019086	3264001021	3265003045	
3261036010	3262019151	3264001027	3265003054	
3261036012	3262019150	3264001046	3265003052	
3261036014	3262019205	3264002041	3265004108	
3261036015	3262019206	3264002044	3265004106	
3262001020	3262019228	3264001041	3265004107	
3262001005	3262020035	3264001047	3265006001	
3262001046	3262020004	3264002024	3265007001	
3261036006	3262020020	3264002025	3265008017	
3261036011	3262020036	3264002095	3265006002	
3262001052	3262020118	3264002096	3265007003	
3262001055	3262020117	3264002131	3265008019	
3261036013	3262020169	3264002132	3265008029	
3262001054	3262020211	3264020007	3265008032	
3262001068	3262020168	3264020001	3265009016	
3262001067	3262020170	3264020006	3265009015	
3262001085	3262023001	3264021001	3265009010	
3262002010	3262023032	3264021011	3265014022	
3262002001	3262023017	3264021013	3265014023	
3262001086	3262023016	3264020003	3265014014	
3262002002	3263006013	3264021012	3265014024	
3262002009	3263006026	3264022001	3265014017	

1.2 Environmental Setting

The proposed project is located on approximately 1,311 acres of undeveloped, privately owned land located in the western extent of the Mojave Desert near Mojave, California. The project is in the Mojave Basin and Range ecoregion and the United States Geological Survey (USGS) Little Buttes and Rosamond 7.5-minute topographical quadrangles. The project sites are zoned for residential development and Raceway Solar 4 is zoned for agriculture but is not currently under cultivation. Development in the area surrounding the project site includes rural residences, agriculture, and renewable energy (solar and wind) facilities.

Vegetation on the project site consists of Mojave Saltbush Scrubland with the most common species being saltbush (*Atriplex polycarpa*); Russian thistle (*Salsola tragus*) and ripgut brome (*Bromus diandrus*) are also very common to the area. This community typically occurs on well-drained soils in alluvial fans, bajadas, and upland slopes. Growth occurs during spring (or rarely in summer or fall) if rainfall is sufficient. This is one of the most widely distributed desert plant communities in the Mojave Desert, occurring from the desert floor up to approximately 3,500 feet in elevation, and extending into northwestern Arizona and southern Utah.

The foothills of the Tehachapi Range occur approximately 13 miles west of the project. The project and surrounding land are mostly flat and exhibit little topographic variation. Land administered by the Bureau of Land Management (BLM) is located approximately 2 miles north of the project.

The proposed project is located entirely within the Federal Emergency Management Agency (FEMA) designated Zone "A." Zone A is the 100-year floodplain or 1 percent annual chance of flood. There are drainage routes near several of the project sites and gen-tie routes. All drainage routes are isolated episodic or ephemeral waters, which typically only flow for brief periods in response to rainfall. The project area usually receives an annual precipitation (rainfall) average of 6.7 inches per year. **Table 6**, *Average High and Low Temperature by Month-Mojave*, below, shows the average high and low temperatures in Mojave by month.

Table 6: Average High and Low Temperature by Month - Mojave

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. High	57	60	66	71	80	89	96	96	88	78	65	56
Avg. Low	33	37	41	46	56	64	70	67	61	50	40	33

U.S. Climate Data, 2017.

Based on a review of records maintained by the California Department Conservation/Division of Oil, Gas and Geothermal Resources (DOGGR), wells are not identified on the project site, and the project is not within the jurisdictional boundaries of an oilfield (California Department of Conservation, 2017).

The proposed project would be served by the Kern County Sheriff's Office for law enforcement and public safety. The closest sheriff station is the Green Empire Substation, located approximately 4.5 miles east of the project. The Kern County Fire Department (KCFD) provides fire protection and emergency medical and rescue services for the project area. KCFD Station 15 is located approximately 3.5 miles east of the

project. The closest school is Tropico Middle School, located approximately 1.6 miles northeast of the project. The nearest hospital is the Palmdale Regional Medical Center, located approximately 19 miles to the southeast, of the project in Palmdale.

The nearest airports to the proposed project are the Rosamond Skypark located 3 miles to the northeast, the Mojave Air and Space Port located 14.5 miles to northeast. Private airstrips include the Lloyd's Landing airport, located approximately 3.5 miles north and the Little Buttes Antique Airfield, located approximately 2.5 miles south of the project in Los Angeles County.

The California Department of Conservation (CDC) Farmland Mapping and Monitoring Program (FMMP), designates the project sites as vacant, disturbed, prime, grazing, and/or rural residential lands (California Department of Conservation, 2016). Surrounding properties are designated as either: (a) vacant or disturbed, (b) rural residential, or (c) nonagricultural and natural vegetation. Parcels within Raceway Solar 4 are subject to a Williamson Act Land Use contract. Although Raceway Solar 4 is zoned for agricultural use, available crop data indicates none of the subject land has been under cultivation between 2010 through 2016.

The proposed project is located within unincorporated Kern County and within the jurisdiction of the Willow Spring Specific Plan. The project has land use designations of 7.1 (Light Industrial), 5.3 (Residential, Maximum 10 units/net acre), 5.3/2.85 (Residential, Maximum 10 units/net acre/Noise Management Area), 5.5 (Residential, Maximum 1 units/net acre), 5.6/2.8 (Residential, Maximum 2.5 gross acres/unit/Military Flight Operations), 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area) and is within the A (Exclusive Agriculture) and E (2.5) (Estate, 2.5 acre minimum) zone districts. The existing land uses of the project and its surroundings are generally undeveloped, including sparse residential dwellings, dirt roads and fallow or active agricultural operations. The entire project is also subject to the provisions of the Kern County Zoning Ordinance. The project proposes to eliminate future road reservations from the General Plan Circulation Element to allow for efficient placement of solar panels.

1.3 Project Description

The proposed project would develop a PV solar facility and associated infrastructure necessary to generate 291-MW of renewable electrical energy and/or energy storage capacity on 1,311 acres of privately-owned land in the eastern high desert region of unincorporated Kern County. Each specific request is described below:

Raceway Solar 1

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 92 acres from map code designation 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of a Zone Change (ZCC 149, Map 231) would change the zoning of the parcels from E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 15 MW solar electrical generating facility on 92 acres, as well as related ancillary structures.

Raceway Solar Site 2

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 90 acres from map code designation 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of a Zone Change would change the zoning on approximately 40 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining and 141 acres from E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 20 MW solar electrical generating facility on 90 acres, as well as related ancillary structures.

Raceway Solar 3

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 494 acres from map code designations 5.6 (Residential, Maximum 2.5 gross acres/unit), 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area), and 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of Zone Changes would change the zoning on approximately 494 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). General Plan Amendments would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid- section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 106 MW solar electrical generating facility on 494 acres, as well as related ancillary structures.

Raceway Solar 4

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 315 acres from map code designations 5.5 (Residential, Maximum 1 units/net acre) and 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area) to 7.1 (Light Industrial). General Plan Amendments would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 70 MW solar electrical generating facility on 315 acres, as well as related ancillary structures. In addition, a Cancellation of a Williamson Act Contract would be processed on APNs: 374-011-04 and 374-011-11 (formerly known as APNs: 257-020-11 and 257-020-04).

Raceway Solar 5

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 240 acres from map code designation 5.3/4/4 (Residential, 10 Dwelling Units Per Acre, Comprehensive Plan Area, Military) to 7.1 (Light Industrial); approval of a Zone Changes would change the zoning on approximately 240 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining) and E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture) for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 60 MW solar electrical generating facility on 240 acres, as well as related ancillary structures.

Raceway Solar 6

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 80 acres from map code designation 5.3/4/4 (Residential, 10 Dwelling Units Per Acre, Comprehensive Plan Area, Military) to 7.1 (Light Industrial); approval of a Zone Changes would change the zoning on approximately 80 acres from OS E 2.5 RS FPS (Open Space, Estate (2.5) Residential Suburban, Floodplain Secondary Combining) A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of Conditional Use Permit would allow for the construction and operation of up to a 20 MW solar electrical generating facility on 60 acres, as well as related ancillary structures.

As shown in Table 1, *Project Assessor Parcel Numbers, and Corresponding Map Codes, Zoning and Acreage*, the proposed solar facility consists of a combined 24 parcels. The proposed project would be developed as six, independent facilities on approximately 1,311 acres.

Vacations of Public Access Easements

The project proponent is requesting vacations of public access easements on the project site to allow optimum placement of solar panels.

Generation Tie Line Options 1 through 4:

There are four options that the proposed project would interconnect to the existing SCE transmission system.

1. **A) Previously approved collector substation (Big Sky North Substation) – 100th Street West via Avenue A.**

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 100th Street West.

   The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the existing Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

   B) Previously approved collector substation (Big Sky North Substation) – 100th Street West via 90th Street to Avenue A-8 to 95th Street to Avenue B.

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via 90th Street heading south to Avenue A-8, then west to 95th Street, then south to Avenue B, and west to 100th Street West. The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the existing Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

2. **Previously approved collector substation (Big Sky North Substation) – 110th Street.**

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 110th Street West.

   The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

3. **Previously approved collector substation (Big Sky North Substation) – 80th Street West.**

Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 80th Street West.

The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the Project Site. Electricity at the previously approved collector substation would ultimately be delivered to the Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster

4. **Los Angeles Department of Water and Power (LADWP) Proposed Substation.**

Under this option, the proposed project would interconnect at a planned LADWP substation in Kern County, located northwest of the project site, along Rosamond Boulevard near the intersection of Rosamond Boulevard and 110th Street West. An approximate 3-mile 34 kV and/or 230 kV gen-tie line originating at the DC collection system located at the northwest portion of the project site, would run north along 90th Street West, west along Rosamond Boulevard, and interconnect at the planned LADWP substation. This LADWP proposed substation is currently in the design phase and is scheduled to be built and constructed by 2019 or 2020.

The proposed project would consist of approximately 720,784 crystalline-silicon modules arranged in a grid-pattern over the project. The PV solar facility would consist of solar arrays mounted on either fixed tilt racking or single axis tracking structures (or a combination thereof) mounted to vertical posts. The proposed facility is intended to operate year-round and would generate electricity during daylight hours when electricity demand is at its peak.

The power generated on the project site would be sold to California investor-owned utilities, municipalities, community choice aggregators, or other purchasers in the furtherance of the goals of the California Renewable Energy Portfolio Standard and other similar renewable programs in the State. The project proponents may eventually choose to decommission and remove all or none of the systems from the project site. If a site is decommissioned, it would be converted to another use consistent with the applicable land use regulations in effect at that time or revert to its original land use.

The combined project facilities would include the following components:

- Installation of up to a total combined 291-MW of solar PV modules made of crystalline-silicon material covered by glass, mounted on a galvanized metal fixed tilt racking or single axis tracking systems embedded into the ground;
- If fixed tilt technology is not used, solar tracking system consisting of drive motors, drive arms and hydraulic systems that allow for rotation of solar panels from east to west, tracking the suns position over the course of the day;
- Underground and/or above ground medium voltage collections systems throughout the project site;
- Medium voltage inverters and step-up transformers;
- Onsite solar substation(s) including circuit breakers, switches, remote terminal units, fiber optic line telecommunication equipment, and main step-up transformer(s);
- Onsite switchyard(s);
- Onsite access roads;
- Perimeter security fencing 6- to 8-feet high with barbed wire;
- Concrete pads sized and installed to accommodate the associated equipment (inverters, switchgear,

transformers, etc.);

- Meteorological data collection systems and supervisory control and data acquisition (SCADA); and
- Several battery energy storage facilities located at each inverter and associated appurtenances or one centralized battery energy storage facility.

Project Facilities

Solar PV Panels

The approximate 291 MW proposed project would utilize PV technology on tracker mounting supports. The proposed project would then have the option to transfer electricity directly into the grid or into energy storage system for distribution to the grid during peak energy hours. The major elements of the proposed project are described as follows.

Up to an estimated 720,784 individual crystalline-silicon panels would be installed onsite. The number of panels present on the six different sites under this scenario is detailed below:

- Raceway Solar 1: 48,336 panels;
- Raceway Solar 2: 46,056 panels;
- Raceway Solar 3: 285,209 panels
- Raceway Solar 4: 177,973 panels
- Raceway Solar 5: 123,462 panels
- Raceway Solar 6: 39,748 panels

The layout of the single-axis tracker solar panels would be aligned in rows in the north-south direction (or in an east-west direction if a fixed tilt racking system were used instead). The maximum height of the single-axis tracker solar panels would be up to 12-feet above grade, at the beginning and end of each day. A fixed tilt racking system would be less than 12-feet high. Each solar panel would be attached to embedded piers using a support structure. Module layout and spacing is typically optimized to balance energy production versus peak capacity and depends on the sun angles and shading due to the surrounding horizon of the site. Individual arrays of modules would be combined to generate the total plant capacity.

Solar Trackers

The PV module rows would be oriented north-to-south if single-axis trackers are used. A solar tracking mechanism is used to maximize the solar energy conversion efficiency by keeping the modules perpendicular to the sun's energy rays throughout the day. This completed assembly of PV modules mounted on a framework structure is called a "tracker" because it tracks the sun from east to west. If used,

single-axis trackers would increase the efficiency of energy production from the arrays relative to a fixed tilt system. The exact tracker manufacturer and model would be determined in the final design. All trackers are intended to function identically in terms of following the motion of the sun.

Module layout and spacing is optimized to balance energy production versus peak capacity and would depend on the sun angles and shading caused by the horizon surrounding the proposed project. The spacing between the rows of trackers is dependent onsite-specific features and would be identified in the final design. The final configuration would allow for sufficient clearance for maintenance vehicles and panel access.

Fixed Tilt Racking System

The solar panels would be in a fixed tilt position that allows for the most sunlight specific to the geography of the project, if the fixed tilt racking system is used.

Electrical Collector System and Inverters

The AC-DC electrical collection system includes all cables and combiners that collect electricity from the panels, delivers it to the inverters, collects it from the inverters, and ultimately delivers it to the proposed project switching station(s). The collection system would likely be installed along internal access roads to collect power from the rows of modules and deliver it to the switching station. This collection system would likely be installed in subsurface trenches, though in some areas of the site, part or all the collection system may be housed in above-grade raceways mounted on supports approximately 24 to 36 inches above ground level. The collection system would be rated at between 1,000 to 2,000 volts DC until it reached the inverters and an intermediate voltage system between the inverters and the proposed project switching station.

The proposed project would use an unmanned field control system. The controls generally include a field supervisory controller in a central location and local microprocessor controllers connected to each tracker, if trackers are to be used. The field control system monitors solar insulation, wind velocity, and tracker performance and status, and communicates with all the local microprocessor controllers. When the appropriate conditions exist, the field supervisory controller initiates the trackers' daily tracking of the sun, and at the end of the day stows the trackers in the solar array.

The DC electricity produced by the solar panels is converted to three-phase alternating current by a series of inverters. Alternating current is the type of electricity usable by the electric utility and is the form required to connect to the transmission system. The inverter pad equipment includes a transformer that steps up the electricity in its new form to an output voltage of 34 kV or 230 kV. This electricity is then transmitted via the medium voltage collection system to the switching station.

Energy Storage System

The proposed project would have either several Energy Storage Systems (ESS) at each site's inverters or ESS at a centralized location onsite. The ESS would be able to provide approximately 291 MWh of energy storage. Each ESS would occupy approximately 1 to 2 acres within the project boundaries and consist of batteries, inverters, switches, cooling equipment, and other appurtenant equipment placed in multiple prefabricated enclosures or containers near the onsite substation. The ESS would either be installed contemporaneously or after the installation of the PV facilities. The final locations are dependent on final design and may require construction of vaults or other supporting foundations.

Generation-Tie Line and Solar Generating Facility (SGF) Interconnection Plan

The power generated by the proposed project would be interconnected to an existing transmission network. See Section 1.2 for a description of the gen-tie line options.

It is expected that one main path would be used for the gen-tie corridor, with deviations from the path as necessary.

Data Collection System

The proposed project would be designed with a comprehensive Supervisory Control and Data Acquisition (SCADA) system for remote monitoring of facility operation and/or remote control of critical components. Within the site, the fiber optic or other cabling required for the monitoring system would be installed throughout the solar fields leading to a centrally located (or series of appropriately located) SCADA system cabinets. The telecommunications connections to the SCADA system cabinets are either wireless or hard wired.

The system would also include a meteorological (met) data collection system at each site. The met stations would have the following weather sensors: a pyranometer for measuring solar irradiance, a thermometer to measure air temperature, a barometric pressure sensor to measure atmospheric pressure, and two wind sensors to measure speed and direction. These sensors would be connected to a data logger to compile the data for transmission to the Data Collection Center.

Site Access and Security

During project construction and operations, the primary access to each site would use the following streets:

- Raceway Solar 1: Avenue A
- Raceway Solar 2: Gaskell Road
- Raceway Solar 3: 90th Street West
- Raceway Solar 4: Willow Avenue and/or 80th Street West
- Raceway Solar 5: 70th Street West
- Raceway Solar 6: Rosamond Boulevard

The necessary road improvements would be completed per County code and regulations. Typical site access would be approximately 20-foot wide, accommodating County approved turning radii in both directions. The rows of solar panels would be separated by access ways. Internal site circulation would include approximately 20-foot-wide access roads consisting of crushed stone and approximately 15- to 20-foot-wide Operations and Maintenance (O&M) roads among the solar arrays consisting of compacted native soil.

Chain-link security fencing would be installed around the site perimeter, switchyard(s), substation(s), and other areas requiring controlled access to restrict public access during construction and operations. The security fence would be 6- to 8-feet tall, with two strings of barbed wire along the top. The fence posts would be set in concrete. Additional security may be provided using closed circuit video surveillance cameras and intrusion systems. Signs would be installed to achieve appropriate safety and security as expected in a solar power facility.

The proposed project's lighting system would provide personnel with illumination for both normal and emergency conditions. Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives. Lighting would be directed downward and shielded to focus illumination on the desired areas only and to avoid light spillage onto adjacent properties. Lighting would be no brighter than required to meet safety and security requirements, and lamp fixtures and lumens would be selected accordingly.

Operation and Maintenance Facilities

No Operations and Maintenance (O&M) facilities would be installed on any of the sites. All maintenance would be performed by personnel located offsite.

Onsite Telecommunication Cell Towers

There would be no telecommunication towers installed at any of the sites.

Construction Activities

Schedule and Workforce

The construction activities for the proposed project fall into three main categories: (1) site grading and earthwork; (2) solar array construction; and (3) electrical interconnection to transmission owner infrastructure. Construction would take approximately 10 to 12 months. Site grading and earthwork is anticipated to begin during the fourth quarter of 2021, with operations beginning in the third or fourth quarter of 2022. Construction would primarily occur during daylight hours, Monday through Friday. Additional hours/days may be necessary to facilitate the schedule.

The construction workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The average workforce is expected to be approximately 500 to 600 construction, supervisory, support, and construction management personnel onsite during construction. The onsite workforce has been conservatively estimated to peak at approximately 800 individuals for short periods of time, which is typically a few weeks. The project construction crews would have a staggered workday, with multiple shifts of workers coming onsite between the hours of 6:00 a.m. and 10:00 a.m. in the mornings, and leaving between 2:00 p.m. and 6:00 p.m. It is anticipated that the construction workforce would commute to the site each day from local communities. In compliance with Kern County Noise Ordinance (Municipal Ordinance Code 8.36.020) construction activities would not occur between the hours of 9:00 p.m. and 6:00 a.m. on weekdays and 9:00 p.m. to 8:00 a.m. on weekends for construction sites located within 1,000 feet of an occupied residential dwelling. Construction personnel not drawn from the local labor pool are anticipated to stay in nearby hotels.

During construction, dusk-to-dawn security lighting would be required for the temporary construction staging area, parking area, construction office trailer entries, and site access points. Lighting is not planned for typical construction activities because construction activities would occur primarily during daylight hours; however, if required, any lighting would be temporary, directed downward, and limited to that needed to ensure safety and security.

Multiple portable toilets would be used during construction, and wastewater would be trucked offsite for disposal in accordance with all applicable regulations by a licensed sewage disposal company.

Site Grading and Earthwork

Beginning work on the project would involve preparing the land for installation of arrays, related infrastructure, access driveways, and temporary construction staging area.

Site preparation would involve the removal and proper disposal of existing vegetation and debris that would unduly interfere with project construction or the health and safety of onsite personnel. Dust minimizing techniques would be employed, such as maintaining natural vegetation where possible, utilizing “mow-and-roll” vegetation clearance strategy, application of water, and application of dust suppressants. Conventional grading would be minimized to the maximum extent possible to reduce unnecessary soil movement that may result in dust. Earthworks scrapers, excavators, dozers, water trucks, paddlewheels,

haul vehicles and graders may all be used to perform grading. Land-leveling equipment, such as a smooth steel drum roller, would be used to even the surface of the ground and to compact the upper layer of soil to a value recommended by a geotechnical engineer for structural support. Access roads may be additionally compacted to 90 percent or greater, as required, to support construction and emergency vehicles. Certain access roads may also require the use of aggregate to meet emergency access requirements. Soil movement from grading would be balanced on the site, and it is anticipated that no import or export of soils would occur.

Trenching would be required for placement of underground electrical and communications lines, and may include the use of trenchers, backhoes, excavators, haul vehicles, compaction equipment and water trucks. After preparation of the site, the pads for structures, equipment enclosures and equipment vaults would be prepared per geotechnical engineer recommendations.

Solar Array Assembly

Erection of the solar arrays would include support structures and associated electrical equipment. First, steel piles would be driven into the soil using pneumatic techniques, similar to a hydraulic rock hammer attachment on the boom of a rubber-tired backhoe excavator. If shallow bedrock, or other obstructions are encountered, the pile locations would be predrilled and then grouted in place with concrete. Once the piles have been installed, the horizontal array support structures would be installed. The final design of the horizontal array support structures may vary, depending on the final selection of the PV technology, as well as whether a fixed tilt or tracking system is selected. Once the support structures are installed, workers would begin to install the solar modules. Solar array assembly and installation would require trenching machines and excavators, compactors, concrete trucks and pumpers, vibrators, forklifts, boom trucks, graders, pile drivers, drilling machines, and cranes.

Concrete would be required for the footings, and pads for the medium voltage transformers, inverters, and communications buildings. Concrete may also be required for pile foundation support depending on the proposed mounting system chosen for installation and whether obstructions are encountered when trying to drive piles. Final concrete specifications would be determined during detailed design engineering. Concrete would be purchased from an offsite supplier and trucked onto the project sites.

During this work, there would be multiple crews working on the site with vehicles, including special vehicles for transporting the modules and other equipment. As the solar arrays are installed, the solar switchyard would be constructed, and the electrical collection and communication systems would be installed. Within the solar fields, the electrical and communication wiring would be installed in underground trenches, although some of the mid-voltage collection runs and communications may be on overhead lines. Collection trenches would likely be mechanically excavated, though in some cases targeted shallow trench blasting may be required as a construction technique due to near-surface bedrock.

The wiring would connect to the appropriate electrical and communication terminations and the circuits would be checked and electrical service would be verified. Additionally, if a tracker system is utilized, the motors would be checked, and control logic verified. Once all the individual systems have been tested, the overall project would be ready for testing under fully integrated conditions.

Electrical Supply

The method of temporary power for construction is expected to be provided by mobile diesel-driven generator sets, batteries, by temporary electrical service from the local power provider, or a combination of all three methods.

Electrical Interconnection to Transmission Owner Infrastructure

The proposed project would connect with a 34 kV and/or 230 kV gen-tie line. Each of the project sites would have its own project substation approximately 1 to 2 acres in size.

Construction Water Use

Water needed for construction is expected to be trucked from an offsite water purveyor. The entire construction process is estimated to be approximately 10 to 12 months. Construction water demands are estimated to be approximately 500 acre-feet (AF) for dust control, site preparation and miscellaneous construction activities. Bottled water would be provided for crews during construction activities.

Initial construction water usage would be in support of site preparation and grading activities. During earthwork for grading of access road foundations, equipment pads and project components, the main use of water would be for compaction and dust control. Smaller quantities would be required for preparation of the concrete required for foundations and other minor uses. After the earthwork activities, water usage would be used for dust suppression and normal construction water requirements that are associated with construction of the building, internal access roads, revegetation and periodic cleaning of solar arrays.

Fire Control

The PV modules and ancillary equipment represent a negligible risk due to fire. However, the project would be required to have a fire prevention plan approved per applicable Kern County regulations.

Solid and Nonhazardous Waste

The proposed project sites would produce a small amount of solid waste associated with maintenance activities. Proposed project waste may include broken and rusted metal, defective or malfunctioning PV modules, electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers, particularly during construction activities. Waste materials would be collected, hauled by truck, separated for recycling where available, and disposed of at a regional disposal facility. Any defective or broken PV modules would be returned to the manufacturer for recycling.

Hazardous Waste

Small quantities of hazardous wastes would most likely be generated over the course of construction. These wastes may include biodegradable fluid and mineral oil from the transformers and miscellaneous electrical equipment. The spent oil would be collected and delivered to a recycling company at the time it is removed from the equipment. This material would not be stored on the proposed project site.

Project Operation and Maintenance Activities

The PV panel surfaces may be washed seasonally to increase the average optical transmittance of the flat panel surface. Panel washing is expected up to four times per year to complete. Staff of two to four people would be required during panel washing and are expected to be hired from the local community.

The facility's regular maintenance program would be largely conducted onsite during daytime hours as a safety precaution. Equipment repairs would typically take place in the early morning or evening when the plant is producing the least amount of energy.

Prudent security measures would be taken to ensure the safety of the public and facility. The proposed project would be fenced along all borders with locking gates at the specified points of ingress and egress. The security fence would be approximately 6- to 8-feet tall, with three strand barbed wire along the top. Offsite security personnel may be dispatched during nighttime hours or be onsite depending on security risks and operating needs. The project site would provide illumination for both normal and emergency conditions. Lighting would be designed to provide the minimum illumination needed.

The project site would produce a small amount of waste associated with maintenance activities. PV solar system wastes typically include broken and rusted metal, defective or malfunctioning modules, electrical materials, and empty containers and other miscellaneous solid materials, including typical household refuse generated by workers. Most of these materials would be collected and delivered back to the manufacturer for recycling.

Operations

The project proponent would ensure consistent and effective facility operations by:

- Responding to automated alarms based on monitored data, including actual versus expected tolerances for system output and other key performance metrics; and
- Communicating with customers, transmission system operators and other entities involved in facility operations.

Electrical Supply

Power for plant auxiliaries would be provided by the project's electrical generation or supplied by the local power provider. The proposed project would require power for the electrical enclosures, tracker motors, associated structures, and for plant lighting and security.

Lighting

The proposed project would include lighting that would be motion-detected and designed to provide the minimum illumination needed to achieve safety and security. Shielded and downward-facing fixtures would provide focused illumination on the desired areas only.

Maintenance

Maintenance to be performed on the sites for the proposed project would consist of equipment inspection and replacement. Maintenance would occur during daylight hours, when possible. However, maintenance activities on the PV modules and DC systems would be typically performed at night. Maintenance program elements include:

- Managing a group of prequalified maintenance and repair firms who can meet the Operations and Maintenance needs of the facility throughout its life;
- Creating a responsive, optimized cleaning schedule;

- Responding to plant emergencies and failures in a timely manner;
- Maintaining an inventory of spare parts to ensure timely repairs and consistent plant output;
- Systematically maintaining a log to effectively record and track all maintenance problems; and
- Performing maintenance on the site as required to clear obstructive ground cover.

Security

To ensure the safety of the public and the solar generating facility, the proposed project site would be fenced, and signs would be posted. Security measures would be installed as necessary to mitigate and/or deter unauthorized access, including lighting. Access to the project site would be controlled and gates would be installed at the roads entering the proposed project site.

Operations Water Use

Water would be used during PV panel washing activities, which is anticipated to occur up to four times a year, as needed. Long-term operational water demand is anticipated to be approximately 4.4 AF of water per washing cycle, or a total of 19 AFY for panel washing. Water for panel washing is expected to be trucked and/or obtained from a local water purveyor.

Project Decommissioning

The project proponents expect to sell the renewable energy electricity produced by the product under the terms of a long-term Power Purchase Agreement (PPA) or directly into the wholesale market. The life of the solar facility is anticipated to be up to 35 years; however, the project proponents may choose to extend the life of the facility, update technology and re-commission, or decommission and remove the system and its components. When a decommissioning event occurs, the solar site could then be converted to other uses in accordance with applicable land use regulations in effect at that time.

When project decommissioning occurs, project structures would be removed from the project site. Above-ground and underground equipment would be removed. The substation would be removed if it is owned by the project, however if a public or private utility assumes ownership of the substation, the substation may remain onsite to be used as part of the utility service to supply other applications. Project roads would be restored to their pre-construction condition unless the landowner elects to retain the improved roads for access throughout that landowner's property. The area would be thoroughly cleaned, and all debris removed. As discussed above, most materials would be recycled to the extent feasible, with minimal disposal to occur in landfills in compliance with all applicable regulations. A collection and recycling program would be executed in the event system components are manufactured with hazardous materials

A collection and recycling program would be executed to promote recycling of project components and minimize disposal of project components in landfills. All decommissioning and restoration activities would adhere to the requirements of the appropriate governing authorities and in accordance with all applicable federal, state, and county regulations. The project proponents expect a secondary market for PV modules to develop over time. Although energy output may diminish, PV modules are expected to continue to have a productive life and can be decommissioned from a prime location or re-commissioned in another location.

Relationship of the Proposed Project to Other Solar Projects

The proposed project is being developed independently of other approved or proposed solar projects in the County. If approved, the Raceway 2.0 Solar Project facilities, would be subject to their own use permits, conditions of approval, interconnection agreements, and power purchase agreements. The County understands that the proposed project facilities would be built and operated independently of any other solar project, and, if approved, would not depend on any other solar project for economic viability. The proposed project involves constructing a new gen-tie line to deliver energy to the Big Sky North Substation (existing collector substation) or future LADWP Substation.

1.4 Project Objectives

The project proponents have defined the following objectives for the project:

- Maximize renewable energy production and economic viability through the installation of 291-MW of solar PV panels on approximately 1,311 acres of private lands with high solar insolation values.
- Locate the project on disturbed land or land that has been previously degraded from prior use.
- Minimize offsite impacts by using existing electrical distribution facilities, rights-of-way, roads, and other existing infrastructure where possible to minimize the need for new electrical support facilities.
- Minimize impacts to threatened or endangered species or their habitats, wetlands and waters of the United States, cultural resources, and sensitive land use.
- Generate substantial direct and indirect economic opportunities in Kern County during construction with the creation of “green” jobs.
- Minimize water usage.
- Assist the State of California in reducing fossil fuel air quality pollution and in achieving the greenhouse gas emission reductions required by the California Global Warming Solutions Act (Assembly Bill 32).
- Offset approximately 695,475 tons of carbon dioxide equivalent annually that would have resulted from producing an equivalent amount of electricity utilizing generators powered by fossil fuels
- Develop a viable source of clean energy to assist California and its utilities in fulfilling California's Renewable Portfolio Standard (RPS) Program. In October 2015, Governor Brown signed into law Senate Bill 350, which establishes a new RPS for all electricity retailers in the state. Electricity retailers must adopt the new RPS goals of 50 percent of retail sales from renewables by the end of 2030.
- Use proven and established PV technology that is efficient and requires low maintenance.

1.5 Proposed Discretionary Actions/Required Approvals

The Kern County Planning and Natural Resources Department as the Lead Agency (per CEQA Guidelines Section 15052) for the proposed project, has discretionary responsibility for the proposed project. The proposed project is owned by sPower. To implement this project, the project proponent may need to obtain the following discretionary and ministerial permits/approvals as detailed below:

Federal

- U.S. Fish and Wildlife Service (USFWS)
- United States Army Corps of Engineers Section 404 Permit

State

- California Public Utilities Commission (CPUC)
    - Section 851 Permit
- California Department of Fish and Wildlife (CDFW)
    - Section 1600 et seq. permits (Streambed Alteration Agreements)
    - Section 2081 Permit (State-listed endangered species)
- Lahontan Regional Water Quality Control Board (RWQCB)
- Waste Discharge Requirements
    - Regional Water Quality Certification (401 Permit)
- National Pollution Discharge Elimination System (NPDES) Construction General Permit
- General Construction Stormwater Permit (Preparation of a SWPPP)
- California Department of Transportation (Caltrans)
    - Oversized Loads Permit

Other additional permits or approvals from responsible agencies may be required for the project

Local

Kern County Board of Supervisors/Kern County Planning Commission

- Certification of Final Environmental Impact Report
- Adoption of Mitigation Monitoring and Reporting Program
- Adoption of 15091 and 15093 Findings and Statement of Overriding Considerations
- Approval of Kern County General Plan Amendments to Circulation Element (Elimination of Future Road Reservations) and Zone Changes
- Approval of Kern County Conditional Use Permits, Willow Springs Specific Plan Amendments, and Williamson Act Cancellation Agreement

Kern County Public Works

- Approval of Kern County Grading Permits
- Approval of Kern County Building Permits
- Approval of Kern County Access Road Design and Encroachment Permits

Kern County Fire Department

- Fire Safety Plan

Eastern Kern Air Pollution Control District (EKAPCD)

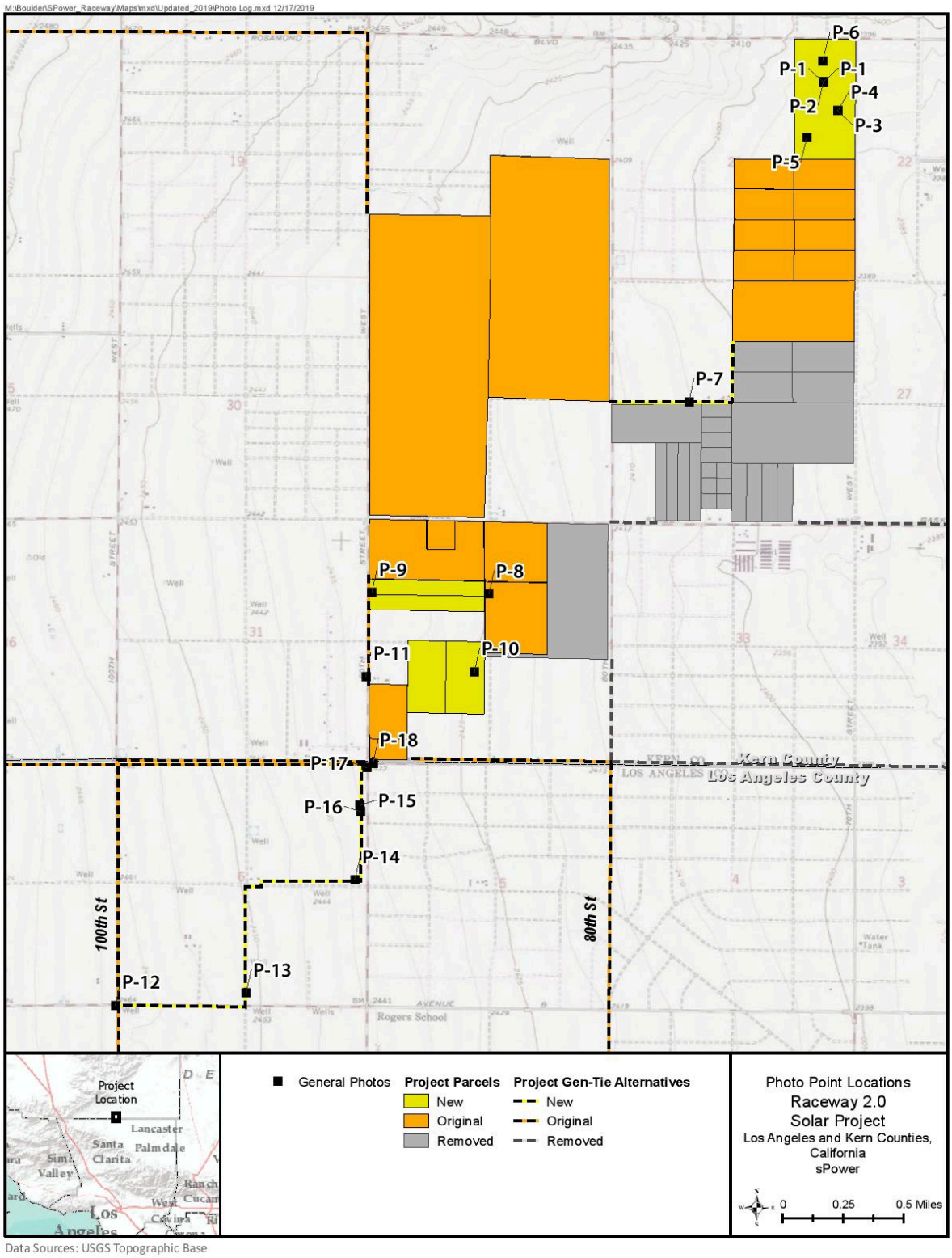
- Fugitive Dust Control Plan
- Authority to Construct (ATC)
- Permit to Operate (PTO)

The preceding discretionary actions/required approvals are potentially required and do not necessarily represent a comprehensive list of all possible discretionary permits/approval required. Other additional permits or approvals from responsible agencies may be required for the proposed project.

Attachment 4

Site Photographs

Photolog – Raceway Solar



Data Sources: USGS Topographic Base



P-1: Representative habitat for the northernmost parcel (APN: 374-011-07); facing southwest.



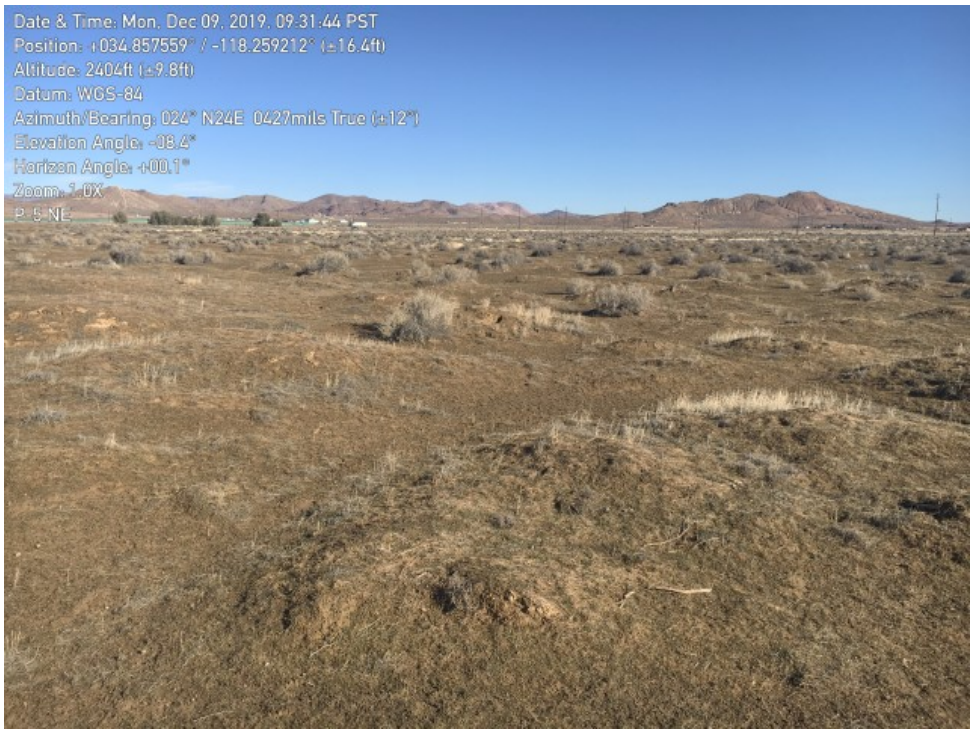
P-2: Representative habitat for the northernmost parcel (APN: 374-011-07); facing north.



P-3: NHD-mapped stream within the northernmost parcel (APN: 374-011-07) – stream not present; facing southeast.



P-4: NHD-mapped stream within the northernmost parcel (APN: 374-011-07) – stream no present; facing northwest.



P-5: Representative habitat in the southwestern corner of the northernmost parcel (APN: 374-011-07); facing northeast.



P-6: Tamarisks within the northernmost parcel (APN: 374-011-07); facing northwest.



P-7: Representative habitat along the new gen-tie line; facing west.



P-8: Representative habitat of the southern parcels (APN: 374-250-09 and 374-250-08); facing west.



P-9: Representative habitat of the southern parcels (APN: 374-250-09 and 374-250-08); facing east.



P-10: Representative habitat of the southernmost parcels (APN: 374-020-47 and 374-020-48); facing west.



P-11: Swainson's hawk nest on the western side of 90th west; facing west.



P-12: Representative habitat and lack of NHD-mapped stream feature along the southern gen-tie line; facing east.



P-13: Representative habitat along the southern gen-tie line; facing north.



P-14: Representative habitat along the southern gen-tie line; facing west.



P-15: Representative habitat along the southern gen-tie line; facing north.



P-16: Representative habitat along the southern gen-tie line; facing south.



P-17: Representative habitat along the southern gen-tie line; facing east.



P-18: Representative habitat along the southern gen-tie line; facing north.

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TECHNICAL MEMORANDUM

To: Dallas Pugh
sPower
5000 East Spring Street, Suite 130
Long Beach, CA 90815

From: Pauline Roberts, Senior Natural Resources Project Manager

Date: July 24, 2020

Re: **Burrowing Owl Survey Results for the Raceway Solar 2.0 Project / SWCA Project No. 060110**

INTRODUCTION

This memorandum summarizes the results of the focused burrowing owl (*Athene cunicularia*) survey conducted by SWCA Environmental Consultants (SWCA) for the approximate 1,300-acre Raceway Solar 2.0 Project (project) located in the community of Rosamond in southeastern Kern County, California in the Mojave Desert (Figures 1–3). The project also includes several generation tie-line (gen-tie) options that connect to Southern California Edison's electrical grid at the Big Sky North Substation in Los Angeles County.

The survey was conducted to support environmental analysis of the project pursuant to the California Environmental Quality Act (CEQA) and supplements the Final Biological Resource Report prepared for the project by Ecology and Environment, Inc.[1] Following current burrowing owl survey guidelines required by California Department of Fish and Game (now known as California Department of Fish and Wildlife [CDFW], the survey consisted of five (5) visits to the project site.[2] The purpose of the first visit was to search for and record the location of all potentially suitable burrows throughout the entire project area; this survey was required to have been conducted between February 15 and April 15. Three follow-up surveys were conducted to determine burrow occupancy and were spaced at least three weeks apart as recommended by CDFW. After the three follow-up surveys were completed, one additional visit was conducted to determine the status of a potential burrowing owl nest site.

METHODS

The initial burrowing owl survey was conducted from April 14–17 and April 22–April 24, 2020. SWCA biologists Ryan Myers, Marlee Antill, Maisie Borg, and Austin Xu performed the survey during the first week, while Mr. Myers, Marshall Webb, and Sharif Durzi completed the survey during the second week.

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[1] sPower. 2018. Raceway Solar Final Biological Resources Report. Prepared by Ecology and Environment, Inc., San Francisco, California.

[2] California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. California Department of Fish and Game, Sacramento, California.

The biologists walked parallel transects spaced approximately 7–20 meters apart throughout the project site to search for any potentially suitable burrows. Along the gen-tie routes, two biologists walked two transects that were spaced 20 meters apart; one biologist on each side. Suitable burrows included burrows excavated by California ground squirrels (*Otospermophilus beecheyi*) (minimum entrance size of 4 inches in diameter), desert kit fox (*Vulpes macrotis arsipus*) dens, and American badger (*Taxidea taxus*) dens.[3] Any potentially suitable burrow encountered was examined. General size and shape were recorded along with any signs of occupancy such as whitewash, pellets, prey remains, or decorations. Each burrow was photographed, and its location recorded on a global positioning system (GPS) unit. The biologists also recorded incidental observations of other wildlife species during the surveys (Appendix A).

The three follow-up surveys were conducted by Mr. Durzi, Mr. Webb, and SWCA biologist Par Singhaseni. The first follow-up visit was performed by Mr. Durzi and Mr. Webb on May 19, 2020. The second and third follow-up visits were conducted by Mr. Webb and Ms. Singhaseni on June 9 and June 30, 2020. During the follow-up visits each burrow recorded during the initial survey was examined and monitored to determine occupancy status (Figures 4–7). The biologists surveyed each area with binoculars, then approached each burrow when no burrowing owls were observed. When burrowing owls were present, the biologists remained in their vehicles and watched them from a distance of at least 500 feet to reduce the disturbance to the owls. The biologists then determined if chicks were present or if the owls were exhibiting nesting behaviors. Nesting behaviors include the males guarding the burrow entrance, foraging, and bringing food to the nest.

After completing the three follow-up visits, the biologists determined that a fourth survey was needed to determine the status of one potential burrowing owl nest site. Ms. Singhaseni completed the fourth and final survey on July 1, 2020. Because one owl was present (see Results below), she did not approach the burrow.

RESULTS

The project site conditions during the initial April survey and the May–June follow-up visits differed in vegetation composition (Figures 8–15). The April survey occurred during the blooming season for most plants in the region and large wildflower fields were present in the project area. The vegetation was completely dried out by the time the follow up visits were conducted. Survey conditions were variable during the initial surveys and warmed up considerably during the follow up visits (Table 1).

Table 1. Survey conditions

Date	Survey Start	Survey End	Temperature (°F)	Conditions
4/14	0900	1630	60–68	Sunny, 10–12 mph wind speed
4/15	0800	1700	48–76	Sunny, 2–16 mph wind speed
4/16	0800	1700	57–74	Sunny, 9–22 mph wind speed
4/17	0800	1630	53	Cloudy, 11 mph wind speed
4/22	0800	1600	60–81	Sunny, 2–6 mph wind speed
4/23	0730	1730	61–81	Sunny, 7–21 mph wind speed
4/24	0730	1200	57–80	Sunny, 3–7 mph wind speed
5/19	0830	1400	55–68	Sunny, 15–20 mph wind speed

[3] Cornell Lab of Ornithology. 2020. Burrowing owl. Available at: https://birdsoftheworld-org.proxy.birdsoftheworld.org/bow/species/burowl/cur/breeding#pheno. Accessed July 2020.

Date	Survey Start	Survey End	Temperature (°F)	Conditions
6/9	0830	1430	64–87	Sunny, 4–13 mph wind speed
6/30	0830	1430	73–90	Sunny, 2–10 mph wind speed
7/1	0645	0845	64	Sunny, 6 mph wind speed

Burrowing Owls

A total of 83 potential burrows were documented during the surveys (see Figures 4–7, Table 2). Potential burrows include both natural burrows and manmade structures, such as concrete irrigation standpipes. Of these, four burrows were determined to be occupied (two active nests and two occupied burrows), one concrete structure with avian skeletal remains, and 78 were determined to be unoccupied burrows (five with sign, and 73 without sign). Of the 73 unoccupied burrows without sign, two are artificial burrows previously built for a separate solar project.

Table 2. Potential burrows

ObservationType	Quantity	Description
Occupied Burrow, Active Nest	2	Burrows with chicks present and/or adults exhibiting nesting behavior.
Occupied Burrow, Nesting not Confirmed	2	Two adjacent burrows with at least one owl present. Not mate was observed, and nesting was not confirmed (shown as non-nesting on Figure 5).
Unoccupied, with Sign	5	Suitable potential burrows with burrowing owl signs such as whitewash, pellets, feathers, or beetle carcasses.
Unoccupied, No Sign	73	Suitable potential burrows that have no sign of occupancy.
Skeletal Remains	1	A concrete structure with avian skeletal remains presumed to be burrowing owl.
Artificial Burrow	2	Manmade burrows constructed for a separate solar project.

Occupied Burrow, Active Nest: Two active nests were observed during the surveys, but both were located outside of the project boundary. The nests were initially observed on June 30, 2020. One nest is located along Gaskell Road approximately 400 feet north of the project boundary (see Figure 5) and approximately 0.25 mile north of the single burrowing owl described above. Two adult and two juvenile owls were observed at this location (Figure 18). The second active nest is located among the photovoltaic (PV) solar arrays in the Antelope Expansion 2 Solar Project, approximately 500 feet west of the 100th Street West gen-tie option and north of West Avenue E (see Figure 7). Two adults and three juveniles were confirmed to be present during a separate survey on July 6, 2020 (Figure 19). The juveniles at both nests were large and appeared to be nearly fledged.

Occupied Burrow, Nesting not Confirmed: Two adjacent burrows were determined to be occupied by a single adult burrowing owl (Figure 16). The owl was determined to be an adult based on the pale coloration of its feathers, which is caused by sun exposure. Juvenile owls do not develop this trait and generally exhibit more vibrant coloration. The burrows are located approximately 900 feet south of Gaskell Road and are approximately 18 feet apart (listed as non-nesting on Figure 5). Both burrows had whitewash, pellets, and feathers at the entrance present during all surveys. The burrowing owl was first observed during the third follow-up visit on June 30. Prior to this date, the burrows appeared to be

unoccupied because of the presence of debris and cobwebs in the entrances and lack of new whitewash and pellets compared to the previous visits (Figure 17).

On July 1, Ms. Singhaseni conducted a fourth visit to determine the nesting status. The owl was observed foraging on five separate occasions within a 2-hour period but did not appear to bring food to a mate or chicks. No other burrowing owls were observed at this location. Based on the timing of the survey and the nest status of other burrowing owls in the vicinity, any chicks present should have already emerged from the burrow. Either the owl was not paired, or the burrow contained a nest that was initiated unusually late in the season.

Unoccupied, with Sign: Five unoccupied burrows with signs of burrowing owl were found in the project area (see Figure 4). These signs included whitewash (feces), beetle carapaces, and/or feathers (Figure 22). These burrows typically had open entrances, but had no signs of recent use during the follow-up surveys. The potential burrows include both natural burrows and irrigation standpipes.

Unoccupied, No Sign: Seventy-one potential burrows throughout the project area were determined to be unoccupied and had no signs of burrowing owl. These burrows are all suitable for burrowing owl and included both natural burrows and manmade structures (Figures 23 and 24). However, most of the potential burrows were either partially collapsed, had vegetation or debris in the entrance, or appeared to be occupied by California ground squirrels. Burrowing owls and California ground squirrels generally do not occupy the same burrow, but may be found occupying adjacent burrows.[4]

Skeletal Remains: During the initial surveys, avian skeletal remains were found in a large concrete structure located along Holiday Avenue west of 80th Street West (see Figure 4). The bird skeletons are presumed to be burrowing owl based on the overall size, long leg bones, and the shape of the bill and skull (Figure 20). The cause of the mortalities could not be determined because there was no remaining flesh or feathers or any indication of predation. The structure may be the site of a failed nest based on the number of bird skeletons (approximately 3–5) and the hundreds of small mammal bones located at the bottom of the structure (Figure 21). Other notable details about this location is the presence of a wooden pole adjacent to the concrete structure. Two common raven (*Corvus corax*) nests were found on the wooden pole, but only one was active during the surveys.

Artificial Burrow: In addition to the potential burrows found during the survey, two known artificial burrows located along the 100th Street West gen-tie option, were also monitored during the follow-up visits (Figure 25). The artificial burrows are located approximately 500 feet northeast of the active nest in the Antelope Expansion 2 Solar Project (see Figure 7). No burrowing owls or sign were observed at the artificial burrows.

Swainson's Hawk

Incidental to the burrowing owl surveys, a pair of Swainson's hawks (*Buteo swainsoni*) was observed nesting within the project area (see Figure 4). Swainson's hawk is a threatened species under the California Endangered Species Act (CESA). The pair was first observed during the April surveys and confirmed to be nesting during the June surveys (Figure 26). On June 30, the biologists observed 2–3 chicks in the nest, and one adult carrying food to the nest (Figure 27).

[4] Coulombe, H. N. 1971. Behavior and Population Ecology of the Burrowing Owl, *Speotyto cunicularia*, in the Imperial Valley of California. *The Condor*. 73:162-176.

Other Special Status Wildlife Species

Two other special status wildlife species, desert kit fox (California protected fur-bearer) and American badger (California species of special concern), were determined to be present in the project vicinity based on the presence of signs. Neither species was directly observed: both species are nocturnal and would have been underground during the daytime surveys. Desert kit fox scat was found at several potential burrowing owl burrow locations. The occurrence data for this species is not tracked in any online database, but they are known to be widespread throughout the Mojave Desert.

Two potential American badger dens were found within the project area (see Figure 4). The dens were excavated sometime between the May 19 and June 9 surveys. Both had fresh scrapes along the walls and loose soil at the entrances (Figure 28).

DISCUSSION

As a result of the burrowing owl surveys, within the Raceway 2.0 Solar Project area, no active nests were confirmed within the project boundary. Two active nests were found near the project but outside the project boundary (see Figures 5 and 6), and one occupied burrow with an owl but no confirmed nest was identified within the main project area.

At the occupied burrow with the single adult, it is not likely that the burrow contained an active nest at the time of the surveys (see Figure 5). The two burrows occupied by this owl had no signs of activity prior to the June 30 survey, which they would have for a typical nest. Instead, the biologists documented the cobwebs in the entrance and that burrowing owl signs were absent in April and May visits. While it is possible that the owl was nesting, it is highly unlikely given the timing of the observation. Burrowing owl egg laying occurs from March to May, and chicks typically emerge approximately 2 weeks after hatching.[5] Because the final surveys were conducted on June 30 and July 1, any chicks present should have already emerged.

Observations indicate that burrowing owls may have nested within the project area in prior years. Skeletal remains likely belonging to burrowing owls were found in a large concrete structure within the project area: the structure is potentially an old nest site. While the site cannot be confirmed as a nest site, the presence of 3–5 bird skeletons and numerous small mammal bones are consistent with the contents of a burrowing owl nest.

In addition to the live observations and skeletal remains, 78 unoccupied potential burrows (5 with sign, 73 without sign) were found within the project area and along the gen-tie routes. Burrowing owls are present year-round in the western Mojave Desert. Based on the site conditions, habitat suitability, and presence of numerous potential burrows, burrowing owls are likely to nest and overwinter in the project area.

Other special status species that occur throughout the western Mojave Desert were confirmed to be present or are likely to be present in the project area. Swainson's hawk was confirmed to be nesting within the project boundary. Swainson's hawks often reuse nest sites and may continue to nest in the same location in the future.[6] Lastly, desert kit fox and American badger signs were found within the project site and these two mammals are likely to be present during project activities.

[5] Cornell Lab of Ornithology. 2020. Burrowing owl. Available at: https://birdsoftheworld-org.proxy.birdsoftheworld.org/bow/species/burowl/cur/breeding#pheno. Accessed July 2020.

[6] Cornell Lab of Ornithology. 2020. Swainson's Hawk. Available at: https://birdsoftheworld-org.proxy.birdsoftheworld.org/bow/species/swahaw/cur/breeding#nestsite Accessed July 2020.



Figure 1. Regional vicinity map.

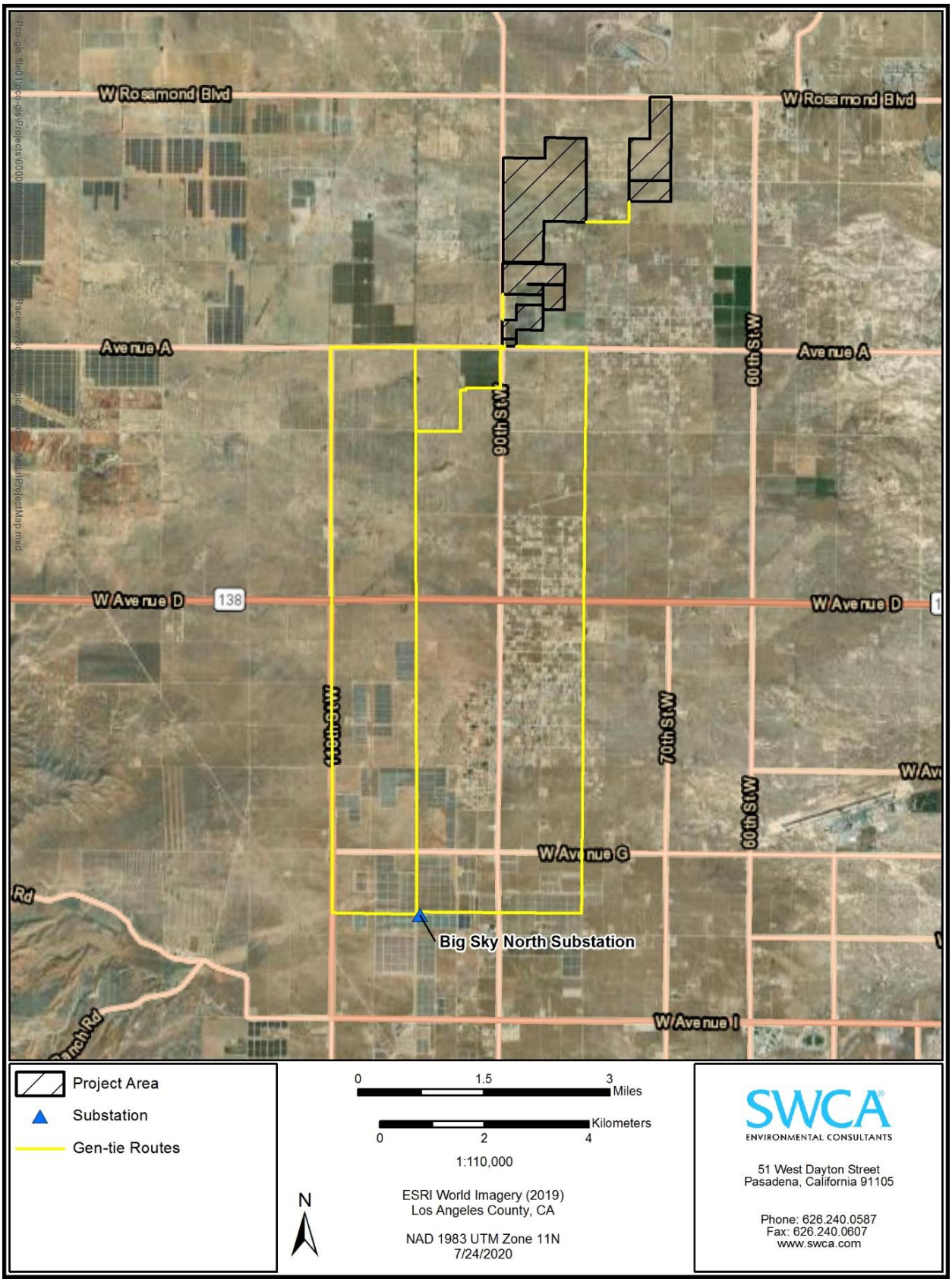

Figure 2. Project location and gen-tie options.

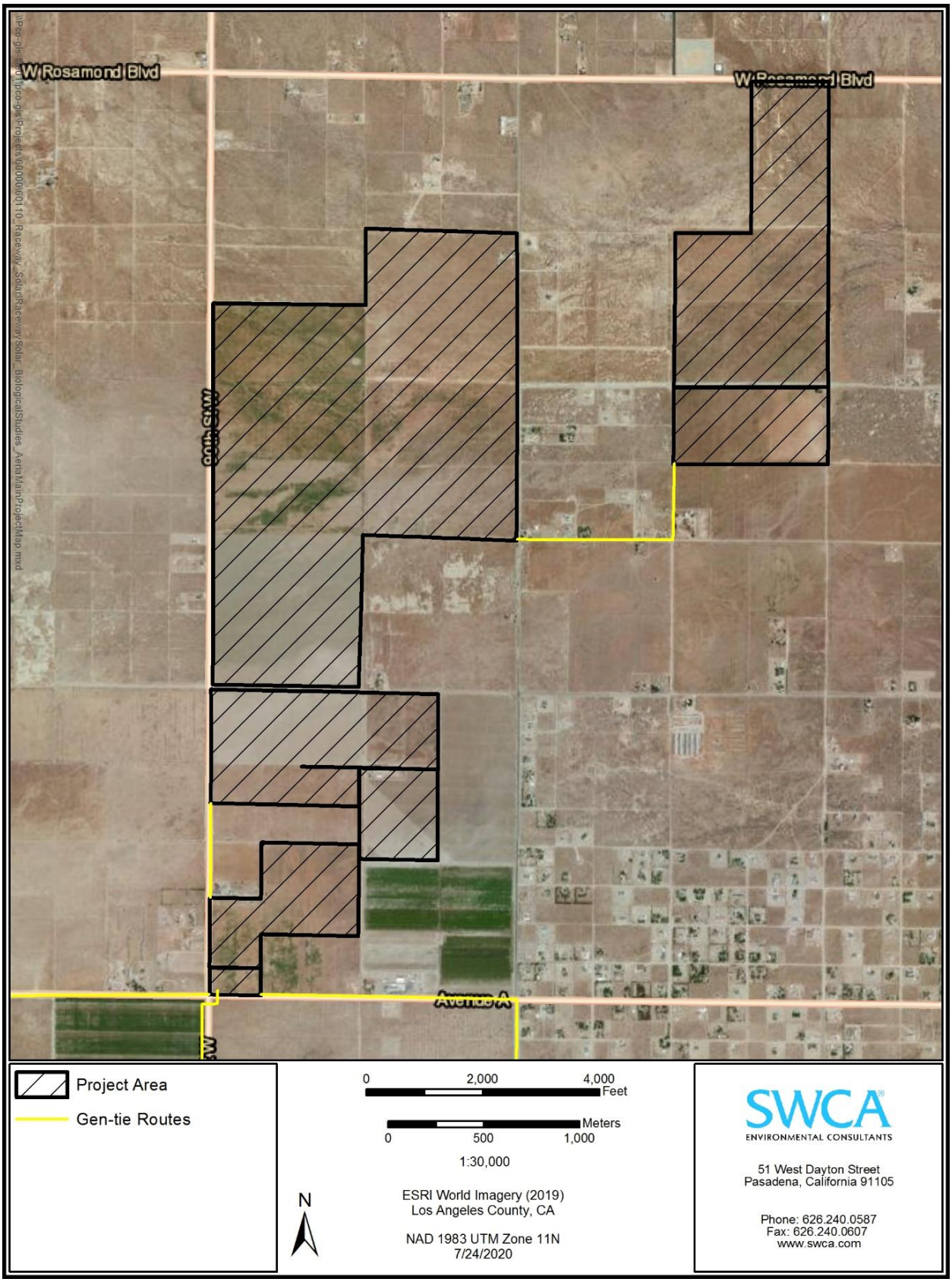

Figure 3. Main project area.

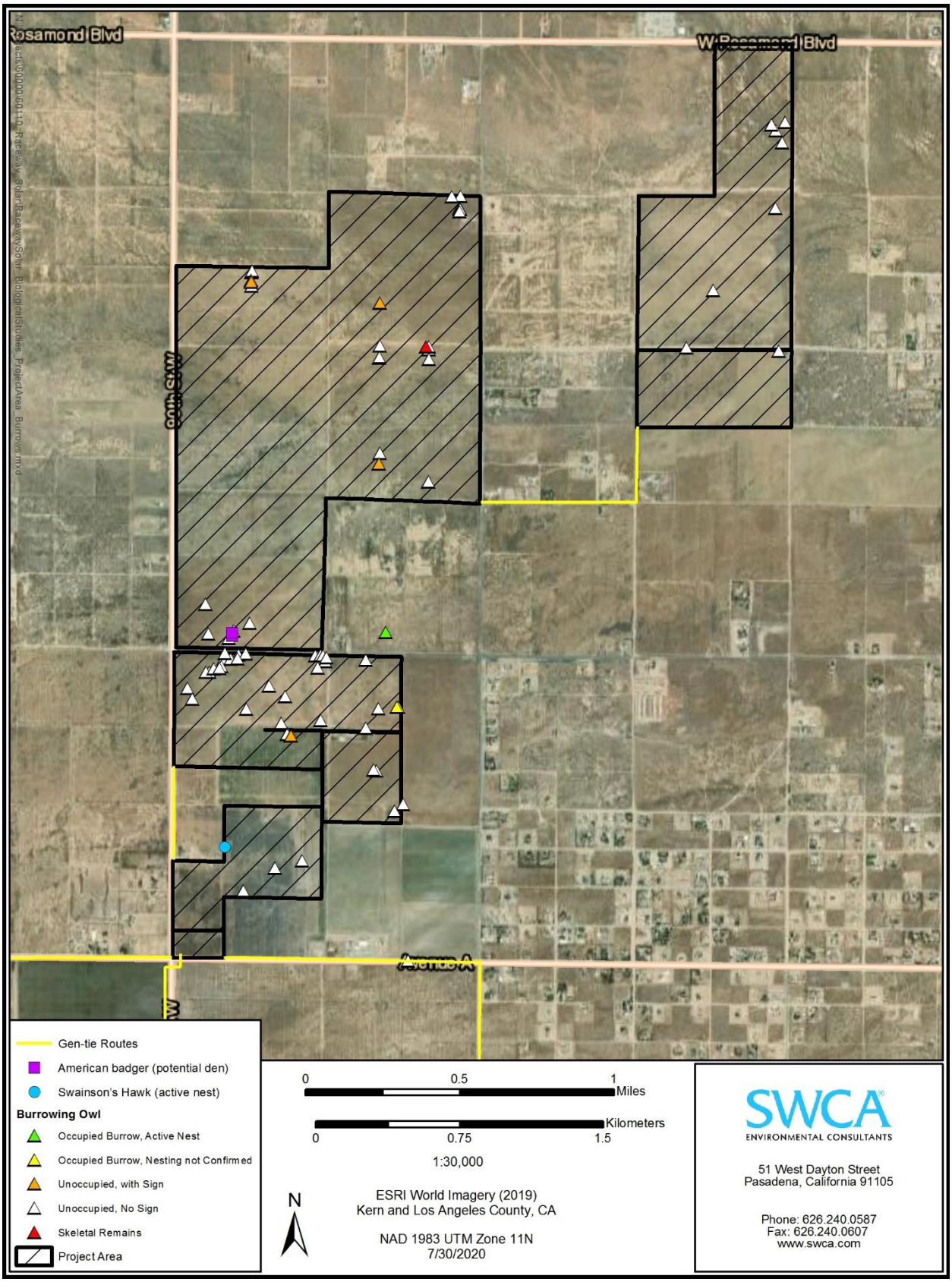

Figure 4. Locations of special status wildlife and signs in the project area.

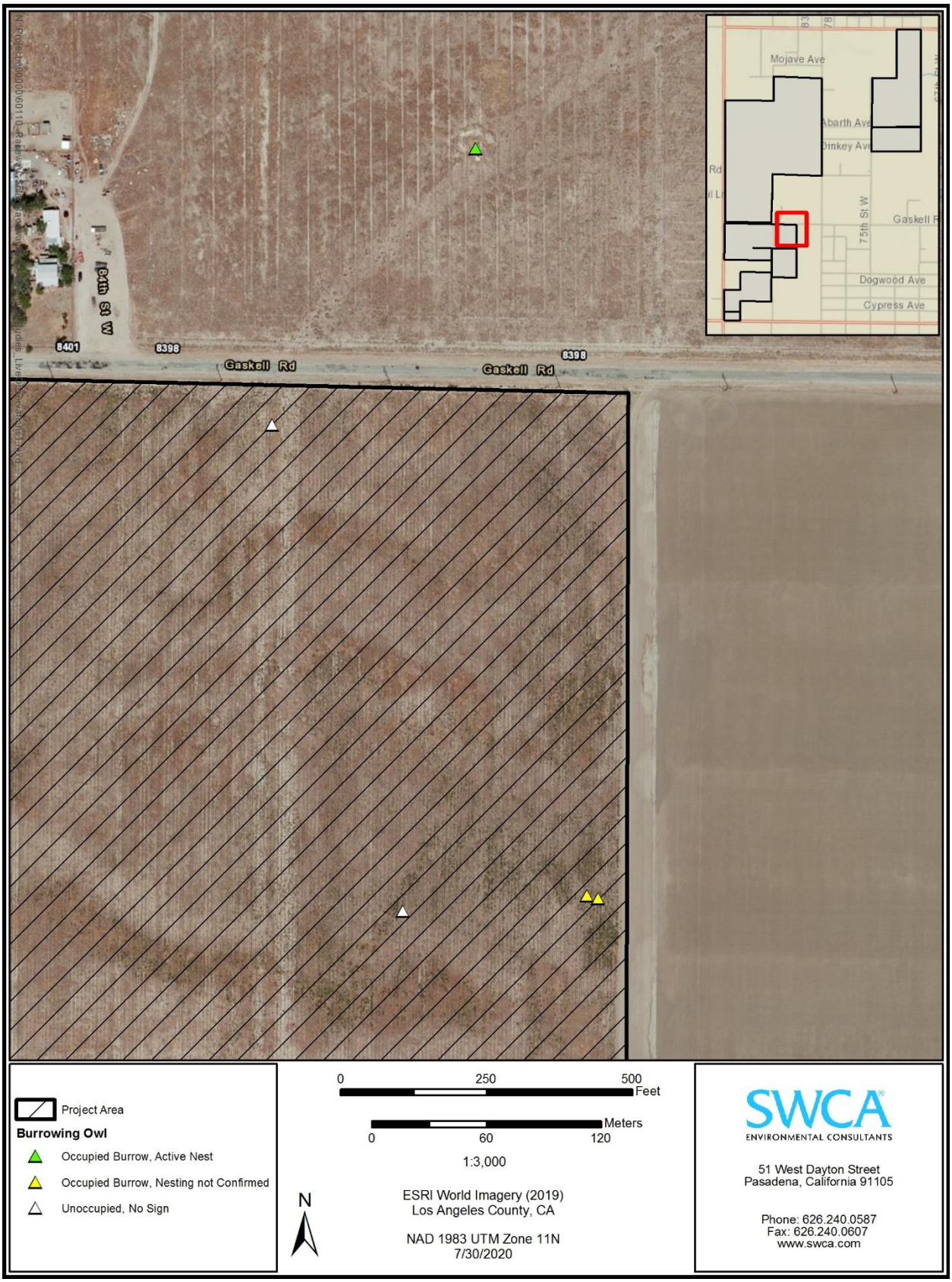

Figure 5. Location of live burrowing owl observations in the project area.

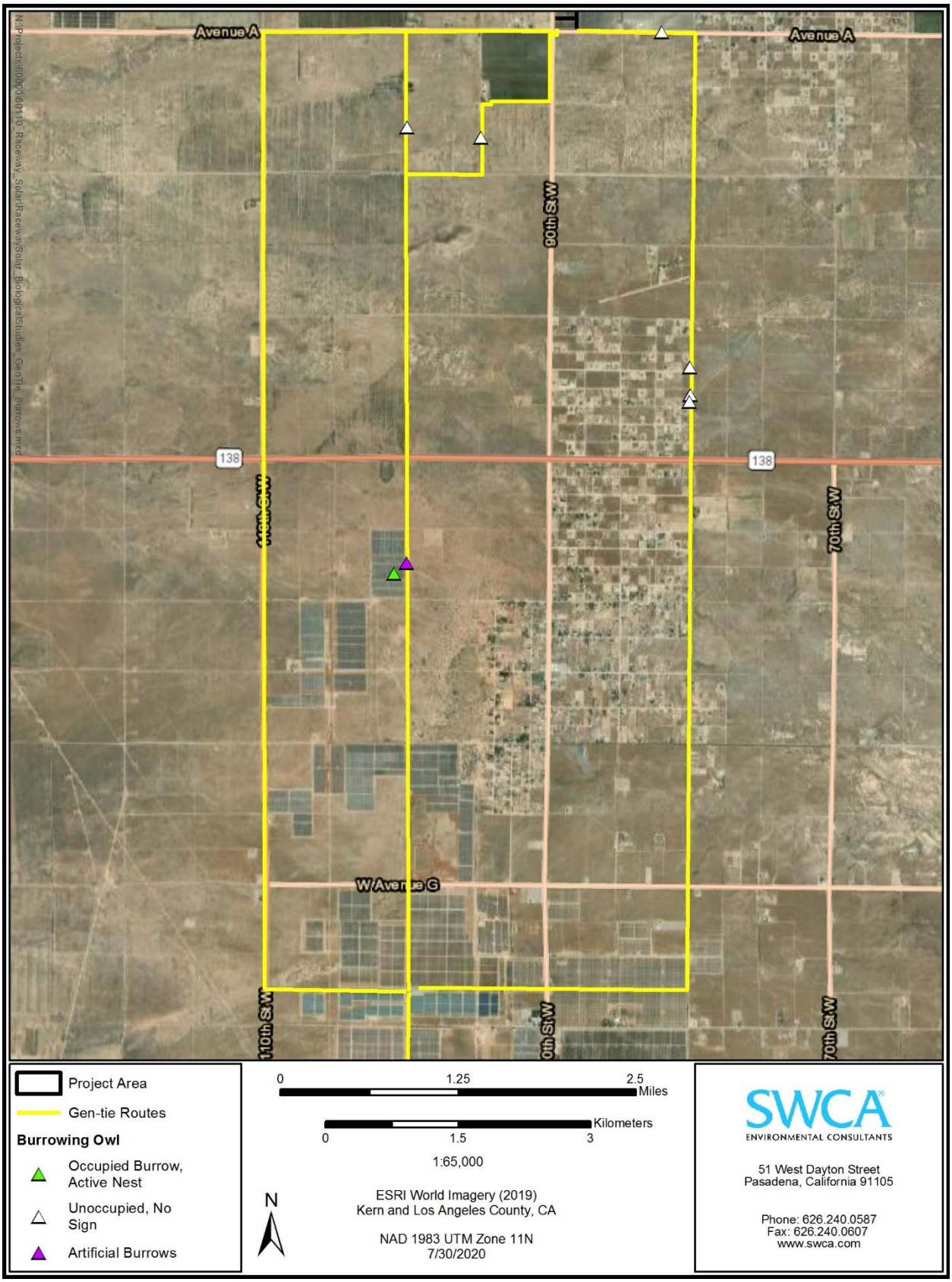

Figure 6. Burrowing owl burrow locations along the gen-tie routes.



Figure 7. Closer view of the burrowing owls and burrows along or near the gen-tie route.



Figure 8. Site conditions on April 14, 2020, facing southeast. Photographed from the northeastern parcel approximately 0.25 mile south of Rosamond Boulevard.



Figure 9. Site conditions on April 15, 2020, facing north-northeast. Photographed from the southeastern parcel along 75th Street West.



Figure 10. Site conditions on April 16, 2020, facing south-southeast. Photographed from the western parcel near the intersection 90th Street West and Sue Avenue.



Figure 11. Site conditions on April 17, 2020, facing north-northeast. Photographed from the southwestern parcel approximately 0.2 mile east of 85th Street West.



Figure 12. Site conditions on April 22, 2020, facing north-northeast. Photographed from the southwestern parcel approximately 0.1 mile west of 85th Street West.

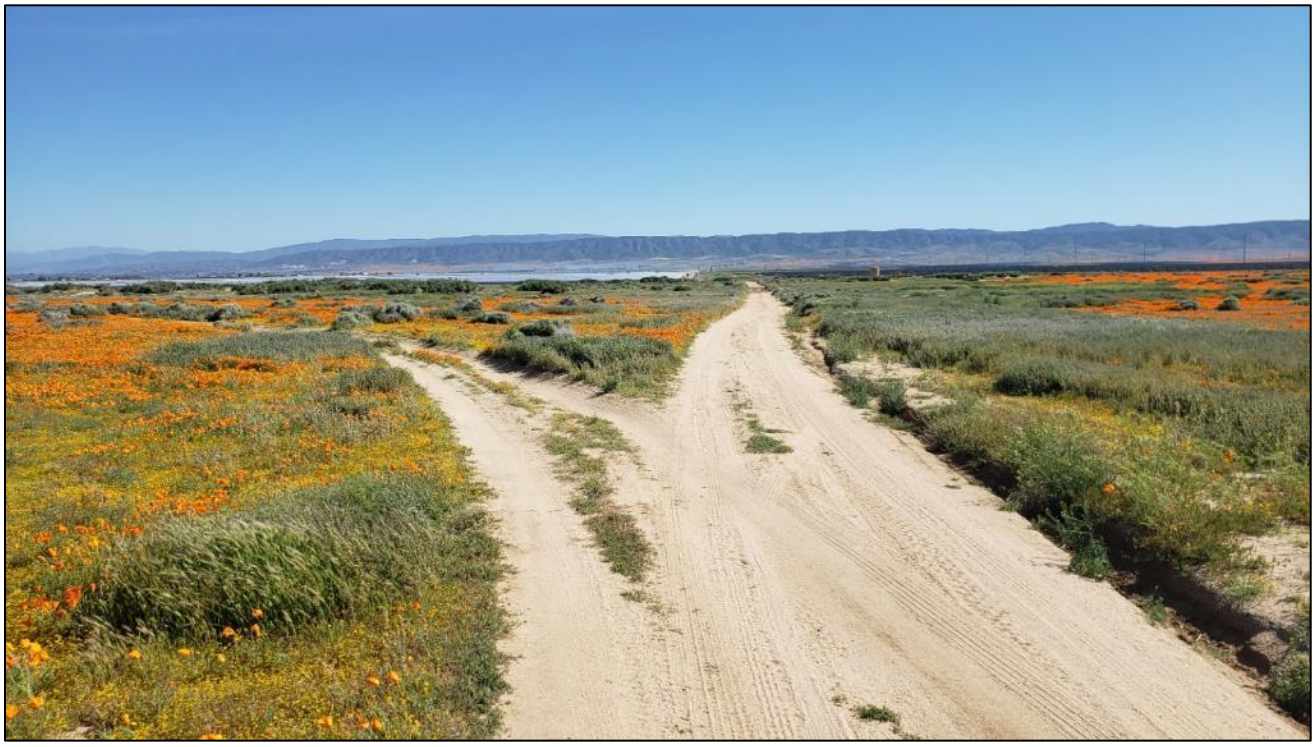

Figure 13. Site conditions on April 23, 2020, facing south. Photographed from 100th Street West, one of the proposed gen-tie routes. The intersection of West Avenue F and 100th Street West is approximately 0.25 mile south from this location.



Figure 14. Site conditions on June 19, 2020, facing south. Photographed along Gaskell Road between 85th Street West and 90th Street West.



Figure 15. Site conditions on June 19, 2020, facing south. The tree in the distance is the location of the Swainson's hawk nest. Photographed along Holiday Road between 85th Street West and 90th Street West.



Figure 16. A burrowing owl at the entrance of an occupied burrow, approximately 900 feet south of Gaskell Road. The arrow is pointing to the location of the second burrow occupied by this owl. Photographed on July 1, 2020.



Figure 17. One of the occupied burrows depicted in Figure 16. This burrow appeared to be unoccupied prior to June 30. Note the cobwebs and debris in the entrance. Photographed June 9, 2020.



Figure 18. Active nest located off-site along Gaskell Road, approximately 400 feet north of the project boundary. Three burrowing owls and a California ground squirrel are visible in this photo. Photographed June 30, 2020.



Figure 19. Active nest located approximately 500 feet west of the 100th Street West gen-tie route. Two juvenile owls are standing at the entrance of the burrow. The nest is located in the Antelope Expansion 2 Solar Project. Photographed July 6, 2020.



Figure 20. Large concrete structure where presumed burrowing owl skeletons were found. The structure is located along Holiday Avenue between 85th Street West and 90th Street West. Photographed June 9, 2020.



Figure 21. Interior view of the large concrete structure in Figure 20. Approximately 3–5 presumed burrowing owl skeletons are present along with hundreds of small mammal bones. Photographed on May 19, 2020.



Figure 22. Example of an unoccupied burrow with sign. Whitewash is visible on the soil at the entrance. Photographed June 30, 2020.



Figure 23. Example of an unoccupied potential burrow with no sign. The interior is collapsed and there is debris and vegetation in the entrance. Photographed June 9, 2020.



Figure 24. Example of an unoccupied potential burrow with no sign. Burrowing owls are known to nest and overwinter in concrete standpipes such as this. Photographed June 9, 2020.



Figure 25. Example of an artificial burrow entrance located along the 100th Street West gen-tie option. Two burrows, each with two entrances, were constructed as a mitigation measure for the Antelope Expansion 2 Solar Project. Photographed June 30, 2020.



Figure 26. Swainson's hawk nest tree. The arrow is pointing to the nest location. Photographed June 30, 2020.



Figure 27. An adult Swainson's hawk carrying a kangaroo rat (*Dipodomys* sp.). Photographed June 30, 2020.



Figure 28. An American badger potential den. This potential den was excavated sometime between May 19 and June 9. Photographed June 9, 2020.

APPENDIX A

Faunal Compendium

Scientific Name	Common Name
CLASS AMPHIBIA	**AMPHIBIANS**
HYLIDAE	**TREEFROGS**
Pseudacris hypochondriaca	Baja California chorus frog
CLASS REPTILIA	**REPTILES**
PHRYNOSOMATIDAE	**ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS**
Uta stansburiana	side-blotched lizard
TEIIDAE	**WHIPTAIL LIZARDS**
Aspidoscelis tigris tigris	Great Basin whiptail
COLUBRIDAE	**COLUBRID SNAKES**
Pituophis catenifer deserticola	Great Basin gopher snake
CROTALIDAE	**PIT VIPERS**
Crotalus scutulatus	Mojave rattlesnake
CLASS AVES	**BIRDS**
ARDEIDAE	**HERONS, BITTERNS**
Ardea alba	great egret
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
Buteo swainsoni[†]	Swainson's hawk
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
CHARADRIIDAE	**PLOVERS**
Charadrius vociferus	killdeer
COLUMBIDAE	**PIGEONS & DOVES**
Columba livia	rock pigeon
Streptopelia decaocto	Eurasian collared dove
Zenaida macroura	mourning dove
STRIGIDAE	**TRUE OWLS**
Athene cunicularia	burrowing owl
TYRANNIDAE	**TYRANT FLYCATCHERS**
Myiarchus cinerascens	ash-throated flycatcher
Sayornis saya	Say's phoebe
Tyrannus verticalis	western kingbird
ALAUDIDAE	**LARKS**
Eremophila alpestris	horned lark
CORVIDAE	**JAYS & CROWS**
Corvus corax	common raven
POLIOPTILIDAE	**GNATCATCHERS**

Scientific Name	Common Name
Polioptila caerulea	blue-gray gnatcatcher
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
LANIIDAE	**SHRIKES**
Lanius ludovicianus	loggerhead shrike
PARULIDAE	**WOOD WARBLERS**
Setophaga occidentalis	hermit warbler
ICTERIDAE	**BLACKBIRDS**
Euphagus cyanocephalus	Brewer's blackbird
Sturnella neglecta	western meadowlark
EMBERIZIDAE	**EMBERIZIDS**
Melospiza lincolnii	Lincoln's sparrow
Passerculus sandwichensis	savannah sparrow
Zonotrichia leucophrys	white-crowned sparrow
CARDINALIDAE	**CARDINALS**
Piranga ludoviciana	western tanager
FRINGILLIDAE	**FINCHES**
Haemorhous mexicanus	house finch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
CLASS MAMMALIA	**MAMMALS**
LEPORIDAE	**HARES & RABBITS**
Lepus californicus	black-tailed jackrabbit
Sylvilagus audubonii	desert cottontail
SCIURIDAE	**SQUIRRELS**
Ammospermophilus leucarus	White-tailed antelope squirrel
Otospermophilus beecheyi	California ground squirrel
CANIDAE	**WOLVES & FOXES**
Canis familiaris	domestic dog
Canis latrans	coyote
*Vulpes macrotis arsipus**	Desert kit fox
MUSTELIDAE	**WEASELS & RELATIVES**
*Taxidea taxus**	American badger

* Not directly observed, signs such as burrows and dens, pellets, whitewash, and scat were present

† Federally Threatened and Endangered species

TECHNICAL MEMORANDUM

To: Dallas Pugh
sPower
5000 East Spring Street, Suite 130
Long Beach, CA 90815

From: Pauline Roberts, Natural Resources Team Lead

Date: June 5, 2020

Re: **Spring 2020 Rare Plant Survey for the Raceway 2.0 Solar Project / SWCA Project No. 60110**

This memorandum describes the results of the rare plant survey conducted by SWCA Environmental Consultants (SWCA) for the approximately 1,300-acre Raceway 2.0 Solar Project (project), located in the community of Rosamond in southeastern Kern County, California (Figures 1, 2 and 3). The project also includes several generation tie-line (gen-tie) options which connect at Southern California Edison's electrical grid at the Big Sky North Substation in Los Angeles County. The survey was conducted to support the proposed project's Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA).

Methods

Prior to the field survey a desktop review of all potentially occurring rare plants was conducted. A query of the California Natural Diversity Database (maintained by the California Department of Fish and Wildlife) yielded one record of alkali mariposa lily (EONDX 85124) adjacent to the northeastern parcel boundary along Rosamond Boulevard.[1] Six other rare plants were determined to have potential to occur within the project site, based on records within the region and the presence of potentially suitable habitat on-site: Horn's milk-vetch, (*Astragalus hornii*), alkali mariposa lily (*Calochortus striatus*), Clokey's cryptantha (*Cryptantha clokeyi*), Rosamond eriastrum (*Eriastrum rosamondense*), sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*), and short-joint beavertail (*Opuntia basilaris* var. *brachyclada*). No records of any other sensitive plant species were documented within the project.

Consistent with the survey guidelines published by the California Department of Fish and Wildlife and the California, the survey was conducted at the appropriate time to detect rare species that may be present, and all plants encountered were identified to the taxonomic level necessary to determine their rarity status.[2,3] Also consistent with these guidelines, the survey was conducted by qualified biologists walking parallel transects spaced 20 meters apart throughout the entire project area, for 100% visual survey of the entire project area.

[1] California Department of Fish and Wildlife. 2020. RAREFIND database ed.3.1.1. Electronic database managed by the Natural Diversity Data Base, Wildlife Data and Habitat Analysis Branch, California Department of Fish and Wildlife. Sacramento, California. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed February 2020.

[2] California Native Plant Society. 2001. CNPS Botanical Survey Guidelines. Revised June 2, 2001. Available at: https://www.cnps.org/plant-science/field-protocols-guidelines. Accessed May 2020.

[3] California Department of Fish and Wildlife. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. Sacramento, California. Available at: https://wildlife.ca.gov/Conservation/Survey-Protocols. Accessed May 2020.

SWCA biologists Ryan Myers, Marlee Antill, Maisie Borg and Austin Xu conducted the survey from April 14 through April 17, 2020. Mr. Myers, Marshall Webb, and Sharif Durzi completed the survey on April 22, 23, and 24. The weather conditions fluctuated from mild to warm during the surveys, with temperatures between 48 and 81 degrees Fahrenheit and wind speeds from 2 to 22 miles per hour.

The biologists walked parallel transects up to 20 meters apart throughout the main project area. Along the proposed gen-tie options, two biologists walked on either side of the proposed route, also spaced 20 meters apart. Plant species were identified to the lowest taxonomic level feasible in the field: species, subspecies, or variety whenever possible. Plants that could not be identified in the field were collected and later identified using *The Jepson Manual: Vascular Plants of California, Second Edition*.[4] Rare plants encountered were documented by counting individuals or estimating size and extent for larger populations using a global positioning system (GPS) location.

A follow-up site visit was conducted on May 19, 2020 by Mr. Durzi and Mr. Webb to confirm the identification of alkali mariposa lily. Conditions were windy with full sun during the survey, with a temperature of 64 degrees Fahrenheit, and wind speeds between 6 to 22 miles per hour.

Results

One rare plant species was observed within the project: alkali mariposa lily (Figures 4, 5 and 6). Approximately 1,550 individuals were recorded in an area of roughly 76 acres (20 plants per acre). The population of alkali mariposa lily was found within the northeastern parcel in chenopod scrub dominated by spinescale saltbush (*Atriplex spinifera*) on alkali sink flats and clayey soils (Figure 7). Associated species observed include: devil's lettuce (*Amsinckia tessellata*), allscale (*Atriplex polycarpa*), red brome (*Bromus madritensis* ssp. *rubens*), red stemmed filaree (*Erodium cicutarium*), foxtail barley (*Hordeum murinum*), goldfields (*Lasthenia gracilis*), and leafy stemmed coreopsis (*Leptosyne calliopsidea*).

Other than the northeastern parcel, the project primarily consists of disturbed former croplands and open fields now dominated with nonnative forbs and grass (Figures 8-11). The gen-tie routes consist of paved and unpaved roads leading to Big Sky North Substation, alongside rural residential plots and disturbed vacant fields. Sections of the proposed gen-tie route along 100th Street West are adjacent to high quality habitat consisting of a diverse array of native shrubs and forbs (Figure 12). A list of plant species observed at the site is attached (Attachment A).

Discussion

During the survey, one rare plant population was detected in the northeastern section the project: alkali mariposa lily. Much of the survey area consist of dense monocultures of nonnative species and overall would be considered poor quality habitat for all types of rare plants. The conditions during this survey were optimal for detecting annual plants as rainfall over the past winter and spring in the Antelope Valley region was slightly above average. As a result, SWCA has a high degree of confidence that only alkali mariposa lily is present within the northeastern parcel and all other rare plant species are absent from the project.

[4] Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds). 2012. *The Jepson Manual: Vascular Plants of California,* second edition. University of California Press, Berkeley.

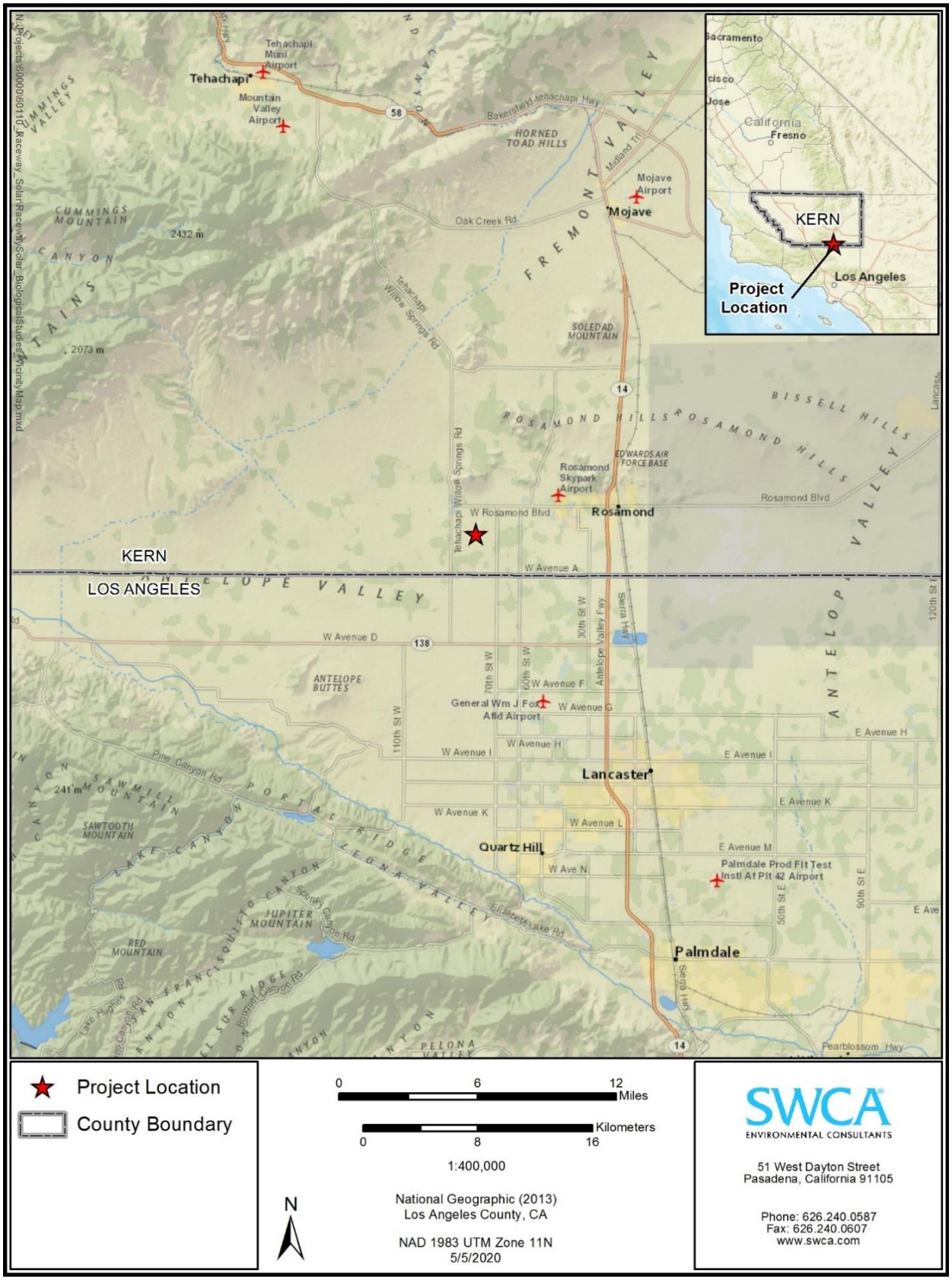
N:\Projects\60001\60110_Raceway_Solar\Raceway_Solar_BiologicalStudies\VicinityMap.mxd
Tehachapi
Tehachapi Muni Airport
Mountain Valley Airport
Bakersfield-Tehachapi Hwy
HORNED TOAD HILLS
Mojave Airport
Mojave
Oak Creek Rd
CUMMINGS MOUNTAIN
2432 m
CANYON
2073 m
FREMONT VALLEY
Tehachapi Willow Springs Rd
SOLEDAD MOUNTAIN
ROSAMOND HILLS
BISSELL HILLS
EDWARDS AIR FORCE BASE
Rosamond Skypark Airport
Rosamond
Rosamond Blvd
W Rosamond Blvd
KERN
LOS ANGELES
W Avenue A
ANTELOPE VALLEY
W Avenue D
ANTELOPE BUTTES
General Wm J Fox Afld Airport
W Avenue F
W Avenue G
W Avenue H
W Avenue I
E Avenue H
E Avenue I
Lancaster
E Avenue K
W Avenue K
W Avenue L
Quartz Hill
W Ave N
E Avenue M
Palmdale Prod Flt Test Instl Af Plt 42 Airport
Palmdale
Pine Canyon Rd
SAWMILL MOUNTAIN
SAWTOOTH MOUNTAIN
LAKE CANYON
PORTAL RIDGE
LEONA VALLEY
JUPITER MOUNTAIN
RED MOUNTAIN
Elizabeth Lake Rd
Sierra Hwy
Pearblossom Hwy
PELONA VALLEY
Sacramento
Fresno
California
KERN
Los Angeles
Project Location
Project Location
County Boundary
0 6 12 Miles
0 8 16 Kilometers
1:400,000
National Geographic (2013)
Los Angeles County, CA
NAD 1983 UTM Zone 11N
5/5/2020
N
SWCA
ENVIRONMENTAL CONSULTANTS
51 West Dayton Street
Pasadena, California 91105
Phone: 626.240.0587
Fax: 626.240.0607
www.swca.com

Figure 1. Regional Vicinity Map.

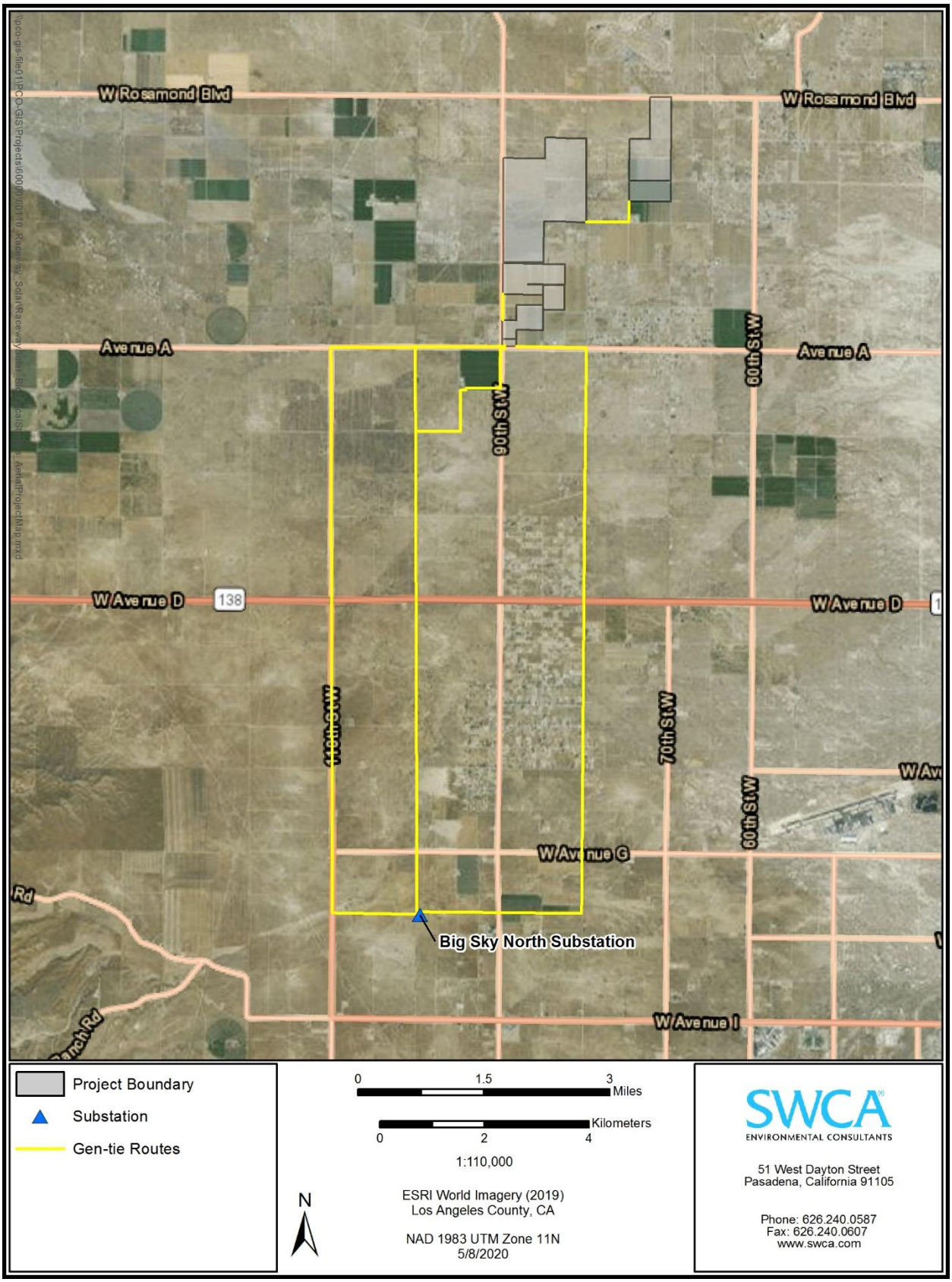

Figure 2. Project location and gen-tie options.

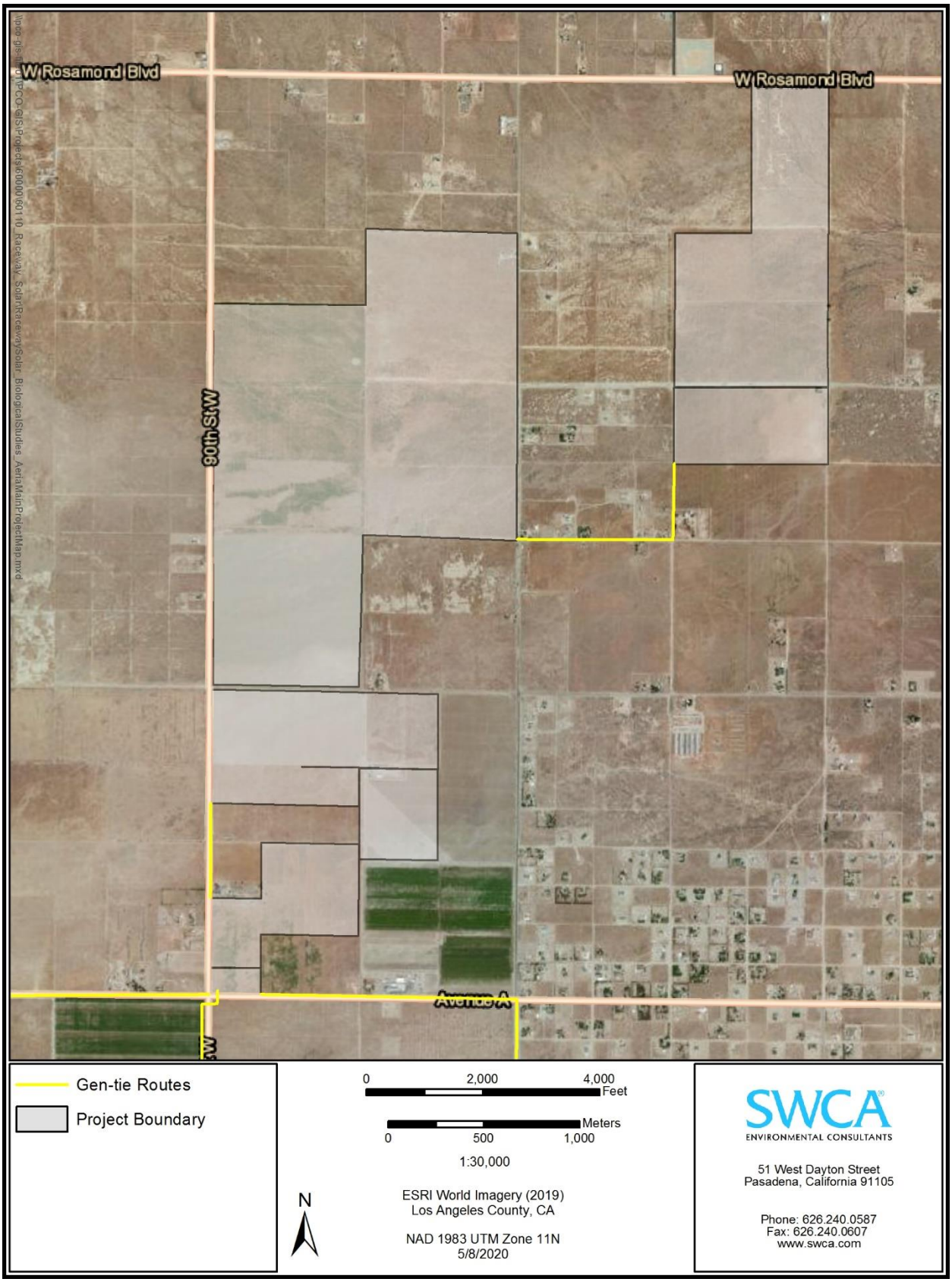

Figure 3. Main project area.



Figure 4. Distribution of alkali mariposa lily in the project.



Figure 5. View of alkali mariposa lily in bud.



Figure 6. Detailed view of alkali mariposa lily showing characteristic purple veins along the length of the petals



Figure 7. Site conditions on April 14, 2020, facing southeast. Photographed from the northeastern parcel approximately 0.25 mile south of Rosamond Boulevard. The alkaline chenopod habitat was found to support a population of alkali mariposa lily.



Figure 8. Site conditions on April 15, 2020, facing north-northeast. Photographed from the southeastern parcel along 75th Street West.



Figure 9. Site conditions on April 16, 2020, facing south-southeast. Photographed from the western parcel near the intersection 90th Street West and Sue Avenue.



Figure 10. Site conditions on April 17, 2020, facing north-northeast. Photographed from the southwestern parcel approximately 0.2 mile east of 85th Street West.



Figure 11. Site conditions on April 22, 2020, facing north-northeast. Photographed from the southwestern parcel approximately 0.1 mile west of 85th Street West.

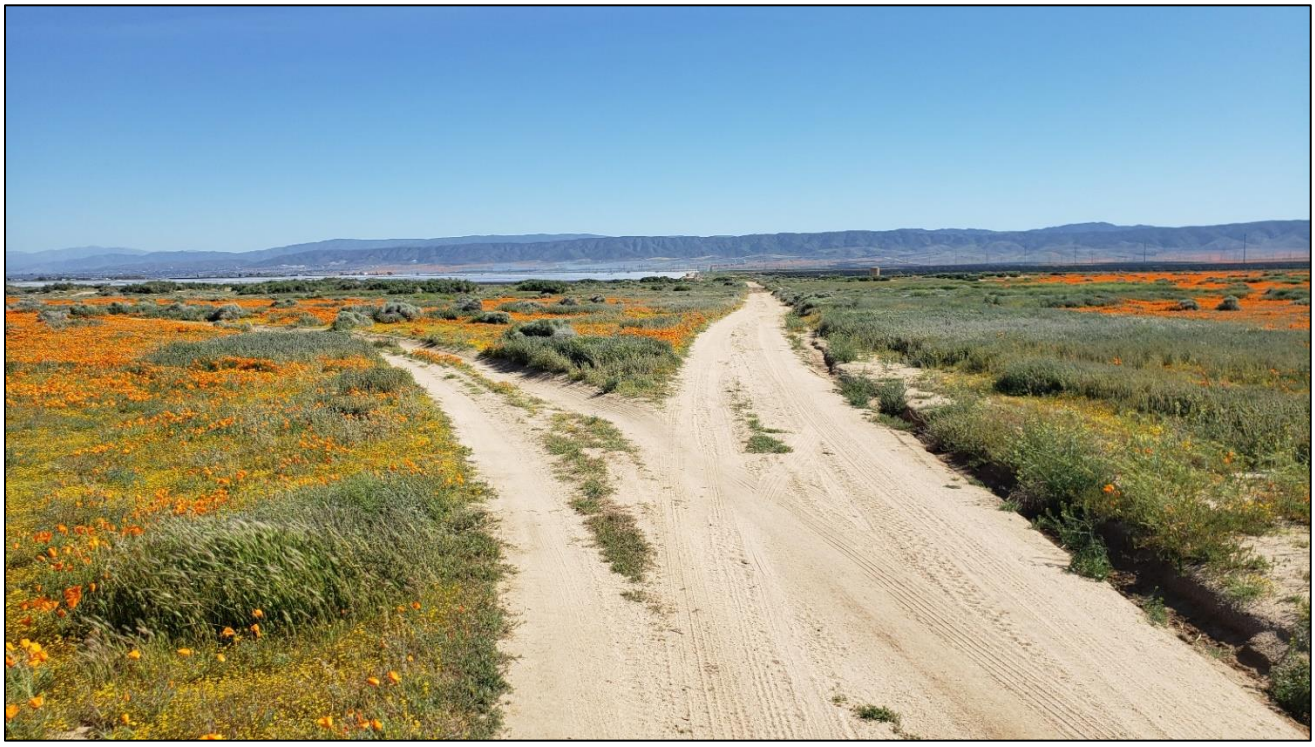

Figure 12. Site conditions on April 23, 2020, facing south. Photographed from 100th Street West, one of the proposed gen-tie routes. The intersection of West Avenue F and 100th Street West is approximately 0.25 mile south from this location.

APPENDIX A

Floral Compendium

Table A-1. Flora Compendium

Scientific Name	Common Name
GYMNOSPERMS	
EPHEDRACEAE	**EPHEDRA FAMILY**
Ephedra nevadensis	Nevada joint fir
PINACEAE	**PINE FAMILY**
Pinus halepensis[1]	Aleppo pine
ANGIOSPERMS (EUDICOTS)	
APIACEAE	**CARROT FAMILY**
Lomatium mohavense	Mohave wild parsley
ASTERACEAE	**SUNFLOWER FAMILY**
Ambrosia acanthicarpa	annual bur-sage
Ambrosia salsola[2]	cheesebush
Chaenactis xantiana	fleshy pincushion
Erigeron canadensis[2]	Canada horseweed
Ericameria cooperi var. *cooperi* [2]	Cooper's goldenbush
Ericameria nauseosa	rabbitbush
Helianthus annuus	common sunflower
Gutierrezia sp.	matchweed
Lactuca serriola[1]	prickly lettuce
Lasthenia gracilis	common goldfields
Leptosyne calliopsidea	leafy stemmed coreopsis
Layia glandulosa	white layia
Layia platygossa	tidy-tips
Logfia depressa	dwarf cottonrose
Malacothrix californica	California dandelion
Malacothrix coulteti	snake's head
Malacothrix glabrata	desert dandelion
Matricaria discoidea	pineapple weed
Monolopia lanceolata	common hillside daisy
Stephanomeria pauciflora	wire lettuce
Uropappus lindleyi	Lindley’s silver puffs
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia tessellata	devil's lettuce
Heliotropium curassavicum	salt heliotrope
Pectocarya penicillata	northern pectocarya
Pectocarya recurvata	arch-nutted pectocarya,
Phacelia crenulata var. *ambigua*	notch-leaved phacelia

Scientific Name	Common Name
Phacelia fremontii	Fremont's phacelia
Phacelia tanacetifolia	lacy phacelia
Plagiobothrys canescens[3]	valley popcornflower
BRASSICACEAE	**MUSTARD FAMILY**
Caulanthus lasiophyllus	California mustard
Capsella-bursa pastoris[1]	shepherd's purse
Descurainia sophia[1]	herb sophia
Hirschfeldia incana[1]	shortpod mustard
Lepidium appelianum[1]	hairy whitetop
Lepidium nitidum	shining pepperweed
Sisymbrium irio[1]	London rocket
Sisymbrium altissimum[1]	tumble mustard
Sisymbrium orientale[1]	Indian hedge mustard
Tropidocarpum gracile	dobie pod
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Atriplex argentea var. *expansa*	Mojave silverscale
Atriplex canescens[2]	four-wing saltbush
Atriplex polycarpa	allscale
Atriplex semibaccata[1]	Australian saltbush
Atriplex spinifera	spiny saltbush
Krascheninnikovia lanata[2]	winterfat
Salsola tragus[1]	Russian thistle
CONVOLVULACEAE	**MORNING GLORY FAMILY**
Convolvulus arvensis[1]	field bindweed
EUPHORBIACEAE	**SPURGE FAMILY**
Croton setiger	turkey-mullein
Euphorbia albomarginata[2]	rattlesnake sandmat
FABACEAE	**LEGUME FAMILY**
Astragalus didymocarpus var. *didymocarpus*	common dwarf milkvetch
Astragalus douglasii var. *douglasii*[2]	Douglas's milkvetch
Astragalus lentiginosus var. *variabilis*[2]	freckled milk vetch
Lupinus bicolor[2]	miniature lupine
Lupinus microcarpus[2]	chick lupine
Medicago sativa[1]	alfalfa
Robinia pseudoacacia[12]	black locust
GERANIACEAE	**GERANIUM FAMILY**
Erodium cicutarium[1]	red-stemmed filaree

Scientific Name	Common Name
LAMIACEAE	**MINT FAMILY**
Marrubian vulgare[1]	white horehound
LOASACEAE	**LOASA FAMILY**
Mentzelia sp.	blazing star
MALVACEAE	**MALLOW FAMILY**
Malva parviflora[1,2]	cheeseweed
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia campestris ssp. campestris[2]	field suncup
Camissonia strigulosa[2]	strigose sun cup
Camissoniopsis bistorta[2]	California sun cup
Oenothera californica ssp. *californica*[2]	California evening primrose
Tetrapteron palmeri[2]	Palmer's evening primrose
OROBRANCHACEAE	**BROOMRAPE FAMILY**
Castilleja exserta ssp. *exserta*	purple owl's clover
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica[2]	California poppy
Platystemon californicus[2]	cream cups
PLANTAGINACEAE	**PLANTAIN FAMILY**
Plantago lanceolata[12]	English plantain
POLEMONIACEAE	**PHLOX FAMILY**
Gilia minor	little gilia
Leptosiphon liniflorus[2]	narrowflower flaxflower
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum angulosum[2]	angled buckwheat
Eriogonum fasciculatum[2]	California buckwheat
Eriogonum sp.	annual buckwheat
Polygonum aviculare[1,2]	prostrate knotweed
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii	Jimsonweed
Lycium andersonii[2]	Anderson's desert thorn
Lycium cooperi[2]	Cooper's boxthorn
Solanum elaeagnifolium[1]	white horse-nettle
TAMARICACEAE	**TAMARISK FAMILY**
Tamarix ramosissima[1]	saltcedar
ULMACEAE	**ELM FAMILY**
Ulmus pumila[1]	Siberian elm
ZYGOPHYLLACEAE	**CALTROP FAMILY**
Larrea tridentata	creosote bush

Scientific Name	Common Name
ANGIOSPERMS (MONOCOTS)	
ALLIACEAE	**ONION FAMILY**
Allium fimbriatus	wild onion
LILIACEAE	**LILY FAMILY**
Calochortus striatus[3]	alkali mariposa lily
POACEAE	**GRASS FAMILY**
Avena fatua[1]	wild oat
Bromus berteroanus[1]	Chilean chess
Bromus diandrus[1,2]	ripgut brome
Bromus madritensis ssp. *rubens*[1]	red brome
Bromus tectorum[12]	cheat grass
Cynodon dactylon[1,2]	Bermuda grass
Festuca microstachys	small fescue
Hordeum murinum[1,]	foxtail barley
Schismus arabicus[1,2]	Arabian schismus
Schismus barbatus[1]	Mediterranean schismus
Stipa cernua[2]	nodding needle grass
Triticum aestivum[1]	common wheat
THEMIDACEAE	**BRODIAEA FAMILY**
Dichelostemma capitatum[2]	blue dicks

[1]Non-Native Species
[2]Observed only along gen-tie routes
[3]Special-status species

Appendix F
Cultural Resources Assessment

FINAL

CULTURAL RESOURCES ASSESSMENT
RACEWAY 2.0 PROJECT

Unincorporated Community of Rosamond, Kern County, California; City of Lancaster, Los Angeles County; and Unincorporated Portions of Los Angeles County, California

Prepared for:

Dallas Pugh
Sustainable Power Group
5000 East Spring Street, Suite 130
Long Beach, California 90815

Prepared by:

David Brunzell, M.A., RPA
BCR Consulting LLC
505 West 8th Street
Claremont, California 91711

Project No. SPO1704

Data Base Information:
Type of Study: Intensive Survey
Resources Recorded: Borgman Ranch, SPO1704-H-3, 502 8th Street West
Keywords: Borgman, Concrete Foundations, Metal Storage Structure
USGS Quadrangle: 7.5-minute *Little Buttes* (1974), *Del Sur* (1995)

BCRCONSULTING LLC

August 31, 2020

MANAGEMENT SUMMARY

BCR Consulting LLC (BCR Consulting) is under contract to Sustainable Power Group to complete a Cultural Resources Assessment of the proposed Raceway 2.0 Project (the project) located in the unincorporated Community of Rosamond, Kern County; the City of Lancaster, Los Angeles County; and in unincorporated portions of Los Angeles County, California. A cultural resources records search, additional research, intensive-level pedestrian field survey, Native American Heritage Commission (NAHC) Sacred Lands File Search, and vertebrate paleontological resources assessment were conducted for the project in partial fulfillment of the California Environmental Quality Act (CEQA). The records search revealed that 55 previous cultural resource studies have taken place, and nine cultural resources have been recorded within one mile of the project site. Of the 55 previous studies, nine have assessed portions of the project site resulting in no cultural resources identified within its boundaries. During the field survey, BCR Consulting recorded three cultural resources within the project site, including the Borgman Ranch, a metal storage structure (designated 502 8th Street West), and a historic-period archaeological site (designated SPO1704-H-3). The field survey and research have indicated that none of these resources is eligible for the California Register of Historical Resources (California Register). Therefore, no significant impact related to historical resources is anticipated and no further investigations or archaeological construction monitoring are recommended for the proposed project unless:

- The proposed project is changed to include areas that have not been subject to this cultural resource assessment;
- The proposed project is changed to include the construction of additional facilities;
- Cultural materials are encountered during project activities.

The current study attempted to determine whether significant archaeological deposits were present on the proposed project site. Although none were yielded during the records search and field survey, ground-disturbing activities have the potential to reveal buried deposits not observed on the surface. Field personnel should be alerted to the possibility of buried prehistoric or historic cultural deposits. In the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register of Historic Places (National Register), plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic-period artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic-period structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;

- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks;
- human remains.

If human remains are encountered during any project activities, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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INTRODUCTION

BCR Consulting LLC (BCR Consulting) is under contract to Sustainable Power Group to complete a Cultural Resources Assessment of the proposed Raceway 2.0 Project (the project) located in the unincorporated Community of Rosamond, Kern County; the City of Lancaster, Los Angeles County; and in unincorporated portions of Los Angeles County, California. A cultural resources records search, additional research, intensive-level pedestrian field survey, Native American Heritage Commission (NAHC) Sacred Lands File Search, and vertebrate paleontological resources assessment were conducted for the project in partial fulfillment of the California Environmental Quality Act (CEQA).

Project Description and Location

The project is a utility scale Solar Generating Facility that will generate renewable solar electricity. The project will employ photovoltaic modules that convert sunlight directly into electrical energy without use of heat transfer fluid or cooling water. The project site, as identified in this report, will occupy 1372 acres of private land in southeastern Kern County, California, and would consist of six separate sites. It would occupy portions of the following legal descriptions (San Bernardino Base and Meridian):

Table A. Project Legal Description

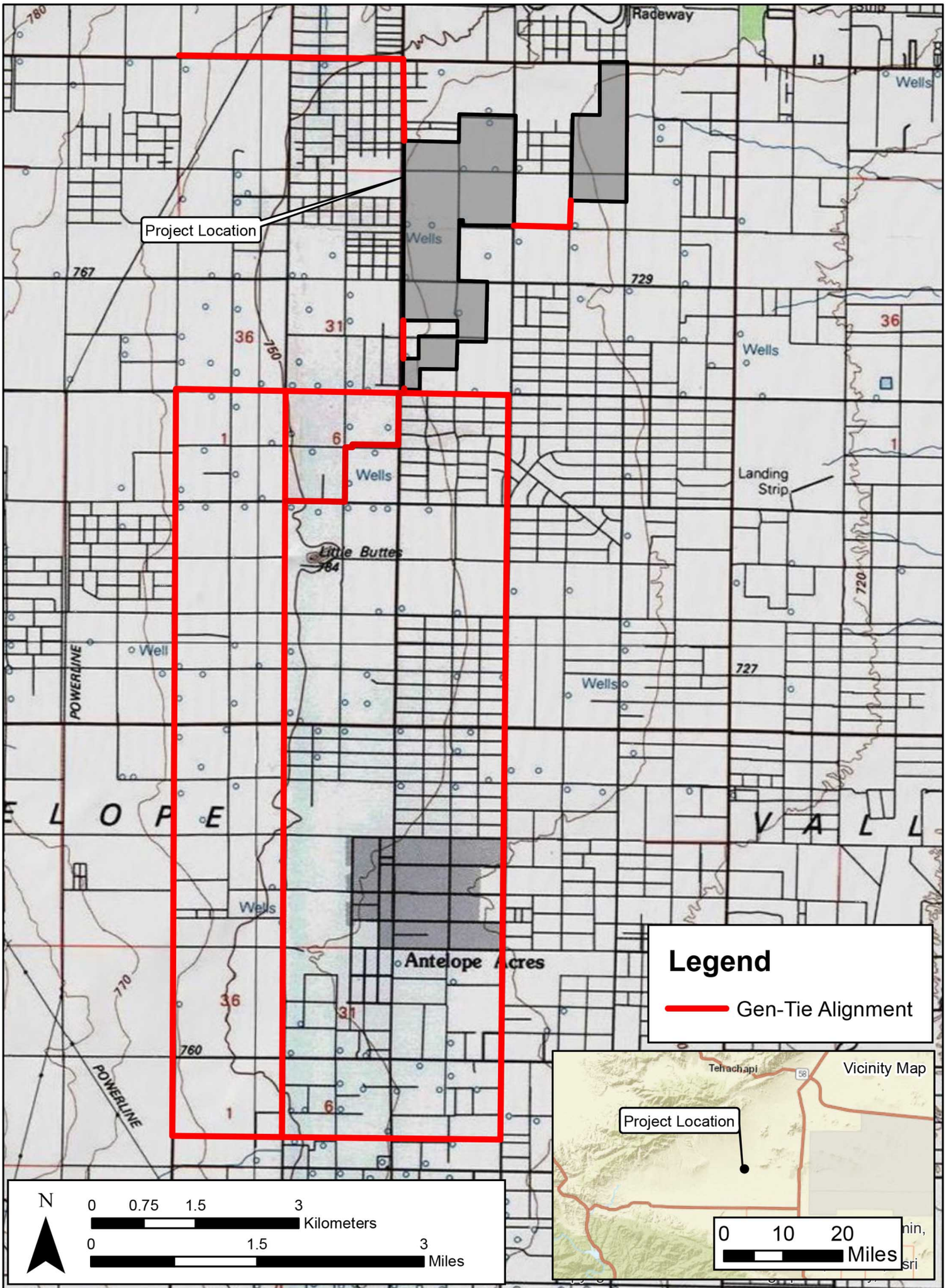
Project Portion	USGS 7.5 Min Quadrangle(s)	Legal Description
Block Portion	*Little Buttes* (1974), *California*	Township 9 North, Range 13 West, Sections 20, 21, 28, 29, 32

The Project may interconnect to sPower's previously approved collector substation via three proposed 34 kV and/or 230 kV gen-tie lines originating at a direct current collection system located at the southwestern portion of the Project area, or to a planned Los Angeles Department of Water and Power (LADWP) substation northwest of the Project via an additional proposed gen-tie route. The entire project location, including Gen-tie alignments, is depicted in Figure 1.

NATURAL SETTING

Geology

The project is located in the southwestern portion of the Mojave Desert. Sediments within the project boundaries have been derived from several geologic units (Hernandez 2010; Lancaster and Holland 2012). These units mainly comprise alluvium ranging in age from modern to late Pleistocene. The alluvium is mostly unconsolidated, yellowish-brown, poorly sorted, overbank deposits which have been designated as types Qa, Qyfc, Qya, Qyfs, Qyf, Qyf_1, Qyf_2, Qf, and Qof. Other deposits include aeolian sediment from the late Pleistocene to the Holocene, mainly concentrated in the southern and central portions of the site, scattered between vast deposits of alluvium. The aeolian sediment (Qe, Qye) is mostly fine to medium-grained, subangular, arkosic, somewhat silty, and form sand sheets and thin veneers over other deposits with a maximum estimated thickness of two meters. There are deposits of colluvium (Qc) located on Little Buttes which partially occupies the southern portion of project site, near proposed Gen-tie alignments.



BCRCONSULTING LLC

Project Location Site
Raceway 2.0 Project

Figure 1

Reference: ESRI; USGS Quad: (1974/1995) Little Buttes ; Del Sur ; Rosamond ; Lancaster W, CA

Sustainable Power Group
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Long Beach, California 90815

The colluvium includes unconsolidated, poorly sorted deposits of angular gravel and sand (Hernandez 2010; Lancaster and Holland 2012). The majority of the project site is made up of geologic deposits that, if undisturbed, have the potential to contain subsurface archaeological deposits in relatively shallow depths (Bornyasz et al. 2015). However, project specific review of historic aerial photography and topographic maps combined with historical research and field survey results indicate that agricultural activities spanning the historic-period to modern times have significantly disturbed project sediments, including deposits with potential for buried deposits (United States Department of Agriculture 1943, 1948, 1954, 1959, 2005, 2009, University of California at Santa Barbara 2020, USGS 1974). As indicated under "Agricultural Development of the Antelope Valley" (page 7), the project site has been "water leveled" so that the water could evenly flood large areas at the same depth. This leveling was done using horse-pulled or mechanical equipment, and significantly transformed the local topography. This leveling has disturbed sediments that might otherwise contain potential for archaeological deposits beyond depths at which such resources are likely.

Hydrology

The project elevation ranges from approximately 2,375 to 2,504 feet above mean sea level (AMSL). Sheetwashing generally occurs from west to east throughout the region, and flood channels are often active after summer and winter storms. Local farming has utilized flood-irrigation, which relies on mechanical terracing for even water distribution. Local topography and natural erosive processes have been severely impacted by these activities to the extent that terraces are sometimes visible in topographic contour lines. To the southeast, the peaks of the San Gabriel Mountains rise above 10,000 feet and are often capped with snow until late spring or early summer. The area currently exhibits an arid climate, with dry, hot summers and cool winters. Rainfall ranges from five to 15 inches annually (Jaeger and Smith 1971:36-37). Precipitation usually occurs in the form of winter and spring rain or snow at high elevations, with occasional warm monsoonal showers in late summer.

Biology

The mild climate of the late Pleistocene allowed piñon-juniper woodland to thrive throughout most of the Mojave (Van Devender et al. 1987). The vegetation and climate during that epoch attracted significant numbers of Rancholabrean fauna, including dire wolf, saber-toothed cat, short-faced bear, horse, camel, antelope, mammoth, pelican, goose, duck, cormorant, and eagle (Reynolds 1988). The drier climate of the middle Holocene resulted in the local development of complementary flora and fauna, which remain largely intact to this day. Common native plants currently include creosote, cacti (various species), rabbit bush, interior golden bush, cheesebush, sage (various species), buckwheat (at high elevations and near drainages), Joshua tree, and seasonal grasses. Common native animals include coyotes, cottontail and jackrabbits, rats, mice, desert tortoises, roadrunners, raptors, turkey vultures, and other bird species (see Williams et al. 2008).

CULTURAL SETTING

Prehistory

The prehistoric cultural setting of the Mojave Desert has been organized into many chronological frameworks (see Warren and Crabtree 1986; Bettinger and Taylor 1974;

Lanning 1963; Hunt 1960; Wallace 1958, 1962, 1977; Wallace and Taylor 1978; Campbell and Campbell 1935), although there is no definitive sequence for the region. The difficulties in establishing cultural chronologies for the Mojave are a function of its enormous size and the small amount of archaeological excavations conducted there. Moreover, throughout prehistory many groups have occupied the Mojave and their territories often overlap spatially and chronologically resulting in mixed artifact deposits. Due to dry climate and capricious geological processes, these artifacts rarely become integrated in-situ. Lacking a milieu hospitable to the preservation of cultural midden, Mojave chronologies have relied upon temporally diagnostic artifacts, such as projectile points, or upon the presence/absence of other temporal indicators, such as groundstone. Such methods are instructive, but can be limited by prehistoric occupants' concurrent use of different artifact styles, or by artifact re-use or re-sharpening, as well as researchers' mistaken diagnosis, and other factors (see Flenniken 1985; Flenniken and Raymond 1986; Flenniken and Wilke 1989). Recognizing the shortcomings of comparative temporal indicators, this study synthesizes Warren and Crabree (1986), who have drawn upon this method to produce a commonly cited and relatively comprehensive chronology.

Paleoindian (12,000 to 10,000 BP) and Lake Mojave (10,000 to 7,000 BP) Periods. Climatic warming characterizes the transition from the Paleoindian Period to the Lake Mojave Period. This transition also marks the end of Pleistocene Epoch and ushers in the Holocene. The Paleoindian Period has been loosely defined by isolated fluted (such as Clovis) projectile points, dated by their association with similar artifacts discovered in-situ in the Great Plains (Sutton 1996:227-228). Some fluted bifaces have been associated with fossil remains of Rancholabrean mammals approximately dated to ca. 13,300-10,800 BP near China Lake in the northern Mojave Desert. The Lake Mojave Period has been associated with cultural adaptations to moist conditions, and resource allocation pointing to more lacustrine environments than previously (Bedwell 1973; Hester 1973). Artifacts that characterize this period include stemmed points, flake and core scrapers, choppers, hammerstones, and crescentics (Warren and Crabtree 1986:184). Projectile points associated with the period include the Silver Lake and Lake Mojave styles. Lake Mojave sites commonly occur on shorelines of Pleistocene lakes and streams, where geological surfaces of that epoch have been identified (Basgall and Hall 1994:69).

Pinto Period (7,000 to 4,000 BP). The Pinto Period has been largely characterized by desiccation of the Mojave. As formerly rich lacustrine environments began to disappear, the artifact record reveals more sporadic occupation of the Mojave, indicating occupants' recession to the more hospitable fringes (Warren 1984). Pinto Period sites are rare, and are characterized by surface manifestations that usually lack significant in-situ remains. Artifacts from this era include Pinto projectile points and a flake industry similar to the Lake Mojave tool complex (Warren 1984), though use of Pinto projectile points as an index artifact for the era has been disputed (see Schroth 1994). Milling stones have also occasionally been associated with sites of this period (Warren 1984).

Gypsum Period. (4,000 to 1,500 BP). A temporary return to moister conditions during the Gypsum Period is postulated to have encouraged technological diversification afforded by the relative abundance of resources (Warren 1984:419-420; Warren and Crabtree 1986:189). Lacustrine environments reappear and begin to be exploited during this era (Shutler 1961,

1968). Concurrently a more diverse artifact assemblage reflects intensified reliance on plant resources. The new artifacts include milling stones, mortars, pestles, and a proliferation of Humboldt Concave Base, Gypsum Cave, Elko Eared, and Elko Corner-notched dart points (Warren 1984; Warren and Crabtree 1986). Other artifacts include leaf-shaped projectile points, rectangular-based knives, drills, large scraper planes, choppers, hammer stones, shaft straighteners, incised stone pendants, and drilled slate tubes. The bow and arrow appears around 2,000 BP, evidenced by the presence of a smaller type of projectile point, the Rose Spring point (Rogers 1939; Shutler 1961).

Saratoga Springs Period (1,500 to 800 BP). During the Saratoga Springs Period regional cultural diversifications of Gypsum Period developments are evident within the Mojave. Basketmaker III (Anasazi) pottery appears during this period, and has been associated with turquoise mining in the eastern Mojave Desert (Warren and Crabtree 1986:191). Influences from Patayan/Yuman assemblages are apparent in the southern Mojave, and include buff and brown wares often associated with Cottonwood and Desert Side-notched projectile points (Warren 1984:423). Obsidian becomes more commonly used throughout the Mojave and characteristic artifacts of the period include milling stones, mortars, pestles, ceramics, and ornamental and ritual objects. More structured settlement patterns are evidenced by the presence of large villages, and three types of identifiable archaeological sites (major habitation, temporary camps, and processing stations) emerge (McGuire and Hall 1988). Diversity of resource exploitation continues to expand, indicating a much more generalized, somewhat less mobile subsistence strategy.

Shoshonean Period (800 BP to Contact). The Shoshonean period is the first to benefit from contact-era ethnography –as well as be subject to its inherent biases. Interviews of living informants allowed anthropologists to match artifact assemblages and particular traditions with linguistic groups, and plot them geographically (see Kroeber 1925; Gifford 1918; Strong 1929). During the Shoshonean Period continued diversification of site assemblages, and reduced Anasazi influence both coincide with the expansion of Numic (Uto-Aztecan language family) speakers across the Great Basin, Takic (Uto-Aztecan language family) speakers into southern California, and the Hopi across the Southwest (Sutton 1996). Hunting and gathering continued to diversify, and the diagnostic arrow points include desert side-notch and cottonwood triangular. Ceramics continue to proliferate, though are more common in the southern Mojave during this period (Warren and Crabtree 1986). Trade routes have become well established across the Mojave, particularly the Mojave Trail, which transported goods and news across the desert via the Mojave River, to the west of the current project. Trade in the western Mojave was more closely related to coastal groups than others.

Ethnography

The Uto-Aztecan “Serrano” people occupied the western Mojave Desert periphery. Kroeber (1925) applied the generic term “Serrano” to four groups, each with distinct territories: the Kitanemuk, Tataviam, Vanyume, and Serrano. Only one group, in the San Bernardino Mountains and West-Central Mojave Desert, ethnically claims the term Serrano. Bean and Smith (1978) indicate that the Vanyume, an obscure Takic population, was found along the Mojave River at the time of Spanish contact. The Kitanemuk lived to the north and west, while the Tataviam lived to the west. The Serrano lived mainly to the south (Bean and Smith 1978). All may have used the western Mojave area seasonally. Historical records are unclear

concerning precise territory and village locations. It is doubtful that any group, except the Vanyume, actually lived in the region for several seasons yearly.

History

Historic-era California is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

Spanish Period. The first European to pass through the project area is thought to be a Spaniard called Father Francisco Garces. Having become familiar with the area, Garces acted as a guide to Juan Bautista de Anza, who had been commissioned to lead a group across the desert from a Spanish outpost in Arizona to set up quarters at the Mission San Gabriel in 1771 near what today is Pasadena (Beck and Haase 1974). This is the first recorded group crossing of the Mojave Desert and, according to Father Garces' journal, they camped at the headwaters of the Mojave River, one night less than a day's march from the mountains. Today, this is estimated to have been approximately 11 miles southeast of Victorville (Marenczuk 1962). Garces was followed by Alta California Governor Pedro Fages, who briefly explored the western Mojave region in 1772. Searching for San Diego Presidio deserters, Fages had traveled north through Riverside to San Bernardino, crossed over the mountains into the Mojave Desert, and then journeyed westward to the San Joaquin Valley (Beck and Haase 1974).

Mexican Period. In 1821, Mexico overthrew Spanish rule and the missions began to decline. By 1833, the Mexican government passed the Secularization Act, and the missions, reorganized as parish churches, lost their vast land holdings, and released their neophytes (Beattie and Beattie 1974).

American Period. The American Period, 1848–Present, began with the Treaty of Guadalupe Hidalgo. The Gold Rush had attracted huge numbers of American settlers and in 1850, California was accepted into the Union. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep from New Mexico and cattle from the Mississippi and Missouri Valleys. When the beef market collapsed, many California ranchers lost their ranchos through foreclosure. A series of disastrous floods in 1861–1862, followed by a significant drought diminished the economic impact of local ranching. This decline combined with ubiquitous agricultural and real estate developments of the late 19th century, set the stage for diversified economic pursuits that have continued to proliferate to this day (Beattie and Beattie 1974; Cleland 1941).

Lancaster. Lancaster grew up around the Southern Pacific Railroad, which entered the area in 1876. The railroad brought speculators that used artesian wells to found an early local agricultural and horticultural economy. A newspaper was established in 1884, and grammar schools and a local post office soon followed (Lewis Publishing Company 1889:350). Parcels within the new town were originally settled near today's I Street and the Sierra Highway. Although farming was initially successful, it was also subject to the caprices of desert rainfall

that varied dramatically and caused a downturn during the early 20th century. Continued well drilling managed to revive local agriculture and by the teens and 1920s local mining and the continued influence of the railroad resulted in a local economic resurgence. Municipal advancements included paved streets in 1916, the formation of a local Los Angeles County Waterworks district in 1919, a fire department in 1921, and electric service brought by Southern California Edison in 1923. Although the economy slowed again during the depression and World War II, the founding of the Muroc Lake Bombing and Gunnery Range (now Edwards Air Force Base) in 1933 compensated somewhat for the losses, and mining and alfalfa farming remained locally viable (Ford 1998). The post war years brought an economic boom to Lancaster, which was locally punctuated by the opening of the first local ready-mix plant, the Antelope Valley Freeway plan, and eventually resulted in the local population expanding to 40,609 by 1970. Lancaster finally incorporated in 1977 and has since developed into a bedroom community, in addition to remaining a hub for farming, mining, and transportation (City of Lancaster 2012).

Rosamond. Rosamond is an unincorporated community in Kern County. Like the City of Lancaster to the south, the Southern Pacific Railroad established Rosamond in the late 1870s. Its Post Office was founded in 1885, discontinued in 1887, and established once again in 1888 (Frickstad 1955:58). Originally dubbed Sand Creek, it became known as Bayles Station or Baylesville for its postmaster David Bayles. In 1888 it was named Rosamond after the daughter of a Southern Pacific Railroad official (Capace 1999). E.M. Hamilton discovered gold in Rosamond and formed the Lida mine there in 1900, making him the pioneer of the Rosamond mining district (Los Angeles Herald 1909). The gold mining industry ebbed and flowed over the ensuing decades. A 1930s discovery resulted in a local gold boom from 1934 to 1942 and while significant gold discoveries have not occurred recently, limited mining does continue (Bakersfield Californian 2016). Post War developments mirrored Lancaster, although Rosamond has never incorporated.

Agricultural Development of the Antelope Valley. Late 19th Century to 1920s: Dry-farming of grain began in the late 1870's to early 1880's in the western part of the Antelope Valley. A drought in 1894 combined with critical misunderstandings of the amount of available stream water in the mountains on the southern edge of the Valley led to the abandonment of most local farms. The drought ended in 1905 and dry-farming made a gradual comeback. Wheat, barley, fruit, almonds, and vines were among the most common crops in the Valley during this era. In an effort to supply adequate water for agriculture, the passage of the Wright Act in 1887 mandated the organization of local irrigation districts.

1920s to 1945: The Little Rock Creek and Palmdale irrigation districts (the only two surviving districts of the original six) used wells and water pumps to supplement the stream water. This was a relatively new irrigation method, and proved to be a success. Ground water obtained by privately owned water pumps soon replaced irrigation district supplied water, and punctuated a small-scale alfalfa-farming era that lasted from the 1920s until about 1945. The exploitation of ground water dropped off with crop demand and prices during the depression of the 1930's, but rebounded in 1934-1935. During this era, improved technology made much larger quantities of ground water available. This combined with a growing demand for silage to make alfalfa the most important crop of the Antelope Valley (Snyder 1955). Utilizing ground water for alfalfa farming in the Antelope Valley required special preparation of the land. Alfalfa

fields were “water leveled” so that the water could evenly flood an entire field at the same depth. This leveling was done using horse-pulled or mechanical equipment, and significantly transformed the local topography. Water was pumped from wells filling an earthen reservoir, which in-turn would be used to flood alfalfa fields on a weekly basis during the growing season. The individual fields (or terraces) were usually about 15 feet wide and separated by earthen dikes. The fields were filled via steel-slide openings in a standpipe. Each field could be filled separately, as needed. The growing season for alfalfa lasted from spring to fall, with summer being the most productive.

1945 to 1970s: The inflated cost of electricity combined with waning interest in family-based alfalfa farming after World War II transformed many local family farms into larger commercial operations. Fields and water systems were purchased by large firms, and consolidated and modernized to enlarge operations and output, farmhouses were abandoned or leased, and numerous larger storage structures were constructed. Commercial farming peaked with 38,000 acres cultivated circa 1964, after which output declined steadily. Between the 1970s and 1990s many alfalfa farms ceased operations, and today only 5,500 acres of alfalfa remains (Jerry Sterk [alfalfa farmer during the 1940s to the 1960s] personal interview October 24, 2017; Orloff and Gildersleeve 1991).

PERSONNEL

David Brunzell, M.A., RPA acted as the Project Manager and Principal Investigator for the current study, and authored the technical report. BCR Consulting Staff Archaeologists Joseph Orozco, M.A. and Nicholas Shepetuk, B.A. completed the records search at the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield and at the South Central Coastal Information (SCCIC) Center at California State University, Fullerton. Mr. Orozco, Mr. Shepetuk, and BCR Consulting Staff Archaeologists Morgan Bird, B.A. and Ryan Nordness, B.A. carried out the fieldwork. Mr. Brunzell, Mr. Orozco, and Mr. Shepetuk, completed the Department of Park and Recreation (DPR) 523 forms.

METHODS

This work was completed pursuant to CEQA, the Public Resources Code (PRC) Chapter 2.6, Section 21083.2, and California Code of Regulations (CCR) Title 14, Chapter 3, Article 5, Section 15064.5. The pedestrian cultural resources survey was intended to locate and document previously recorded and new cultural resources, including archaeological sites, features, isolates, and historic buildings, that exceed 45 years in age within defined project boundaries. The project site was examined using systematic pedestrian field survey methods. The study is intended to determine whether cultural resources are located within the project boundaries, whether any cultural resources are significant pursuant to the above-referenced regulations and standards, and to develop specific mitigation measures that will address potential impacts to existing or potential resources. Tasks include:

- Cultural resources records search to review any studies conducted and the resulting cultural resources recorded within a one-mile radius of the project boundaries
- Additional research through various local and regional resources
- Systematic pedestrian survey of the project site
- California Register eligibility evaluation for any cultural resources discovered

- Development of recommendations for cultural resources documented within the project boundaries, following CEQA guidelines
- Completion of Department of Park and Recreation (DPR) 523 forms for any discovered cultural resources
- Paleontological Resources Assessment completed by Michael Pasenko.

Research

Prior to fieldwork, a records search was conducted at the SCCIC on October 2, 2017, and at the SSJVIC on October 4, 2017. This archival research reviewed the status of all recorded historic and prehistoric cultural resources, and survey and excavation reports completed within one mile of the current project. Additional resources reviewed included the National Register of Historic Places (National Register), the California Register, and documents and inventories published by the California Office of Historic Preservation. These include the lists of California Historical Landmarks, California Points of Historical Interest, Listing of National Register Properties, and the Inventory of Historic Structures.

Additional Research. Limited land use research was also conducted for the project site through local repositories and internet resources to provide a context for historic-era buildings that were located within the project boundaries. Information sources included the Kern County Assessor-Recorder, General Land Office Records maintained by the Bureau of Land Management, the West Antelope Valley Historical Society, the Kern County Library Rosamond Branch Library, newspapers.com, historicaerials.com, ancestry.com, and other internet resources.

Field Survey

An intensive-level cultural resources field survey of the project site was conducted between October 9-27, 2017; July 2-5, 2019; September 2, 2019; and October 24, 2019. The survey was conducted by walking parallel transects spaced approximately 15 meters apart across the block portions of the project site. Two parallel transects spaced 15 meters apart (where accessible) have been walked along each frontage of the proposed gen-tie alignments. Digital photographs were taken at various points within the project site. These included overviews as well as detail photographs of all cultural resources. Cultural resources were recorded per the California OHP *Instructions for Recording Historical Resources* in the field using:

- Detailed note taking for entry on DPR Forms (see Appendix A)
- Hand-held Global Positioning Systems for mapping purposes
- Digital photography of all cultural resources (see Appendices A and E).

RESULTS

Research

Data from the SCCIC and the SSJVIC revealed that 55 previous cultural resource studies have taken place, and nine cultural resources have been recorded within one mile of the project site. Of the 55 previous studies, nine have assessed portions of the project site resulting in no cultural resources identified within its boundaries. The records search is summarized as follows:

Table B. Cultural Resources and Reports Within One Mile of the Project Site

USGS Quad	Cultural Resources	Studies
Del Sur (1995), *Little Buttes* (1974), *Rosamond* (1995), *California*	**Resources within One Mile of Block Portion** P-15-6786: historic-period foundations P-15-11586: historic-period raceway **Resources within One Mile of Gen-tie Portion** P-15-8487: iso. prehistoric hammerstone P-15-12786: isolated prehistoric core P-15-14898: historic-period farm P-15-18733: isolated prehistoric flake P-19-4414: historic-period State Route 138 (crosses over gen-tie at 80th St. W., 100th St. W, 110th St. W) P-19-4637: historic-period road P-15-18681: historic period trans. line (wires above Gen-tie at Rosamond Bl. b/w 100th St. W/110th St. W)	KE-355, 519, 607*, 634, 802, 803, 822*, 845, 869, 899*, 901*, 927*, 1009, 1010, 1269*, 1327, 1350, 1355, 1435, 1452, 1458, 1605*, 2059, 3212, 3317, 3521, 3710, 3793, 3874, 3889, 3892, 3941, 3994, 4057, 4058, 4099, 4135, 4224, 4225, 4227, 4229, 4233, 4234, 4833; LA-2053, 7941, 8186*, 8426, 8496, 10472, 10781, 10859*, 11061, 11220, 12579

*Cultural resource studies that included a portion of the project site.

Additional Research/Borgman Ranch. The southeast quarter of Section 20 (Township 9 North, Range 13 West) included 158.18 acres occupied by the historic-era Borgman Ranch, an alfalfa farm. Although the term "ranch" is used in several references, livestock were never raised on this property. William "Carl" Borgman received the land patent for this portion of the project site in 1927 as a homestead (General Land Office 1927). Borgman constructed the original residence, barn and shed immediately after receiving the property. He drilled a well and water-leveled and partitioned the entire quarter-section to plant alfalfa (Weiser 2017). The fields were oriented in multiple directions so that water could be distributed throughout the entire property from the main reservoir, which was located along the southern boundary (see United States Department of Agriculture 1948). Borgman and his wife Erna raised two daughters and one son and ran the alfalfa operation on the property for about 13 years. In 1939 or 1940 they moved to Los Angeles so that William could pursue a career as a real estate broker (U.S. Federal Census 1930 and 1940). About this time Los Angeles residents Irene Krumsiek (a widow) and her daughter Muriel Krumsiek acquired the property. Although they never lived there, during their ownership three barns were added to the southeast of the house, the water-leveled fields were reoriented to the east/west, and barriers to adjacent fields to the south disappeared, more than doubling the contiguous operation to approximately 400 acres. The southern reservoir was also removed and water was accessed via a well and reservoir off the property to the north. The property continued to produce alfalfa during their ownership (United States Department of Agriculture 1948). Since they never lived at the property, and its water was now acquired offsite to the north, it is likely that they leased the property to a large-scale alfalfa farming operation. The Krumsieks sold to Ada L. Tucker in 1952 (Bernath 2013). The property remained in alfalfa production during Tucker's ownership although no other improvements were noted, and the three barns added by the Krumsieks were gone by 1959 (United States Department of Agriculture 1959). Albert and Helen Veldhuizen bought the property in 1964 and constructed the second residence in front of the original Borgman house (Bernath 2013). Albert was a dairy farmer (U.S. Federal Census 1940), and likely leased the property and the house. The Veldhuizens never lived on the property, and were the last owners to maintain an alfalfa operation there. Charles Murray

Howard, founder and President of Murray Howard Realty, acquired the property in the 1980s and when Murray died in 1989 James T. Hsu assumed ownership.

Additional Research/502 85th Street West. A historic-period metal storage structure (barn) and a modern ancillary building were noted at 502 85th Street West. Research has not informed the name of the builders nor architects but historic aerial photographs indicate that the barn was constructed between 1954 and 1959, during the post war era of commercial agricultural development in the Antelope Valley. In the 1940s, a farmhouse was present on the west side of 85th Street, directly across from storage structure. Assessor information indicates that the storage structure and ancillary building occupy a 135.91-acre parcel that was planted in alfalfa from prior to 1948 until 2005. The fenced area on the east side of 85th Street West, which contains the storage structure, was expanded eastward between 1974 and 1995. The ancillary building adjacent to the storage structure was built during this time. The farmhouse on the west side of 85th Street West was demolished between 2009 and 2012. The irrigated field is no longer in use and has not been maintained. No other historic-period features, structures, buildings, or archaeological items associated with the farm have been identified. The storage structure was probably an early (though not original) feature of the 135.91-acre alfalfa operation. Research did not indicate a direct connection between the farmhouse and the storage structure (Kern County Assessor Recorder 2020; United States Department of Agriculture 1948, 1954, 1959, 1974, 2005, 2009, 2012).

SPO1704-H-3. The site is a single-family residential complex that was used to raise livestock. It originally contained a house and several ancillary structures. It currently contains three abandoned wells, a concrete foundation, an animal pen, and a set of concrete footings. The property was patented to the Southern Pacific Railroad Company through a land grant in 1904 (Bureau of Land Management 1904). It was developed to raise livestock between 1943 and 1959, and the buildings were demolished between 2005 and 2009 (U.S. War Department 1943; United States Department of Agriculture 2009, 2005, 1959). Subsequent owners were not indicated in City or County records.

Field Survey

In general the project site has been highly disturbed by former farming and ranch activities, and building, utility, and road installations and maintenance. None of the naturally occurring materials observed during the field survey exhibited evidence of the manufacture or acquisition of prehistoric stone tools or materials. During the field survey, BCR Consulting archaeologists identified the historic-age Borgman Ranch, a metal storage structure at 502 85th Street West, and a historic-period archaeological site (designated SPO1704-H-3). A complete description of each resource is included below and they have been recorded and mapped on DPR 523 forms (Appendix A).

The Borgman Ranch. The Borgman Ranch consists of a 158.18-acre farm with two single-family residences (residence #1 and #2), a barn, and wooden utility shed. Residence #1 is a one-story wooden clapboard farmhouse set approximately 250 feet west of 80th Street West. It is square in shape and topped by a plank wood roof and tarpaper. The primary entrance, which faces east, is adjacent to a long curvilinear walkway that ends at a small square paved pad. The rear entrance faces west and is sheltered by a small shed extension off the rear wall. Immediately south of the rear entrance is a concrete lined cellar with the remains of a wooden

door that granted access to the cellar. Residence #1 rests entirely on a horizontal wooden beam foundation. A brick chimney is also present. A barn is located southwest of residence #1. The barn, which measures approximately 75 by 35 feet is constructed from wooden planks and clad in stucco with a corrugated tin roof. Southwest of the barn is a small utility shed made entirely of wood. Residence #2 is a single story, L-shaped home set approximately 75 feet west of 80th Street West. It is wood frame construction, and clad in stucco with brick facing. It contains an attached garage with a modern door and wooden shake shingles. The primary entrance faces east while a separate entrance faces south.

502 85th Street West. The property is enclosed by chain-link fencing and contains a metal-framed storage unit (barn) constructed with corrugated sheet metal cladding. A large addition has been added to form an "L" shape, resulting in the removal of the original western wall and nearly doubling the size of the original structure. Adjacent to the southeast of the barn is an ancillary building with metal framing and exterior metal cladding.

SPO1704-H-3. The site is a single-family residential complex that was used to raise livestock. It originally contained a house and several ancillary structures. It currently contains six features, comprising three abandoned wells, a concrete foundation, an animal pen, and a set of concrete footings. 1959 aerials show two additional buildings (likely animal shelters or ancillary buildings) for which no trace remains (United States Department of Agriculture 1959). The property was likely a single-family residence first settled in the early post-World War II years, and used to raise livestock. It originally contained an intermittent stream that was diverted when it was developed (see U.S. War Department 1943). The grading necessary to divert the stream and prepare the property for construction indicates a low potential for any intact buried remains that predate the settlement. Research and fieldwork have not indicated any evidence of farming. The buildings were removed between 2005 and 2009.

SIGNIFICANCE EVALUATIONS

During the field survey, three historic-period (i.e. 45 or more years old) resources were identified onsite. CEQA (PRC Chapter 2.6, Section 21083.2 and CCR Title 145, Chapter 3, Article 5, Section 15064.5) calls for the evaluation and recordation of historic and archaeological resources. The criteria for determining the significance of impacts to cultural resources are based on Section 15064.5 of the *CEQA Guidelines* and Guidelines for the Nomination of Properties to the California Register. Properties eligible for listing in the California Register and subject to review under CEQA are those meeting the criteria for listing in the California Register, National Register, or designation under a local ordinance.

Significance Criteria

California Register of Historical Resources. The California Register criteria are based on National Register criteria. For a property to be eligible for inclusion on the California Register, one or more of the following criteria must be met:

1. It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. It is associated with the lives of persons important to local, California, or U.S. history;

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of a master, possesses high artistic values; and/or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resources." (CCR 4852 [d][2]). The California Register also requires that a resource possess integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association.

California Register Evaluations

Potential for Indirect Impacts. Please note that P-15-18681 and P-19-4414 are located near proposed gen-tie locations (see Table B and Appendix B). Although these resources will not be directly impacted by the project, their proximity to the project raises a possibility for indirect (particularly visual) impacts, should any of these be historical resources (i.e. significant under CEQA). Potential for indirect impacts are addressed briefly below.

P-15-18681 is a historic-period transmission alignment. The existing right of way is intact, however tower replacement, repairs and upgrades, and shifts in the terminus have detracted from the integrity of this historic-period resource, and led to a recommendation for a lack of historical significance (Dice 2004:1-4). As a result, it is not a historical resource and is not significant under CEQA. No further work is necessary for this resource.

P-19-4414 is the historic-period State Route 138. While the alignment is historic in age (i.e. over 45 years old), it has been subject to regular maintenance activities (including repaving), and has been recently found ineligible for listing by the California State Historic Preservation Officer (see Polanco 2016:2). As a result, it is not a historical resource and is not significant under CEQA. No further work is necessary for this resource.

The Borgman Ranch. Criterion 1: The Borgman Ranch was originally associated with agricultural development of the Antelope Valley during the early 20th century, an era when homesteads provided the impetus for families to develop local farms. It was constructed within the context of early twentieth century alfalfa farming (occasionally referred to as ranching). After the Borgman family left, the farm took on a very different appearance. The original well and reservoir were removed, and water leveled fields were re-oriented to access water sources to the north. The alfalfa operation more than doubled in size. Updated barns were constructed and subsequently removed and the original house fell into disrepair. The new operation was no longer occupied by a family farm/homestead that was a hallmark of early development in the Antelope Valley. Rather it had assumed the context of a larger commercial enterprise, more locally common during the post-War years (see *Agricultural Development of the Antelope Valley* section, above). Even so, the house built in 1964 is not closely associated with a commercial agricultural enterprise, and no recognizable attributes from this era have been identified within the property boundaries. As a result, in spite of potential association with local agricultural development, the removal of original features and changes in property

configuration has removed any integrity of association. As a result, it is not considered eligible for the California Register under Criterion 1. Criterion 2: Extensive research has revealed that the property was owned and operated by the Borgman family, and subsequently by absent owners. None of the people associated with the property is or was notable in local, state, or national history. Criterion 3: When in operation, it may have been a good example of an early 20th century alfalfa farm, which typically included a farmhouse, barn(s), well, pump, reservoir, and water-leveled fields. However the reconfiguration of the property, removal of all of the original irrigation infrastructure, and condition of the original house has rendered it a poor example of its type. As such, the property and its constituent buildings and structures do not embody the distinctive characteristics of a type, period, region, or represent the work of an important creative individual or possess high artistic values. Criterion 4: Extensive research has exhausted this resource's data potential, and as such it has not and is not likely to yield information important in prehistory or history.

The Borgman Ranch and its constituent historic-age residences and ancillary structures are therefore recommended not eligible under any of the four criteria for listing in the California Register, have very limited integrity, and as such are not recommended historical resources under CEQA.

502 85th Street West. Criterion 1: This storage building/barn was erected in an alfalfa field for use as a barn during large-scale alfalfa operations that took place after World War II. It is associated with alfalfa farming during this era (ca. 1945 to the 1970s). However, since the alfalfa farm no longer exists, it lacks integrity sufficient to convey that association. It is therefore not eligible for Criterion 1. Criterion 2: Extensive research, conducted through the Kern County Assessor, historic aerial photographs, newspaper clippings, and local directory listings, has not revealed that anyone associated with the property is or was notable in local, state, or national history. Criterion 3: Metal storage structures of this type are relatively common, and are constructed without architectural distinction. Also, an addition to the western wall has removed a portion of the original structure. Therefore, it is not eligible under Criterion 3. Criterion 4: Extensive research, conducted through the Kern County Assessor, historic aerial photographs, newspaper clippings, and local directory listings, has exhausted this resource's data potential, and as such it has not and is not likely to yield information important in prehistory or history.

The storage building/barn is therefore recommended not eligible under any of the four criteria for listing in the California Register, has limited integrity, and as such is not recommended a historical resource under CEQA. The adjacent ancillary building is modern and as such does not merit consideration as a historical resource under CEQA.

SPO1704-H-3. Criterion 1: This site was in use as a residence and livestock facility after World War II. It is associated with small scale farming/ranching during this era (ca. 1945 to the 1970s). Small scale ranches were not unusual during this era. However, since the buildings and structures are gone, it lacks integrity sufficient to convey any significant association. It is therefore not eligible for Criterion 1. Criterion 2: Extensive research, conducted through historic aerial photographs, Kern County Assessor records, and General Land Office records provided by the Bureau of Land Management, has not revealed that anyone associated with the property is or was notable in local, state, or national history. Criterion 3: This site does not

embody distinctive characteristics of a type, period, region, or method of construction, represent the work of a master, or possess high artistic values. Therefore, it is not eligible under Criterion 3. Criterion 4: Extensive research and fieldwork have demonstrated negligible data potential for this resource. Surface visibility was high and there was no indication of significant sediment accumulation. Furthermore, this is a relatively late archaeological site (post World War II) and buried deposits related to the resources present are rarely significant. As such this site has not and is not likely to yield information important in prehistory or history.

This archaeological site is therefore recommended not eligible under any of the four criteria for listing in the California Register, and as such is not recommended a historical resource under CEQA.

RECOMMENDATIONS

BCR Consulting conducted an intensive survey of the Raceway 2.0 Project in the unincorporated town of Rosamond, Kern County; the City of Lancaster, Los Angeles County; and portions of unincorporated Los Angeles County, California. During the field survey, BCR Consulting recorded three cultural resources within the project site, including the Borgman Ranch, a metal storage structure (designated 502 85th Street West), and a historic-period archaeological site (designated SPO1704-H-3). The field survey and research have indicated that none of these resources is eligible for the California Register. The field survey yielded no diagnostic surface artifacts or indications of sediment accumulation on archaeological sites, and surface visibility was high. The earliest site present (the Borgman Ranch) had been completely rebuilt. Its fields were re-oriented to derive water from a new source, new buildings were constructed, and the subsurface infrastructure was removed and replaced in 1964. The later resources (502 85th Street West and SPO1704-H-3) exhibited features unlikely to yield significant buried deposits. Regarding potential for prehistoric discoveries, the majority of the project site is made up of geologic deposits that, if undisturbed, have the potential to contain subsurface archaeological deposits in relatively shallow depths. However, project specific review of historic aerial photography and topographic maps combined with historical research and field survey results indicate that agricultural activities spanning the historic-period to modern times have significantly disturbed project sediments, including deposits with potential for buried deposits. These activities have disturbed sediments that might otherwise contain potential for archaeological deposits beyond depths at which such resources are likely. Therefore, no significant impact related to historical resources is anticipated and no further investigations or archaeological construction monitoring are recommended for the proposed project unless:

- The proposed project is changed to include areas that have not been subject to this cultural resource assessment;
- Cultural materials are encountered during project activities.

Although no archaeological deposits were yielded during the records search and field survey, ground-disturbing activities have the potential to reveal buried deposits not observed on the surface. Prior to the initiation of ground-disturbing activities, field personnel should be alerted to the possibility of buried prehistoric or historic-period cultural deposits. In the event that buried cultural materials are encountered by field personnel, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the

significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register, plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic-period cultural materials that may be encountered during ground-disturbing activities include:

- historic-period artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic-period structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;
- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks;
- human remains.

If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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APPENDIX A

DPR523 FORMS

State of California — The Resources Agency	**Primary #**
DEPARTMENT OF PARKS AND RECREATION	**HRI #**
PRIMARY RECORD	**Trinomial**
	NRHP Status Code 6Z
Other Listings	
Review Code	**Reviewer** **Date**

 ***Resource Name or #:** Borgman Ranch

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** ***a. County:** Kern

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Little Buttes, CA **Date:** 1974 T9N; R13W; Section 20**;** SBBM

c. Address: City: Zip:

d. UTM: Zone: N/A mE/ Elevation: 2412' AMSL

e. Other Locational Data: The property is located on the southwest corner of 80th Street West and Astoria Avenue in the City of Rosamond.

***P3a. Description:** The Borgman Ranch consists of a 158.18-acre farm with two single-family residences (residence #1 and #2), a barn, and wooden utility shed. Residence #1 is a one-story wooden clapboard farmhouse set approximately 250 feet west of 80th Street West. It is square in shape and topped by a plank wood roof and tarpaper. The primary entrance, which faces east, is adjacent to a long curvilinear walkway that ends at a small square paved pad. The rear entrance faces west and is sheltered by a small shed extension off the rear wall. Immediately south of the rear entrance is a concrete lined cellar with the remains of a wooden door that granted access to the cellar. Residence #1 rests entirely on a horizontal wooden beam foundation. A brick chimney is also present. A barn is located southwest of residence #1. The barn, which measures approximately 75 by 35 feet is constructed from wooden planks and clad in stucco with a corrugated tin roof. Southwest of the barn is a small utility shed made entirely of wood. Residence #2 is a single story, L-shaped home set approximately 75 feet west of 80th Street West. It is wood frame construction, and clad in stucco with brick facing. It contains an attached garage with a modern door and wooden shake shingles. The primary entrance faces east while a separate entrance faces south.

***P3b. Resource Attributes:** HP2. Single Family Property, HP33. Farm/Ranch

***P4. Resources Present:** ☑ Building ☑Structure ☐Object ☐Site ☐District ☐Element of District ☐Other

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #) Photo 768: Residence #1 Overview (West View)

***P6. Date Constructed/ Age and Sources:**
☑Historic 1927-1932, 1963-1972
☐Prehistoric ☐Both
(see Continuation, pg. 3)

***P7. Owner and Address:**
Sustainable Power Group
2 Embarcardero Ctr, #410
San Francisco, CA 94111

***P8. Recorded by:**
J. Orozco and M. Bird
BCR Consulting
505 West 8th Street
Claremont, California 91711

***P9. Date Recorded:**
10/19/17

***P10. Survey Type:**
Intensive.

***P11. Report Citation:**

Cultural Resources Assessment Raceway Project City of Rosamond, Kern County and Unincorporated Los Angeles County, California

***Attachments:** ☐NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

 ***NRHP Status Code**: 6Z ***Resource Name or #** (Assigned by recorder) Borgman Ranch

B1. Historic Name: Borgman Ranch
B2. Common Name: Borgman Ranch
B3. Original Use: Farm
B4. Present Use: Abandoned

***B5. Architectural Style:** Vernacular Farm House, Midcentury Ranch

***B6. Construction History:** (Construction date, alterations, and date of alterations; see report for citations): The southeast quarter of Section 20 (Township 9 North, Range 13 West) included 158.18 acres occupied by the historic-era Borgman Ranch, an alfalfa farm. Although the term "ranch" is used in several references, livestock were never raised on this property. William "Carl" Borgman received the land patent for this portion of the project site in 1927 as a homestead. Borgman constructed the original residence, barn and shed immediately after receiving the property. He drilled a well and water-leveled and partitioned the entire quarter-section to plant alfalfa. The fields were oriented in multiple directions so that water could be distributed throughout the entire property from the main reservoir, which was located along the southern boundary. Borgman and his wife Erna raised two daughters and one son and ran the alfalfa operation on the property for about 13 years. In 1939 or 1940 they moved to Los Angeles so that William could pursue a career as a real estate broker. About this time Los Angeles residents Irene Krumsiek (a widow) and her daughter Muriel Krumsiek acquired the property. Although they never lived there, during their ownership three barns were added to the southeast of the house, the water-leveled fields were reoriented to the east/west, and barriers to adjacent fields to the south disappeared, more than doubling the contiguous operation to approximately 400 acres. The southern reservoir was also removed and water was accessed via a well and reservoir off the property to the north. The property continued to produce alfalfa during their ownership. Since they never lived at the property, and its water was now acquired offsite to the north, it is likely that they leased the property to a large-scale alfalfa farming operation. The Krumsieks sold to Ada L. Tucker in 1952. The property remained in alfalfa production during Tucker's ownership although no other improvements were noted, and the three barns added by the Krumsieks were gone by 1959. Albert and Helen Veldhuizen bought the property in 1964 and constructed the second residence in front of the original Borgman house. Albert was a dairy farmer, and likely leased the property and the house. The Veldhuizens never lived on the property, and were the last owners to maintain an alfalfa operation there. Charles Murray Howard, founder and President of Murray Howard Realty, acquired the property in the 1980s and when Murray died in 1989 James T. Hsu assumed ownership.

***B7. Moved?** ☑**No** ☐**Yes** ☐**Unknown** **Date:** N/A **Original Location:** N/A

***B8. Related Features:** A row of dilapidated open-air hay barns is located directly northwest of residence #2, parallel of Astoria Avenue between 85th Street West and 80th Street West.

***B10. Significance:** See continuation sheet, page 3. **Theme:** Agricultural Development
Area: Rosamond, California **Period of Significance:** 1920s and 1960s/1970s
Property Type: Farm homestead **Applicable Criteria:** N/A
(Discuss importance in terms of historical/architectural context by theme, period, and geographic scope. Address integrity.)
(See continuation Sheet, page 3)

B11. Additional Resource Attributes: (List attributes and codes) N/A

***B12. References:** see Report

***B14. Evaluators:** David Brunzell and Joseph Orozco, BCR Consulting, Claremont, California
***Date of Evaluation:** 11/21/17

Sketch Map with north arrow required.)



B10. Significance:

Evaluation:
Criterion 1: The Borgman Ranch was originally associated with agricultural development of the Antelope Valley during the early 20th century, an era when homesteads provided the impetus for families to develop local farms. It was constructed within the context of early twentieth century alfalfa farming (occasionally referred to as ranching). After the Borgman family left, the farm took on a very different appearance. The original well and reservoir were removed, and water leveled fields were re-oriented to access water sources to the north and more than doubled in size. Updated barns were constructed and subsequently removed and the original house fell into disrepair. The new operation was no longer occupied by a family farm/homestead that was a hallmark of early development in the Antelope Valley. Rather it had assumed the context of a larger commercial enterprise, more locally common during the 1950s and 1960s. Even so, the house built in 1964 is not closely associated with a commercial agricultural enterprise, and no recognizable attributes from this era have been identified within the property boundaries. As a result, in spite of potential association with local agricultural development, the removal of original features and changes in property configuration has removed any integrity of association. As a result, it is not considered eligible for the California Register under Criterion 1. Criterion 2: Extensive research has revealed that the property was owned and operated by the Borgman family, and subsequently by absent owners. None of the people associated with the property is or was notable in local, state, or national history. Criterion 3: When in operation, it may have been a good example of an early 20th century alfalfa farm, which typically included a farmhouse, barn(s), well, pump, reservoir, and water-leveled fields. However the reconfiguration of the property, removal of all of the original irrigation infrastructure, and condition of the original house has rendered it a poor example of its type. As such, the property and its constituent buildings and structures do not embody the distinctive characteristics of a type, period, region, or represent the work of an important creative individual or possess high artistic values. Criterion 4: Extensive research has exhausted this resource's data potential, and as such it has not and is not likely to yield information important in prehistory or history.

The Borgman Ranch and its constituent historic-age residences and ancillary structures are therefore recommended not eligible under any of the four criteria for listing in the California Register, have very limited integrity, and as such are not recommended historical resources under CEQA.


Photo 779: Residence #2 (View NE)


Barn (View NW)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

 *__Resource Name or #:__ SPO1704-H-3

P1. Other Identifier: N/A

***P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted**

***a. County:** San Bernardino

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** *Little Buttes, California* **Date:** 1974 **T** 9**N**; **R** 14**W**; Section 21**;** SBBM

c. Address: N/A City: Rosamond Zip:

d. UTM: Zone: 11; 384948 mE/ 3858582 mN (G.P.S.; NAD83) Elevation: 2400 Feet AMSL

e. Other Locational Data: Resource is located at the southeast corner of Rosamond Blvd and 71st Street.

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)
The site is a single-family residential complex that was used to raise livestock. It originally contained a house and several ancillary structures. It currently contains six features, comprising three abandoned wells, a concrete foundation, an animal pen, and a set of concrete footings. The property was patented to the Southern Pacific Railroad Company through a land grant in 1904 (Bureau of Land Management). It was developed to raise livestock between 1943 and 1959, and the buildings were demolished between 2005 and 2009 (U.S. War Department 1943; United States Department of Agriculture 2009, 2005, 1959). Subsequent owners were not indicated in City or County records.

***P3b. Resource Attributes:** AH2 Foundations/Structure pads. AH5 Wells/Cisterns. AH11 Walls/Fences.

P5a. Photo or Drawing



Assessment of the Raceway Project. BCR Consulting LLC.

P5b. Description of Photo: (View, date, accession #) Southeast, 9/4/19, Photo 1

***P6. Date Built; Age and Source:** ☑Historic 1943-1959
☐Prehistoric ☐Both

***P7. Owner and Address:**
Sustainable Power Group
5000 East Spring St., #130
Long Beach, Calif. 90815

***P8. Recorded by:**
J. Orozco, N. Shepetuk
BCR Consulting LLC
505 W. Eighth Street
Claremont, CA 91711

***P9. Date:** 9/4/19

***P10. Survey Type:**
Intensive.

***P11. Report Citation:**
Cultural Resources

***Attachments:** ☐NONE ☑ Location Map ☑ Sketch Map ☐ Continuation Sheet ☐Building, Structure, and Object Record ☑Archaeological Site Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

ARCHAEOLOGICAL SITE RECORD

***A1. Dimensions: a. Diameter:** 0.21 miles by 0.19 miles
Method of Measurement: ☐ Paced ☐ Taped ☐ Visual estimate ☑ Other: GPS
Method of Determination (Check any that apply.): ☐ Artifacts ☑ Features ☐ Soil ☐ Vegetation ☐ Topography ☐ Cut bank ☐ Animal burrow ☐ Excavation ☑ Property boundary ☐ Other (Explain):
Reliability of Determination: ☐ High ☑ Medium ☐ Low Explain:
Limitations (Check any that apply): ☐ Restricted access ☐ Paved/built over ☐ Site limits incompletely defined ☐ Disturbances ☐ Vegetation ☐ Other (Explain):

A2. Depth: ☐ None ☑ Unknown Method of Determination: Surface Survey. Buried remains are unlikely due to grading.
***A3. Human Remains:** ☐ Present ☑ Absent ☐ Possible ☐ Unknown (Explain):

***A4. Features** (Number, describe, indicate size, list assoc. cultural constituents, and show location of each feature on sketch map.): The GPS coordinates are at the southeast corner of each features.
Feature 1: Well #1 (11S 0384949mE / 3858543mN) consists of an 11-inch diameter steel pipe protruding two feet above ground.
Feature 2: Well #2 (11S 0384959mE / 3858539mN) is a similar vertical iron steel pipe with the same dimensions as Well #1.
Feature 3: Well #3 (11S 0384941mE / 3858613mN) is a 15-inch diameter steel pipe embedded in a concrete housing.
Feature 4: (11S 0384977mE / 3858510mN) is a poured-concrete foundation measuring about 15 by 11 connected to a six-inch wide concrete footing that occupies 24 by 24 feet, immediately to the west. This was probably a small house.
Feature 5 (11S 0384978mE/3858462 mN) is an animal pen constructed of wooden posts and steel wire, measuring 39 by 31 feet.
Feature 6 (11S 0384985mE / 3858417mN) consists of six pyramid-shaped concrete footings measuring one square foot at the top, one foot and four inches square at the base, and one foot in height. Two steel anchor bolts rise vertically out of the top of each footing. These footings apparently supported an ancillary building (probably a barn).

***A5. Cultural Constituents (**Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.): A cone top tin can was discovered just south of Well #2 (feature #2). This was the only historical artifact recognized on the site.
***A6. Were Specimens Collected?** ☑ No ☐ Yes
***A7. Site Condition:** ☐ Good ☐ Fair ☑ Poor Disturbances: The buildings have been demolished; only foundations remain.
***A8. Nearest Water** (Type, distance, and direction.)**:** Many intermittent drainages flow throughout the region from NW to SE.

***A9. Elevation:** 2400 feet AMSL

A10. Environmental Setting (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.)**:** Seasonal grasses and desert scrub brush dominate the site, with tamarisk trees interspersed throughout. The site sits on a gradual slope with a SE aspect. Prior to the property's development, an intermittent stream crossed the property from northwest to southeast. The property was graded flat when it was developed.

A11. Historical Information: The land was patented to the Southern Pacific Railroad Company in 1904 (Bureau of Land Management 1904). It was developed between 1943 and 1959 (U.S. War Department 1943; U.S. Dept. of Agriculture 1959).

***A12. Age:** ☐ Prehistoric ☐ Protohistoric ☐ 1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☐ 1880-1914 ☑ 1914-1945 ☑ Post 1945 ☐ Undetermined
Describe position in regional prehistoric chronology or factual historic dates if known: The property was developed between 1943 and 1959 (U.S. War Department 1943; United States Department of Agriculture 1959).

A13. Interpretations (Discuss data potential, function[s], ethnic affiliation, and other interpretations): This was likely a single-family residence first settled in the early post-World War II years, and used to raise livestock. The property was graded flat when it was developed (see also A10. above), indicating a low potential for any intact buried remains that predate the settlement. There is no evidence of farming. The buildings were removed between 2005 and 2009.

A14. Remarks: 1959 aerials indicate two additional buildings (likely animal shelters or ancillary buildings) for which no trace could be identified (United States Department of Agriculture 1959).
A15. References (Documents, informants, maps, and other references):
Bureau of Land Management. 1904. Grant-RR-Atlantic and Pacific (14 Stat. 292). *Bureau of Land Management's General Land Office.* Electronic Document: blm.gov. Accessed September 5, 2019.
United States Department of Agriculture. 2009, 2005, 1959. Aerial Photos of Los Angeles County. Electronic Document: historicaerials.com. Accessed September 5, 2019.
United States War Department. 1943. Willow Springs, California 1:62,500 Topographic Quadrangle. On File at BCR Consulting.

A16. Photographs (List subjects, direction of view, and accession numbers): see page 1.
Original Media/Negatives Kept at: BCR Consulting LLC Claremont, California.

***A17. Form Prepared by:** Nicholas Shepetuk **Date:** September 5, 2019
Affiliation and Address: BCR Consulting LLC. 505 West 8th Street, Claremont, California 91711.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

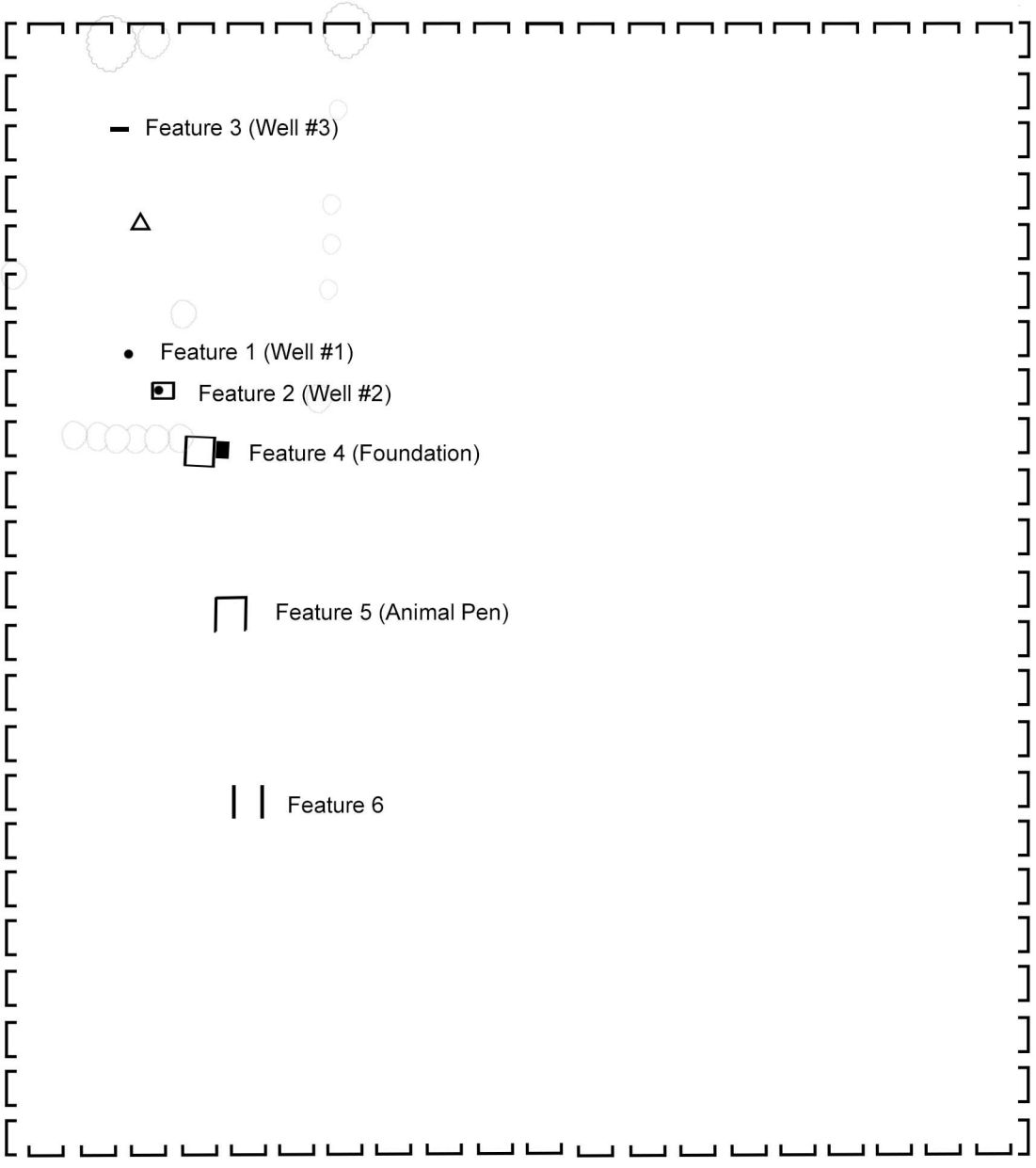
SKETCH MAP

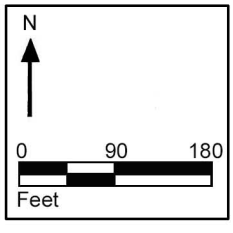
Primary #
HRI#
Trinomial

***Resource Name or #** (Assigned by Recorder): SPO1704-H-3

Drawn By: Nicholas Shepetuk

***Date**: 9/6/19





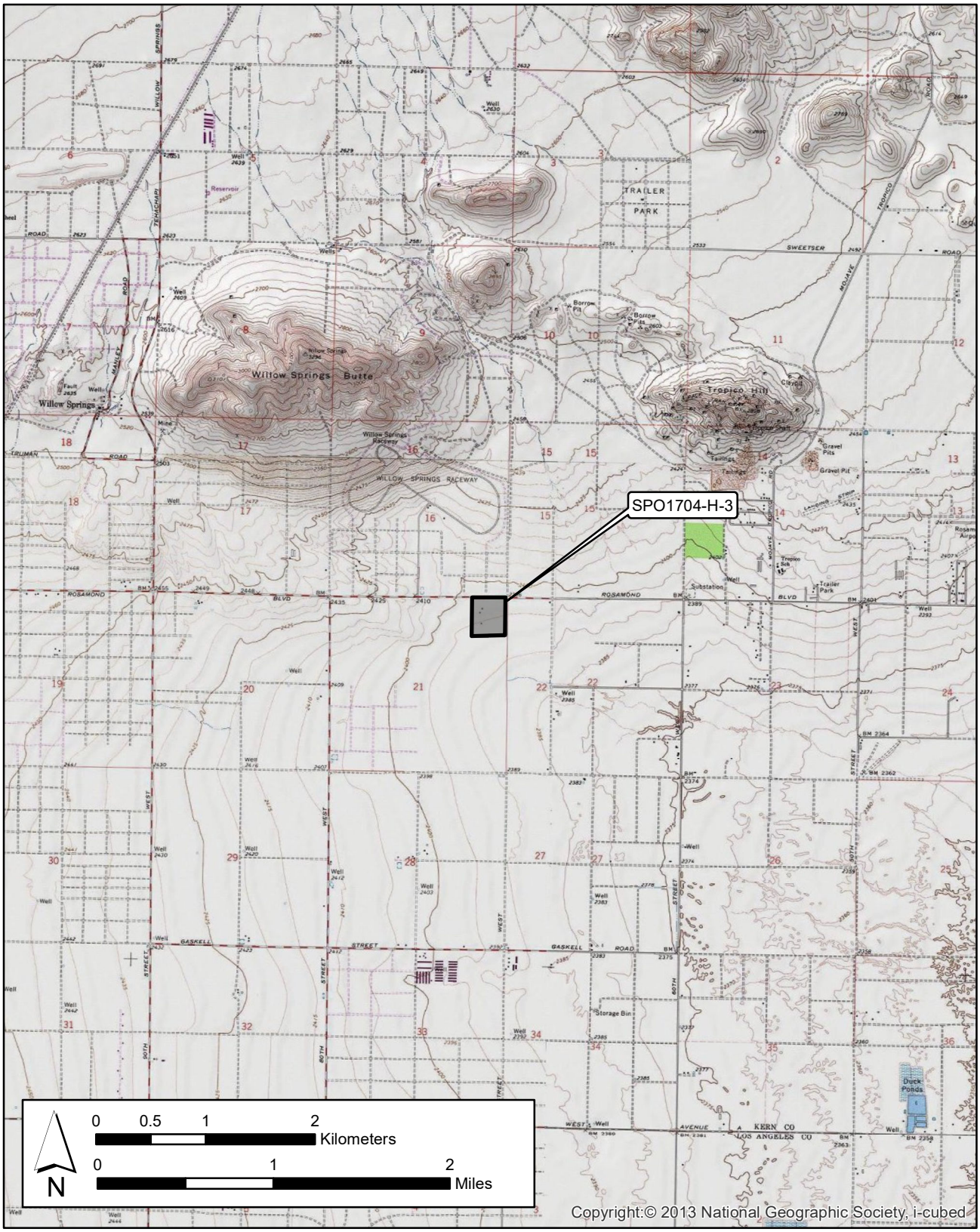
Site Boundary (Intermittent Fencing)
Tree
Street
Datum (11S 384948mE/3858582mN NAD83)

NOTE: Include bar scale and north arrow.

State of California - The Resources Agency DEPARTMENT OF PARKS AND RECREATION **LOCATION MAP**	**Primary #** **HRI#** **Trinomial**

 ***Resource Name or#:** SPO1704-H-3

***Map Name:** Little Buttes, CA ***Scale:** 1:24,000 ***Date of Map:** 1974



DEPARTMENT OF PARKS AND RECREATION **HRI #**

PRIMARY RECORD

Trinomial

NRHP Status Code

Other Listings **Review Code** **Reviewer** **Date**

 ***Resource Name or #:** 502 85th St West

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** ***a. County:** Kern

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Little Buttes, CA **Date:** 1974 **T**9N; **R**13W (SBBM); Section 32

c. Address: 502 85th St West City: Rosamond Zip: 93560

d. UTM: Zone: N/A mE/ Elevation: 2430' AMSL

e. Other Locational Data: The subject property is south of the intersection of Gaskell Rd and 85th St West

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)

A historic-period metal storage structure (barn) and a modern ancillary building were noted at 502 85th Street West. Research has not informed the name of the builders nor architects but historic aerial photographs indicate that the barn was constructed between 1954 and 1959, during the post war era of commercial agricultural development in the Antelope Valley. In the 1940s, a farmhouse was present on the west side of 85th Street, directly across from storage structure. Assessor information indicates that the storage structure and ancillary building occupy a 135.91-acre parcel that was planted in alfalfa from prior to 1948 until 2005. The fenced area on the east side of 85th Street West, which contains the storage structure, was expanded eastward between 1974 and 1995. The ancillary building adjacent to the storage structure was built during this time. The farmhouse on the west side of 85th Street West was demolished between 2009 and 2012. The irrigated field is no longer in use and has not been maintained. No other historic-period features, structures, buildings, or archaeological items associated with the farm have been identified. The storage structure was probably an early (though not original) feature of the 135.91-acre alfalfa operation. Research did not indicate a direct connection between the farmhouse and the storage structure (Kern County Assessor Recorder 2020; United States Department of Agriculture 1948, 1954, 1959, 1974, 2005, 2009, 2012).

References:

Kern County Assessor Recorder. 2020. *Assessor Parcel Map No. 374-02 of Kern County.*

United States Department of Agriculture. 1948, 1959, 1974, 1995, 2009, 2012. Aerial Photos of Kern County. Electronic Document: historicaerials.com.

P5a. Photo or Drawing **(**Photo required for buildings, structures, and objects.)



***P3b. Resource Attributes:** HP4. Ancillary Bldg.

***P4. Resources Present:** ☑ Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other

P5b. Description of Photo: (View, date, accession #) Photo 1: Metal Storage Unit (SE View)

***P6. Date Constructed/ Age and Sources:** ☑Historic 1954-1959 USDA 1954, 1959) ☐Prehistoric ☐Both (see P3a. above)

***P7. Owner and Address:** AVEK Water District

***P8. Recorded by:** J. Orozco BCR Consulting

***P9. Date Recorded:** 02/14/18

***P10. Survey Type:** Intensive.

***P11. Report Citation:** *Cultural Resources Assessment of the Raceway Project*

***Attachments:** ☐NONE ☑ Location Map ☐ Sketch Map ☐ Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

*Required information

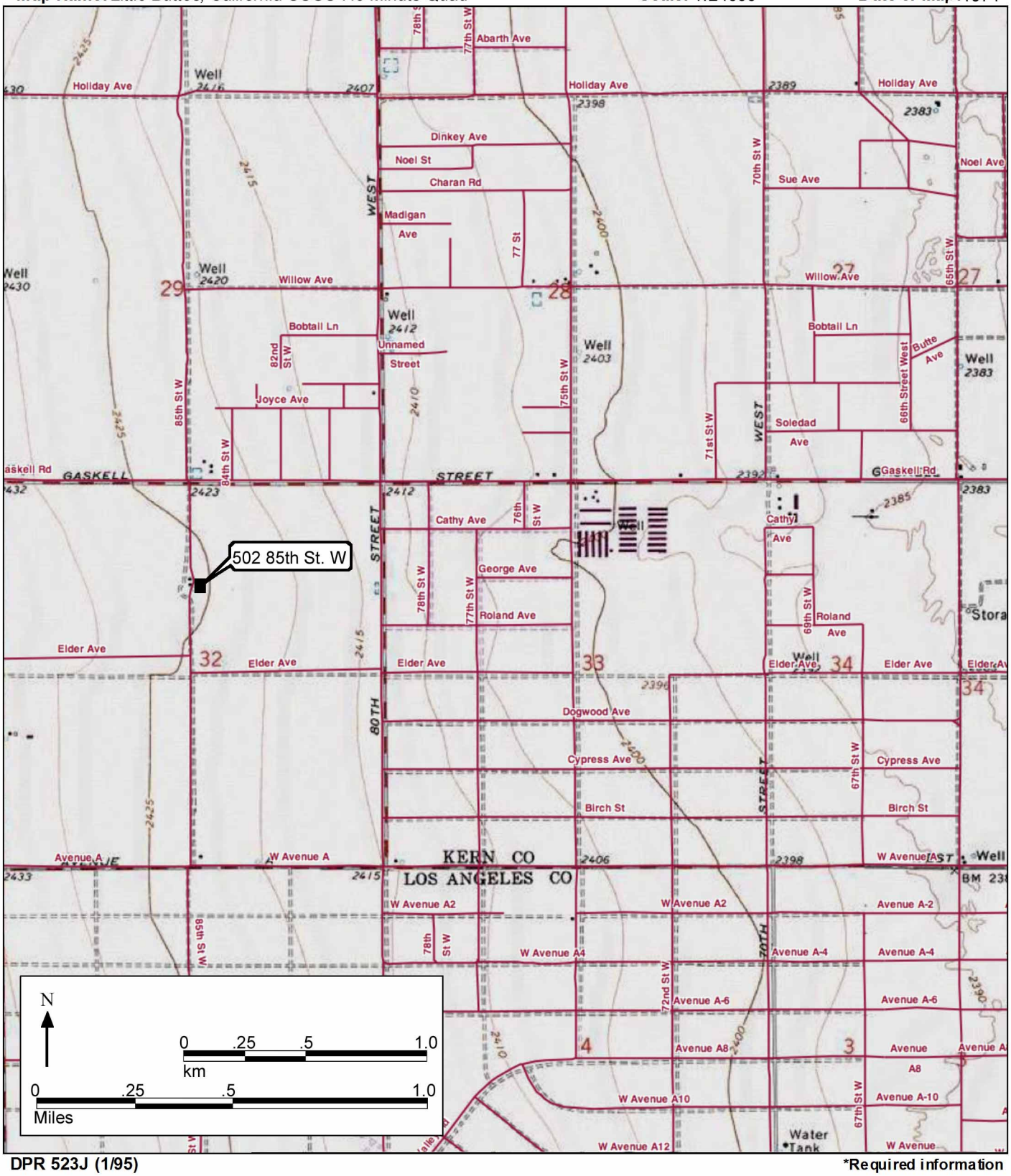
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or#**502 85th St. W

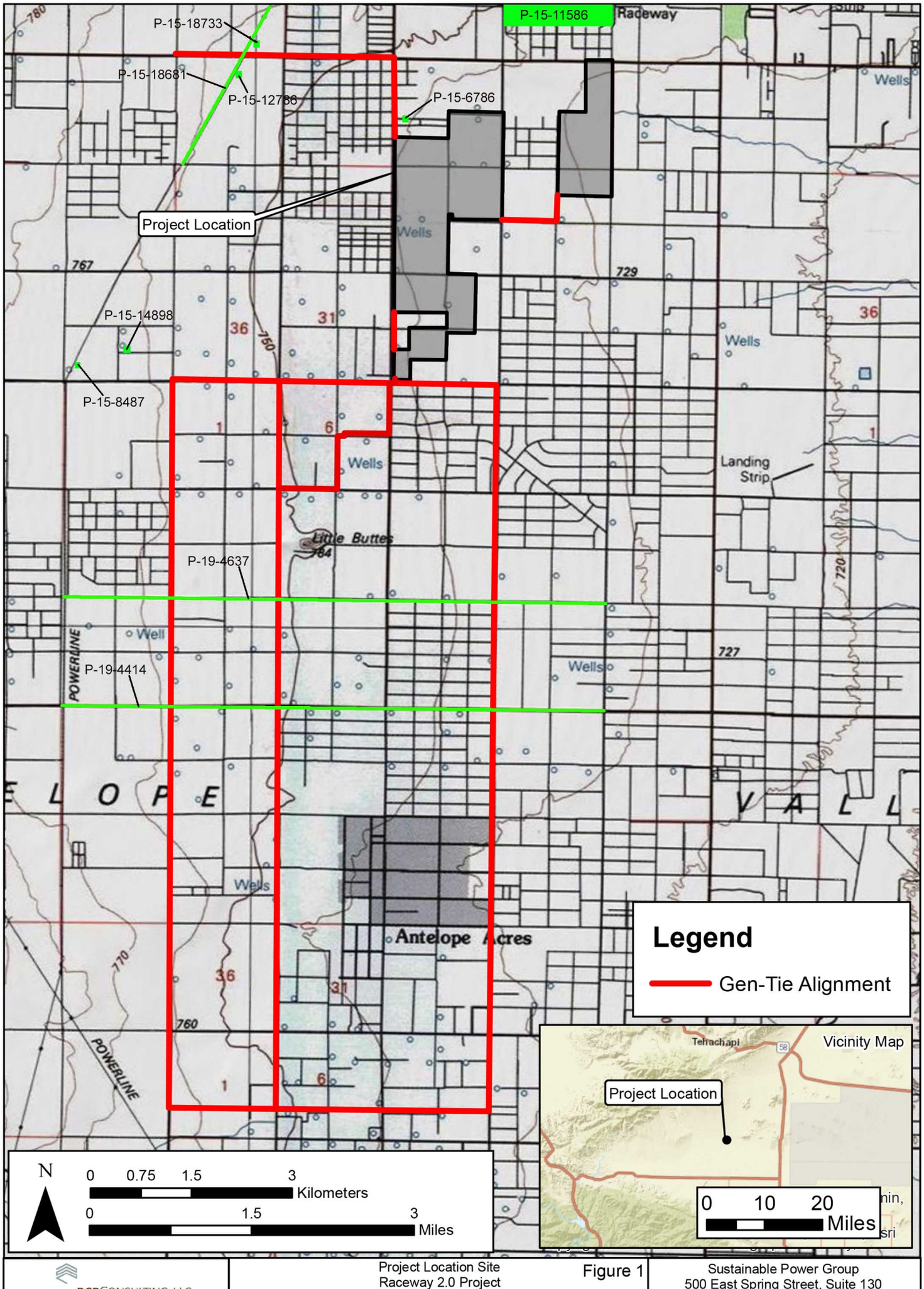
***Map Name:** *Little Buttes, California* USGS 7.5 Minute Quad ***Scale:** 1:24000 ***Date of Map:**1974



*Required information

APPENDIX B

CONFIDENTIAL CULTURAL RESOURCE LOCATIONS FROM RECORDS SEARCH



BCRCONSULTING LLC

Project Location Site
Raceway 2.0 Project

Figure 1

Reference: ESRI; USGS Quad: (1974/1995) Little Buttes ; Del Sur ; Rosamond ; Lancaster W, CA

Sustainable Power Group
500 East Spring Street, Suite 130
Long Beach, California 90815

APPENDIX C

NATIVE AMERICAN HERITAGE COMMISSION CORRESPONDENCE

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

November 3, 2017

David Brunzell
BCR Consulting, LLC

Sent by E-mail: david.brunzell@yahoo.com

RE: Proposed Raceway Solar Project, Cities of Lancaster and Rosamond; Del Sur, Little Buttes, and Fairmont Butte USGS Quadrangles, Los Angeles and Kern Counties, California

Dear Mr. Brunzell:

A records search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
(916) 373-3714

Native American Heritage Commission
Native American Contact List
Los Angeles, Kern Counties
11/3/2017

Fernandeno Tataviam Band of Mission Indians
Alan Salazar, Chairman Elders Council
1019 Second St., Suite 1 — Tataviam
San Fernando, CA, 91340
Phone: (805) 423 - 0091

Fernandeno Tataviam Band of Mission Indians
Kimia Fatehi, Tribal Historic and Cultural Preservation Officer
1019 Second Street, Suite 1 — Tataviam
San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
kfatehi@tataviam-nsn.us

Fernandeno Tataviam Band of Mission Indians
Beverly Salazar Folkes, Elders Council
1931 Shady Brooks Drive — Tataviam
Thousand Oaks, CA, 91362
Phone: (805) 558 - 1154
folkes9@msn.com

Kern Valley Indian Council
Julie Turner, Secretary
P.O. Box 1010 — Kawaiisu, Tubatulabal, Western Shoshone
Lake Isabella, CA, 93240
Phone: (661) 340 - 0032

Kern Valley Indian Council
Robert Robinson, Chairperson
P.O. Box 1010 — Kawaiisu, Tubatulabal, Western Shoshone
Lake Isabella, CA, 93283
Phone: (760) 378 - 2915
brobinson@iwvisp.com

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street — Kitanemuk, Southern Valley Yokut
Bakersfield, CA, 93305
Phone: (626) 339 - 6785
deedominguez@juno.com

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
Fax: (951) 922-8146

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838 — Kitanemuk, Serrano, Tataviam
Newhall, CA, 91322
Phone: (760) 885 - 0955
tsen2u@hotmail.com

San Manuel Band of Mission Indians
Lee Clauss, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Fax: (909) 864-3370
lclauss@sanmanuel-nsn.gov

Serrano Nation of Mission Indians
Goldie Walker, Chairperson
P.O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909) 528 - 9027

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Raceway Solar Project, Los Angeles, Kern Counties.

Native American Heritage Commission
Native American Contact List
Los Angeles, Kern Counties
11/3/2017

Tejon Indian Tribe
Octavio Escobedo, Chairperson
1731 Hasti-acres Drive, Suite 108 Kitanemuk
Bakersfield, CA, 93309
Phone: (661) 834 - 8566
Fax: (661) 834-8564
oescobedo@tejontribe.net

Tubatulabals of Kern Valley
Robert L. Gomez, Chairperson
P.O. Box 226 Tubatulabal
Lake Isabella, CA, 93240
Phone: (760) 379 - 4590
Fax: (760) 379-4592

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Raceway Solar Project, Los Angeles, Kern Counties.

APPENDIX D

PALEONTOLOGICAL RESOURCES ASSESSMENT

CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE

RACEWAY SOLAR PHOTOVOLTAIC PROJECT

PALEONTOLOGICAL RESOURCE ASSESSMENT

Prepared for:

Kern County

And

BCR Consulting

Prepared by:

Environmental Planning Group, LLC

Henderson, Nevada

Michael R. Pasenko, M.S.

December 2017

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1.0 Introduction 3
1.1 Definition of Paleontological Resources 3
1.2 Regulatory Setting 3
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1.2.2 State 3
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3.0 Project Description 6

4.0 Geology and Paleontology 6
4.1 Determination of Paleontological Sensitivity 6
4.2 Geological Units Within Project 7

5.0 Results 7

6.0 Recommendations 8

7.0 References Cited 8

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List of Acronyms and Abbreviations

CEQA	California Environmental Quality Act
EPG	Environmental Planning Group, LLC. (Third-party environmental consultant)
NHM	Natural History Museum of Los Angeles County
PRPA	Paleontological Resources Preservation Act of 2009
SVP	Society of Vertebrate Paleontology
USGS	United States Geological Survey

1.0 INTRODUCTION

Environmental Planning Group, LLC (EPG) was retained by BCR Consulting to prepare a Paleontological Resources Assessment for the Raceway Solar Project in Kern and Los Angeles counties, California (Figure 1.). This assessment discusses the geology underlying the project, the potential for paleontological resources to occur within the project area, the potential impacts to paleontological resources, and recommendations.

1.1 Definition of Paleontological Resources

Paleontological resources (i.e., fossils) means any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth (16 USC 470aaa SEC. 6301). Fossil remains may include bone, teeth, shell, leaves, wood, and tracks found in geological deposits in which they were originally buried. Paleontological resources include not only the actual fossils, but also the collecting localities and the geological deposits that contain the fossils.

1.2 Regulatory Setting

The Society of Vertebrate Paleontology (SVP) provides guidelines for the assessment and mitigation of paleontological resources. Under these guidelines, different rock units are described as having (a) high, (b) undetermined, (c) low, or (d) no potential for containing significant paleontological resources (SVP 2010).

1.2.1 Federal

The Paleontological Resources Preservation Act of 2009 (PRPA) requires the secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land using scientific principles and expertise (16 U.S.C. 470aaa et seq.). The PRPA includes specific provisions addressing management of these resources by the Bureau of Land Management, National Park Service, Bureau of Reclamation, and the United States Forest Service. This includes collection of scientifically significant fossils by qualified researchers who have obtained a permit. No federal protection of paleontological resources pertains to this project.

1.2.2 State

The California Environmental Quality Act (CEQA) (Article 1, Section 15002 (a) (3)) states that CEQA is intended to:

"Prevent significant avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible."

Public Resources Code Section 5097.5 states:

"No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (state, city, county, district, authority, or public corporation, or any

agency thereof), except with the express permission of the public agency having jurisdiction over such lands."

1.2.3 Local

The Kern County Land Use, Open Space, and Conservation Element of the General Plan states under Section 1.10.3 (Archaeological, Paleontological, Cultural, and Historic Preservation) Policy 25:

"The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors."

"In areas of known paleontological resources, the County should address the preservation of these resources where feasible."

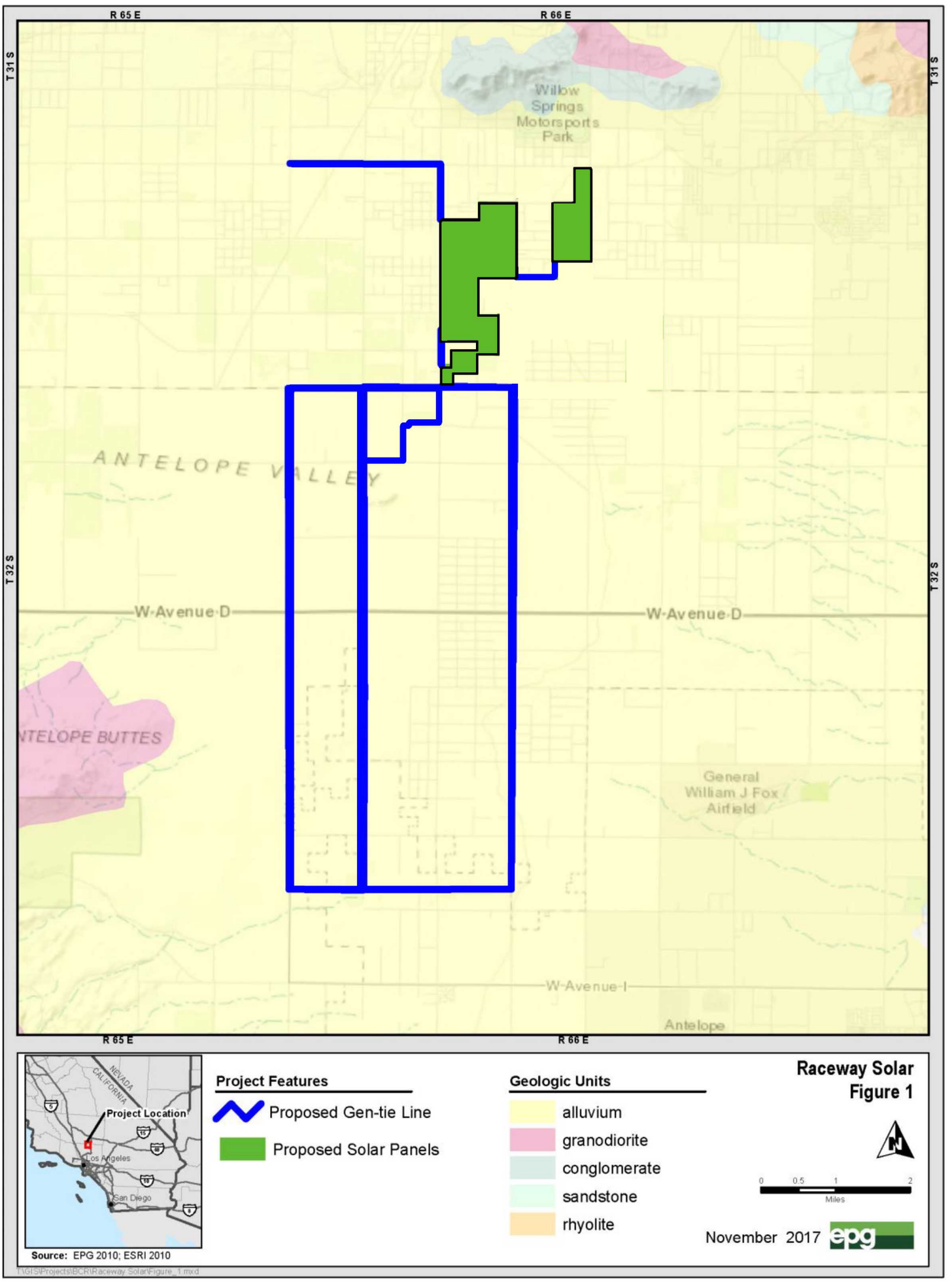


Figure 1. Project Area and Geological Units

2.0 METHODS

EPG paleontologist Michael Pasenko performed a review of all pertinent geological and paleontological literature for the project area. This was done to identify the geological units present at and below the surface within the project boundaries to determine the paleontological sensitivity of the geologic units identified, and to assess the impact to nonrenewable paleontological resources that could occur during project development. The online database of the University of California Museum of Paleontology was reviewed for previously recorded fossil localities. EPG also requested a fossil locality record search from the Natural History Museum of Los Angeles County (NHM) for any fossil localities within one mile of the project. In preparation for the paleontological resources assessment, EPG compiled a map of project area based on the geological maps of Dibblee Jr. (1959, 1960, and 1963).

3.0 PROJECT DESCRIPTION

The Project is located northwest of Lancaster, California in Los Angeles and Kern counties, California in Sections 20, 21, 28, 29, 32, and 33 of Township 9 North, Range 13 West (San Bernardino Base and Meridian). The project includes an area for the solar panels to be constructed, and five gen-tie lines. The project will employ photovoltaic modules that convert sunlight directly into electrical energy without use of heat transfer fluid or cooling water.

4.0 GEOLOGY AND PALEONTOLOGY

The Project lies in Antelope Valley within the western margin of the Mojave Desert Geomorphic Province. The Mojave Desert is a broad interior region of isolated mountain ranges separated by expanses of desert plains. It has an interior enclosed drainage and many playas (California Geological Survey 2002) The project overlies only Quaternary sedimentary rocks of Holocene age (Qa).

4.1 Determination of Paleontological Sensitivity

The SVP (2010) provides guidelines for assessing the paleontological sensitivity, or potential for geologic units to produce fossils that includes a four-tiered system:

- High Potential – Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing significant paleontological resources. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), and some low-grade metamorphic rocks that contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units that contain potentially datable organic remains older than late Holocene, including deposits

associated with animal nests or middens, and rock units that may contain new vertebrate deposits, traces, or trackways, are also classified as having high potential.

- Undetermined Potential - Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist (see "definitions" section in this document) to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

- Low Potential - Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, only fossils are preserved in rare circumstances and the presence of fossils is the exception, not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

- No Potential - Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

4.2 Geological Units Within Project

The above literature and review of geological maps revealed that the Project overlies the geological unit Quaternary alluvium (Qa) (Figure 1), which is considered recent in age (Holocene) (Dibblee Jr. 1963). The Qa is composed of gravel, sand, and silt and represents two types: fan alluvium and valley alluvium. The fan alluvium is of an unknown thickness and the valley alluvium is considered to be several hundred feet thick (Dibblee Jr. 1963.). Since the Qa of Dibblee Jr. (1963) is Holocene in age, the paleontological sensitivity for this geologic unit is considered low. Holocene age geologic units are considered too young to contain scientifically significant paleontological resources. Towards the south end of one of the gen-tie lines, west of Antelope Acres, a small area of windblown sand (Qs) is present close to the line. This windblown sand is considered to be recent in age.

5.0 RESULTS

A review of the University of California Paleobiology database revealed no previously recorded fossil localities within the project area. The record search with the NHM also revealed no previously recorded fossil localities within the project area. However, the NHM did report that there were three previously recorded fossil localities near the project. One fossil locality east of the project reported fish, reptiles, rodents, and a rabbit. Another fossil locality, north of Lancaster, reported the extinct camel *Camelops hesternus*. And a third fossil locality, near Palmdale, found a fauna that contained reptiles and rodents (Appendix A).

6.0 RECOMMENDATIONS

Geologic units of low sensitivity are mapped at the surface within the project area. Therefore, it is not believed that fossils would be expected at the surface. It is unlikely that deeper, older, underlying deposits would be impacted by development of the project. The Holocene age Qa can be up to several hundred feet thick, but there is no real break between the Holocene deposits and those of Pleistocene age (Dibblee Jr. 1963).

It is unlikely that grading or shallow excavations for the project will impact any geologic unit other than the recent alluvium. However, if deeper excavations are implemented in the project area, there is the possibility that older sediments of Pleistocene age could be encountered. If any paleontological resources are encountered during construction of the project, a qualified paleontologist should be contacted to assess the discovery.

7.0 REFERENCES CITED

California Geological Survey. 2002. California Geomorphic Provinces. Note 36, 4 pages.

Dibblee, Jr. T.W. 1959. Geologic map of the Rosamond Quadrangle, California. USGS Open File Report OF-59-30 (Scale 1:48,000).

Dibblee, Jr., T.W. 1960. Geologic map of the Lancaster quadrangle, Los Angeles County, California. USGS Mineral Investigations Field Studies Map MF-76 (Scale 1:62,500).

Dibblee, Jr. T.W. 1963. Geology of the Willow Springs and Rosamond Quadrangles, California. USGS Bulletin 1089-C, 119 pages and two plates.

Appendix A: Record Search

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

6 November 2017

EPG
2020 West Sunset Road, Suite 100
Henderson, NV 89014

Attn: Michael Pasenko, Paleontologist & Earth Resources Manager

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed Raceway Solar Project, northwest of Lancaster, Los Angeles and Kern Counties, project area

Dear Michael:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Raceway Solar Project, northwest of Lancaster, Los Angeles and Kern Counties, project area as outlined on the map covering portions of the Little Buttes, Rosamond, and Del Sur USGS topographic quadrangle maps that you sent to me via e- mail on 23 October 2017. We do not have any vertebrate fossil localities that lie within the proposed project area boundaries, but we do have localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The entire proposed project area has surface deposits that consist of younger Quaternary Alluvium, derived as alluvial fan deposits primarily from the convergence of the Sierra Nevada and Transverse Ranges at the head of the Antelope Valley to the west including the Antelope Buttes area hills to the west of the southern portion of the proposed project area. Typically, these deposits do not contain significant vertebrate fossils in the uppermost layers, but they may well contain significant fossil vertebrate remains at depth. Our closest vertebrate fossil locality from these deposits is probably LACM 7853, due east of the southern portion of the proposed project area, that from only three feet deep in the younger Quaternary deposits produced fossil specimens of smelt, Osmeridae, western whiptail lizard, *Aspidocelis tigris*, desert iguana, *Dipsosaurus*

dorsalis, desert spiny lizard, *Sceloporus magister*, side-blotched lizard, *Uta stansburiana*, desert night lizard, *Xantusia vigilis*, skink, *Plestiodon*, whip snake, *Masticophis*, leaf-nosed snake, *Phyllorhynchus*, western lyre snake, *Trimorphodon biscutatus*, wood rat, *Neotoma*, field mouse, *Peromyscus*, pocket gopher, *Thomomys bottae*, kangaroo rat, *Dipodomys*, pocket mouse, *Perognathus*, Audubon's cottontail rabbit, *Sylvilagus audubonii*, and antelope ground squirrel, *Ammospermophilus leucurus*. Just west of south of locality LACM 7853, on the north side of Lancaster east and south of the proposed project area, we have another vertebrate fossil locality in the younger Quaternary deposits, LACM 7884, that from only four feet below the surface produced a fossil specimen of camel, *Camelops hesternus*.

Further to the southeast of the proposed project area, east of Palmdale along Avenue S from Little Rock eastward, we have localities LACM 5942-5953 from pipeline excavations in the Quaternary Alluvium and older Quaternary sediments that produced a fauna of small vertebrates including gopher snake, *Pituophis*, kingsnake, *Lampropeltis*, leopard lizard, *Gambelia wislizenii*, cottontail rabbit, *Sylvilagus*, pocket mouse, *Chaetodipus*, kangaroo rat, *Dipodomys*, and pocket gopher, *Thomomys*.

Even relatively shallow excavations in the younger Quaternary Alluvium exposed in the proposed project area may well uncover significant fossil vertebrate remains. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Sediment samples should also be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

APPENDIX E

PROJECT PHOTOGRAPHS



Photo 1: Project Site Overview (View West)



Photo 2: Project Site Overview (View Northwest)



Photo 3: Project Overview (View North)



Photo 4: Project Overview (View East)

Appendix G
Soils Report

Technical Memorandum

To: Dallas Pugh, Permitting Manager, sPower

From: Chuck Cleeves, Environmental Specialist/Project Manager, Ecology and Environment, Inc., member WSP

Date: August 25, 2020

Re: Raceway 2.0 Solar Project: Soils Technical Memorandum

cc: Sean Fox, Project Director, Ecology and Environment, Inc., member WSP

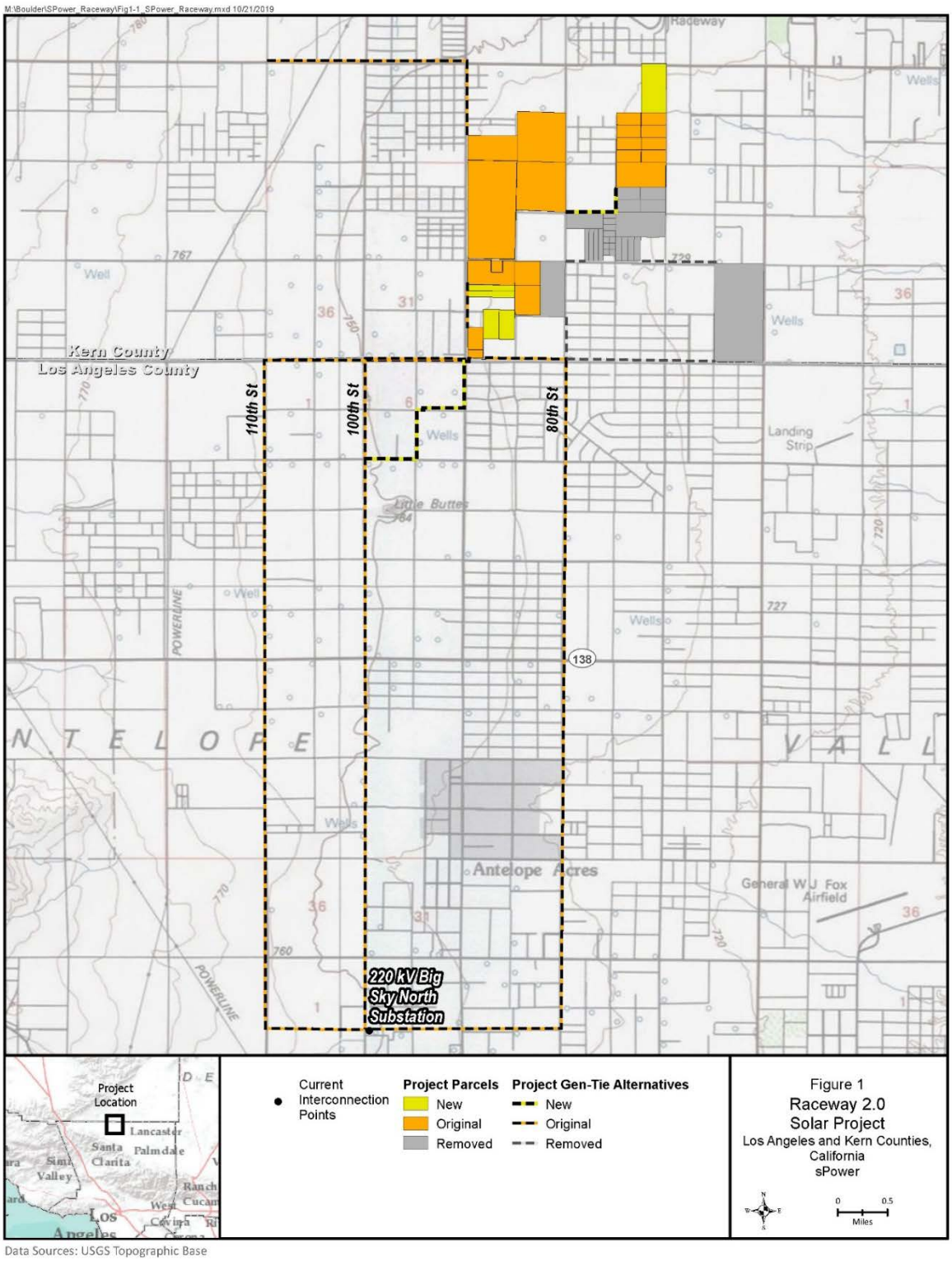
Ecology and Environment, Inc., member of WSP (hereafter referred to as E & E) has prepared this technical memorandum to document the updates to the Final Soils Report (Report) prepared for the original Raceway Solar Project in November 2017. This memorandum summarizes the main project features revised in the Report and identifies relevant updates made to the analysis of the potential construction- and operation-related impacts on soils from implementation of the new Raceway Solar Project 2.0 (proposed Project).

PROJECT DESCRIPTION

The proposed Project is reduced in size from the original proposed project (Figure 1). The proposed Project consists of six sites and would develop photovoltaic (PV) solar facilities and the associated infrastructure necessary to generate a combined total of 291 megawatts (MW) of renewable electrical energy and/or energy storage capacity on approximately 1,311 acres of privately-owned land. The proposed Project consists of the following sites: Raceway Solar 1, Raceway Solar 2, Raceway Solar 3, Raceway Solar 4, Raceway Solar 5, and Raceway Solar 6.

The Project applicant proposes that the project either be built at the same time as a single, 291-MW facility or, alternatively, developed as six independent facilities, depending upon market conditions. The proposed project includes advanced energy battery storage units. The power generated by the proposed project would be interconnected to an existing transmission network. The project interconnection options are described below. It is expected that one main path would be used for the generation tie (gen-tie) corridor, with deviations from the path as necessary.

The project has five interconnection options as further described in the full revised Project Description (Attachment 1).


M:\Boulder\SPower_Raceway\Fig1-1_SPower_Raceway.mxd 10/21/2019
Raceway
Kern County
Los Angeles County
110th St
100th St
80th St
Wells
Landing Strip
Little Buttes
POWERLINE
138
Antelope Acres
General WJ Fox Airfield
220 kV Big Sky North Substation
Project Location
Lancaster
Palmdale
Santa Clarita
Los Angeles
Current Interconnection Points
Project Parcels
New
Original
Removed
Project Gen-Tie Alternatives
New
Original
Removed
Figure 1
Raceway 2.0
Solar Project
Los Angeles and Kern Counties, California
sPower
0
0.5
Miles
Data Sources: USGS Topographic Base

OVERVIEW OF SOILS REPORT

The Report described existing soils conditions and potential impacts of the original project on soil resources (Attachment 2). It also described the environmental setting and potential impacts associated with construction and operation of the project and identifies recommended measures to reduce potential impacts.

The Report used the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) to identify and describe the soils of the project site and surrounding areas (Figure 2). The soils identified include:

- Adelanto Series
- Cajon Series
- Greenfield Series
- Hanford Series
- Hesperia Series
- Ramona Series
- Rosamond Series
- Sunrise Series
- Tray Series

Figure 2 displays the soils comprising new areas associated with the proposed project (i.e., existing soils conditions). The descriptions of the soils remain the same as summarized within the Report (Attachment 2).

California Environmental Quality Act Significance Criteria

The following significance criteria were presented in the Report, defined based on the checklist items in Appendix G of the California Environmental Quality Act (CEQA) Guidelines, and have been reassessed for the proposed project. An impact to soil resources is considered significant if the project would meet the following impact criteria.

Criterion GEO-1: Result in substantial soil erosion or the loss of topsoil.

The Report identified a potential significant impact because of a wind erodibility rating of "moderately susceptible" to "susceptible". This potential remains for the revised project because the area~~of it~~ consists of the same soil types as the original site, however, there is a potential to reduce the wind erodibility by using water as a dust suppressant during construction. The Report also identified the reduction of sediment production/soil erosion and storm water pollution accomplished by preparation of a storm water pollution prevention plan (SWPPP). It is anticipated that the SWPPP for the project would identify appropriate erosion control measures for both construction and post-construction.

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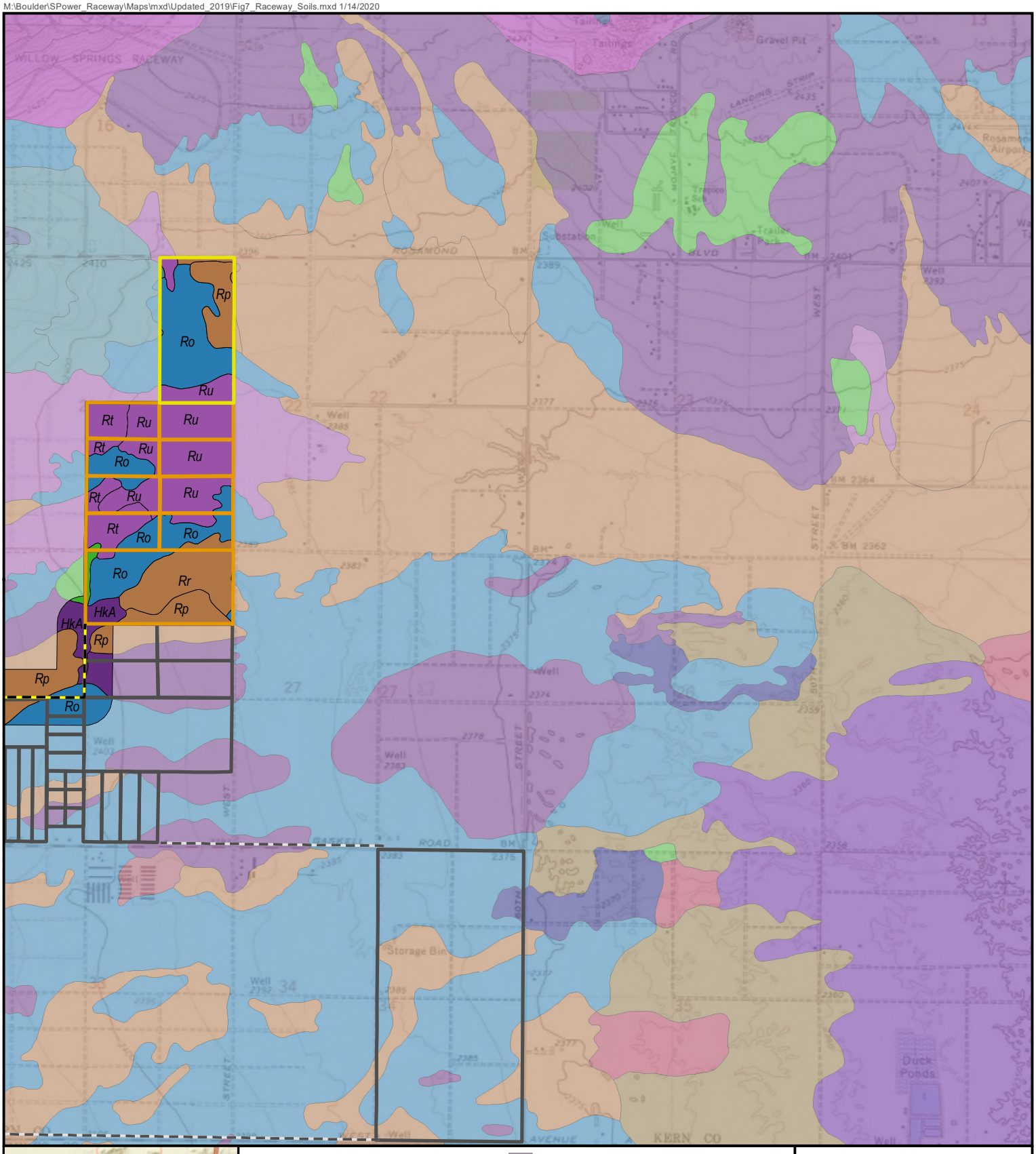

Figure 2
Raceway 2.0 Solar Project
Soils
Page 1 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

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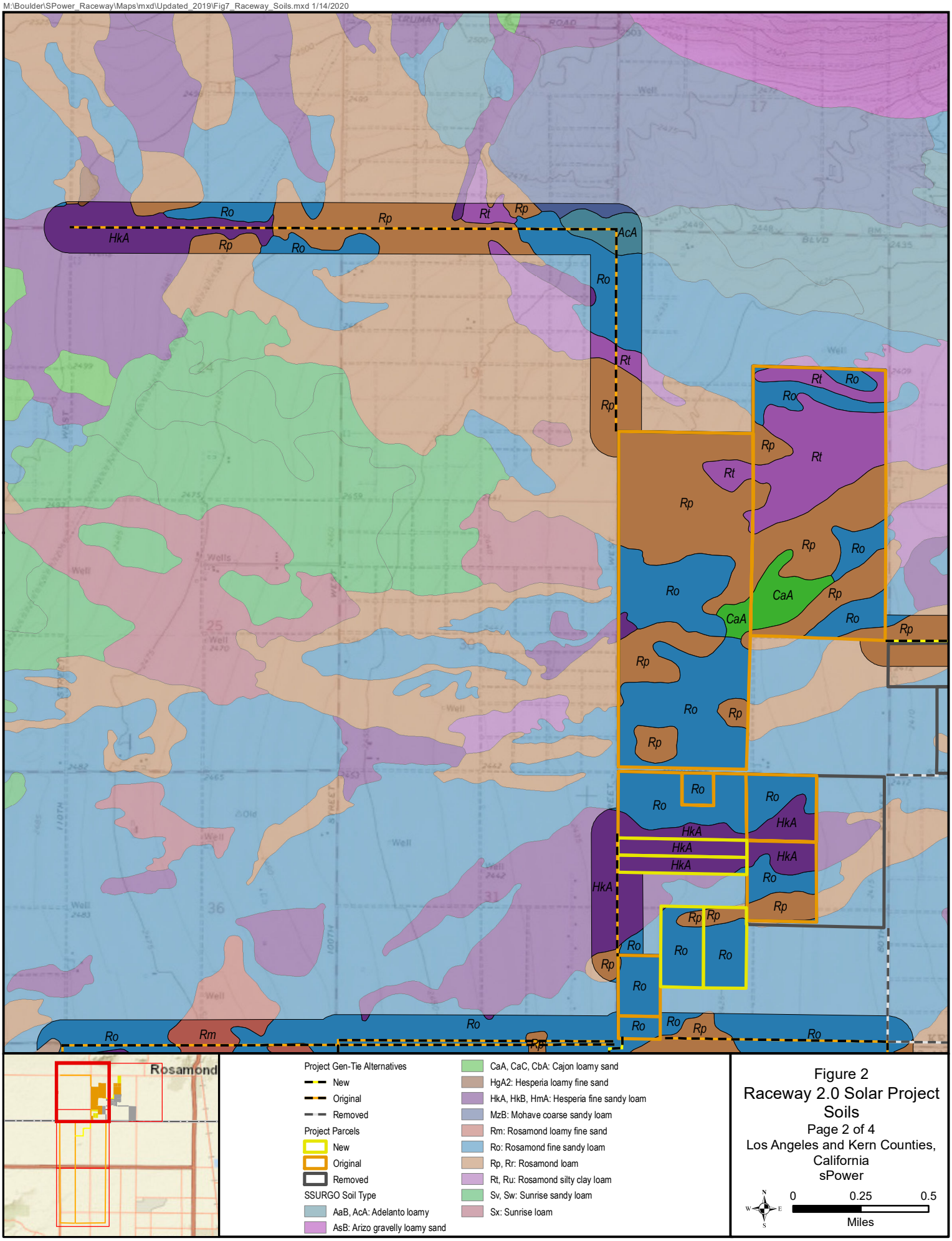

Figure 2
Raceway 2.0 Solar Project
Soils
Page 2 of 4
Los Angeles and Kern Counties, California
sPower

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Data Sources: ESRI 2019, USDA SSURGO 2019

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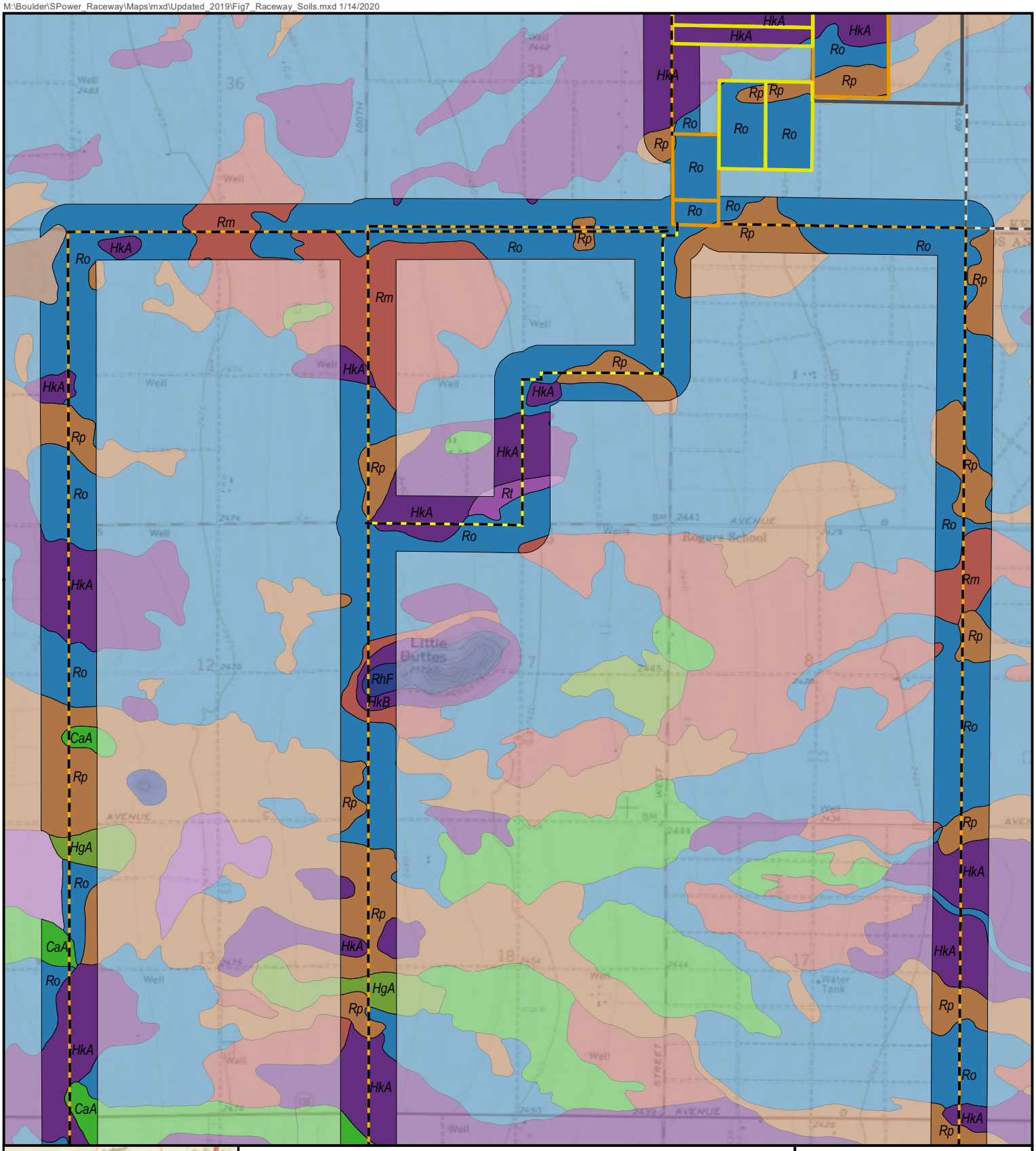

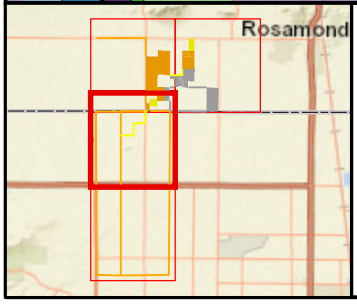

Project Gen-Tie Alternatives
- New
- Original
- Removed

Project Parcels
- New
- Original
- Removed

SSURGO Soil Type
- CaA, CaC, CbA: Cajon loamy sand
- HgA2: Hesperia loamy fine sand
- HgA: Hesperia loamy fine sand, 0 to 2 percent slopes
- HkA, HkB, HmA: Hesperia fine sandy loam
- RhF: Rock land
- Rm: Rosamond loamy fine sand
- Ro: Rosamond fine sandy loam
- Rp, Rr: Rosamond loam
- Rt, Ru: Rosamond silty clay loam
- Sx: Sunrise loam

Figure 2
Raceway 2.0 Solar Project
Soils
Page 3 of 4
Los Angeles and Kern Counties, California
sPower

N W E S
0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

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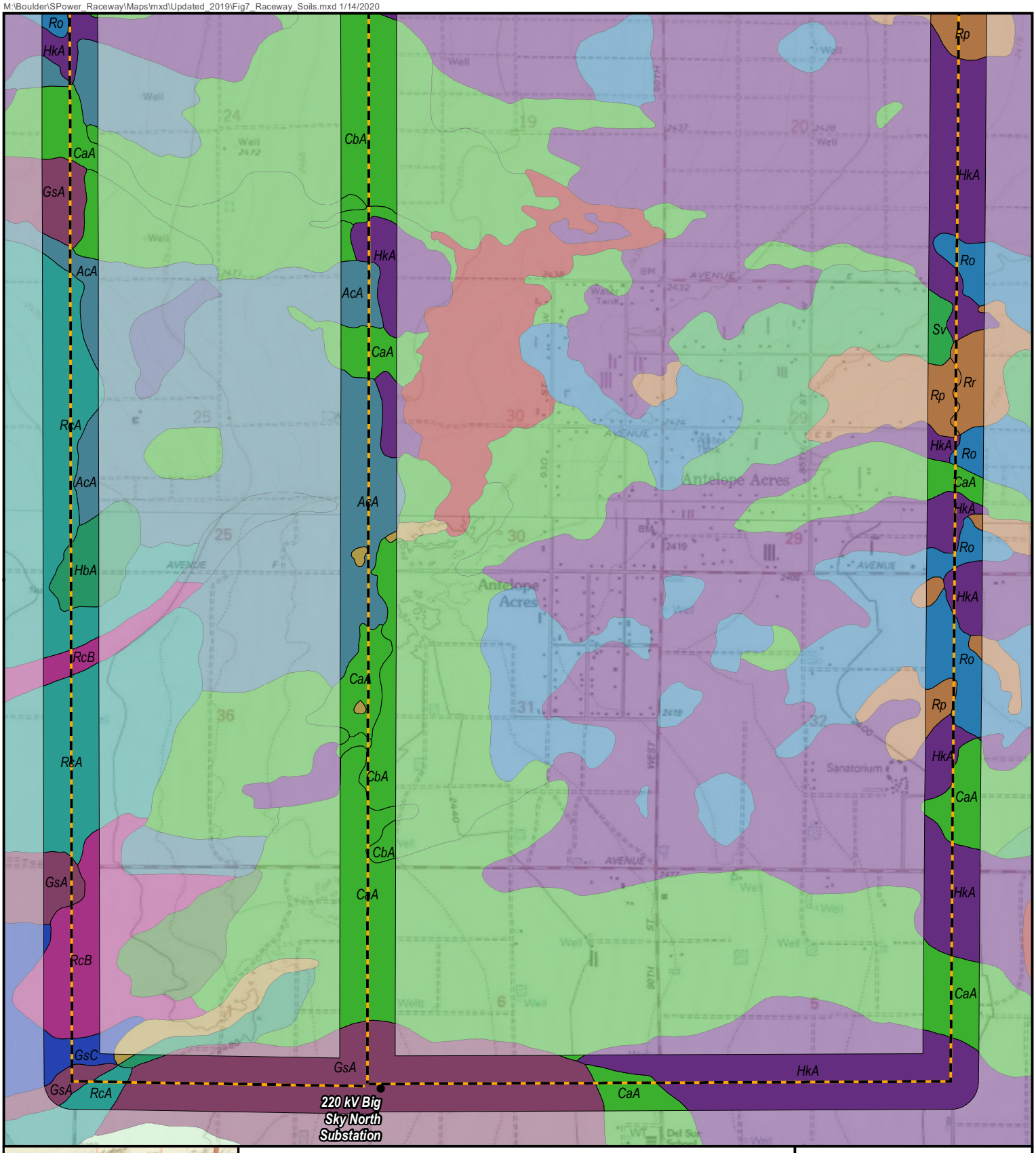

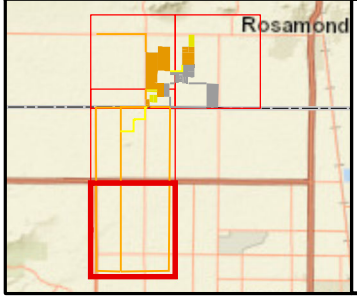

Current Interconnection Points

Project Gen-Tie Alternatives

Original

<all other values>

SSURGO Soil Type

- AaB, AcA: Adelanto loamy
- CaA, CaC, CbA: Cajon loamy sand
- CcA2: Cajon loamy fine sand, 0 to 2 percent slopes, hummocky
- DuD: Dune land
- GsA: Greenfield sandy loam, 0 to 2 percent slopes
- GsC: Greenfield sandy loam, 2 to 9 percent slopes
- HbA: Hanford coarse sandy loam, 0 to 2 percent slopes
- HkA, HkB, HmA: Hesperia fine sandy loam
- MzB: Mohave coarse sandy loam
- RcA: Ramona coarse sandy loam, 0 to 2 percent slopes
- RcB: Ramona coarse sandy loam, 2 to 5 percent slopes
- RfB: Ramona loam, 2 to 5 percent slopes
- Ro: Rosamond fine sandy loam
- Rp, Rr: Rosamond loam
- Sv, Sw: Sunrise sandy loam

Figure 2
Raceway 2.0 Solar Project Soils
Page 4 of 4
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: ESRI 2019, USDA SSURGO 2019

Criterion GEO-2: Be located on a soil that is unstable, or would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
The Report recommended using the results of a site-specific geotechnical evaluation to inform project design to avoid any potential unsuitable areas. The change (and reduction) in area associated with the Project does not change the recommendation because of the same soil types are present.

The Report indicated that liquefaction and lateral spreading has the potential to occur during an earthquake in areas with groundwater levels less than 50 feet below ground surface. The Report identified groundwater levels between 159 and 247 feet below ground surface. Thus, as the Report concluded, the potential impacts from liquefaction are still not considered significant.

Criterion GEO-3: Be located on expansive soil, creating substantial risks to like or property.
The Report recommended using the results of a site-specific geotechnical evaluation to inform project design to reduce the impacts associated with expansive soil. The change in project area associated with the project does not change the recommendation because of the similar project footprint, and soil types. Therefore, a geotechnical evaluation is still recommended.

Criterion GEO-4: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
The Report indicated that the project does not currently include construction of any septic tanks or alternative wastewater disposal systems. While the proposed project would result in modifications (and reductions) to the project footprint, the proposed components of the Project are not anticipated to change. Thus, the project would have no impact under this criterion, as the project is still not anticipated to include construction of septic tanks or alternative wastewater disposal systems.

Criterion GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?
It should be noted that the CEQA Guidelines have changed since the Report was completed. In December 2018 the CEQA Guidelines moved consideration of impacts to paleontological resources from the Cultural Resources section to the Geology and Soils section of the CEQA Guidelines (Appendix G). The Paleontological Report (December 2017), prepared by Environmental Planning Group, LLC, for the Raceway site is attached to the Cultural Resources Evaluation of the site as Appendix C to the overall Cultural Resources Report. The conclusions of the Paleontological Report stated that the proposed project would not impact potential paleontological resources within the project area.

Attachment 1

Revised Project Description

1. Project Description

1.1 Project Location

The proposed Raceway 2.0 Solar Project (proposed project) consists of six (6) sites and would develop photovoltaic (PV) solar facilities and the associated infrastructure necessary to generate a combined total of 291 megawatts (MW) of renewable electrical energy and/or energy storage capacity on approximately 1,311 acres of privately owned land. The proposed project consists of the following sites: Raceway Solar 1, Raceway Solar 2, Raceway Solar 3, Raceway Solar 4, Raceway Solar 5, and Raceway Solar 6.

The project proponent proposes the project be built at the same time as a single, 291-MW facility or, alternatively, developed as six independent facilities (**Table 1**, *Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage*), depending upon market conditions. The proposed project includes advanced energy battery storage units.

The proposed project is located within the southern half of Township S 9 N, Range N 13 W of the San Bernardino Meridian and is contained by but does not fully occupy sections W 20, W 21, W 28, W 29, W 32. The proposed project is in the eastern high desert region of unincorporated Kern County and within the jurisdictional boundaries of the Willow Springs Specific Plan and the Kern County Zoning Ordinance. The proposed project is in the western extent of the Mojave Desert near Rosamond, California between Rosamond Boulevard and Avenue A, and between 70th Street West and 90th Street West.

Land uses in the region include a mix of undeveloped land, agriculture, residential, recreational and renewable energy projects (solar and wind). Desert vegetation dominates the project site and region. Topography across the project site is relatively flat as the site is located on the bajada of the Tehachapi Mountains, which is an overlapping of alluvial fans with southern trending slope. The major north-south route in the region is SR 14, a four-lane highway located approximately 4 miles east of the proposed project. The major east-west route near the proposed project is SR 58, which is also a four-lane highway, located approximately 14 miles north of the proposed project. Paved and unpaved roadways, generally following section lines, are found throughout the area.

The Assessor Parcel Numbers (APNs) are summarized in Table 1, *Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage*. **Table 2,** *Kern County APNs for Generation Tie Lines*, summarizes the APNs for the four generation tie line options.

The power generated by the proposed project would be interconnected to an existing transmission network. The project has five interconnection options as further described in Section 1.3. It is expected that one main path would be used for the gen-tie corridor, with deviations from the path as necessary. Kern County gen-tie assessor's parcels are detailed in **Table 2**.

Tables 3 through **5** below, detail the Los Angeles County assessor's parcel numbers for property where the generation tie line route shall be installed, should the project be connected to the Big Sky North Substation near the City of Lancaster in Los Angeles County or a future LADWP (Los Angeles Department of Water and Power) substation.

Table 1. Project Assessor Parcel Numbers, Corresponding Map Codes, Zoning & Acreage

	Megawatts (MW)	APNs	Willow Springs Specific Plan Map Code Designation	Zoning	Acres
Raceway Solar 1	15	374-020-42, 374-020-40, 370-020-47, 370-020-48	7.1/4.4	E (2.5) RS MH FPS	92
Raceway Solar 2	20	374-250-04, western third of 374-020-55	7.1 /4.4	E (2.5) RS FPS and E (2.5) RS MH FPS	90
Raceway Solar 3	106	374-210-08, 374-011-13, 374-250-03, 374-250-01, 374-250-09, 374-250-08	5.6; 5.6/2.85; 7.1/4.4	E (2.5) RS FPS	494
Raceway Solar 4	70	374-011-04, 374-011-11	5.5; 5.6/2.85	A FPS	315
Raceway Solar 5	60	374-440-01, 374-440-02, 374-440-03, 374-440-04, 374-440-05, 374-440-06, 374-440-07, 374-440-08, 374-011-08	5.3/4.4	E (2.5) RS FPS and E (2.5) RS MH FPS	240
Raceway Solar 6	20	374-011-07	5.3/4.4	OS, E 2.5 RS, FPS	80
Total Megawatts	**291**	**Proposed Solar Project Total Acreage**			**1,311**

Willow Springs Specific Plan Map Code Designations

5.3 = Residential, Maximum 10 units/net acre

5.5 = Residential, Maximum 1 units/net acre

5.6 = Residential, Maximum 2.5 gross acres/unit

7.1 = Light Industrial

7.2 = Service Industrial

4.4 = Comprehensive Plan Required

Physical Constraints Overlay

2.8 = Military Flight Operations

2.85 = Noise Management Area

Kern County Zone Districts

A = (Exclusive Agriculture)

E (2.5) = Estate (2.5 acre minimum)

RS = Residential Suburban Combining

MH = Mobile Home Combining

FPS = Floodplain Combining

Table 2. Kern County APNs for Generation Tie Lines						
90th Street West and Rosamond Blvd.			**80th Street West**	**100th Street West &Ave A**	**110th Street West &Ave A**	**West Ave A**
252-152-25	374-051-14	374-042-39	374-020-53	374-020-40	359-032-08	374-020-38
252-152-26	374-051-15	374-051-01	374-020-55	374-020-46	359-032-13	374-020-49
252-152-27	374-052-15	374-071-23	374-121-01	374-290-01	359-032-14	374-020-50
252-152-28	374-052-16	374-071-25	374-121-16	374-303-01	359-032-17	374-020-53
252-152-29	374-061-01	374-071-28	374-121-17	374-303-02	359-032-27	374-122-25
252-152-30	374-061-02	374-082-03	374-121-32	374-321-05	359-032-28	374-122-26
252-152-31	374-061-03	374-082-08	374-122-01	374-321-06	374-020-40	374-122-27
252-152-32	374-061-04	374-210-01	374-122-16	374-322-01	374-020-46	374-122-28
252-331-15	374-061-05	374-210-04	374-122-17	374-322-04	374-290-01	374-122-29
252-352-05	374-061-07	374-210-08	374-122-32	374-322-05	374-303-01	374-122-30
252-352-22	374-061-08	374-210-12		374-322-08	374-303-02	374-122-31
252-352-23	374-061-09	374-210-14		374-450-08	374-321-05	374-122-32
252-352-24	374-061-10			374-450-09	374-321-06	374-132-25
252-352-33	374-061-12			374-450-13	374-322-01	374-132-26
358-030-21	374-061-14				374-322-04	374-132-27
359-051-22	374-061-16				374-322-05	374-132-28
359-051-24	374-061-17				374-322-08	374-132-29
359-051-25	374-061-18				374-450-08	374-132-30
359-051-26	374-061-19				374-450-09	374-132-31
359-051-27	374-061-21				374-450-13	374-132-32
359-051-28	374-062-01					374-142-25
359-051-29	374-062-03					374-142-26
359-051-31	374-062-21					374-142-27
374-041-32	374-062-22					374-142-28
374-041-33	374-071-01					374-142-29
374-041-34	374-071-05					374-142-30
374-041-35	374-071-08					374-142-31
374-042-01	374-071-14					374-142-32
374-042-02	374-071-16					375-020-01
374-042-03	374-071-17					
374-042-04	374-071-18					
374-042-07						
374-042-08						

Table 3. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 80th Street West							
3268001001	3268019099	3219015001	3220007070	3220015054	3233002047	3233015017	3229009010
3268001004	3268019086	3220001028	3220007127	3220022040	3233002042	3233015032	3229007026
3268001006	3219009011	3220001024	3220007146	3220022043	3233002037	3233013022	3229008031
3268003025	3219009010	3220001025	3220007157	3220022041	3233002049	3233013024	3229006006
3268001005	3219010012	3220001027	3220007158	3220022042	3233002048	3233018001	3229006016
3268001036	3219010013	3220004036	3220011008	3229008029	3233005007	3233018032	3229008013
3268003010	3219009014	3220004037	3220011009	3229006012	3233005008	3233018016	3229014002
3268003020	3219010016	3220004038	3220011001	3229006013	3233005009	3233019019	3229014003
3268003021	3268019099	3220004035	3220011032	3229006014	3233004025	3233019018	3233002019
3268003030	3268019086	3220005035	3220011024	3229009009	3233004026	3233018017	3233004036
3268005002	3219009011	3220005036	3220011025	3229008012	3233005006	3233019001	3233012026
3268007001	3219009010	3220005037	3220012001	3229006015	3233008004	3233019034	3233019002
3268007002	3219010012	3220006025	3220012002	3229008030	3233008002	3233022001	3219017022
3268007003	3219010013	3220006026	3220011036	3229009026	3233008001	3233022017	3219011012
3268017002	3219009014	3220006024	3220011035	3229010012	3233008003	3233022016	3219011013
3268017039	3219010016	3220005038	3220012043	3229010013	3233009008	3233022032	3219026001
3268017013	3268019099	3220006027	3220012045	3229010024	3233009009	3219009009	3265024007
3268017040	3268019086	3220007004	3220012052	3229010025	3233009024	3268005001	3265024004
3268017003	3219009011	3220007048	3220012044	3229011010	3233009025	3268001034	
3268017005	3219009010	3220007052	3220012040	3229012010	3233012010	3268001003	
3268017023	3219010012	3219015001	3220012051	3229011009	3233012025	3220016006	
3268018006	3219010013	3220001028	3220012042	3229012002	3233012034	3220011016	
3268018007	3219009014	3220001024	3220012039	3229012007	3233013023	3220015043	
3268018900	3219010016	3220005038	3220015046	3229012021	3233013026	3229009025	
3268018039	3219013002	3220006027	3220015042	3229012008	3233013028		
3268018017	3219013007	3220007004	3220015017	3229012009	3233013025		
3268018022	3219012007	3220007048	3220015041	3229012003	3233015001		
3268019030	3219013004	3220007052	3220016005	3233002021	3233013027		
3268019046	3219013003	3220007057	3220017019	3233002022	3233013029		
3268019087	3219010015	3220007061	3220017020	3233002038	3233015016		

Table 4. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 100th Street West and Ave A			
3262001007	3262012001	3262025008	3265003049
3262001029	3262012002	3262025025	3265003033
3262001020	3262012003	3262025024	3265003051
3262001025	3262012004	3262024025	3265004063
3262001044	3262015002	3262025009	3265004062
3262001038	3262015003	3264001008	3265004032
3262001022	3262015001	3264001011	3265004088
3262001031	3262016001	3264001018	3265004091
3262001039	3262016002	3264001053	3265004093
3262001048	3262016007	3264001048	3265004065
3262001071	3262016003	3264002016	3265005006
3262001081	3262018019	3264001026	3265004075
3262001070	3262016006	3264001049	3265005013
3262001078	3262018053	3264003032	3265005014
3262001072	3262018056	3264003017	3219001027
3262001069	3262016004	3264003016	3219001054
3262001075	3262018054	3264003001	3219001055
3262001077	3262018055	3264006016	3219027022
3262001082	3262019034	3264006001	3219027033
3262001084	3262019078	3264006032	3219027034
3262004003	3262019038	3264007001	3219027049
3262004002	3262019061	3264006017	3219001042
3262004001	3262019073	3264007008	3219001043
3262004004	3262019110	3264007009	3264014002
3262004008	3262019125	3264008001	3264018010
3262004007	3262019126	3264007016	3264018011
3262004009	3262019079	3264008002	3264018012
3262004005	3262019222	3264013021	3219027021
3262004006	3262019221	3264013022	3265005005
3262004025	3262020029	3264013027	3265024007
3262005001	3262020115	3264013028	3265024005
3262004024	3262020153	3264015002	3265024006
3262005013	3262020220	3264015001	
3262007001	3262020233	3264015003	
3262005014	3262020154	3264015004	3229001001 **
3262006002	3262021029	3264016001	3262009001 **
3262005027	3262020232	3264013025	3262009002 **
3262007021	3262021027	3264016003	3262001007 **
3262007022	3262020230	3264017004	3262013008 **
3262007020	3262021026	3264017003	
3262008002	3262020236	3264017001	
3262008001	3262021028	3264018013	
3262005015	3262020235	3264017002	
3262008022	3262021018	3264016002	
3262011002	3262020234	3264016004	
3262011004	3262021039	3265003031	
3262011003	3262022001	3265003030	
3262011001	3262024009	3265003027	
3262011005	3262024008	3265003023	
3262008023	3262024024	3265003015	

** Option B: Alternate route to 100th Street West via 90th Street to Avenue A-8 to 95th Street to Avenue B

Table 5. Los Angeles APNs for Generation Tie Lines (south of Avenue A) 110th Street West and Ave A				
3261017009	3262001064	3263006029	3264022049	3265015013
3261017024	3262001065	3263006900	3264021010	3264020005
3261017008	3262002025	3263006019	3264022005	3263020001
3261017025	3262002017	3263006023	3264022055	3264020002
3261018009	3262004003	3263007020	3264022050	3264020004
3261018024	3262004002	3263008008	3264022004	3263006032
3261019009	3262004001	3263007019	3264022059	3263020023
3261019024	3262001053	3263006031	3265001026	3261034017
3261019008	3262001058	3263007021	3265001047	3263020025
3261019025	3262004004	3263008024	3265001067	3263020024
3261018008	3262002018	3263008009	3265001088	3263020010
3261018025	3262004008	3263007023	3265001058	3265002045
3261020008	3262004007	3263008025	3265001036	3265001059
3261020009	3262004005	3263009016	3265001057	3265007030
3261020031	3262004006	3263009042	3265002044	3265007007
3261020032	3262006002	3263009012	3265002043	3265024007
3261032003	3262017005	3263009046	3265002055	3265024003
3261032002	3262018001	3263009015	3265002080	
3261033001	3262017021	3263009006	3265003002	
3261032072	3262017020	3263009054	3265003006	
3261032069	3262017036	3263009073	3265002138	
3261032070	3262019044	3263020008	3265003005	
3261032071	3262019085	3263020009	3265003009	
3261033081	3262019045	3264002027	3265003008	
3261036005	3262019077	3264001031	3265002075	
3261034015	3262019084	3264001037	3265002163	
3261036009	3262019086	3264001021	3265003045	
3261036010	3262019151	3264001027	3265003054	
3261036012	3262019150	3264001046	3265003052	
3261036014	3262019205	3264002041	3265004108	
3261036015	3262019206	3264002044	3265004106	
3262001020	3262019228	3264001041	3265004107	
3262001005	3262020035	3264001047	3265006001	
3262001046	3262020004	3264002024	3265007001	
3261036006	3262020020	3264002025	3265008017	
3261036011	3262020036	3264002095	3265006002	
3262001052	3262020118	3264002096	3265007003	
3262001055	3262020117	3264002131	3265008019	
3261036013	3262020169	3264002132	3265008029	
3262001054	3262020211	3264020007	3265008032	
3262001068	3262020168	3264020001	3265009016	
3262001067	3262020170	3264020006	3265009015	
3262001085	3262023001	3264021001	3265009010	
3262002010	3262023032	3264021011	3265014022	
3262002001	3262023017	3264021013	3265014023	
3262001086	3262023016	3264020003	3265014014	
3262002002	3263006013	3264021012	3265014024	
3262002009	3263006026	3264022001	3265014017	

1.2 Environmental Setting

The proposed project is located on approximately 1,311 acres of undeveloped, privately owned land located in the western extent of the Mojave Desert near Mojave, California. The project is in the Mojave Basin and Range ecoregion and the United States Geological Survey (USGS) Little Buttes and Rosamond 7.5-minute topographical quadrangles. The project sites are zoned for residential development and Raceway Solar 4 is zoned for agriculture but is not currently under cultivation. Development in the area surrounding the project site includes rural residences, agriculture, and renewable energy (solar and wind) facilities.

Vegetation on the project site consists of Mojave Saltbush Scrubland with the most common species being saltbush (*Atriplex polycarpa*); Russian thistle (*Salsola tragus*) and ripgut brome (*Bromus diandrus*) are also very common to the area. This community typically occurs on well-drained soils in alluvial fans, bajadas, and upland slopes. Growth occurs during spring (or rarely in summer or fall) if rainfall is sufficient. This is one of the most widely distributed desert plant communities in the Mojave Desert, occurring from the desert floor up to approximately 3,500 feet in elevation, and extending into northwestern Arizona and southern Utah.

The foothills of the Tehachapi Range occur approximately 13 miles west of the project. The project and surrounding land are mostly flat and exhibit little topographic variation. Land administered by the Bureau of Land Management (BLM) is located approximately 2 miles north of the project.

The proposed project is located entirely within the Federal Emergency Management Agency (FEMA) designated Zone "A." Zone A is the 100-year floodplain or 1 percent annual chance of flood. There are drainage routes near several of the project sites and gen-tie routes. All drainage routes are isolated episodic or ephemeral waters, which typically only flow for brief periods in response to rainfall. The project area usually receives an annual precipitation (rainfall) average of 6.7 inches per year. **Table 6**, *Average High and Low Temperature by Month-Mojave*, below, shows the average high and low temperatures in Mojave by month.

Table 6: Average High and Low Temperature by Month - Mojave

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. High	57	60	66	71	80	89	96	96	88	78	65	56
Avg. Low	33	37	41	46	56	64	70	67	61	50	40	33

U.S. Climate Data, 2017.

Based on a review of records maintained by the California Department Conservation/Division of Oil, Gas and Geothermal Resources (DOGGR), wells are not identified on the project site, and the project is not within the jurisdictional boundaries of an oilfield (California Department of Conservation, 2017).

The proposed project would be served by the Kern County Sheriff's Office for law enforcement and public safety. The closest sheriff station is the Green Empire Substation, located approximately 4.5 miles east of the project. The Kern County Fire Department (KCFD) provides fire protection and emergency medical and rescue services for the project area. KCFD Station 15 is located approximately 3.5 miles east of the

project. The closest school is Tropico Middle School, located approximately 1.6 miles northeast of the project. The nearest hospital is the Palmdale Regional Medical Center, located approximately 19 miles to the southeast, of the project in Palmdale.

The nearest airports to the proposed project are the Rosamond Skypark located 3 miles to the northeast, the Mojave Air and Space Port located 14.5 miles to northeast. Private airstrips include the Lloyd's Landing airport, located approximately 3.5 miles north and the Little Buttes Antique Airfield, located approximately 2.5 miles south of the project in Los Angeles County.

The California Department of Conservation (CDC) Farmland Mapping and Monitoring Program (FMMP), designates the project sites as vacant, disturbed, prime, grazing, and/or rural residential lands (California Department of Conservation, 2016). Surrounding properties are designated as either: (a) vacant or disturbed, (b) rural residential, or (c) nonagricultural and natural vegetation. Parcels within Raceway Solar 4 are subject to a Williamson Act Land Use contract. Although Raceway Solar 4 is zoned for agricultural use, available crop data indicates none of the subject land has been under cultivation between 2010 through 2016.

The proposed project is located within unincorporated Kern County and within the jurisdiction of the Willow Spring Specific Plan. The project has land use designations of 7.1 (Light Industrial), 5.3 (Residential, Maximum 10 units/net acre), 5.3/2.85 (Residential, Maximum 10 units/net acre/Noise Management Area), 5.5 (Residential, Maximum 1 units/net acre), 5.6/2.8 (Residential, Maximum 2.5 gross acres/unit/Military Flight Operations), 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area) and is within the A (Exclusive Agriculture) and E (2.5) (Estate, 2.5 acre minimum) zone districts. The existing land uses of the project and its surroundings are generally undeveloped, including sparse residential dwellings, dirt roads and fallow or active agricultural operations. The entire project is also subject to the provisions of the Kern County Zoning Ordinance. The project proposes to eliminate future road reservations from the General Plan Circulation Element to allow for efficient placement of solar panels.

1.3 Project Description

The proposed project would develop a PV solar facility and associated infrastructure necessary to generate 291-MW of renewable electrical energy and/or energy storage capacity on 1,311 acres of privately-owned land in the eastern high desert region of unincorporated Kern County. Each specific request is described below:

Raceway Solar 1

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 92 acres from map code designation 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of a Zone Change (ZCC 149, Map 231) would change the zoning of the parcels from E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 15 MW solar electrical generating facility on 92 acres, as well as related ancillary structures.

Raceway Solar Site 2

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 90 acres from map code designation 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of a Zone Change would change the zoning on approximately 40 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining and 141 acres from E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 20 MW solar electrical generating facility on 90 acres, as well as related ancillary structures.

Raceway Solar 3

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 494 acres from map code designations 5.6 (Residential, Maximum 2.5 gross acres/unit), 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area), and 7.1/4.4 (Light Industrial, Comprehensive Plan Area) to 7.1 (Light Industrial); approval of Zone Changes would change the zoning on approximately 494 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining) to A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). General Plan Amendments would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid- section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 106 MW solar electrical generating facility on 494 acres, as well as related ancillary structures.

Raceway Solar 4

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 315 acres from map code designations 5.5 (Residential, Maximum 1 units/net acre) and 5.6/2.85 (Residential, Maximum 2.5 gross acres/unit/Noise Management Area) to 7.1 (Light Industrial). General Plan Amendments would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 70 MW solar electrical generating facility on 315 acres, as well as related ancillary structures. In addition, a Cancellation of a Williamson Act Contract would be processed on APNs: 374-011-04 and 374-011-11 (formerly known as APNs: 257-020-11 and 257-020-04).

Raceway Solar 5

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 240 acres from map code designation 5.3/4/4 (Residential, 10 Dwelling Units Per Acre, Comprehensive Plan Area, Military) to 7.1 (Light Industrial); approval of a Zone Changes would change the zoning on approximately 240 acres from E 2.5 RS FPS (Estate (2.5) Residential Suburban, Floodplain Secondary Combining) and E 2.5 RS MH FPS (Estate (2.5) Residential Suburban, Mobile Home Combining, Floodplain Secondary Combining) to A (Exclusive Agriculture) for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of a Conditional Use Permit would allow for the construction and operation of up to a 60 MW solar electrical generating facility on 240 acres, as well as related ancillary structures.

Raceway Solar 6

A Specific Plan Amendment would amend the Willow Springs Specific Plan designation on approximately 80 acres from map code designation 5.3/4/4 (Residential, 10 Dwelling Units Per Acre, Comprehensive Plan Area, Military) to 7.1 (Light Industrial); approval of a Zone Changes would change the zoning on approximately 80 acres from OS E 2.5 RS FPS (Open Space, Estate (2.5) Residential Suburban, Floodplain Secondary Combining) A (Exclusive Agriculture), for consistency with the underlying proposed General Plan Designation of 7.1 (Light Industrial). A General Plan Amendment would amend the circulation element of the Kern County General Plan and eliminate road reservations along section and mid-section lines to allow for efficient placement of solar panels. Approval of Conditional Use Permit would allow for the construction and operation of up to a 20 MW solar electrical generating facility on 60 acres, as well as related ancillary structures.

As shown in Table 1, *Project Assessor Parcel Numbers, and Corresponding Map Codes, Zoning and Acreage*, the proposed solar facility consists of a combined 24 parcels. The proposed project would be developed as six, independent facilities on approximately 1,311 acres.

Vacations of Public Access Easements

The project proponent is requesting vacations of public access easements on the project site to allow optimum placement of solar panels.

Generation Tie Line Options 1 through 4:

There are four options that the proposed project would interconnect to the existing SCE transmission system.

1. **A) Previously approved collector substation (Big Sky North Substation) – 100th Street West via Avenue A.**

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 100th Street West.

   The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the existing Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

   B) Previously approved collector substation (Big Sky North Substation) – 100th Street West via 90th Street to Avenue A-8 to 95th Street to Avenue B.

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via 90th Street heading south to Avenue A-8, then west to 95th Street, then south to Avenue B, and west to 100th Street West. The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the existing Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

2. **Previously approved collector substation (Big Sky North Substation) – 110th Street.**

   Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 110th Street West.

   The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the project Site. Electricity at the previously approved collector substation would ultimately be delivered to the Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster.

3. **Previously approved collector substation (Big Sky North Substation) – 80th Street West.**

Under this option, the proposed project would interconnect at a previously approved collector substation located at the approximate intersection of 100th Street West and Avenue G-12 (further north of Avenue H) in the City of Lancaster, Los Angeles County, via Avenue A and 80th Street West.

The proposed project would interconnect via an approximately 10 to 12-mile 34 kV and/or 230 kV gen-tie line originating at a DC collection system located at the southwestern portion of the Project Site. Electricity at the previously approved collector substation would ultimately be delivered to the Big Sky Substation (owned and operated by the applicant) located along West Avenue J and 100th Street West in the City of Lancaster

4. **Los Angeles Department of Water and Power (LADWP) Proposed Substation.**

Under this option, the proposed project would interconnect at a planned LADWP substation in Kern County, located northwest of the project site, along Rosamond Boulevard near the intersection of Rosamond Boulevard and 110th Street West. An approximate 3-mile 34 kV and/or 230 kV gen-tie line originating at the DC collection system located at the northwest portion of the project site, would run north along 90th Street West, west along Rosamond Boulevard, and interconnect at the planned LADWP substation. This LADWP proposed substation is currently in the design phase and is scheduled to be built and constructed by 2019 or 2020.

The proposed project would consist of approximately 720,784 crystalline-silicon modules arranged in a grid-pattern over the project. The PV solar facility would consist of solar arrays mounted on either fixed tilt racking or single axis tracking structures (or a combination thereof) mounted to vertical posts. The proposed facility is intended to operate year-round and would generate electricity during daylight hours when electricity demand is at its peak.

The power generated on the project site would be sold to California investor-owned utilities, municipalities, community choice aggregators, or other purchasers in the furtherance of the goals of the California Renewable Energy Portfolio Standard and other similar renewable programs in the State. The project proponents may eventually choose to decommission and remove all or none of the systems from the project site. If a site is decommissioned, it would be converted to another use consistent with the applicable land use regulations in effect at that time or revert to its original land use.

The combined project facilities would include the following components:

- Installation of up to a total combined 291-MW of solar PV modules made of crystalline-silicon material covered by glass, mounted on a galvanized metal fixed tilt racking or single axis tracking systems embedded into the ground;
- If fixed tilt technology is not used, solar tracking system consisting of drive motors, drive arms and hydraulic systems that allow for rotation of solar panels from east to west, tracking the suns position over the course of the day;
- Underground and/or above ground medium voltage collections systems throughout the project site;
- Medium voltage inverters and step-up transformers;
- Onsite solar substation(s) including circuit breakers, switches, remote terminal units, fiber optic line telecommunication equipment, and main step-up transformer(s);
- Onsite switchyard(s);
- Onsite access roads;
- Perimeter security fencing 6- to 8-feet high with barbed wire;
- Concrete pads sized and installed to accommodate the associated equipment (inverters, switchgear,

transformers, etc.);

- Meteorological data collection systems and supervisory control and data acquisition (SCADA); and
- Several battery energy storage facilities located at each inverter and associated appurtenances or one centralized battery energy storage facility.

Project Facilities

Solar PV Panels

The approximate 291 MW proposed project would utilize PV technology on tracker mounting supports. The proposed project would then have the option to transfer electricity directly into the grid or into energy storage system for distribution to the grid during peak energy hours. The major elements of the proposed project are described as follows.

Up to an estimated 720,784 individual crystalline-silicon panels would be installed onsite. The number of panels present on the six different sites under this scenario is detailed below:

- Raceway Solar 1: 48,336 panels;
- Raceway Solar 2: 46,056 panels;
- Raceway Solar 3: 285,209 panels
- Raceway Solar 4: 177,973 panels
- Raceway Solar 5: 123,462 panels
- Raceway Solar 6: 39,748 panels

The layout of the single-axis tracker solar panels would be aligned in rows in the north-south direction (or in an east-west direction if a fixed tilt racking system were used instead). The maximum height of the single-axis tracker solar panels would be up to 12-feet above grade, at the beginning and end of each day. A fixed tilt racking system would be less than 12-feet high. Each solar panel would be attached to embedded piers using a support structure. Module layout and spacing is typically optimized to balance energy production versus peak capacity and depends on the sun angles and shading due to the surrounding horizon of the site. Individual arrays of modules would be combined to generate the total plant capacity.

Solar Trackers

The PV module rows would be oriented north-to-south if single-axis trackers are used. A solar tracking mechanism is used to maximize the solar energy conversion efficiency by keeping the modules perpendicular to the sun's energy rays throughout the day. This completed assembly of PV modules mounted on a framework structure is called a "tracker" because it tracks the sun from east to west. If used,

single-axis trackers would increase the efficiency of energy production from the arrays relative to a fixed tilt system. The exact tracker manufacturer and model would be determined in the final design. All trackers are intended to function identically in terms of following the motion of the sun.

Module layout and spacing is optimized to balance energy production versus peak capacity and would depend on the sun angles and shading caused by the horizon surrounding the proposed project. The spacing between the rows of trackers is dependent onsite-specific features and would be identified in the final design. The final configuration would allow for sufficient clearance for maintenance vehicles and panel access.

Fixed Tilt Racking System

The solar panels would be in a fixed tilt position that allows for the most sunlight specific to the geography of the project, if the fixed tilt racking system is used.

Electrical Collector System and Inverters

The AC-DC electrical collection system includes all cables and combiners that collect electricity from the panels, delivers it to the inverters, collects it from the inverters, and ultimately delivers it to the proposed project switching station(s). The collection system would likely be installed along internal access roads to collect power from the rows of modules and deliver it to the switching station. This collection system would likely be installed in subsurface trenches, though in some areas of the site, part or all the collection system may be housed in above-grade raceways mounted on supports approximately 24 to 36 inches above ground level. The collection system would be rated at between 1,000 to 2,000 volts DC until it reached the inverters and an intermediate voltage system between the inverters and the proposed project switching station.

The proposed project would use an unmanned field control system. The controls generally include a field supervisory controller in a central location and local microprocessor controllers connected to each tracker, if trackers are to be used. The field control system monitors solar insulation, wind velocity, and tracker performance and status, and communicates with all the local microprocessor controllers. When the appropriate conditions exist, the field supervisory controller initiates the trackers' daily tracking of the sun, and at the end of the day stows the trackers in the solar array.

The DC electricity produced by the solar panels is converted to three-phase alternating current by a series of inverters. Alternating current is the type of electricity usable by the electric utility and is the form required to connect to the transmission system. The inverter pad equipment includes a transformer that steps up the electricity in its new form to an output voltage of 34 kV or 230 kV. This electricity is then transmitted via the medium voltage collection system to the switching station.

Energy Storage System

The proposed project would have either several Energy Storage Systems (ESS) at each site's inverters or ESS at a centralized location onsite. The ESS would be able to provide approximately 291 MWh of energy storage. Each ESS would occupy approximately 1 to 2 acres within the project boundaries and consist of batteries, inverters, switches, cooling equipment, and other appurtenant equipment placed in multiple prefabricated enclosures or containers near the onsite substation. The ESS would either be installed contemporaneously or after the installation of the PV facilities. The final locations are dependent on final design and may require construction of vaults or other supporting foundations.

Generation-Tie Line and Solar Generating Facility (SGF) Interconnection Plan

The power generated by the proposed project would be interconnected to an existing transmission network. See Section 1.2 for a description of the gen-tie line options.

It is expected that one main path would be used for the gen-tie corridor, with deviations from the path as necessary.

Data Collection System

The proposed project would be designed with a comprehensive Supervisory Control and Data Acquisition (SCADA) system for remote monitoring of facility operation and/or remote control of critical components. Within the site, the fiber optic or other cabling required for the monitoring system would be installed throughout the solar fields leading to a centrally located (or series of appropriately located) SCADA system cabinets. The telecommunications connections to the SCADA system cabinets are either wireless or hard wired.

The system would also include a meteorological (met) data collection system at each site. The met stations would have the following weather sensors: a pyranometer for measuring solar irradiance, a thermometer to measure air temperature, a barometric pressure sensor to measure atmospheric pressure, and two wind sensors to measure speed and direction. These sensors would be connected to a data logger to compile the data for transmission to the Data Collection Center.

Site Access and Security

During project construction and operations, the primary access to each site would use the following streets:

- Raceway Solar 1: Avenue A
- Raceway Solar 2: Gaskell Road
- Raceway Solar 3: 90th Street West
- Raceway Solar 4: Willow Avenue and/or 80th Street West
- Raceway Solar 5: 70th Street West
- Raceway Solar 6: Rosamond Boulevard

The necessary road improvements would be completed per County code and regulations. Typical site access would be approximately 20-foot wide, accommodating County approved turning radii in both directions. The rows of solar panels would be separated by access ways. Internal site circulation would include approximately 20-foot-wide access roads consisting of crushed stone and approximately 15- to 20-foot-wide Operations and Maintenance (O&M) roads among the solar arrays consisting of compacted native soil.

Chain-link security fencing would be installed around the site perimeter, switchyard(s), substation(s), and other areas requiring controlled access to restrict public access during construction and operations. The security fence would be 6- to 8-feet tall, with two strings of barbed wire along the top. The fence posts would be set in concrete. Additional security may be provided using closed circuit video surveillance cameras and intrusion systems. Signs would be installed to achieve appropriate safety and security as expected in a solar power facility.

The proposed project's lighting system would provide personnel with illumination for both normal and emergency conditions. Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives. Lighting would be directed downward and shielded to focus illumination on the desired areas only and to avoid light spillage onto adjacent properties. Lighting would be no brighter than required to meet safety and security requirements, and lamp fixtures and lumens would be selected accordingly.

Operation and Maintenance Facilities

No Operations and Maintenance (O&M) facilities would be installed on any of the sites. All maintenance would be performed by personnel located offsite.

Onsite Telecommunication Cell Towers

There would be no telecommunication towers installed at any of the sites.

Construction Activities

Schedule and Workforce

The construction activities for the proposed project fall into three main categories: (1) site grading and earthwork; (2) solar array construction; and (3) electrical interconnection to transmission owner infrastructure. Construction would take approximately 10 to 12 months. Site grading and earthwork is anticipated to begin during the fourth quarter of 2021, with operations beginning in the third or fourth quarter of 2022. Construction would primarily occur during daylight hours, Monday through Friday. Additional hours/days may be necessary to facilitate the schedule.

The construction workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The average workforce is expected to be approximately 500 to 600 construction, supervisory, support, and construction management personnel onsite during construction. The onsite workforce has been conservatively estimated to peak at approximately 800 individuals for short periods of time, which is typically a few weeks. The project construction crews would have a staggered workday, with multiple shifts of workers coming onsite between the hours of 6:00 a.m. and 10:00 a.m. in the mornings, and leaving between 2:00 p.m. and 6:00 p.m. It is anticipated that the construction workforce would commute to the site each day from local communities. In compliance with Kern County Noise Ordinance (Municipal Ordinance Code 8.36.020) construction activities would not occur between the hours of 9:00 p.m. and 6:00 a.m. on weekdays and 9:00 p.m. to 8:00 a.m. on weekends for construction sites located within 1,000 feet of an occupied residential dwelling. Construction personnel not drawn from the local labor pool are anticipated to stay in nearby hotels.

During construction, dusk-to-dawn security lighting would be required for the temporary construction staging area, parking area, construction office trailer entries, and site access points. Lighting is not planned for typical construction activities because construction activities would occur primarily during daylight hours; however, if required, any lighting would be temporary, directed downward, and limited to that needed to ensure safety and security.

Multiple portable toilets would be used during construction, and wastewater would be trucked offsite for disposal in accordance with all applicable regulations by a licensed sewage disposal company.

Site Grading and Earthwork

Beginning work on the project would involve preparing the land for installation of arrays, related infrastructure, access driveways, and temporary construction staging area.

Site preparation would involve the removal and proper disposal of existing vegetation and debris that would unduly interfere with project construction or the health and safety of onsite personnel. Dust minimizing techniques would be employed, such as maintaining natural vegetation where possible, utilizing “mow-and-roll” vegetation clearance strategy, application of water, and application of dust suppressants. Conventional grading would be minimized to the maximum extent possible to reduce unnecessary soil movement that may result in dust. Earthworks scrapers, excavators, dozers, water trucks, paddlewheels,

haul vehicles and graders may all be used to perform grading. Land-leveling equipment, such as a smooth steel drum roller, would be used to even the surface of the ground and to compact the upper layer of soil to a value recommended by a geotechnical engineer for structural support. Access roads may be additionally compacted to 90 percent or greater, as required, to support construction and emergency vehicles. Certain access roads may also require the use of aggregate to meet emergency access requirements. Soil movement from grading would be balanced on the site, and it is anticipated that no import or export of soils would occur.

Trenching would be required for placement of underground electrical and communications lines, and may include the use of trenchers, backhoes, excavators, haul vehicles, compaction equipment and water trucks. After preparation of the site, the pads for structures, equipment enclosures and equipment vaults would be prepared per geotechnical engineer recommendations.

Solar Array Assembly

Erection of the solar arrays would include support structures and associated electrical equipment. First, steel piles would be driven into the soil using pneumatic techniques, similar to a hydraulic rock hammer attachment on the boom of a rubber-tired backhoe excavator. If shallow bedrock, or other obstructions are encountered, the pile locations would be predrilled and then grouted in place with concrete. Once the piles have been installed, the horizontal array support structures would be installed. The final design of the horizontal array support structures may vary, depending on the final selection of the PV technology, as well as whether a fixed tilt or tracking system is selected. Once the support structures are installed, workers would begin to install the solar modules. Solar array assembly and installation would require trenching machines and excavators, compactors, concrete trucks and pumpers, vibrators, forklifts, boom trucks, graders, pile drivers, drilling machines, and cranes.

Concrete would be required for the footings, and pads for the medium voltage transformers, inverters, and communications buildings. Concrete may also be required for pile foundation support depending on the proposed mounting system chosen for installation and whether obstructions are encountered when trying to drive piles. Final concrete specifications would be determined during detailed design engineering. Concrete would be purchased from an offsite supplier and trucked onto the project sites.

During this work, there would be multiple crews working on the site with vehicles, including special vehicles for transporting the modules and other equipment. As the solar arrays are installed, the solar switchyard would be constructed, and the electrical collection and communication systems would be installed. Within the solar fields, the electrical and communication wiring would be installed in underground trenches, although some of the mid-voltage collection runs and communications may be on overhead lines. Collection trenches would likely be mechanically excavated, though in some cases targeted shallow trench blasting may be required as a construction technique due to near-surface bedrock.

The wiring would connect to the appropriate electrical and communication terminations and the circuits would be checked and electrical service would be verified. Additionally, if a tracker system is utilized, the motors would be checked, and control logic verified. Once all the individual systems have been tested, the overall project would be ready for testing under fully integrated conditions.

Electrical Supply

The method of temporary power for construction is expected to be provided by mobile diesel-driven generator sets, batteries, by temporary electrical service from the local power provider, or a combination of all three methods.

Electrical Interconnection to Transmission Owner Infrastructure

The proposed project would connect with a 34 kV and/or 230 kV gen-tie line. Each of the project sites would have its own project substation approximately 1 to 2 acres in size.

Construction Water Use

Water needed for construction is expected to be trucked from an offsite water purveyor. The entire construction process is estimated to be approximately 10 to 12 months. Construction water demands are estimated to be approximately 500 acre-feet (AF) for dust control, site preparation and miscellaneous construction activities. Bottled water would be provided for crews during construction activities.

Initial construction water usage would be in support of site preparation and grading activities. During earthwork for grading of access road foundations, equipment pads and project components, the main use of water would be for compaction and dust control. Smaller quantities would be required for preparation of the concrete required for foundations and other minor uses. After the earthwork activities, water usage would be used for dust suppression and normal construction water requirements that are associated with construction of the building, internal access roads, revegetation and periodic cleaning of solar arrays.

Fire Control

The PV modules and ancillary equipment represent a negligible risk due to fire. However, the project would be required to have a fire prevention plan approved per applicable Kern County regulations.

Solid and Nonhazardous Waste

The proposed project sites would produce a small amount of solid waste associated with maintenance activities. Proposed project waste may include broken and rusted metal, defective or malfunctioning PV modules, electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers, particularly during construction activities. Waste materials would be collected, hauled by truck, separated for recycling where available, and disposed of at a regional disposal facility. Any defective or broken PV modules would be returned to the manufacturer for recycling.

Hazardous Waste

Small quantities of hazardous wastes would most likely be generated over the course of construction. These wastes may include biodegradable fluid and mineral oil from the transformers and miscellaneous electrical equipment. The spent oil would be collected and delivered to a recycling company at the time it is removed from the equipment. This material would not be stored on the proposed project site.

Project Operation and Maintenance Activities

The PV panel surfaces may be washed seasonally to increase the average optical transmittance of the flat panel surface. Panel washing is expected up to four times per year to complete. Staff of two to four people would be required during panel washing and are expected to be hired from the local community.

The facility's regular maintenance program would be largely conducted onsite during daytime hours as a safety precaution. Equipment repairs would typically take place in the early morning or evening when the plant is producing the least amount of energy.

Prudent security measures would be taken to ensure the safety of the public and facility. The proposed project would be fenced along all borders with locking gates at the specified points of ingress and egress. The security fence would be approximately 6- to 8-feet tall, with three strand barbed wire along the top. Offsite security personnel may be dispatched during nighttime hours or be onsite depending on security risks and operating needs. The project site would provide illumination for both normal and emergency conditions. Lighting would be designed to provide the minimum illumination needed.

The project site would produce a small amount of waste associated with maintenance activities. PV solar system wastes typically include broken and rusted metal, defective or malfunctioning modules, electrical materials, and empty containers and other miscellaneous solid materials, including typical household refuse generated by workers. Most of these materials would be collected and delivered back to the manufacturer for recycling.

Operations

The project proponent would ensure consistent and effective facility operations by:

- Responding to automated alarms based on monitored data, including actual versus expected tolerances for system output and other key performance metrics; and
- Communicating with customers, transmission system operators and other entities involved in facility operations.

Electrical Supply

Power for plant auxiliaries would be provided by the project’s electrical generation or supplied by the local power provider. The proposed project would require power for the electrical enclosures, tracker motors, associated structures, and for plant lighting and security.

Lighting

The proposed project would include lighting that would be motion-detected and designed to provide the minimum illumination needed to achieve safety and security. Shielded and downward-facing fixtures would provide focused illumination on the desired areas only.

Maintenance

Maintenance to be performed on the sites for the proposed project would consist of equipment inspection and replacement. Maintenance would occur during daylight hours, when possible. However, maintenance activities on the PV modules and DC systems would be typically performed at night. Maintenance program elements include:

- Managing a group of prequalified maintenance and repair firms who can meet the Operations and Maintenance needs of the facility throughout its life;
- Creating a responsive, optimized cleaning schedule;

- Responding to plant emergencies and failures in a timely manner;
- Maintaining an inventory of spare parts to ensure timely repairs and consistent plant output;
- Systematically maintaining a log to effectively record and track all maintenance problems; and
- Performing maintenance on the site as required to clear obstructive ground cover.

Security

To ensure the safety of the public and the solar generating facility, the proposed project site would be fenced, and signs would be posted. Security measures would be installed as necessary to mitigate and/or deter unauthorized access, including lighting. Access to the project site would be controlled and gates would be installed at the roads entering the proposed project site.

Operations Water Use

Water would be used during PV panel washing activities, which is anticipated to occur up to four times a year, as needed. Long-term operational water demand is anticipated to be approximately 4.4 AF of water per washing cycle, or a total of 19 AFY for panel washing. Water for panel washing is expected to be trucked and/or obtained from a local water purveyor.

Project Decommissioning

The project proponents expect to sell the renewable energy electricity produced by the product under the terms of a long-term Power Purchase Agreement (PPA) or directly into the wholesale market. The life of the solar facility is anticipated to be up to 35 years; however, the project proponents may choose to extend the life of the facility, update technology and re-commission, or decommission and remove the system and its components. When a decommissioning event occurs, the solar site could then be converted to other uses in accordance with applicable land use regulations in effect at that time.

When project decommissioning occurs, project structures would be removed from the project site. Above-ground and underground equipment would be removed. The substation would be removed if it is owned by the project, however if a public or private utility assumes ownership of the substation, the substation may remain onsite to be used as part of the utility service to supply other applications. Project roads would be restored to their pre-construction condition unless the landowner elects to retain the improved roads for access throughout that landowner's property. The area would be thoroughly cleaned, and all debris removed. As discussed above, most materials would be recycled to the extent feasible, with minimal disposal to occur in landfills in compliance with all applicable regulations. A collection and recycling program would be executed in the event system components are manufactured with hazardous materials

A collection and recycling program would be executed to promote recycling of project components and minimize disposal of project components in landfills. All decommissioning and restoration activities would adhere to the requirements of the appropriate governing authorities and in accordance with all applicable federal, state, and county regulations. The project proponents expect a secondary market for PV modules to develop over time. Although energy output may diminish, PV modules are expected to continue tohave a productive life and can be decommissioned from a prime location or re-commissioned in another location.

Relationship of the Proposed Project to Other Solar Projects

The proposed project is being developed independently of other approved or proposed solar projects in the County. If approved, the Raceway 2.0 Solar Project facilities, would be subject to their own use permits, conditions of approval, interconnection agreements, and power purchase agreements. The County understands that the proposed project facilities would be built and operated independently of any other solar project, and, if approved, would not depend on any other solar project for economic viability. The proposed project involves constructing a new gen-tie line to deliver energy to the Big Sky North Substation (existing collector substation) or future LADWP Substation.

1.4 Project Objectives

The project proponents have defined the following objectives for the project:

- Maximize renewable energy production and economic viability through the installation of 291-MW of solar PV panels on approximately 1,311 acres of private lands with high solar insolation values.
- Locate the project on disturbed land or land that has been previously degraded from prior use.
- Minimize offsite impacts by using existing electrical distribution facilities, rights-of-way, roads, and other existing infrastructure where possible to minimize the need for new electrical support facilities.
- Minimize impacts to threatened or endangered species or their habitats, wetlands and waters of the United States, cultural resources, and sensitive land use.
- Generate substantial direct and indirect economic opportunities in Kern County during construction with the creation of “green” jobs.
- Minimize water usage.
- Assist the State of California in reducing fossil fuel air quality pollution and in achieving the greenhouse gas emission reductions required by the California Global Warming Solutions Act (Assembly Bill 32).
- Offset approximately 695,475 tons of carbon dioxide equivalent annually that would have resulted from producing an equivalent amount of electricity utilizing generators powered by fossil fuels
- Develop a viable source of clean energy to assist California and its utilities in fulfilling California's Renewable Portfolio Standard (RPS) Program. In October 2015, Governor Brown signed into law Senate Bill 350, which establishes a new RPS for all electricity retailers in the state. Electricity retailers must adopt the new RPS goals of 50 percent of retail sales from renewables by the end of 2030.
- Use proven and established PV technology that is efficient and requires low maintenance.

1.5 Proposed Discretionary Actions/Required Approvals

The Kern County Planning and Natural Resources Department as the Lead Agency (per CEQA Guidelines Section 15052) for the proposed project, has discretionary responsibility for the proposed project. The proposed project is owned by sPower. To implement this project, the project proponent may need to obtain the following discretionary and ministerial permits/approvals as detailed below:

Federal

- U.S. Fish and Wildlife Service (USFWS)
- United States Army Corps of Engineers Section 404 Permit

State

- California Public Utilities Commission (CPUC)
    - Section 851 Permit
- California Department of Fish and Wildlife (CDFW)
    - Section 1600 et seq. permits (Streambed Alteration Agreements)
    - Section 2081 Permit (State-listed endangered species)
- Lahontan Regional Water Quality Control Board (RWQCB)
- Waste Discharge Requirements
    - Regional Water Quality Certification (401 Permit)
- National Pollution Discharge Elimination System (NPDES) Construction General Permit
- General Construction Stormwater Permit (Preparation of a SWPPP)
- California Department of Transportation (Caltrans)
    - Oversized Loads Permit

Other additional permits or approvals from responsible agencies may be required for the project

Local

Kern County Board of Supervisors/Kern County Planning Commission

- Certification of Final Environmental Impact Report
- Adoption of Mitigation Monitoring and Reporting Program
- Adoption of 15091 and 15093 Findings and Statement of Overriding Considerations
- Approval of Kern County General Plan Amendments to Circulation Element (Elimination of Future Road Reservations) and Zone Changes
- Approval of Kern County Conditional Use Permits, Willow Springs Specific Plan Amendments, and Williamson Act Cancellation Agreement

Kern County Public Works

- Approval of Kern County Grading Permits
- Approval of Kern County Building Permits
- Approval of Kern County Access Road Design and Encroachment Permits

Kern County Fire Department

- Fire Safety Plan

Eastern Kern Air Pollution Control District (EKAPCD)

- Fugitive Dust Control Plan
- Authority to Construct (ATC)
- Permit to Operate (PTO)

The preceding discretionary actions/required approvals are potentially required and do not necessarily represent a comprehensive list of all possible discretionary permits/approval required. Other additional permits or approvals from responsible agencies may be required for the proposed project.

Attachment 2

2017 Final Soils Report

Soils Report

Raceway Solar Project

Kern County, California

For:

S·POWER
An AES and AIMCo Company

Sustainable Power Group, LLC

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By:

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°F	degrees Fahrenheit
applicant	Sustainable Power Group, LLC; *also,* sPower
CEQA	California Environmental Quality Act
E & E	Ecology & Environment, Inc.
gen-tie	generation power tie
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
NRCS	Natural Resources Conservation Service
Project	Raceway Solar Project
PV	photovoltaic
sPower	Sustainable Power Group, LLC; *also,* the applicant
SWPPP	storm water pollution prevention plan
USGS	U.S. Geological Survey
WEG	wind erodibility group

1.1 Introduction

On behalf of Sustainable Power Group, LLC (sPower, or the applicant) Ecology & Environment, Inc., completed a preliminary soils analysis for the Raceway Solar Project (Project) in the Antelope Valley, approximately 5 miles west of Rosamond, in unincorporated Kern County, California (Figures 1 and 2). The Project would involve construction of seven solar photovoltaic (PV) power generating facilities connected by generation power tie (gen-tie) lines. The seven sites include the 30-acre Site 1, 180-acre Site 2, 466-acre Site 3, 315-acre Site 4, 310-acre Site 5, 240-acre Site 6, and 313-acre Site 7. The Project would deliver power to the grid along one of three alternative routes through a previously approved collector substation to an existing substation and/or to a substation that has currently been approved but not completed. This report describes the soil types underlying the various Project components and the anticipated potential impacts related to soils as defined by the impact criteria described in Appendix G of the California Environmental Quality Act (CEQA).

1.2 Project Overview

The Project would involve the construction, operation, and eventual decommissioning of a solar PV power generating facility with an energy storage system. The Project would be capable of producing up to approximately 400 megawatts of renewable electricity and storing up to 2,000 megawatt hours of electricity. The Project would be located on approximately 1,854 acres of private land in southeastern Kern County, California. Raceway Solar 1, 2, 3, 5, 6, and 7 are zoned Estate 2.5 Acres (E 2.5), and Raceway Solar 4 is zoned Agriculture. The Project would be located approximately 5 miles west of the community of Rosamond, within the Willow Springs community. All solar arrays and interconnection lines between solar arrays would be located in Kern County.

Major components of each facility would include PV modules mounted on single-axis or dual-axis tracker systems, electrical collection systems, data monitoring equipment, an energy storage system, a meteorological data collection system, private access roads, fencing, and a 34 kilovolt (kV) and/or 230 kV gen-tie line. There are four potential routes for interconnections to nearby substations. The Project may interconnect to sPower's previously approved collector substation via three proposed 10- to 12-mile 34 kV and/or 230 kV gen-tie lines originating at a direct current collection system located at the southwestern portion of the Project area, or to a planned Los Angeles Department of Water and Power (LADWP) substation northwest of the Project area, via an additional proposed gen-tie route. Potential interconnection routes would be as follows:

- 100th Street West and Avenue G-12;
- 110th Street West and Avenue G-12;
- 80th Street and Avenue G-12; and
- Rosamond Boulevard to the proposed LADWP Substation.

PV system installation would include earthwork, grading, and erosion control, as well as erection of the PV modules, supports, and associated electrical equipment. The energy storage system would be modular and fully enclosed and would employ telecommunication systems to charge and discharge the battery

according to power delivery needs. Typical modular energy storage systems are approximately 102 inches in height and 20 to 40 feet in length. The energy storage system would be located near inverter stations or switchgear. Cables would be installed in underground ducts, utilizing standard trenching techniques, electrical routing, backfilling, and compaction. The energy storage system could also be located on a centralized battery on site.

Construction is expected to be completed in approximately 10 to 12 months. Upon commissioning, the Project would enter the operational phase. For the duration of the operational phase, the Project would be operated on an unstaffed basis and monitored remotely, with regular on-site personnel visitations for security, maintenance, and system monitoring.

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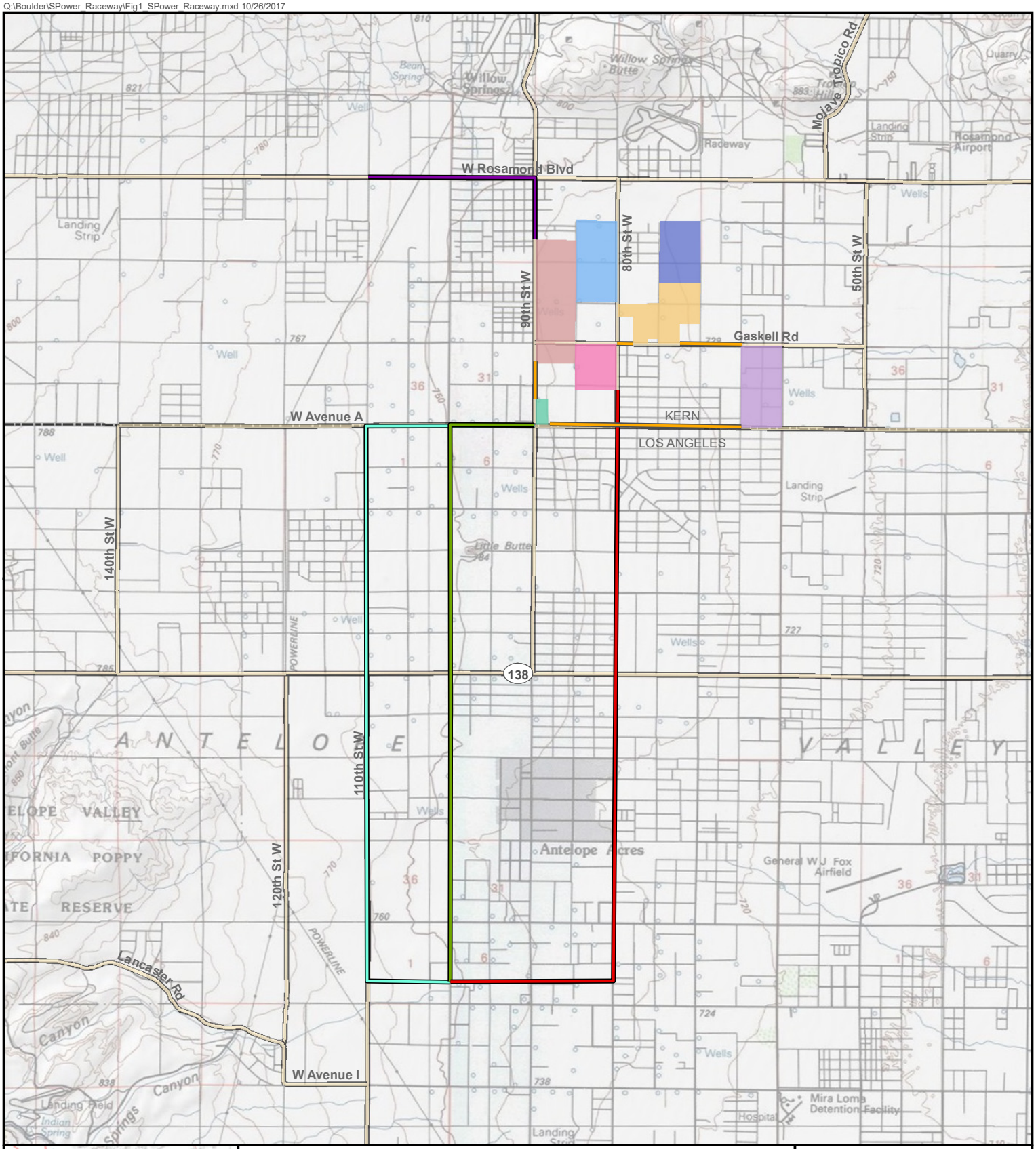

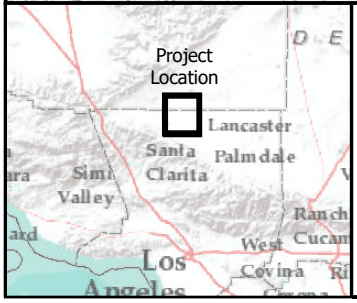

Interconnection Alternatives
- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Raceway Solar Projects
- Site 1
- Site 2
- Site 3
- Site 4
- Site 5
- Site 6
- Site 7

- Major Road
- County Boundary

Figure 1
Raceway Solar Project
Los Angeles and Kern Counties, California
sPower

0 0.5 1 Miles

Data Sources: USGS Topographic Base

1.3 Purpose of Investigation

This technical study describes potential impacts of the Project that may affect soil resources. It also describes the environmental setting and potential impacts associated with construction and operation of the Project and identifies recommended measures to reduce potential impacts.

1.4 Soils

Soils are divided into visibly, chemically, or physically distinct layers, referred to as horizons. Typically, each soil has three horizons, but there could be as few as one horizon (from erosion or anthropogenic removal) or as many as five (A, B, C, O, and E). The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) describes the soil horizons as follows: the A horizon generally consists of topsoil; the B horizon represents the subsoil (the zone where materials leached from the A horizon are immediately precipitated below); the C horizon consists of substratum (generally weathered rock); the O horizon is organic material; and the E horizon is the eluviation horizon (soils consisting of resistant material remaining from the dissolution of other materials). The NRCS ranks soils into wind erodibility groups (WEGs) from 1 to 8, with one being the most susceptible and 8 the least susceptible.

The NRCS soil series occurring within the Project area are described below (NRCS 1997, 1999, 2003, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2016). The major soil map units within the Project area are summarized in Table 1. The soil series underlying the Project area are shown in Figure 2 and described in detail in the attached soil series descriptions from the NRCS. Although portions of the Project would overlie soils classified as dune land and rock land, the NRCS does not provide descriptions for them because they are not considered soil series, but miscellaneous areas.

Adelanto Series: The Adelanto series consists of very deep, well-drained soils that formed from granitic parent material on alluvial fans and plains. Slopes range from 0 to 5 percent. This soil occurs where the mean annual precipitation is about 7 inches and the mean annual temperature is about 65 degrees Fahrenheit (°F). Adelanto soils have brown and light brown, lightly acidic and neutral sandy loam A horizons (0 to 27 inches); reddish brown, moderately alkaline, somewhat finer-textured, sandy loam B horizons (27 to 80 inches); and brown, somewhat coarser, sandy loam C horizons (80 to 86 inches). Runoff is low to very low, and permeability is moderate to moderately rapid. Adelanto series soils have low shrink-swell potential and are ranked with moderate susceptibility to wind erosion in WEG 3. Large areas with this soil type are used for desert range. With irrigation, alfalfa is the main crop. Native vegetation that grows in this soil includes creosote bush, annual grasses and forbs, perennial grasses, and Joshua and juniper trees on the more moist fringes.

Cajon Series: The Cajon series consists of very deep, somewhat excessively drained soils that formed in sandy alluvium from dominantly granitic rocks. Cajon soils are on alluvial fans, fan aprons, fan skirts, inset fans, and river terraces. Slopes are 0 to 15 percent. This soil occurs where the average annual precipitation is about 6 inches and the mean annual temperature is about 65°F. Cajon soils have light gray, moderately alkaline, sandy A horizons (0 to 2 inches) and very pale brown, moderately alkaline, sandy C horizons (2 to 60 inches). Runoff is negligible to low, and permeability is rapid. Cajon series soils have low shrink-swell potential and are ranked with moderately high susceptibility to wind erosion in WEG 2. Areas with this soil type are used mostly for range, watershed, and recreation. A few areas are

irrigated and are used for growing alfalfa and other crops. Vegetation growing in this soil consists primarily of desert shrubs, including creosote bush, salt bush, Mormon tea, Joshua trees, Indian ricegrass, and annual grasses and forbs.

Greenfield Series: The Greenfield series consists of deep, well-drained soils that formed in moderately coarse and coarse textured alluvium derived from granitic and mixed rock sources on alluvial fans and terraces. Slopes range from 0 to 30 percent. This soil occurs where the mean annual precipitation is about 15 inches and the mean annual air temperature is about 62°F. Greenfield soils have pale to dark brown, slightly acidic, coarse sandy loam A horizons (0 to 23 inches); light to dark yellowish brown, neutral alkalinity, fine sandy loam or sandy loam B Horizons (23 to 51 inches); and brownish yellow, yellow, or yellowish brown, neutral alkalinity, loamy sand, sandy loam, or fine sandy loam C horizons (51 to 72 inches). Runoff is slow to medium, and permeability is moderately rapid. Greenfield series soils have low shrink-swell potential and are ranked with moderate susceptibility to wind erosion in WEG 3. Areas with this soil type are used for production of a wide variety of irrigated field, forage, and fruit crops and also for growing dryland grain and pasture. Native vegetation growing in this soil in uncultivated areas includes annual grass, forbs, some shrubs, and oak trees.

Hanford Series: The Hanford series consists of very deep, well-drained soils that formed in moderately textured alluvium dominantly from granite on stream bottoms, floodplains, and alluvial fans. Slopes range from 0 to 15 percent. This soil occurs where the mean annual precipitation is about 12 inches and the mean annual air temperature is about 63°F. Hanford soils have pale brown to dark brown, slightly acidic, fine sandy loam A horizons (0 to 12 inches) and pale brown, dark brown, light yellowish brown, or yellowish brown, neutral to slightly alkaline, sandy loam and fine sandy loam C horizons (12 to60 inches). Runoff is negligible to low, and permeability is moderately rapid. Hanford series soils have low shrink-swell potential and are ranked with moderate susceptibility to wind erosion in WEG 3. Areas with this soil type are used for growing a wide range of fruits, vegetables, and general farm crops; for urban development; and for dairies. Native vegetation growing in uncultivated areas is mainly annual grasses and associated herbaceous plants.

Hesperia Series: The Hesperia series consists of very deep, well-drained soils that formed on alluvial fans, valley plains, and stream terraces. Slopes range from 0 to 9 percent. This soil occurs where the mean annual precipitation is about 8 inches and the mean annual air temperature is about 64°F. Hesperia soils have pale brown, slightly acidic, sandy loam A horizons (0 to 4 inches) and pale brown, slightly to moderately alkaline, fine sandy loam or sandy loam C horizons (4 to 77 inches). Runoff is negligible to low, and permeability is moderately rapid. Hesperia series soils have low shrink-swell potential and are ranked with moderately high to moderate susceptibility to wind erosion in WEG 2 and 3. Areas with this soil type are used for desert range and for production of irrigated orchards, row crops, field crops, grain, hay, pasture, and grapes. Native vegetation growing in this soil includes creosote bush in the high desert and sparse annuals in the valleys.

Ramona Series: The Ramona series consists of deep, well-drained soils that formed in alluvium derived mostly from granitic and related rock sources. Ramona soils are on alluvial fans and terraces with slopes of 0 to 5 percent. This soil occurs where the mean annual precipitation is 10 to 20 inches and mean annual air temperature is about 63°F. Ramona soils have brown, slightly to moderately acidic, sandy loam and fine sandy loam A horizons (0 to 23 inches); brown, reddish brown, dark reddish brown, and yellowish red, slightly acidic, loam to sandy clay loam B horizons (23 to 68 inches); and strong brown to dark brown, neutral acidity, fine sandy loam C horizons (68 to 74 inches). Runoff is slow to rapid, and

permeability is moderately slow. Ramona series soils have low shrink-swell potential and are ranked with moderate susceptibility to wind erosion in WEG 3. Areas with this soil type are used mostly for production of grain, grain-hay, pasture, irrigated citrus, olives, truck crops, and deciduous fruits. Uncultivated areas of this soil have a cover of annual grasses, forbs, chamise, or chapparal.

Rosamond Series: The Rosamond series consists of deep, well-drained soils that formed in material weathered mainly from granitic alluvium. Rosamond soils are on the lower margin of the alluvial fans between the sloping fans and the playas and have slopes of 0 to 2 percent. This soil occurs where the mean annual precipitation is about 5 inches and mean annual air temperature is about 63°F. Rosamond soils have light brownish, gray, or pale brown, moderately or slightly alkaline, fine sandy loam, very fine sandy loam, light silty clay loam, light sandy clay loam, or loam C horizons (0 to 60 inches). Runoff is moderate, and permeability is moderately slow. Rosamond series soils have moderate to moderately high shrink-swell potential and are ranked with low to moderately high susceptibility to wind erosion in WEG 2 to 6. Large areas with this soil type are used for desert range. Other extensive areas are irrigated for alfalfa or row crops. Native vegetation growing in this soil includes rabbitbrush, big sagebrush, *Atriplex,* and annual and perennial grasses and weeds.

Sunrise Series: The Sunrise series consists of deep, well-drained soils that formed in material from mixed alluvium. Sunrise soils occur on flood plains and in basins and have slopes of 0 to 9 percent. This soil occurs where the mean annual precipitation is about 5 inches and the mean annual air temperature is 62°F. Sunrise soils have pale brown or light yellowish brown, moderately alkaline, sandy loam A horizons (0 to 11 inches) and very pale brown, moderately alkaline, clay loam C horizons (11 to 65 inches). Runoff is slow to medium, and permeability is moderately slow. Sunrise series soils have moderate shrink-swell potential and are ranked with moderate susceptibility to wind erosion in WEG 3. Areas with this soil are used mainly for recreation. In good years, the soil may be used to graze sheep. Native vegetation growing in this soil includes *Atriplex* and creosote bush, with scattered annual grasses.

Tray Series: The Tray series consists of very deep, moderately well-drained soils that formed in alluvium predominantly from granitic sources. Tray soils occur on basin rims and in basins and have slopes of 0 to 2 percent. This soil occurs where the mean annual precipitation is about 4 to 9 inches and the mean annual air temperature is 63°F. Tray soils have light yellowish brown, very strongly alkaline, sandy loam A horizons (0 to 8 inches); light to dark yellowish brown, very strongly alkaline, heavy sandy loam and sandy loam B horizons (8 to 32 inches); and light yellowish brown to yellowish brown, very strongly to strongly alkaline, coarse sandy loam C horizons (32 to 70 inches). Runoff is very slow, and permeability is moderate. Tray series soils have low shrink-swell potential and are ranked with moderately low susceptibility to wind erosion in WEG 6. Areas with this soil are used mainly for desert range, with some used for growing alfalfa and irrigated pasture. Native vegetation growing in this soil consists of fourwing saltbush and a few related shrubs and grasses.

Table 1 Soils in the Project Area

Soil Name	Project Component	Description/ Soil Texture (NRCS)	Soil Series Thickness (inches)	Wind Erodibility Group[(a)]
Adelanto coarse sandy loam (map symbol AcA)	Rosamond Blvd., 100th Street, and 110th Street interconnection alternatives	Coarse sandy loam on 2 to 5 percent slopes.	86	3
Cajon loamy sand (map symbols CaA and CbA)	80th Street, 100th Street, and 110th Street interconnection alternatives	Loamy sand on 0 to 9 percent slopes	60	2
Dune land (map symbol DuD)	100th Street interconnection alternative	Not given	Not Given	1
Greenfield sandy loam (map symbols GsA and GsC)	80th Street, 100th Street, and 110th Street interconnection alternatives	Sandy loam on 0 to 9 percent slopes	72	3
Hanford coarse sandy loam (map symbol HbA)	110th Street interconnection alternative	Coarse sandy loam on 0 to 2 percent slopes	60	3
Hesperia loamy fine sand (map symbol HgA)	100th Street and 110th Street interconnection alternatives	Loamy fine sand on 0 to 2 percent slopes	77	2
Hesperia fine sandy loam (map symbols HkA and HkB)	Sites 2, 5, 6, and 7; Gen-ties between Sites 1–3, 5–7, and 1–7; and all interconnection alternatives	Fine sandy loam on 0 to 5 percent slopes	77	3
Ramona coarse sandy loam (map symbols RcA and RcB)	110th Street interconnection alternative	Coarse sandy loam on 0 to 5 percent slopes	74	3
Rock Land (map symbol RhF)	100th Street interconnection alternative	Not given	Not Given	Not Given
Rosamond loamy fine sand and fine sandy loam (map symbols Rm and Ro)	All Project components	Loamy fine sand and fine sandy loam on 0 to 2 percent slopes	60	2–3
Rosamond loam and Rosamond loam, saline-alkali (map symbols Rp and Rr)	Sites 2 through 7; Gen-ties between Sites 1–3 and 1–7; and all interconnection alternatives	Loam and loam, saline-alkali on 0 to 2 percent slopes	60	5

Table 1 Soils in the Project Area

Soil Name	Project Component	Description/ Soil Texture (NRCS)	Soil Series Thickness (inches)	Wind Erodibility Group[(a)]
Rosamond silty clay loam and silty clay loam, saline-alkali (map symbols Rt and Ru)	Sites 3, 4, and 6; and Rosamond Blvd. interconnection alternative	Silty clay loam and silty clay loam, saline-alkali on 0 to 2 percent slopes	60	6
Sunrise sandy loam (map symbol Sv)	80th Street interconnection alternative	Sandy loam on 0 to 2 percent slopes	65	3
Tray loam, saline-alkali (map symbol Tw)	Site 7	Loam, saline-alkali on 0 to 2 percent slopes	70	6

Sources: NRCS 1997, 1999, 2003, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2016.
Notes:
[(a)] Soils are assigned to wind erodibility groups based on their susceptibility to wind erosion. Soils assigned to group 1 are the most susceptible. Soils assigned to group 8 are the least susceptible.
Key:
NRCS = United States Department of Agriculture, Natural Resources Conservation Service

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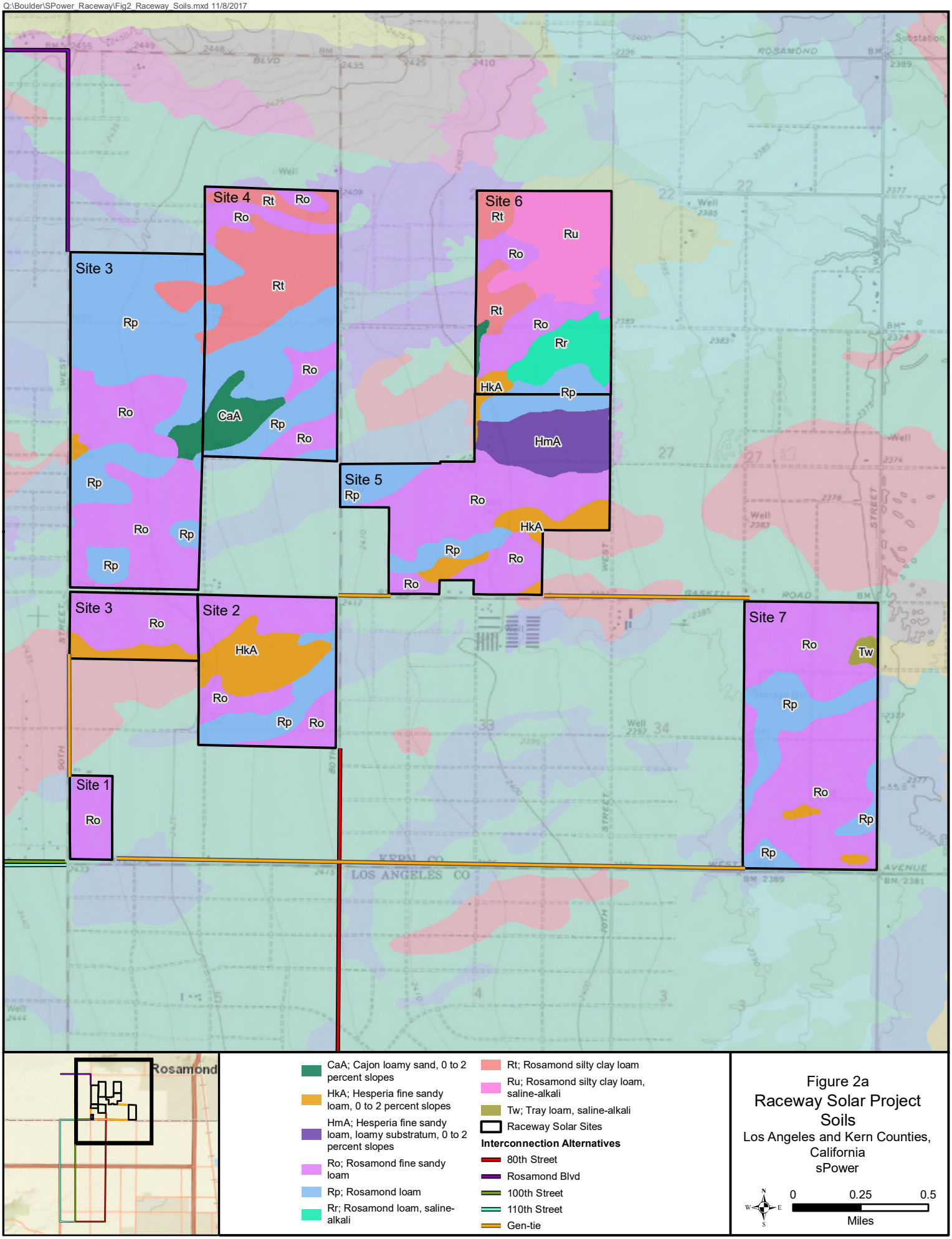

- CaA; Cajon loamy sand, 0 to 2 percent slopes
- HkA; Hesperia fine sandy loam, 0 to 2 percent slopes
- HmA; Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes
- Ro; Rosamond fine sandy loam
- Rp; Rosamond loam
- Rr; Rosamond loam, saline-alkali
- Rt; Rosamond silty clay loam
- Ru; Rosamond silty clay loam, saline-alkali
- Tw; Tray loam, saline-alkali
- Raceway Solar Sites

Interconnection Alternatives

- 80th Street
- Rosamond Blvd
- 100th Street
- 110th Street
- Gen-tie

Figure 2a
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

0 0.25 0.5
Miles

Data Sources: USDA 2016

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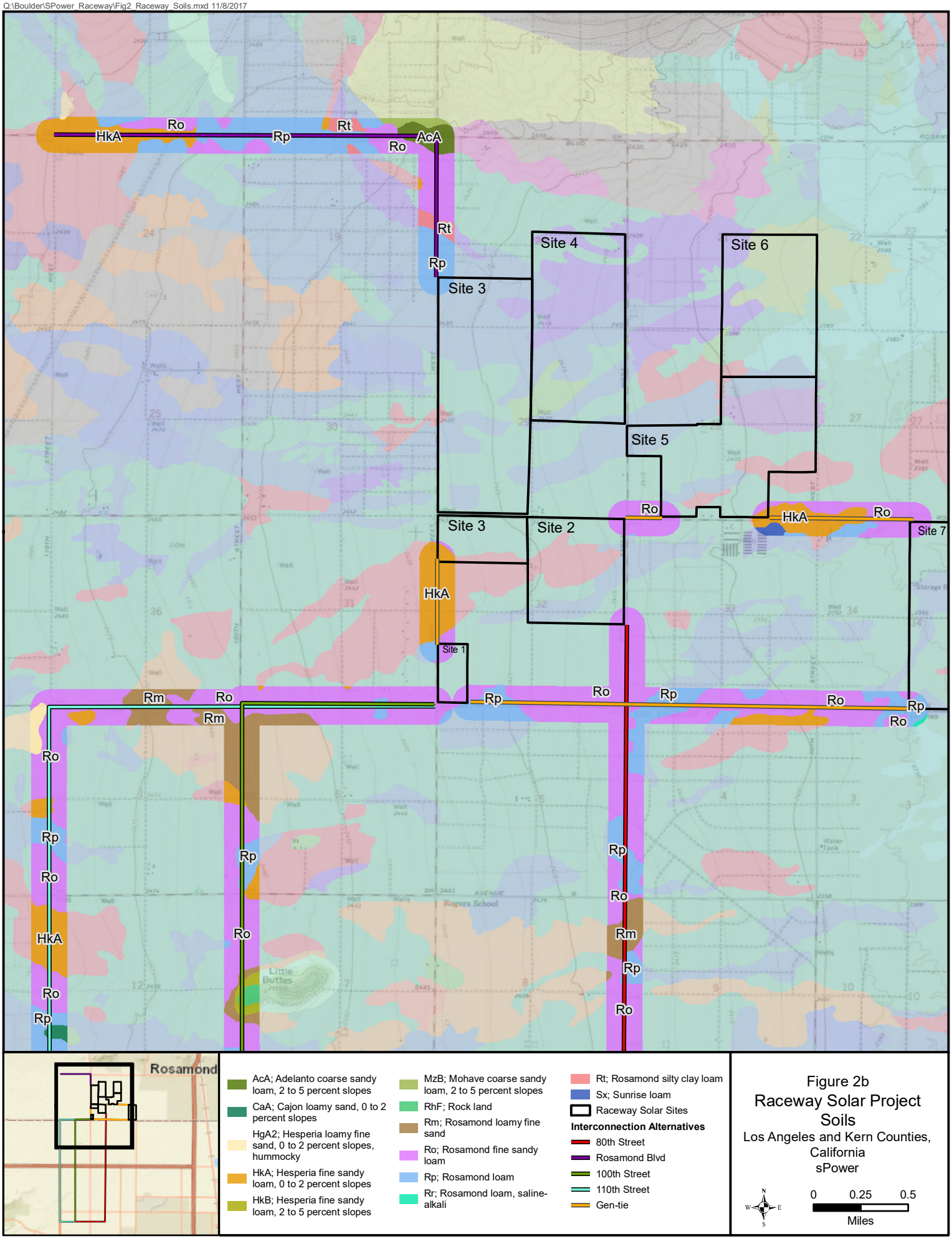

Figure 2b
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

Data Sources: USDA 2016

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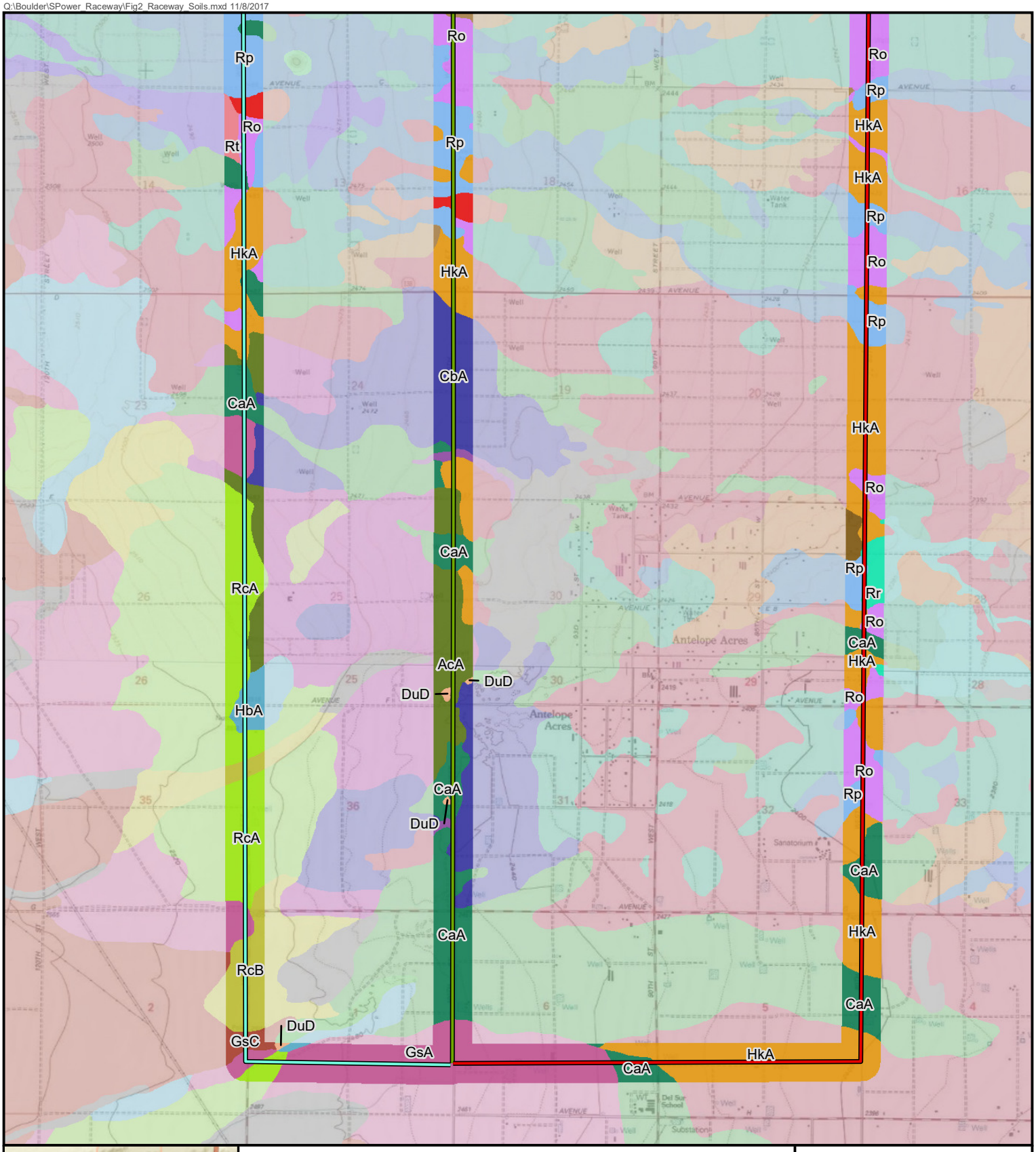

Figure 2c
Raceway Solar Project
Soils
Los Angeles and Kern Counties, California
sPower

Data Sources: USDA 2016

2.1 California Environmental Quality Act Significance Criteria

The following significance criteria were defined based on the checklist items in Appendix G of the CEQA Guidelines. An impact to soil resources is considered significant if the Project would meet the following impact criteria.

Criterion GEO-1: Result in substantial soil erosion or the loss of topsoil.

Construction

Soils in the Project area are generally loamy with varying proportions of clay, silt, and sand. Most soils within the Project area have a wind erodibility rating of moderately susceptible to susceptible, as shown in Table 1. During construction, the majority of ground disturbance would occur during construction of the solar arrays, access roads, energy storage system, and related equipment/infrastructure. Erosion at these sites would occur as a result of wind, water, and tracking from construction vehicles and equipment. Construction of the Project may result in a significant impact if erosion control measures are not implemented. To reduce sediment production and storm water pollution, the applicant would prepare and implement a Project-specific storm water pollution prevention plan (SWPPP). The applicant would use information about the physical properties of subsurface soils, soil resistivity, and slope stability data from the geotechnical study to inform development of the SWPPP.

The SWPPP would include a variety of erosion, sediment, and fugitive dust controls to reduce the potential for erosion and sedimentation that could result from construction of the Project. Erosion controls consist of source control measures that are designed to prevent soil particles from detaching and being transported by wind or in storm water runoff. The SWPPP would also require the applicant to install erosion control devices, where appropriate, such as straw mulch, geotextiles, and mats, earth dikes and drainage swales, velocity dissipation devices (at culvert outlets), and slope drains to reduce erosion potential during construction. Examples of sediment control measures could include silt fences, waddles, sediment traps, check dams, fiber rolls, gravel bag berms, street sweeping and vacuuming, and sandbag barriers. These measures would be implemented at appropriate locations throughout the Project area. Dust control measures would consist of applying water as needed. Impacts would be less than significant with the design and implementation of erosion, sediment, and fugitive dust control measures in the SWPPP.

Operation

During operation, the potential for soil erosion at the developed sites would be low due to the erosion, sediment, and fugitive dust control measures implemented during construction and as part of post-construction site stabilization. Routine operation and maintenance would not require grading or other ground-disturbing activities, and further loss of topsoil is not expected to occur. Long-term use of access roads may lead to rutting, which could concentrate runoff and increase rill erosion. However, the applicant would apply appropriate erosion and sediment control practices as needed during operations to meet post-construction water quality standards adopted by the Regional Water Quality Control Board and State Water Resources Control Board. Therefore, the Project would not result in substantial topsoil erosion or the loss of topsoil during operations, and impacts under this criterion would be less than significant for the Project.

Criterion GEO-2: Be located on a soil that is unstable, or would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Construction and Operation

The General and Specific Plans covering areas of proposed ground disturbance indicate that secondary seismic hazards such as lateral spreading, subsidence, collapse, and differential settlement are not known to be significant hazards in the Project area (KCDPDS 1992, 2009).

Areas where the natural slope is over-steepened by the construction of access roads, structure foundations, or other excavated areas would have increased landslide and lateral spreading susceptibility as a result of the Project. A geotechnical investigation will be undertaken prior to construction the results of which should inform project design. Incorporating recommendations from a geotechnical investigation may reduce the potential for the Project to be sited in an unstable area and would require, as appropriate, incorporation of design features (e.g., stabilization fills, retaining walls, and slope coverings) to avoid or reduce potential adverse effects to people or structures resulting from ground failure, or reduce the potential for ground failure to occur.

Liquefaction and lateral spreading can occur in lowland areas where saturated sandy soil loses strength and cohesion due to ground shaking during an earthquake. Liquefaction is not normally considered a significant hazard where depth to groundwater is more than 50 feet below ground. Historical depth to groundwater data are available from the U.S. Geological Survey (USGS) groundwater watch website. The USGS indicates that the depth to water for six wells located on or adjacent to one of the seven Project sites has historically ranged from approximately 159 to 247 feet below ground (USGS 2017). Thus, potential impacts from liquefaction are not considered significant.

Criterion GEO-3: Be located on expansive soil, creating substantial risks to life or property.

Construction and Operation

Expansive soils (i.e., those with high-plasticity clay content) can cause structural failure of foundations such as those associated with Project components that involve permanent structures, including collector substations, energy storage system, and solar arrays. The shrink-swell potential of Adelanto, Cajon, Greenfield, Hanford, Hesperia, Ramona, and Tray soil series is low (NRCS 2016). The shrink-swell potential of Rosamond and Sunrise soil series is moderate or moderately high (NRCS 2016). According to the Willow Springs Specific Plan, the lateral and vertical extent of expansive soils of the Rosamond and Sunrise series are not well known (KCDPDS 1992). Soils of the Rosamond and Sunrise series occur in the Project area. If the Project is not properly engineered to account for soil characteristics, impacts resulting in ground failure from soil expansion or contraction could occur, and impacts would be significant. To reduce the impact associated with expansive soil, which may be encountered at various locations in the Project area, we recommend that a geotechnical investigation be undertaken prior to construction, the results of which should inform project design.

Criterion GEO-4: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Construction and Operation

Soil series encountered at the seven project sites are deep, well-drained to excessively drained soils that are well suited for supporting the use of septic tanks or alternative wastewater disposal systems except for a very small portion of Site 7, where Tray soils are only moderately well drained. The proposed Project does not currently include construction of any septic tanks or alternative wastewater disposal systems; thus, there would be no impact under this criterion.

Geotechnical Investigation. The project design would be determined based on a full geotechnical study to be completed prior to construction and as part of final engineering. The design engineers should utilize the recommendations from the geotechnical report to incorporate design elements that minimize potential impacts from geologic hazards.

The Project would not result in significant impacts to geology and soils according to the CEQA significance criteria for soils. Implementation of the Project's specific Best Management Practices (BMPs) would reduce impacts to less than significant.

Chapter 4
References

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Attachment A
Detailed Soil Unit Descriptions

LOCATION ADELANTO CA

Established Series
Rev. GAW/LCL/ET
04/2015

ADELANTO SERIES

The Adelanto series consists of very deep, well drained soils that formed in granitic parent material on alluvial fans and plains. Slopes range from 0 to 5 percent. The mean annual precipitation is about 7 inches, and the mean annual temperature is about 65 degrees F. The Adelanto soils have brown and light brown slightly acid and neutral sandy loam A horizons, reddish brown, moderately alkaline somewhat finer textured sandy loam B2t horizons and brown somewhat coarser sandy loam alluvial C horizons.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, thermic Xeric Haplargids

TYPICAL PEDON: Adelanto coarse sandy loam - desert shrubs and annuals (Colors for dry conditions unless otherwise noted.)

A1--0 to 16 inches; brown (10YR 5/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; plentiful micro, few very fine and fine roots; common micro interstitial, few micro and very few very fine tubular pores; slightly acid (pH 6.5); gradual wavy boundary. (6 to 17 inches thick)

AB--16 to 27 inches; light brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, frible, nonsticky, nonplastic; plentiful micro, few very fine roots; common micro interstitial, few micro tubular pores; neutral (pH 7.0); gradual wavy boundary. (0 to 11 inches thick)

Btk--27 to 41 inches; light brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 4/4) moist; massive slightly hard, friable, nonplastic, nonsticky; few micro and very fine roots; common micro interstitial, very few very fine tubular pores; few thin clay films as bridges; strongly effervescent lime that occurs as soft masses; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 16 inches thick)

Bt1--41 to 50 inches; reddish brown (5YR 5/4) heavy sandy loam, reddish brown (5YR 4/4) moist; weak fine and medium angular blocky structure; hard, firm, slightly sticky, slightly plastic; few micro roots; few micro interstitial and very fine tubular pores; few moderately thick clay films on ped faces, common moderately thick clay films as bridges and in pores; has about 10 to 15 percent fine gravels by volume; disseminated lime slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (6 to 10 inches thick)

Bt2--50 to 64 inches; reddish brown (5YR 5/4) heavy sandy loam near loam, reddish brown (5YR 4/4) moist; weak fine and medium angular blocky structure; very hard, firm, slightly sticky, slightly plastic; very few micro roots; very few micro interstitial, few micro and very few very fine tubular pores; has about 14 percent by volume fine gravels; common moderately thick clay films on ped

faces; few thin clay films as bridges; strongly effervescent disseminated lime; moderately alkaline (pH 8.4) clear wavy boundary. (6 to 14 inches thick)

Bt3--64 to 80 inches; brown (7.5YR 5/4) heavy sandy loam, dark brown (7.5YR 4/4) moist; massive; hard, firm, slightly sticky, slightly plastic; few micro interstitial pores; about 10 percent fine gravels by volume; few moderately thick clay films on ped faces and a few thin clay films as bridges; strongly effervescent, disseminated lime; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 18 inches thick)

C--80 to 86 inches; brown (7.5YR 5/4) coarse sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, friable, nonsticky, nonplastic; disseminated lime slightly effervescent; moderately alkaline (pH 8.4). (Many feet.)

TYPE LOCATION: Los Angeles County, California; NE 1/4, SE 1/4, Sec. 6 T. 6 N, R. 12 W; intersection of Avenue M-8 and 37th Street West.

RANGE IN CHARACTERISTICS: Adelanto soils have ochric epipedons and argillic subsurface horizons. The solum thickness ranges from 32 to 86 inches, the great variation being due to differences in precipitation and the slow differential accretion of soil material. Coarse fragments of gravel size may range from 1 to 35 percent throughout the profile; 1 to 10 percent fine gravels are common. The soils are usually dry throughout the year. Mean soil temperature ranges from about 65 to 71 F. Mineralogy is mixed.

A hues are usually 10YR and 7.5YR and include 5YR. Chromas are 3 and 4 and may include 2; dry values are 5 and 6 and 4 moist. Organic matter content is very low. Textures of the A may be loamy sand or sandy loam; usually some coarse sand and fine gravel are noticeable. The A may be massive, or may have weak plates near the surface. Dry consistence is soft or slightly hard. Reaction may range from slightly acid to slightly alkaline except where soil manipulation or irrigation water has added lime. An A3 or AB horizon is usually present or the boundary between A and Bt is not abrupt.

Color of the Bt horizon is in hues of 7.5YR and 5YR with chromas of 3 to 6. Textures are a sandy loam, but with less than 18 percent clay and at least 3 percent more clay than the A. Structure is usually weak.

The Bt may be massive or it may have weak to moderate angular blocky or even weak priamatic structure. Dry consistence is hard. Reaction is slightly or moderately alkaline. Usually the Bt is noncalcareous at least in the upper part, but there is much variation and all or none may be calcareous. Usually the uppermost lime is in the form of segregations or soft powdery secondary lime.

The C horizons are usually somewhat stratified coarse sandy loams, and loamy sands with some gravel and sand. Reaction is moderately alkaline and usually the C is weakly calcareous. Lenses with lime segragations and thin seams of weak lime cementation are common.

COMPETING SERIES: These are the Chollawell, Cowspring and Lucerne soils. The Chollawell soils have a mean annual soil temperature of 59 to 64 degrees F. Cowspring soils are moderately deep to partially decomposed granodiorite bedrock. Lucerne soils do not have a Btk horizon and typically have an older buried Bt horizon with an upper boundary at about 60 inches.

GEOGRAPHIC SETTING: Adelanto soils occur on nearly level to gently sloping alluvial fans and

plains. The sediments are derived mostly from granite and closely related rocks. The climate is arid. Annual precipitation is about 4 to 9 inches. Winters are cool with occasional gentle rains and a little snow. Summer are hot with very infrequent thunder showers. The mean air temperature is about 65 F; the average July temperature is about 82 F; the average January temperature is about 44 F. The frost-free period is about 250 to 260 days. Elevations range from 2,000 to 2,900 feet.

GEOGRAPHICALLY ASSOCIATED SOILS: Adelanto soils occur in the same general area as Cajon, Hesperia and Mohave. Cajon and Hesperia are young soils lacking argillic horizons.

DRAINAGE AND PERMEABILITY: Well drained; runoff is low to very low; permeability is moderate to moderately rapid.

USE AND VEGETATION: Large areas are used for desert range. With irrigation, alfalfa is the main crop. Native Vegetation is creosote bush, a few annual grasses and forbs, a few perennial grasses, with a little Joshua and juniper trees on the more moist fringes.

DISTRIBUTION AND EXTENT: Mohave Desert area of California and adjoining Southwest (upper desert). The series is extensive. MLRA 30

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES ESTABLISHED: Victorville Area, California 1921.

REMARKS: The Adelanto series was formerly classified in the Red Desert Group, and Xeralfic Haplargids.

Series reclassified on September, 1997. CEC activity class determined from lab data. Competing series reviewed at that time.

National Cooperative Soil Survey
U.S.A.

LOCATION CAJON CA

Established Series
Rev. GAW/TDC/MAV/KJO/ET
04/2015

CAJON SERIES

The Cajon series consists of very deep, somewhat excessively drained soils that formed in sandy alluvium from dominantly granitic rocks. Cajon soils are on alluvial fans, fan aprons, fan skirts, inset fans and river terraces. Slopes are 0 to 15 percent. The average annual precipitation is about 6 inches and the mean annual temperature is about 65 degrees F.

TAXONOMIC CLASS: Mixed, thermic Typic Torripsamments

TYPICAL PEDON: Cajon sand, on a 1 1/2 percent slope under creosotebush, spiny hopsage, and Mormon-tea at 3,060 feet elevation. (Colors are for dry soil unless otherwise stated. When described on 4/29/75 the soil was moist to 18 inches and dry below).

A--0 to 2 inches; light gray (10YR 7/2) sand, light brownish gray (10YR 6/2) moist; weak fine and medium subangular blocky structure; soft, very friable; few fine roots; many very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (0 to 14 inches thick).

C1--2 to 7 inches; very pale brown (10YR 7/3) sand, light gray (10YR 7/2) moist; single grained; loose; common fine roots; many very fine interstitial pores; 1 to 2 percent 3/8 to 1/2 inch gravel; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 6 inches thick).

C2--7 to 13 inches; very pale brown (10YR 7/3) sand, brown (10YR 5/3) moist; single grained; loose; common fine roots; common very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 7 inches thick).

C3--13 to 18 inches; very pale brown (10YR 7/3) sand, brown (10YR 5/3) moist; single grained; loose; common fine roots; many very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 7 inches thick).

C4--18 to 25 inches; very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grained; loose; common fine roots; many very fine interstitial pores; about 4 percent 1/2 inch gravel; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary. (3 to 8 inches thick).

2C5--25 to 38 inches; very pale brown (10YR 7/4) gravelly sand, light yellowish brown (10YR 6/4) moist; single grained; loose; common fine roots; many fine interstitial pores; 25 percent 1/2 to 1 inch gravel; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (10 to 15 inches thick).

2C6--38 to 45 inches; very pale brown (10YR 7/3) gravelly sand, pale brown (10YR 6/3) moist; single grained; loose; few very fine roots; many fine interstitial pores; 20 percent 1/2 to 1 inch gravel; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (3 to 8 inches thick).

2C7--45 to 60 inches; very pale brown (10YR 7/4) sand, light yellowish brown (10YR 6/4) moist; single grained; loose; few very fine roots; common fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0).

TYPE LOCATION: San Bernardino County, California; about 5 miles east of Lucerne Valley, 0.5 mile east of intersection of Visalia Avenue and Foothill Road; and 0.3 mile north in NE1/4, SE1/4, SE1/4 section 16, T.4N., R.1E.

RANGE IN CHARACTERISTICS:

Soil moisture- usually dry from mid March to mid December and is not continuously moist for as long as 90 days in the winter.

Soil temperature: 59 degrees to 72 degrees F. and soil temperature usually is not below 47 degrees F. at any time.

Control section - Rock fragments are mostly gravel size and they make up as much as 35 percent though many pedons have less than 15 percent gravel. There is weak stratification of sandy material in some or all parts.

Typically the soil is slightly effervescent to strongly effervescent throughout although some pedons are noneffervescent in the A horizon.

Typically the profile is slightly alkaline or moderately alkaline although some pedons are neutral.

Some pedons are strongly alkaline and mildly saline-alkali to strongly saline-alkali. Electrical conductivity ranges up to 16 ds/m and the SAR to 20.

The A - Hue: 10YR or 2.5Y
Value: 5 through 7 dry and 3 through 6 moist
Chroma: 2 through 6 dry and moist.
Texture: Coarse sand, loamy coarse sand, sand and loamy sand. Some pedons have sandy loam overblown phases. Some pedons have as much as 60 percent gravel within 2 inches.

The C horizon - Hue: 10YR or 2.5Y
Value: 5 through 7 dry and 3 through 6 moist
Chroma: 2 through 6 dry and moist
Texture: Coarse sand, loamy coarse sand, sand, loamy sand, fine sand, or loamy fine sand or their gravelly or cobbly equivalents. Some pedons have a sandy loam horizon at a depth of more than 40 inches.

COMPETING SERIES: These are the Bluepoint (NV), Brazito (NM), Maynard Lake (NV), Moapa (NV), Pintura (UT), Toquop (NV), University (T NM) and Yturbide (NM) series in the same family and the Carsitas series in another family. Bluepoint soils are dominantly in hue of 5YR and have chroma of 3 through 6. Brazito soils are not dry in all parts of the moisture control section for months

following the summer solstice. Carsitas and Myoma soils have a hyperthermic temperature regime. Maynard Lake soils contain a significant amount of volcanic ash. Moapa soils have a paralithic contact at a depth of 20 to 40 inches. Pintura soils have hue of 5YR or redder and lack stratification. Toquop soils typically have hue redder than 10YR. Yturbide soils are noncalcareous or have small amounts of disseminated lime. Also, Yturbide soils are moist in the summer.

GEOGRAPHIC SETTING: The Cajon soils have gradients of 0 to 15 percent and are on recent fans, fan skirts, fan aprons, inset fans and river terraces at elevations of 200 to 4,300 feet. The lower elevations commonly occur in the San Joaquin Valley. They formed in sandy alluvium, mostly granitic rock sources, but also a variety of sources are included. The climate is arid with hot dry summers and somewhat moist winters. Average annual precipitation is 2 to 9 inches, mostly in the form of winter rain. Mean January temperature is 43 degrees to 48 degrees F., mean July temperature is 82 degrees to 84 degrees F., mean annual temperature is 57 degrees to 70 degrees F. Frost-free season is 150 to 340 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Adelanto, Arizo, Calcio, Edalph, Goldivide, Gravesumit, Hesperia, Livefire and Rosamond soils. Adelanto soils have an argillic horizon. Arizo soils have a sandy skeletal particle size control section. Calcio, Goldivide and Gravesumit soils have an argillic horizon and a calcic horiaon. Edalph and Hesperia soils have a coarse-loamy control section. Livefire soils have sandy loam textures within the particle size control section. Rosamond soils have a fine-loamy particlr size control section.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained; negligible to low runoff; rapid permeability. Cajon soils with sandy loam surface textures have moderately rapid over rapid permeability. Flooding is none to rare.

USE AND VEGETATION: Used mostly for range, watershed, and recreation. A few areas are irrigated and are used for growing alfalfa and other crops. Vegetation is mostly desert shrubs including creosotebush, saltbush, Mormon-tea, Joshua trees, some Indian ricegrass, annual grasses and forbs.

DISTRIBUTION AND EXTENT: Southeastern California, southern Nevada, and Arizona. The soils are extensive. The central concept for the series is in MLRA 30. Use in other MLRA's should be reevaluated.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES ESTABLISHED: Central-Southern California Reconnaissance, 1917.

REMARKS: The ranges of the Bluepoint, Cajon and Toquop series overlap.

Runoff classes based on Ksat and slope as described in "Terminology Used in Soil Survey Data Entry or Manuscript Editing of: 9-23-94 MAV." Runoff changed from slow or very slow; runoff is now negligible to low.

Responsibility for this series was transferred from Davis to Phoenix 4/2015. The last revision to the series was 1/2002. ET

National Cooperative Soil Survey
U.S.A.

LOCATION GREENFIELD CA

Established Series
Rev. LCL/GWH/RWK
04/2015

GREENFIELD SERIES

The Greenfield series consists of deep, well drained soils that formed in moderately coarse and coarse textured alluvium derived from granitic and mixed rock sources. Greenfield soils are on alluvial fans and terraces and have slopes of 0 to 30 percent. The mean annual precipitation is about 15 inches and the mean annual air temperature is about 62 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, thermic Typic Haploxeralfs

TYPICAL PEDON: Greenfield coarse sandy loam, annual grass pasture. (Colors are for dry soil unless otherwise noted.)

A1--0 to 23 inches; pale brown (10YR 6/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; slightly acid (pH 6.3); gradual smooth boundary. (8 to 30 inches thick)

B1--23 to 37 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; thin patchy clay film; neutral (pH 6.6); gradual smooth boundary. (10 to 20 inches thick)

B2t--37 to 51 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; thin patchy clay films; neutral (pH 6.8); gradual smooth boundary. (10 to 20 inches thick)

C--51 to 72 inches; brownish yellow (10YR 6/6) and yellow (10YR 7/6) stratified loamy sand, sandy loam, and fine sandy loam; yellowish brown (10YR 5/6) moist; massive; soft, very friable; neutral (pH 7.0).

TYPE LOCATION: Madera County, California; SW1/4 NW1/4 section 18, T.10S., R.18E.

RANGE IN CHARACTERISTICS: The mean annual soil temperature is 59 to 65 degrees F. and the soil temperature is not below 47 degrees F. at any time for more than a few days all of the time from late April or May until November or early December and usually is moist in some or all parts of the moisture control section all the rest of the year. Rock fragments range from less than 1 to 25 percent in the A and B horizons. Coarse and very coarse sand average more than 20 percent.

The A horizon is pale brown, light brownish gray, grayish brown, brown, light yellowish brown, dark yellowish brown, yellowish brown, pinkish gray or light brown (10YR 6/2, 6/3, 6/4, 5/2, 5/3, 5/4, 4/3,

4/4; 7.5YR 5/2, 5/4, 6/2, 6/4). It is loamy sand, sandy loam, fine sandy loam or gravelly equivalents of each. This horizon contains less than 1 percent organic matter in all parts. It is slightly acid to mildly alkaline. The lower boundary is gradual or clear.

The B2t horizon is pale brown , brown, light brown, light gray, light yellowish brown, yellowish brown, dark yellowish brown, grayish brown, reddish yellow, pink or brownish yellow (10YR 6/1, 6/3, 5/3, 6/4, 6/6, 5/4, 5/6, 5/8, 4/4, 4/6, 7/4, 7/6, 5/2; 7.5YR 5/2, 5/4, 4/2, 4/4, 6/4, 6/6, or 7/4). It is heavy sandy loam, heavy fine sandy loam, or gravelly equivalents of each and has 3 to 6 percent more clay than the A horizon. This horizon is slightly acid to mildly alkaline.

The C horizon is light yellowish brown, very pale brown, yellowish brown, pale brown, light brownish yellow (10YR 6/4, 5/4, 5/6, 5/8, 6/3, 6/2, 6/6, 6/8, 7/3, 7/4, 4/2, 4/4) or brown (7.5YR 4/4, 4/2). It is loamy sand, coarse sandy loam, sandy loam, fine sandy loam or gravelly equivalents of each. This horizon is neutral to moderately alkaline. Some pedons have silica cementation or contrasting soil material or more than 35 percent gravel, all below 40 inches.

COMPETING SERIES: These are the Atwater and Dinuba series in the same family and the Hanford, Oakdale, Ramona, and Snelling series. Atwater soils average less than 20 percent coarse and very coarse sand, and are essentially gravel free. Dinuba soils are calcareous between depths of 20 to 40 inches and have silty unrelated sediments below the argillic horizon. Hanford soils lack an argillic horizon. Oakdale soils have a moist value of 3 and more than 1.2 percent organic matter to a depth of more than 4 inches. Ramona and Snelling soils have more than 18 percent clay in the argillic horizon.

GEOGRAPHIC SETTING: Greenfield soils are on fans and terraces at elevations of 100 to 3,500 feet. Slopes range from 0 to 30 percent. The soils formed in moderately coarse and coarse textured alluvium or some wind deposited material derived from granitic and mixed sources. The climate is dry subhumid mesothermal with hot, dry summers and cool, moist winters. The mean annual precipitation is 9 to 20 inches. The mean annual temperature is 60 to 64 degrees F.; the average January temperature is 42 to 46 degrees F.; and the average July temperature is 76 to 80 degrees F. The frost free season averages about 200 to 325 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Hanford, Ramona and Snelling soils and the Arlington, Docas, Garey, Lockwood, and San Joaquin soils. Arlington and San Joaquin soils have duripans at depths of less than 40 inches. Docas soils lack argillic horizons. Garey soils have an argillic horizon consisting of lamellae and intervening sandy layers without clay bridges. Lockwood soils have a mollic epipedon.

DRAINAGE AND PERMEABILITY: Well drained; slow to medium runoff; moderately rapid permeability.

USE AND VEGETATION: Used for the production of a wide variety of irrigated field, forage and fruit crops and also for growing dryland grain and pasture. Vegetation on uncultivated areas consists of annual grass, forbs, some shrubs and scattered oak trees.

DISTRIBUTION AND EXTENT: Interior and coastal valleys of central and southern California. The soils are extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES ESTABLISHED: Monterey County (Salinas Area), California, 1924.

REMARKS: The activity class was added to the classification in January of 2003. Competing series were not checked at that time. - ET

Responsibility for this series was transferred from Davis to Phoenix 4/2015. The last revision to the series was 1/2003. ET

National Cooperative Soil Survey
U.S.A.

LOCATION HANFORD CA

Established Series
Rev. LCL/ARW/JJJ/CAF
10/1999

HANFORD SERIES

The Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Hanford soils are on stream bottoms, floodplains and alluvial fans and have slopes of 0 to 15 percent. The mean annual precipitation is about 12 inches and the mean annual air temperature is about 63 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, nonacid, thermic Typic Xerorthents

TYPICAL PEDON: Hanford fine sandy loam, pasture. (Colors are for dry soil unless otherwise noted.)

A1--0 to 12 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots in the upper few inches; many fine interstitial pores; slightly acid; gradual smooth boundary. (6 to 14 inches thick)

C1--12 to 36 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; neutral; diffuse boundary. (10 to 24 inches thick)

C2--36 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam and sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; slightly alkaline.

TYPE LOCATION: Madera County, California; SW1/4 NW1/4 section 30, T. 10 S., R. 18 E.

RANGE IN CHARACTERISTICS: The mean annual soil temperature at a depth of 20 inches is about 59 to 68 degrees F., and the soil temperature is not below 47 degrees F. for any significant period. Soil between the depths of about 8 to 24 inches usually is dry all of the time from late April or May until November or early December and usually is moist in some or all parts of this section all the rest of the year. The 10 to 40 inch control section averages sandy loam, coarse sandy loam, fine sandy loam or gravelly equivalents of each. The coarse fragments range from 0 to 35 percent. The particle size control section has little or no stratification. Clay content usually averages 6 to 18 percent. Organic matter is less than 1 percent and decreases regularly with increasing depth. Below a depth of 40 inches some pedons have marked stratification. The soils are medium acid to slightly alkaline and usually become more alkaline with depth. Secondary free carbonates do not occur above a depth of 40 inches. In some cases carbonates have been added to the soil by farmers which results in slight effervescence in the surface layers.

The A horizon is pale brown or light brownish gray (10YR 5/2, 5/3, 6/3, 6/2).

The C horizon is very pale brown, pale brown or light yellowish brown (10YR 5/3, 6/3, 6/4, 7/3, 7/4).

COMPETING SERIES: These are the Honcut, Pollasky and Saugus series. Honcut soils have more silt or clay in the 10 to 40 inch particle-size control section, lower available water holding capacity, and/or redder hues. Pollasky soils are underlain by unrelated moderately consolidated sandy sediments at depths of less than 40 inches. Saugus soils have a paralithic contact at depths of more than 40 inches.

GEOGRAPHIC SETTING: The Hanford soils are on stream bottoms, floodplains and alluvial fans at elevations of 150 to 3,500 feet. Slopes range from 0 to 15 percent. The soils formed in deep, moderately coarse textured alluvium dominantly from granite and other quartz bearing rocks of similar texture. The climate is dry subhumid mesothermal with hot, dry summers and cool, moist winters. The mean annual precipitation is 9 to 20 inches. The mean annual temperature is 62 to 65 degrees F.; the mean January temperature is about 45 degrees F.; and the mean July temperature is about 81 degrees F. The frost free season is 200 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Elder, Dinuba, Ramona, and Tujunga soils. Elder soils have mollic epipedons. Dinuba and Ramona soils have argillic horizons and Tujunga soils are sand or loamy sand throughout the 10 to 40 inch control section.

DRAINAGE AND PERMEABILITY: Well drained; negligible to low runoff; moderately rapid permeability.

USE AND VEGETATION: Hanford soils are used for growing a wide range of fruits, vegetables, and general farm crops. They are also used for urban development and dairies. Vegetation in uncultivated areas is mainly annual grasses and associated herbaceous plants.

DISTRIBUTION AND EXTENT: Widely distributed in the San Joaquin Valley and in the valleys of central and southern California. The soils are extensive. MLRA 17

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: Kings County (Hanford Area), California, 1901.

National Cooperative Soil Survey
U.S.A.

LOCATION HESPERIA CA

Established Series
Rev. GWH/GAW/TDC/ET
10/97

HESPERIA SERIES

The Hesperia series consists of very deep, well drained soils that formed in alluvium derived primarily from granite and related rocks. Hesperia soils are on alluvial fans, valley plains and stream terraces and have slopes of 0 to 9 percent. The mean annual precipitation is about 8 inches and the mean annual air temperature is about 64 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, nonacid, thermic Xeric Torriorthents

TYPICAL PEDON: Hesperia fine sandy loam--disturbed site. (Colors are for dry soil unless otherwise stated).

Ap--0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few very fine tubular pores; slightly acid (pH 6.3); abrupt smooth boundary. (4 to 10 inches thick).

C1--4 to 22 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial and few very fine tubular pores; slightly alkaline (pH 7.5); gradual smooth boundary. (16 to 20 inches thick).

C2--22 to 54 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial, and few very fine tubular pores; slightly effervescent with disseminated lime moderately alkaline (pH 8.0); gradual smooth boundary. (30 to 34 inches thick).

C3--54 to 77 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine, few fine roots; common very fine interstitial, few very fine tubular pores; strongly effervescent with disseminated lime; moderately alkaline (pH 8.0).

TYPE LOCATION: Los Angeles County, California; about 2 miles northeast of Little Rock; near center of NE 1/4, SE 1/4 section 8, T.5N., R.10W.

RANGE IN CHARACTERISTICS: The mean annual soil temperature ranges from 57 degrees to 71 degrees F. The soil is dry in all parts, unless irrigated, from early May until early November. Organic matter content is very low and decreases regularly with increasing depth. The soils are typically calcareous between depths of 16 and 40 inches.

The A horizon has a dry color of 10YR 5/2, 5/3, 5/4, 6/2, 6/3, 6/4, 7/2, 7/3, 8/3 and 7.5YR 5/2, 5/4, 6/2 and 6/4. Moist color is 10YR 3/2, 3/3, 4/2, 4/3, 4/4, 4/6, 5/3, 6/3; 7.5YR 3/2, 4/4, 5/4. It is loamy

fine sand, loamy sand, sandy loam, fine sandy loam, very fine sandy loam or light loam, and has 0 to 5 percent rock fragments ranging from 2 mm to 2 cm. This horizon is slightly acid to moderately alkaline.

The C horizon is similar in color to the A horizon. It is fine sandy loam, sandy loam or coarse sandy loam. Contrasting textures are excluded from the 10 to 40 inches control section although some fine or weak stratification is common. Rock fragments 2 mm to 2 cm in diameter range from 0 to 15 percent. The soil is slightly acid to moderately alkaline. Lime is usually disseminated but a few pedons have lime veins in the lower part of the profile. Some pedons have loamy sand substratums.

COMPETING SERIES: There are no competing soils series.

GEOGRAPHIC SETTING: Hesperia soils are on long smooth alluvial fans, and valley fill. The alluvium is from granite and closely related rocks. Elevations are as low as 200 feet in the San Joaquin Valley and as high as 4,800 feet in the high desert. The climate is semiarid bordering on arid. Winters have some general widespread rains plus occasional snow in the high desert. Summers have infrequent thunder showers in the high desert. Mean annual precipitation is 4 to 9 inches. Average January temperature is about 46 degrees F; average July temperature is about 83 degrees F; mean annual temperature is 57 degrees to 69 degrees F. Frost-free season is about 140 to 310 days. (see remarks).

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Arvin, Cajon and Whitewolf soils and the Adelanto soils. Adelanto soils have B2t horizons.

DRAINAGE AND PERMEABILITY: Well drained; negligible to low runoff, moderately rapid permeability.

USE AND VEGETATION: Used for desert range, and for production of irrigated orchards, row crops, field crops, grain, hay, pasture and grapes. Native vegetation consists of creosotebush in the high desert and sparse annuals in the valley.

DISTRIBUTION AND EXTENT: Mainly in the lower San Joaquin Valley and the high desert of Southern California and adjoining areas of the southwest. The series is extensive in MLRA-17 and of minor extent in MLRA 29.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California.

SERIES ESTABLISHED: Central-Southern Area California Reconnaissance, 1917.

REMARKS: The soils now mapped at elevations of less than 500 feet would be separated as new soils. These map units should be warm phases with the lower San Joaquin Valley with the longer (310) frost-free season. Series last updated 9/97. CEC activity class supported by lab data. Series competed at that time.

National Cooperative Soil Survey
U.S.A.

LOCATION RAMONA CA

Established Series
Rev. GB/LAB/LCL
01/2003

RAMONA SERIES

The Ramona series is a member of the fine-loamy, mixed, thermic family of Typic Haploxeralfs. Typically, Ramona soils have brown, slightly and medium acid, sandy loam and fine sandy loam A horizons, reddish brown and yellowish red, slightly acid, sandy clay loam B2t horizons, and strong brown, neutral, fine sandy loam C horizons.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, thermic Typic Haploxeralfs

TYPICAL PEDON: Ramona fine sandy loam - cultivated (Colors are for dry soil unless otherwise noted.)

Ap--0 to 14 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; massive; hard, very friable, nonsticky, nonplastic; few fine roots: many very fine interstitial and tubular pores; moderately acid (pH 6.0); clear smooth boundary. (8 to 15 inches thick)

A12--14 to 23 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; massive; hard, very friable, slightly sticky, slightly plastic; few fine roots; common fine tubular pores; slightly acid (pH 6.5); clear smooth boundary. (5 to 10 inches thick)

B1--23 to 29 inches; brown (7.5YR 5/4) loam, dark reddish brown (5YR 3/4) moist; moderate coarse angular blocky structure; hard, friable, slightly sticky, slightly plastic; few fine roots; many fine tubular pores; few thin clay films on faces of peds and lining pores; slightly acid (pH 6.5); clear smooth boundary. (3 to 8 inches thick)

B21t--29 to 37 inches; reddish brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate coarse prismatic structure; very hard, firm, sticky, plastic; few fine roots; common fine tubular pores; common thin clay films on faces of peds and lining pores; slightly acid (pH 6.5); gradual smooth boundary. (6 to 10 inches thick)

B22t--37 to 46 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse prismatic structure; very hard, firm, sticky, plastic; very few fine roots; few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; slightly acid (pH 6.5); gradual smooth boundary. (6 to 12 inches thick)

B23t--46 to 58 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse prismatic structure; very hard, firm, sticky, plastic; few fine tubular pores; many moderately thick clay films on faces of peds and lining pores; slightly acid (pH 6.5); gradual smooth boundary. (8 to 14 inches thick)

B3--58 to 68 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse angular blocky structure; very hard, firm, sticky, plastic; few fine tubular pores;

many moderately thick clay films on faces of peds and lining pores; neutral (pH 6.8); clear irregular boundary. (6 to 12 inches thick)

C--68 to 74 inches; strong brown (7.5YR 5/6) fine sandy loam, dark brown (7.5YR 4/4) moist; massive; hard, firm, slightly sticky, slightly plastic; few fine pores; neutral (pH 7.0).

TYPE LOCATION: Riverside County, California; about 3 miles northwest of Beaumont, California; approximately 1,100 feet north and 500 feet west of the S1/4 corner of sec. 31, T.2S., R.1W.

RANGE IN CHARACTERISTICS: The mean annual soil temperature at a depth of 20 inches is 59 degrees to 65 degrees F. and the soil temperature usually is not below 47 degrees F. or is below 47 degrees F. for only a few days in January. Soil between the depth of about 5 and 15 inches usually is moist in some or all parts from November or early December until late April or May and is dry all the rest of the year. The A and B horizons have more than 15 percent combined coarse and very coarse sand and 5 to 35 percent fine rock fragments of 2 to 5mm size. Rock fragments larger than 5mm are less than 5 percent. The C horizons are variable as to coarse sand, fine gravel, and rock fragments larger than 5mm but in general are more coarse than the A and B horizons.

The A horizon is light brownish gray to dark grayish brown or yellowish brown (10YR 6/2, 5/2, 4/2, 6/3, 5/3, 4/3, 5/4; 7.5YR 5/2, 5/4) when dry. It is course sandy loam, sandy loam, fine sandy loam or light loam and has less than 1 percent organic matter. After considerable cultivation or cattle trampling some or all of the A horizon is hard or very hard and massive when dry. It is neutral to moderately acid. The lower boundary is gradual or there is an A3 horizon or a B1 horizon or both horizons are present.

The B2t horizon is dark brown, strong brown, brown or light brown in 7.5YR hue or reddish brown or yellowish red in 5YR hue in yellowish in 10YR hue in the lower part. It is heavy sandy loam, sandy clay loam or loam with 18 to 27 percent clay. Total clay content is 3 to 12 percent more in the B2t horizon than in the A horizon. The B2t horizon is slightly acid or neutral in all parts or in some pedons it is slightly alkaline in the lower part. It has weak or moderate angular blocky or prismatic structure. In pedons having a B3 or B3t horizon, color of the transitional horizon is similar to the B2t horizon or it has a hue 1/4 letter interval less red. It is slightly acid to moderately alkaline.

The C horizon is coarse sandy loam, fine sandy loam or loam and is neutral to moderately alkaline. In some pedons it is calcareous in some part with a small amount of segregated or disseminated lime.

COMPETING SERIES: These are the Arbuckle, Blasingame, Borden, Esparto, Fallbrook, Montpellier, Sesame, Snalling, Tivy, Wasioja, and Wyman series. Arbuckle soils are gravelly with more than 15 percent gravel larger than 5mm in the argillic horizon. Blasingame and Tivy soils have a paralithic contact less than 40 inches below the surface. Borden soils have an argillic horizon that is moderately alkaline and is calcareous in some or all parts. Esparto soils are marginal to the silty family with less than 20 percent fine gravel, coarse and very coarse sand. Fallbrook soils have 27 to 35 percent clay in the argillic horizon. The difference in total clay content between A and B2t horizon is more than 10 percent absolute. Sesame soils have a lithic contact between A and B2t horizon is more than 10 percent absolute. Sesame soils have a lithic contact at a depth of 20 to 40 inches. Snalling soils are medium acid in the B2t horizon. (See Remarks). Wasioja soils have an aridic moisture regime marginal to xeric. Wyman soils have less than 15 percent coarse and very coarse sand, less than 10 percent absolute clay difference between A and B horizon and about 27 to 35 percent clay in the B2t horizon.

GEOGRAPHIC SETTING: The Ramona soils are nearly level to moderately steep. They are on terraces and fans at elevations of 250 to 3,500 feet. They formed in alluvium derived mostly from granitic and related rock sources. The climate is dry subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 10 to 20 inches. Average January temperature is 50 degrees F., average July temperature is about 70 degrees F., average annual temperature is 60 degrees to 66 degrees F. The frost-free season is 230 to 320 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Fallbrook and Montpellier soils and the Arlingtonk, Greenfield, Hanford, and Placentia soils. Arlington soils have a duripan. Greenfield soils have less than 18 percent clay in the argillic horizon. Hanford soils lack an argillic horizon. Placentia soils have a natric horizon with more than 35 percent clay.

DRAINAGE AND PERMEABILITY: Well-drained; slow to rapid runoff; moderately slow permeability.

USE AND VEGETATION: Used mostly for production of grain, grain-hay, pasture, irrigated citrus, olives, truck crops, and deciduous fruits. Uncultivated areas have a cover of annual grasses, forbs, chamise or chaparral.

DISTRIBUTION AND EXTENT: The Ramona soils are in the interior valleys of central and the western part of southern California. The soils are extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: Los Angeles County (Pasadena Area), California, 1915.

REMARKS: The Ramona soils are formerly classified as Noncalcic Brown soils. The Snalling soils are differentiated from Ramona soils on soil reaction in the B2t horizon. Some differentiae used to separate series within this family are difficult to apply consistently.

The activity class was added to the classification in January of 2003. Competing series were not checked at that time. - ET

OSED scanned by SSQA. Last revised by state on 10/72.

National Cooperative Soil Survey
U.S.A.

LOCATION ROSAMOND CA+NM

Established Series
Rev. GAW/LCL/RWK/SBS
12/2015

ROSAMOND SERIES

The Rosamond series consists of deep, well drained soils that formed in material weathered mainly from granitic alluvium. Rosamond soils are on the lower margin of the alluvial fans between the sloping fans and the playas and have slopes of 0 to 2 percent. The mean annual precipitation is about 5 inches and the mean annual air temperature is about 63 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents

TYPICAL PEDON: Rosamond fine sandy loam, desert range. (Colors are for dry soil unless otherwise noted.)

C1--0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and thick platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine and few fine pores; slightly alkaline (pH 7.8); abrupt smooth boundary. (4 to 6 inches thick)

C2--4 to 8 inches; light brownish gray (10YR 6/2) very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; many very fine and few fine pores; slightly effervescent, disseminated lime; moderately alkaline (pH 7.9); clear smooth boundary. (4 to 6 inches thick)

2C3--8 to 28 inches; pale brown (10YR 6/3) light silty clay loam, dark brown (10YR 4/3) moist; weak medium angular blocky structure; hard, friable, sticky and plastic; few fine, medium and coarse roots; many very fine and few fine pores; strongly effervescent;, disseminated lime, few soft spherical concretions of lime; moderately alkaline (pH 8.2); clear wavy boundary. (18 to 24 inches thick)

3C4--28 to 34 inches; pale brown (10YR 6/3) light sandy clay loam, dark brown (10YR 4/3) moist; massive; hard, friable, sticky and plastic; few fine and medium roots; many very fine and few fine pores; slightly effervescent; disseminated lime and few fine filaments of lime; moderately alkaline (pH 8.2); clear wavy boundary. (4 to 10 inches thick)

4C5--34 to 60 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; weak medium angular blocky structure; very hard, firm, sticky and plastic; few fine roots; many very fine, few fine and few medium pores; violently effervescent with disseminated lime and common irregular soft bodies of lime; moderately alkaline (pH 8.2).

TYPE LOCATION: Los Angeles County, California; Avenue G and 100th Street East; 11 miles northeast of Lancaster; 0.2 miles east and 30 feet north of the SW corner of section 33, T.8 N., R.10

W.

RANGE IN CHARACTERISTICS: The mean soil temperature ranges from about 63 to 67 degrees F. The soils are usually dry more than 3/4 of the time and are not moist for as long as 60 consecutive days. The soil is very low in organic matter. The organic matter decreases irregularly with increasing depth.

Some pedons have weak A1 horizons, other Ap horizons or lack either of these. The color is about the same throughout the soil. Hue is 10YR or 7.5YR, value is 5 or 6 dry, 4 or 5 moist and chroma ranges from 2 through 4. A few strata have colors of higher chroma. The surface layer is sandy loam to silty clay loam. The 10 to 40 inch control section averages loam, clay loam or silty clay loam and contains 18 to 30 percent clay and more than 15 percent sand. The soil is stratified but lacks contrasting textures within the control section.

Some pedons have contrasting textures below the control section. Structure is weak or the horizons are massive. Usually the soil is calcareous and moderately alkaline throughout except that the upper few inches of some undisturbed pedons are mildly alkaline and noncalcareous. All parts below depths of 10 to 20 inches are calcareous. A few small soft to hard concretions or filaments of lime are common, but they are not definitive for the series. Some pedons contain some salt and alkali but the soil is not typically strongly saline alkali.

COMPETING SERIES: These are the Leeds series in the same family and the Anthony, Docas, Gila, Hesperia, Panoche, San Emigidio and Steuber series. Leeds soils have hue of 5YR or 2.5YR in the C horizon. Anthony, Gila, Hesperia, San Emigdio and Steuber soils have less than 18 percent clay. Docas soils have less than 15 percent of material coarser than very fine sand. Panoche soils are not distinctly stratified and have a regular decrease in organic matter.

GEOGRAPHIC SETTING: Rosamond soils are in the lower margins of fans, between the sloping fans and the basins and playas at elevations from 2,200 to 2,900 feet. Slopes are 0 to 2 percent. The soils formed in alluvium derived mostly from granite and similar rocks. The climate is arid. Precipitation is from 3 to 6 inches. Winters have gentle regional rains and a little snow and summers have very infrequent local thunder showers. The mean annual temperature is between 61 and 65 degrees F.; the average January temperature is about 44 to 45 degrees F.; and the average July temperature is about 80 to 82 degrees F. The frost free season is 200 to 260 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Hesperia soils and the Cajon and Tray soils. Cajon soils are sandy throughout. Tray soils have B2t horizons and are strongly alkaline.

DRAINAGE AND PERMEABILITY: Well drained; medium runoff; moderate to moderately slow permeability.

USE AND VEGETATION: Large areas are used for desert range. Other extensive areas are irrigated and cropped to alfalfa and row crops. Native vegetation is rabbit brush, big sagebrush, a small amount of Atriplex and a little annual and perennial grass and weeds.

DISTRIBUTION AND EXTENT: The high desert area of Los Angeles and adjoining counties in California. The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES ESTABLISHED: Lancaster Area, California, 1922.

Responsibility for this series was transferred from Davis to Phoenix 12/2015. The last revision to the series was 5/2001. ET

National Cooperative Soil Survey
U.S.A.

LOCATION SUNRISE CA

Established Series
Rev. HLH/JCW/RWK
12/2015

SUNRISE SERIES

The Sunrise series consists of deep, well drained soils that formed in material from mixed alluvium. Sunrise soils are on flood plains and in basins and have slopes of O to 9 percent. The mean annual precipitation is about 5 inches and the meal annual air temperature is 62 degrees F.

TAXONOMIC CLASS: Fine-loamy, carbonatic, thermic Typic Haplocalcids

TYPICAL PEDON: Sunrise sandy loam, rangeland. (Colors are for dry soil unless otherwise noted).

All--0 to 2 inches; pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; weak medium platy structure; soft, very friable nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; violently effervescent with disseminated lime; moderately alkaline (pH 8.0); abrupt smooth boundary. (1 to 7 inches thick)

A12--2 to 11 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few fine tubular and common very fine interstitial pores; violently effervescent with disseminated lime; moderately alkaline (pH 8.2); gradual smooth boundary. (0 to 12 inches thick)

Clca--11 to 21 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and plastic; few very fine and fine roots; few very fine and medium tubular pores; violently effervescent with disseminated and segregated lime; approximately 50 percent (by volume) irregularly shaped, extremely hard, white (10YR 8/2) lime nodules, 1 to 2 cm in diameter; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 25 inches thick)

C2ca--21 to 32 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; massive, hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; violently effervescent with disseminated and segregated lime; approximately 60 percent (by volume) irregularly shaped, extremely hard, white (10YR 8/2) lime nodules, 1 to 2 cm in diameter, moderately alkaline (pH 8.4); clear wavy boundary. (8 to 31 inches thick)

C3ca--32 to 52 inches; very, pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; few medium tubular pores; violently effervescent with disseminated and segregated lime; approximately 70 percent (by volume) irregularly shaped, extremely hard,white (10YR 8/2) lime nodules, 2 to 5 cm in diameter; moderately alkaline (pH 8.4); clear wavy boundary. (O to 25 inches thick)

C4--52 to 65 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; massive; hard, film sticky and plastic; few fine and medium roots; few fine tubular pores; violently effervescent with lime in filaments and threads; moderately alkaline (pH 8.4).

TYPE LOCATION: Kern County, California. Mojave Desert. About 4 miles southwest of California City in the SE1/4, of SW1/4 of SW1/4 of sec. 2, T.11N., R.11W., SBBM.

RANGE IN CHARACTERISTICS: The soil between the depths of 8 and 15 inches is moist in all parts from late November until March. Mean annual soil temperature is about 64 degrees F. Organic matter is less than 1 percent. Some pedons are saline with conductivity of the saturation extract ranging up to 16 mmhos/cm.

The A horizon is loam, fine sand, sandy loam, loam or light sandy clay loam. It is brown, pale brown, or light yellowish brown (lOYR 5/3, 6/3, 6/4). Disseminated lime may occur throughout the A horizon or start in the lower part.

The C horizon is light yellowish brown, pale brown, or very pale brown (lOYR 6/4, 6/3, 7/3, 7/4), or light brownish gray, light gray, or white (2.5Y 6/2, 7/2, 8/2). It is clay loam or sandy clay loam with 18 to 35 percent clay between 10 and 40 inches. It is heavy sandy loam in the lower part in some pedons. Extremely hard 2mm to 2 inches lime nodules make up 35 to 80 percent by volume, 10 to 40 inch control section. The sum of the carbonates is greater than 65 percent with calcium carbonate greater than 40 percent by weight. Some pedons have an unrelated faintly mottled stratified horizon at depths greater than 60 inches.

COMPETING SERIES: These are the Jal and Laveldo in the same family and the Bridge, Laverkin, Reeves, Sotim and Turney series. Jal soils are driest from October through May and have a Thornthwaite PE index over 12. Laveldo soils are characteristically saline-alkali and have 7.5YR and 5YR hues in the upper part. Bridge, Laverkin, Sotim and Turney soils have less than 40 percent carbonates in the control section. Reeves soils have more than 40 percent carbonates plus gypsum. (gypsic mineralogy).

GEOGRAPHIC SETTING: Sunrise soils occur on stream flood plains and basins and have formed from mixed alluvium. Elevations are 1500 to 3500 feet. The climate is aridic with hot, dry summers and mild, somewhat moist winters. Mean annual precipitation is 3 to 8 inches, some as snow. Average January air temperature is 44 degrees to 45 degrees F.; average July air temperature is 80 degrees to 88 degrees F. The mean annual temperature is 61 degrees to 65 degrees F. The frost-free season is 200 to 300 days. The Thornthwaite PE index is less than 12.

GEOGRAPHICALLY ASSOCIATED SOILS: These are Cajon, Garlock, and Rosamond soils. These all have less than 40 percent calcium carbonate. Further, Garlock soils leave a B2t horizon, and Cajon soils are sandy.

DRAINAGE AND PERMEABILITY: Well drained slow to medium runoff moderately slow permeability. Wind erosion is moderate in some areas.

USE AND VEGETATION: Used mainly for recreation. In good years the soil may be used for sheep range. Vegetation is Atriplex and Creosote bush, with scattered annual grasses.

DISTRIBUTION AND EXTENT: High Desert area of the Mojave Desert. Series is inextensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES ESTABLISHED: Victorville Area, California, 1921.

REMARKS: Sampled for Riverside Lab. sample Number S74 CAL 29-6. Lab. number C-74-7-4-46-51.

OSED scanned by SSQA. Last revised by state on 6/76.

Responsibility for this series was transferred from Davis to Phoenix 12/2015. ET

National Cooperative Soil Survey
U.S.A.

LOCATION TRAY CA

Established Series
Rev. GAW/LCL
12/2015

TRAY SERIES

The Tray series is a member of the coarse-loamy, mixed, thermic family of Typic Haplargids Typically, Tray soils have light yellowish brown, very strongly alkaline, sandy loam A horizons, yellowish brown, very strongly alkaline, heavy sandy loam B2t horizons grading to light yellowish brown, very strongly and strongly alkaline, sandy loam C horizon.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, thermic Typic Haplargids

TYPICAL PEDON: Tray sandy loam - native shrubs (Colors are for dry soil unless otherwise noted.)

A1--0 to 8 inches; Light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky, nonplastic; common very fine, few fine roots; common very fine interstitial, few very fine tubular pores; slightly effervescent, disseminated lime; very strongly alkaline (pH 9.2); clear smooth boundary. (6 to 16 inches thick)

B2t--8 to 20 inches; Yellowish brown (10YR 5/4) heavy sandy loam near loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky, nonplastic; common very fine roots; many very fine, common fine tubular pores; common moderately thick and many thin clay films line pores and as bridges; strongly effervescent, disseminated lime; very strongly alkaline (pH 9.5); gradual smooth boundary. (12 to 16 inches thick)

B3--20 to 32 inches; Light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial, common very fine and fine tubular pores; few thin clay films line pores and as bridges; strongly effervescent, disseminated lime; very strongly alkaline (pH 9.5); diffuse smooth boundary. (10 to 14 inches thick)

C1--32 to 55 inches; Light yellowish brown (10YR 6/4) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial and few very fine and fine tubular pores; strongly effervescent, disseminated lime; very strongly alkaline (pH 9.5); diffuse smooth boundary. (20 to 24 inches thick)

C2ca--55 to 70 inches; Light yellowish brown (10YR 6/4) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial and tubular pores; about 2 to 3 percent of horizon is made up of very thin lime- cemented plates; violently effervescent, disseminated lime and some lime as threads; strongly alkaline (pH 8.6).

TYPE LOCATION: Los Angeles County, California; 90 feet north of Avenue H and 225 feet east of 50th Street West in SW1/4SW1/4 sec. 1, T.7N., R.12W.

RANGE IN CHARACTERISTICS: Thickness of solum is 28 to 46 inches. The mean annual soil temperature is about 65 degrees. The soil between depths of about 8 and 25 inches is dry most of the year and is not moist for as long as 60 consecutive days in winter and spring. Rock fragments are in the form of fine gravel and they are less than 10 percent of all horizons. The soils are calcareous in all parts. Distinct lime segregations do not occur within 40 inches of the surface. The A horizon is grayish brown to light yellowish brown (10YR 5/2, 6/2, 6/3, 6/4; 2.5Y 6/2, 6/4). It is dominantly sandy loam, but in some pedons or parts of some pedons the upper few inches are loamy sand or sand, especially under shrubs. This horizon is soft or slightly hard and is massive or has weak platy structure in the upper part. The B2t horizon is grayish brown to light gray (10YR 5/2, 5/3, 5/4, 6/4; 2.5Y 6/2, 7/2). It is sandy loam or heavy sandy loam with about 14 to 18 percent clay and has 3 to 6 percent more clay absolute than the A horizon. The B2 horizon is strongly or very strongly alkaline and has 15 to 30 percent exchangeable sodium in all parts. This horizon is massive or has weak coarse angular or subangular blocky structure. The C horizon is grayish brown to light olive brown (10YR 5/2, 6/2, 6/3, 6/4; 2.5Y 6/2, 6/4, 5/4). It is sandy loam or loamy sand and is uniform in texture or has some stratification.

COMPETING SERIES: These are the Barstow, Lost Hills, Onite, and Sonoita series. Barstow soils have 5YR hue in the argillic horizon. Lost Hills soils have prismatic structure in the argillic horizon. (See Remarks). Onite and Sonoita soils have 7.5YR and 5YR hues in the argillic horizon. Onite soils are dominantly noncalcareous in the A and B horizons.

GEOGRAPHIC SETTING: The Tray soils are nearly level and are along the rim or in basins at elevations of 2,300 to 2,400 feet. They formed in alluvium dominantly from granitic sources. The climate is arid with long hot summers and cool somewhat moist winters. Mean annual precipitation is 4 to 9 inches. Average January temperature is 44 degrees., average July temperature is 82 degrees., and mean annual temperature is 63 degrees. The freeze-free season is 240 to 260 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Oban, Pond, Rosamond, and Sunrise soils. Oban soils have fine textured natric horizons. Pond soils have 18 to 35 percent clay in the argillic horizon. Rosamond soils lack argillic horizons. Sunrise soils lack argillic horizons and have distinct calcic horizons within a depth of 40 inches.

DRAINAGE AND PERMEABILITY: Moderately well-drained; very slow runoff; moderate permeability.

USE AND VEGETATION: Used mostly for desert range. A few areas used for growing alfalfa and irrigated pasture. Vegetation is fourwing saltbush and a few related shrubs and grasses.

DISTRIBUTION AND EXTENT: High desert areas of southern California and possibly in adjoining states. The soils are of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: PHOENIX, ARIZONA

SERIES PROPOSED: Los Angeles County, California, 1973.

REMARKS: The Tray soils were formerly classified as Solonetz soils. The Lost Hills series has not

been correlated in recent years and conclusion on major soil properties has not been made. Strong differentiae from the Tray series should be no problem.

OSED scanned by SSQA. Last revised by state on 10/73.

Responsibility for this series was transferred from Davis to Phoenix 12/2015. ET

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