

APPENDIX C

Biological Assessment

Prepared by

Live Oak Associates

May 2019



LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

AQUAMARINE SOLAR PROJECT AND GEN-TIE LINE BIOLOGICAL ASSESSMENT KINGS AND FRESNO COUNTIES, CALIFORNIA

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EXECUTIVE SUMMARY

Live Oak Associates, Inc., (LOA) conducted an investigation of the biological resources of the Aquamarine Solar project site (“Project Site”, “Site”) in Kings County, California, and the associated Gen-Tie line corridor (“Gen-Tie”) in Kings and Fresno Counties, California.

LOA evaluated likely impacts to biological resources resulting from development of an approximately 1,825-acre photo-voltaic solar energy project on the Aquamarine site. The Project Site is located in west-central Kings County southeast of Avenal Cutoff Road, and is centered on the intersection of Laurel Avenue and the 25th Avenue alignment. The project site includes Assessor’s Parcel Nos. 026-010-37, -38, -39, and -40; 026-260-04, -09, -28, -34, and -37; and 026-290-08 (discontinuously through) -79 (22 small parcels). On November 8, 2016, May 4, 2017, and April 9, 10, and May 28, 2018 Live Oak Associates (LOA) conducted a site visit to assess for biotic habitats, the plants and animals occurring in those habitats, and significant habitat values that may be protected by state and federal law.

The approximately 1,825-acre Project Site consists of agricultural lands within a region dominated by similar agricultural lands with large canals crossing the site in east-west and north-south directions. The Project Site does not provide suitable habitat for locally occurring special-status plant or animal species except for burrowing owls and foraging habitat for Swainson’s hawks. However, a number of special status animal species may occur onsite. Suitable habitat was found for fifteen special status animal species that potentially occur as regular foragers or residents of the Project Site. These include the western snowy plover, mountain plover, white-faced ibis, Swainson’s hawk, northern harrier, white-tailed kite, western burrowing owl, long-eared owl, loggerhead shrike, tricolored blackbird, Townsend’s big-eared bat, pallid bat, California mastiff bat, American badger, and San Joaquin kit fox. Additional impacts to Swainson’s hawks will be mitigated through avoidance of active nests found during required preconstruction surveys; and if active nests are found onsite or on adjacent lands, additional mitigation for loss of habitat may be required. Similar avoidance and preconstruction surveys will reduce impacts to burrowing owls, raptors, loggerhead shrike, tricolored blackbird and other nesting birds protected by the federal Migratory Bird Treaty Act. While there are no reported sightings of San Joaquin kit fox or American badgers within or near the Project Site except for near the western edge of the Gen-tie in Fresno County, and no evidence of kit fox or badger was found during LOA’s field survey, impacts to kit fox and badger are potentially significant. Prior to the construction of the solar development, preconstruction surveys will be conducted. Preconstruction surveys and avoidance measures will reduce impacts to kit fox and badgers from direct construction related mortality to a less-than-significant level. Impacts to wildlife movements and movement corridors will be minimized through the planned retention of canals as well as the construction of wildlife-friendly fencing. Waters of the U.S. are absent from the Project Site.

The planned Gen-Tie line will connect the Aquamarine project to the Gates Substation in Fresno County. The gen-tie line will commence from the southwest corner of the Aquamarine site and run along the east side of the 25th Avenue alignment for a distance of 2.5 miles to Nevada Avenue. The Gen-Tie line will then turn west and follow the north side of Nevada Avenue for a distance of 6.2 miles to the Fresno County line just west of Avenal Cutoff Road. An additional

6.3 miles of Gen-Tie line is planned to continue along Jayne Avenue in Fresno County to the Gates Substation. The Kings County portion of the Gen-Tie line is included in the subject CUP application to Kings County. The Fresno County segment of the Gen-Tie line will be the subject of a separate Conditional Use Permit application to the County of Fresno.

Land uses along the Gen-Tie route consist of agricultural use, including row crop, orchards, and fallowed/pasture; a few residences are adjacent to the route and a retired cotton gin is included within the project footprint as a staging area as well. This route supports trees which may provide nesting locations for birds. Historical sightings from 1981 of the San Joaquin kit fox occur near the western portion of the Gen-tie route in Fresno County.

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1 INTRODUCTION

Live Oak Associates, Inc. (LOA) has prepared the following report. This report describes the biotic resources of the proposed approximately 1,825-acre Aquamarine Solar project site (“Project Site, site”), and the associated Gen-Tie line project (“Gen-Tie”) evaluates likely impacts to biological resources resulting from the construction of these projects.

The Aquamarine Project Site is located in west-central Kings County southeast of Avenal Cutoff Road, and is centered on the intersection of Laurel Avenue and the 25th Avenue alignment. The project site includes Assessor’s Parcel Nos. 026-010-37, -38, -39, and -40; 026-260-04, -09, -28, -34, and -37; and 026-290-08 (discontinuously through) -79 (22 small parcels). (Figure 1). The Project Site is located within the Westhaven and Huron U.S. Geological Survey (USGS) 7.5-minute quadrangles, with the Aquamarine site entirely in the Westhaven quadrangle and the Gen-Tie spanning both quadrangles.

The planned Gen-Tie line will connect the Aquamarine project to the Gates Substation in Fresno County. The total length of the Gen-Tie is 15.0 miles, of which the easterly 8.7 miles are in Kings County and the westerly 6.3 miles are in Fresno County. The Gen-Tie will commence from the southwest corner of the Aquamarine site and run along the east side of the 25th Avenue alignment for a distance of 2.5 miles to Nevada Avenue. The Gen-Tie will then turn west and follow the north side of Nevada Avenue for a distance of 6.2 miles to the Fresno County line just west of Avenal Cutoff Road. An additional 6.3 miles of Gen-Tie is planned to continue along Jayne Avenue in Fresno County to the Gates Substation. The Kings County portion of the Gen-Tie line is included in the subject CUP application to Kings County. The Fresno County segment of the Gen-Tie line will be the subject of a separate Conditional Use Permit application to the County of Fresno.

1.1 PROJECT DESCRIPTION

Aquamarine Solar Project

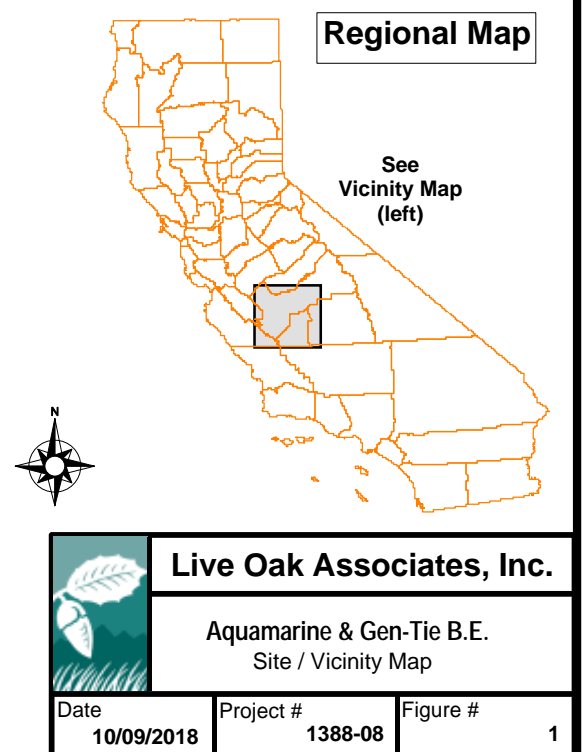
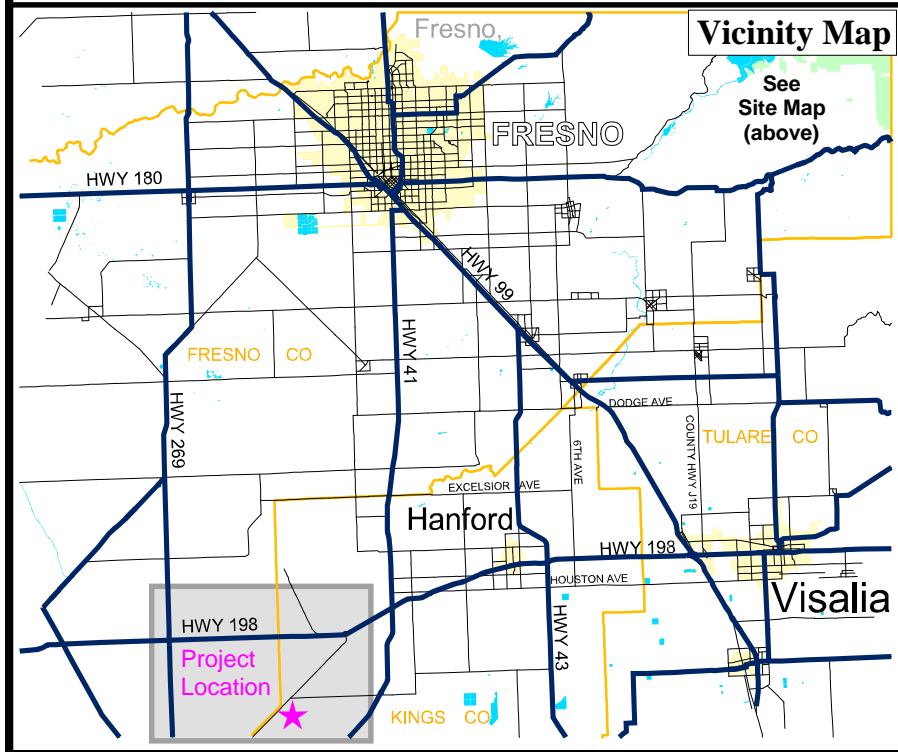
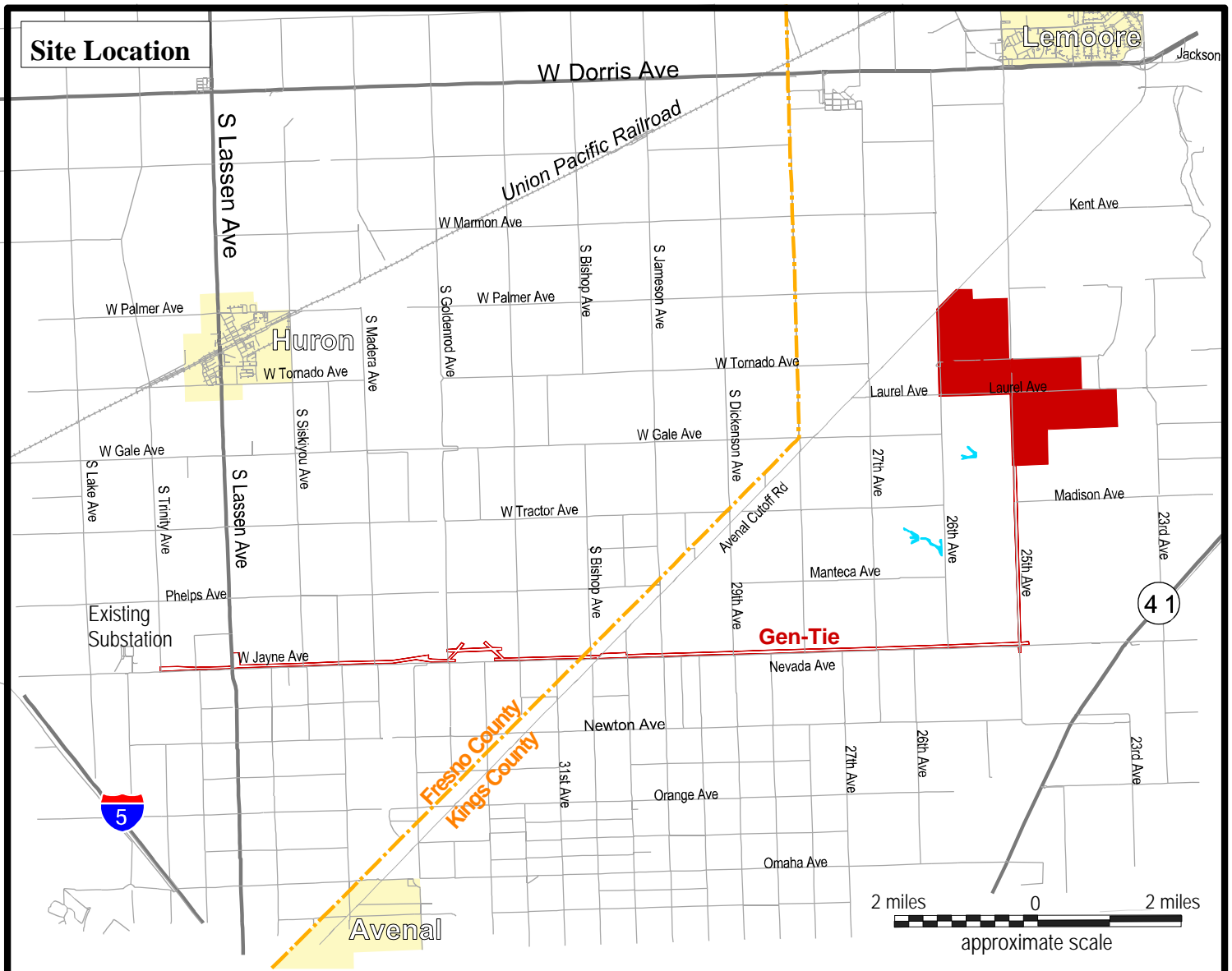
The approximately 1,825-acre Project Site located southeast of Avenal Cutoff Road in west-central Kings County, and is centered on the intersection of Laurel Avenue and the 25th Avenue alignment. The project site is virtually level with elevations ranging from a high of 228 feet above mean sea level (amsl) at the western site boundary to a low of 205 feet amsl at the southeast corner. The project site is located in the Westhaven and Huron U.S. Geological Survey (USGS)

quadrangles, with the Aquamarine site entirely in the Westhaven quadrangle and the Gen-Tie spanning both quadrangles. Most of the site is currently used for the cultivation of winter wheat during the wet season and is typically left fallow during the dry season. There is an existing agricultural well on the western boundary of the project site. The 70-kV Henrietta to Tulare Lake sub-transmission line runs in a north-south direction through the center of the site along the 25th Avenue alignment. Two large agricultural canals run through the center of the site. One canal runs in a north-south direction along the east side of the 25th Avenue alignment, and the other canal runs in an east-west direction along the south side of Laurel Avenue. Smaller irrigation canals and ditches are present in the eastern half of the site.

The Aquamarine Solar project is planned to generate a total of 230 MW of electrical output from solar photovoltaic (PV) modules.

Gen-Tie Line

The planned Gen-Tie line will connect the Aquamarine project to the Gates Substation in Fresno County. The Gen-Tie line will commence from the southwest corner of the Aquamarine site and run along the east side of the 25th Avenue alignment for a distance of 2.5 miles to Nevada Avenue. The Gen-Tie will then turn west and follow the north side of Nevada Avenue for a distance of 6.2 miles to the Fresno County line just west of Avenal Cutoff Road. An additional 6.3 miles of Gen-Tie line is planned to continue along Jayne Avenue in Fresno County to the Gates Substation. The Kings County portion of the Gen-Tie line is included in the subject CUP application to Kings County. The Fresno County segment of the Gen-Tie line will be the subject of a separate Conditional Use Permit application to the County of Fresno.



1.2 REPORT OBJECTIVES

The development of land can damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to provisions of the California Environmental Quality Act (CEQA), and/or covered by policies and ordinances of Kings County and Fresno County. This report addresses issues related to: 1) sensitive biotic resources occurring within the Aquamarine Project Site and Gen-Tie line; 2) the federal, state, and local laws regulating such resources, and 3) mitigation measures which may be required to reduce the magnitude of anticipated impacts and/or comply with permit requirements of state and federal resource agencies, and the requirements of the California Environmental Quality Act (CEQA). As such, the objectives of this report are to:

- Summarize all site-specific information related to existing biological resources, based on a review of the literature, a search of species databases, and field surveys conducted by LOA over the entire Project Site;
- In addition to species observed to be present within the Project Site, make reasonable inferences about the other biological resources that could occur onsite based on habitat suitability and the proximity of the Project Site to a species' known range;
- Summarize all state and federal natural resource protection laws that may be relevant to development of Solar project within the Project Site;
- Identify and discuss project impacts to biological resources likely to occur within the Project Site within the context of CEQA or any state or federal laws; and
- Identify avoidance and mitigation measures that would reduce impacts to a less-than-significant impact (as identified by CEQA) and are generally consistent with recommendations of the resource agencies for affected biological resources.

1.3 STUDY METHODOLOGY

The analysis of impacts, as discussed in Section 3.0 of this report, is based on the known and potential biotic resources of the Project Site discussed in Section 2.0. Sources of information used in the preparation of this analysis included: (1) the *California Natural Diversity Data Base* (CDFW 2018), (2) the *Online Inventory of Rare and Endangered Vascular Plants of California*

(CNPS 2018), and (3) manuals, reports, and references related to plants and animals of the San Joaquin Valley region. Field survey of the Project Site and Gen-Tie corridor were conducted on November 8, 2016 by LOA ecologist Katrina Krakow, May 4, 2017 by LOA ecologists Ms. Krakow and Emily Moffitt, September 25, 2017 by Ms. Krakow, and April 9 and 10, 2018 by LOA ecologists Ms. Krakow and Robert Shields. During this site visits, the principal land uses of the site were identified and the constituent plants and animals were noted. Ms. Krakow evaluated the cotton gin site for potential bat roosting habitat on April 26, 2019.

Detailed surveys for sensitive biological resources were not conducted during the site visit, however a Swainson's hawk nest survey was conducted for the larger Westlands Solar Park study area on April 27 and May 3 and 4, 2012 which included the Project Site within the larger Wetlands Solar Park study area, and a 10-mile buffer of the Westlands Solar Park study area, with nest sites being revisited in 2017 and 2018 (Appendix D).

It is noted that this Biological Assessment was prepared for the Mitigated Negative Declaration (MND) on the Aquamarine Solar project and gen-tie line project. The potential biological impacts associated with this solar development and gen-tie line construction were previously addressed in the Westlands Solar Park Master Plan and Gen-Tie Corridors Program EIR, which was certified by the Westlands Water District (WWD) Board of Directors on January 16, 2018. The Program EIR (PEIR) provides plan-level environmental review for the Aquamarine Solar project and Gen-Tie line. As such, the MND (and this biological report) constitute second tier environmental documents under CEQA. As provided in the CEQA Guidelines, the previous biological report and analysis prepared for the PEIR are hereby incorporated by reference into this project-specific biological report on the Aquamarine Solar project and Gen-Tie line project. The PEIR can be accessed with the following web link:

<https://wwd.ca.gov/news-and-reports/environmental-docs/>

2 EXISTING CONDITIONS

2.1 REGIONAL SETTING

Like most of California, the Central San Joaquin Valley (and the Project Site) experiences a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures commonly exceed 90 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely rise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation within the Project Site is about 10 inches, almost 85% of which falls between the months of October and March. Nearly all precipitation falls in the form of rain.

The Kings County area of the Central San Joaquin Valley receives water from the Kings River, which is located approximately two miles east of the Project Site. The Kings River historically drained into the Tulare Lake Basin which contained the vast Tulare Lake, which encompassed a large area of Kings County and at times extended to the eastern edge of the Project Site. The Kings River and Tulare Lake contained large areas of riparian, wetland, and aquatic ecosystems that supported large populations of diverse native plants and animals. Under present conditions, the Kings River supports only a fraction of the riparian habitat it once supported and the aquatic habitat has been greatly degraded from agricultural runoff and irregular flows. In essence, the river currently provides water to a series of distributary channels supplying water to farmland in the region. Tulare Lake has long been drained and converted to farmland and urban uses.

Native upland biotic habitats of the Central San Joaquin Valley once consisted of grassland and shrubland, nearly all of which have been converted to farmland or urban use within the last 50 years or more. Native plant and animal species once abundant in the valley have become locally extirpated or have experienced large reductions in their populations. The native habitat that remains in the region is particularly valuable to native wildlife species including special status species that still persist in the region.

The lands surrounding the Project Site consist of agricultural land. The nearest natural habitats to the Project Site are the Kettleman Hills approximately 12.5 miles to the southwest and the Kings River drainage approximately two miles to the east of the Project Site.

2.2 PROJECT SITE

Aquamarine Solar Project

The approximately 1,825-acre Aquamarine Solar Project site located on the southeast of Avenal Cutoff Road in west-central Kings County, and centered on the intersection of Laurel Avenue and the 25th Avenue alignment. The project site is virtually level with elevations ranging from a high of 355 feet above mean sea level (amsl) at the northern site boundary to a low of 335 feet amsl at the western edge of the Gen-Tie route. The project site is located in the Westhaven and Huron U.S. Geological Survey (USGS) quadrangles, with the Aquamarine site entirely in the Westhaven quadrangle and the Gen-Tie spanning both quadrangles. Most of the site is currently used for the cultivation of winter wheat during the wet season and is typically left fallow during the dry season. There is an existing agricultural well on the western boundary of the project site. The 70-kV Henrietta to Tulare Lake sub-transmission line runs through the site in a north-south direction along the 25th Avenue alignment. An agricultural irrigation canal runs along the eastern site boundary, and agricultural drainage ditches run alongside the northwest and west boundaries. Two large agricultural canals run through the center of the site. One canal runs in a north-south direction along the east side of the 25th Avenue alignment, and the other canal runs in an east-west direction along the south side of Laurel Avenue. Smaller irrigation canals and ditches are present in the eastern half of the site.

The Aquamarine Solar project is planned to generate a total of 230 MW of electrical output from solar photovoltaic (PV) modules.

Only two soil types: 1) Lethent clay loam and 2) Calflax clay loam, saline-sodic, 0-2% slopes, MLRA (Major Land Resource Area) 17 were identified on the Aquamarine site (NRCS Web Soil Survey 2018). Both soil types are considered hydric. Hydric soils are soils defined as saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions they support hydrophytic vegetation. Due to ongoing agricultural disturbance; however, no hydric vegetation was observed on the site except for within canals, which the project will avoid.

Gen-Tie Line

The planned Gen-Tie line will connect the Aquamarine project to the Gates Substation in Fresno County. The Gen-Tie line will commence from the southwest corner of the Aquamarine site and

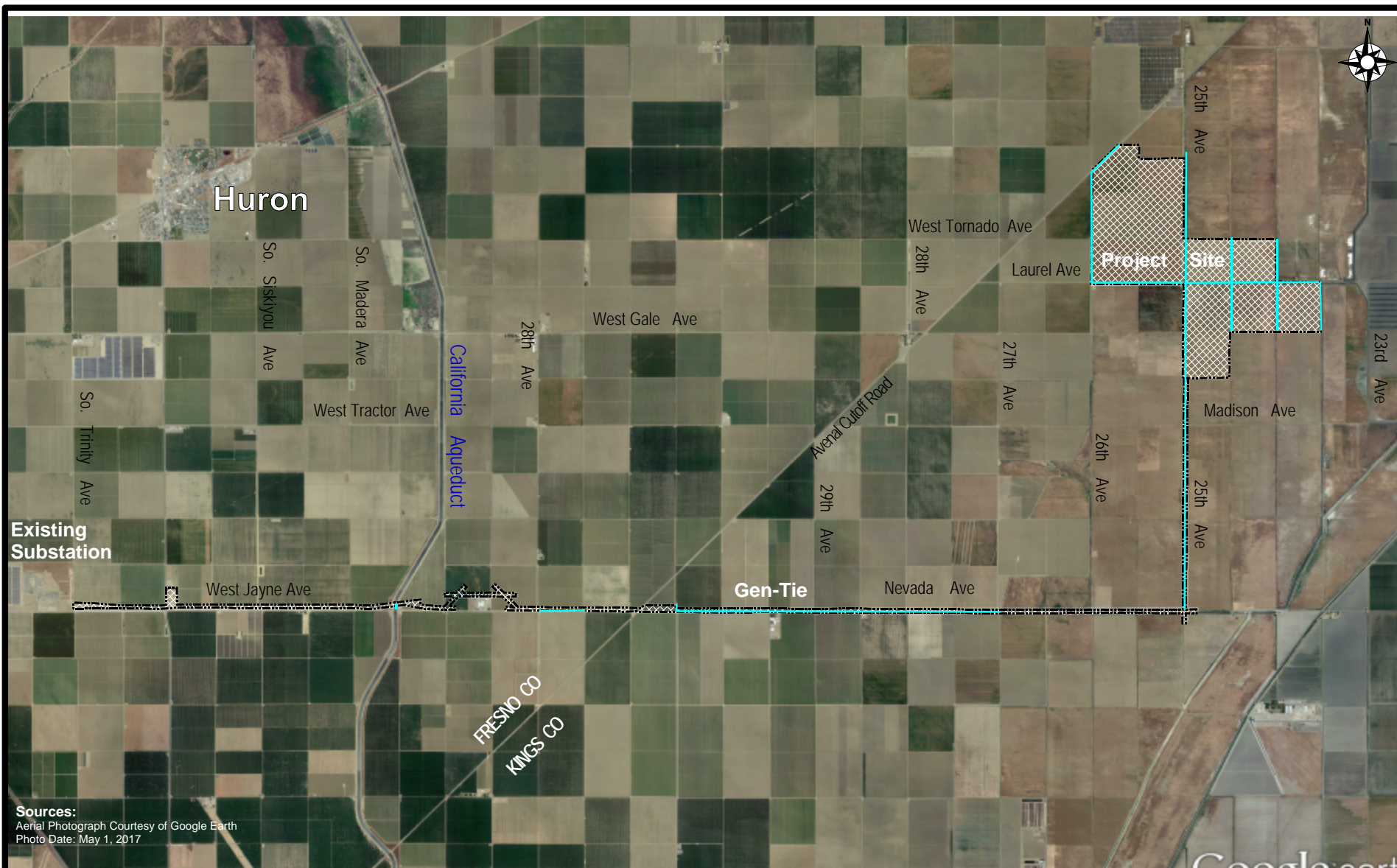
run along the east side of the 25th Avenue alignment for a distance of 2.5 miles to Nevada Avenue. The Gen-Tie line will then turn west and follow the north side of Nevada Avenue for a distance of 6.2 miles to the Fresno County line just west of Avenal Cutoff Road. An additional 6.3 miles of Gen-Tie line is planned to continue along Jayne Avenue in Fresno County to the Gates Substation. The Kings County portion of the Gen-Tie is included in the subject CUP application to Kings County. The Fresno County segment of the Gen-Tie will be the subject of a separate Conditional Use Permit application to the County of Fresno.

Land uses along the Gen-Tie route consists of agricultural use, including row crop, orchards, and fallowed/pasture; a few residences are adjacent to the route and a retired cotton gin is included within the project footprint as a staging area as well.



Seven soil types were identified on the Gen-Tie alignment: 1) Excelsior sandy loam, sandy substratum, 0 to 2 percent slopes, 2) Westhaven loam, 0 to 2 percent slopes, 3) Lethent clay loam, 4) Panoche loam, 0 to 2 percent slopes, MLRA 17, 5) Twisselman silty clay, saline-alkali, 6) Westhaven loam, 0 to 2 percent slopes, and 7) Westhaven clay loam, saline-alkali, 0 to 2 percent slopes. Three soil types along the Gen-Tie, Lethent clay loam, Twisselman silty clay, saline-alkali, and Westhaven clay loam, saline-alkali, 0 to 2 percent slopes are hydric. Hydric soils are soils defined as saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions they support hydrophytic vegetation. Due to ongoing agricultural disturbance; however, no hydric vegetation was observed on the site except for within canals, which the project will avoid.

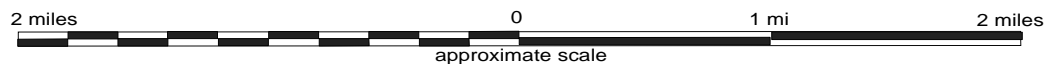
2.3 BIOTIC HABITATS/LAND USES


The entire Aquamarine portion of the Project Site consists of agricultural lands and most of the Gen-Tie route also crosses over agricultural lands, although it does also include crossing over roadways, the California Aqueduct, passes near residences, and includes a retired cotton gin facility (Figure 2). A list of the terrestrial vertebrates observed to be using, or potentially using, the habitats of the site is provided in Appendix A.



LEGEND

-  Project Boundary 2,251 Ac.
-  Agricultural Land Use
-  Canals & Ditches



	Live Oak Associates, Inc.		
	Aquamarine & Gen-Tie B.E. Biotic Habitats / Land Uses		
Date	Project #	Figure #	
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2.3.1 Agricultural

Aquamarine Solar Project

Regular agricultural activities on the site create unsuitable habitat for most native amphibian, reptile, bird, and mammal species. Nonetheless, a number of animal species are expected to use the disked field, especially in times where disking is not recent. Pacific chorus frogs (*Pseudacris regilla*) and western toads (*Bufo boreas*) may use the irrigation canals and the California Aqueduct for breeding and may also disperse through the adjacent fields during the winter and spring or when the fields are not regularly disked. Reptile species that may forage in this habitat include lizards such as the side-blotched lizard (*Uta stansburiana*) and western whiptail (*Cnemidophorus tigris*), and snakes such as the gopher snake (*Pituophis melanoleucus*), common kingsnake (*Lampropeltis getulus*), coachwhip (*Masticophis flagellum*), and glossy snake (*Arizona elegans*).

Resident bird species expected to use this habitat would include Brewer's blackbirds (*Euphagus cyanocephalus*), brown-headed cowbirds (*Molothrus ater*), and European starlings (*Sturnus vulgaris*), among others. Wintering birds that may utilize the disked fallow field would be the savannah sparrow (*Passerella sandwichensis*), American pipit (*Anthus rubescens*), and Say's phoebe (*Sayornis saya*), among others. Summer migrants such as the barn swallow (*Hirundo rustica*) may forage on the site.

Burrowing rodent activity in the field is expected to be minimal due to the ground disturbance regime. Botta's pocket gopher (*Thomomys bottae*) burrows may occur within the site, and California ground squirrel (*Otospermophilus beecheyi*) burrows may occur along the agricultural field perimeters.

The site offers limited foraging opportunities for mammalian and avian predators. Raptors such as red-tailed hawks (*Buteo jamaicensis*), Swainson's hawks (*Buteo swainsoni*), great horned owls (*Bubo virginianus*), burrowing owls (*Athene cunicularia*) and barn owls (*Tyto alba*) may occasionally forage on the site, and burrowing owls are known to breed in the larger managed canals onsite. Disturbance-tolerant mammalian predators such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), coyotes (*Canis latrans*), and red foxes (*Vulpes vulpes*) may occasionally forage on or pass through the site.

Gen-Tie Corridor

Kings County

The Gen-Tie Corridor within Kings County consists of agricultural lands similar to the agricultural lands of the Aquamarine site, however, the Gen-Tie corridor includes fallow/pasture land, orchards, and row crops with a few dispersed agricultural residences and farm buildings. Much of the Gen-Tie corridor supports roadside ditches and irrigation basins, all of which will be avoided. The Gen-Tie corridor would be expected to support the same species as the Aquamarine site except for the increase in potential for nesting raptors, as trees exist along the corridor which do not exist on the Aquamarine portion of the site.

Fresno County

The Gen-Tie Corridor within Fresno County consists of agricultural lands similar to the agricultural lands of the Aquamarine site, however, the Gen-Tie corridor includes fallow/pasture land, orchards, and row crops with a few dispersed agricultural residences and farm buildings. Much of the Gen-Tie corridor supports roadside ditches and irrigation basins, all of which will be avoided. In addition, a retired cotton gin facility is included within the corridor within Fresno County, the corridor bypasses Giovanetti Cooler, and crosses the California Aqueduct. The Gen-Tie corridor would be expected to support the same species as the Aquamarine site except for the increase in potential for nesting raptors, as trees exist along the corridor which do not exist on the Aquamarine portion of the site.

2.4 WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are areas where regional wildlife populations regularly and predictably move during dispersal or migration. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines. In the San Joaquin Valley, which lacks many of the more pronounced topographic features found in the surrounding foothills, wildlife will often move across ill-defined undeveloped habitat patches, or regional movement is facilitated along existing linear features such as ditches, canals, farm roads, and creeks. In areas of intense farming, these existing linear features tend to be used disproportionately for movement when compared to the adjacent, intensely farmed lands. While actively farmed fields are not barriers in themselves, they are used less often than the linear features that cut through them.

The intense farming throughout the San Joaquin Valley over the last century has long altered the more traditional regional movement patterns of wildlife. While regionally-occurring wildlife do, in fact, move across the broad range of the Valley, they do so less effectively than they once did, relying more extensively on various linear features such as canals, ditches and creeks. Regionally, the nearest areas believed to provide for regional wildlife movement include areas in the surrounding Sierra and inner coast range foothills that have not been substantially altered.

The Project Site consists of agricultural fields adjacent to canal habitat. Canals and ditches within the Project Site as well as the California Aqueduct can function as movement corridors for the regular home range or dispersal movements of native wildlife, including special status species. The USFWS' *Recovery Plan for Upland Species of the San Joaquin Valley* (Recovery Plan) does not show movement corridors within or near the Project Site. The Recovery Plan shows the foothills to the west as a north-south movement corridor (USFWS 1998). The nearest significant riparian corridor that likely facilitates regional movement of wildlife is the Kings River to the northeast of the site. This riparian area is located approximately two miles to the east of the Project Site at its nearest point. Approximately 2.5 miles west of the Kings/Fresno County line within Fresno County, the Gen-Tie will pass over the California Aqueduct which, although less significant, is also expected to act as a movement corridor.

2.5 SPECIAL STATUS PLANTS AND ANIMALS

Several species of plants and animals within the state of California have low populations and/or limited distributions. Such species may be considered “rare” and are vulnerable to extirpation as the state’s human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Others have been designated as candidates for such listing. Still others have been designated as “species of special concern” by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2018). Collectively, these plants and animals are referred to as “special status species”.

A number of special status plants and animals occur in the vicinity of the Project Site (Figures 3 and 4). These species, and their potential to occur in the Project Site, are listed in Table 2 in the following pages. Sources of information for this table included *California Amphibian and Reptile Species of Special Concern* (Thomson et.al. 2016), *California Bird Species of Special Concern* (Shuford and Gardall 2008), *California Natural Diversity Data Base* (CDFW 2018), *Endangered and Threatened Wildlife and Plants* (USFWS 2018), *Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants* (CDFW 2018), and *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2018). This information was used to evaluate the potential for special status plant and animal species to occur within the Project Site. It is important to note that the California Natural Diversity Data Base (CNDDB) is a volunteer database.

A search of published accounts for all of the relevant special status plant and animal species was conducted for the Westhaven and Huron USGS 7.5-minute quadrangles within which the Project Site and Gen-Tie line are located, and for the 10 surrounding quadrangles (Harris Ranch, Calflax, Lemoore, Stratford, Stratford SE, Kettleman City, La Cima, Vanguard, Avenal, and Guijarral Hills) using the California Natural Diversity Data Base Rarefind 5 (2018).

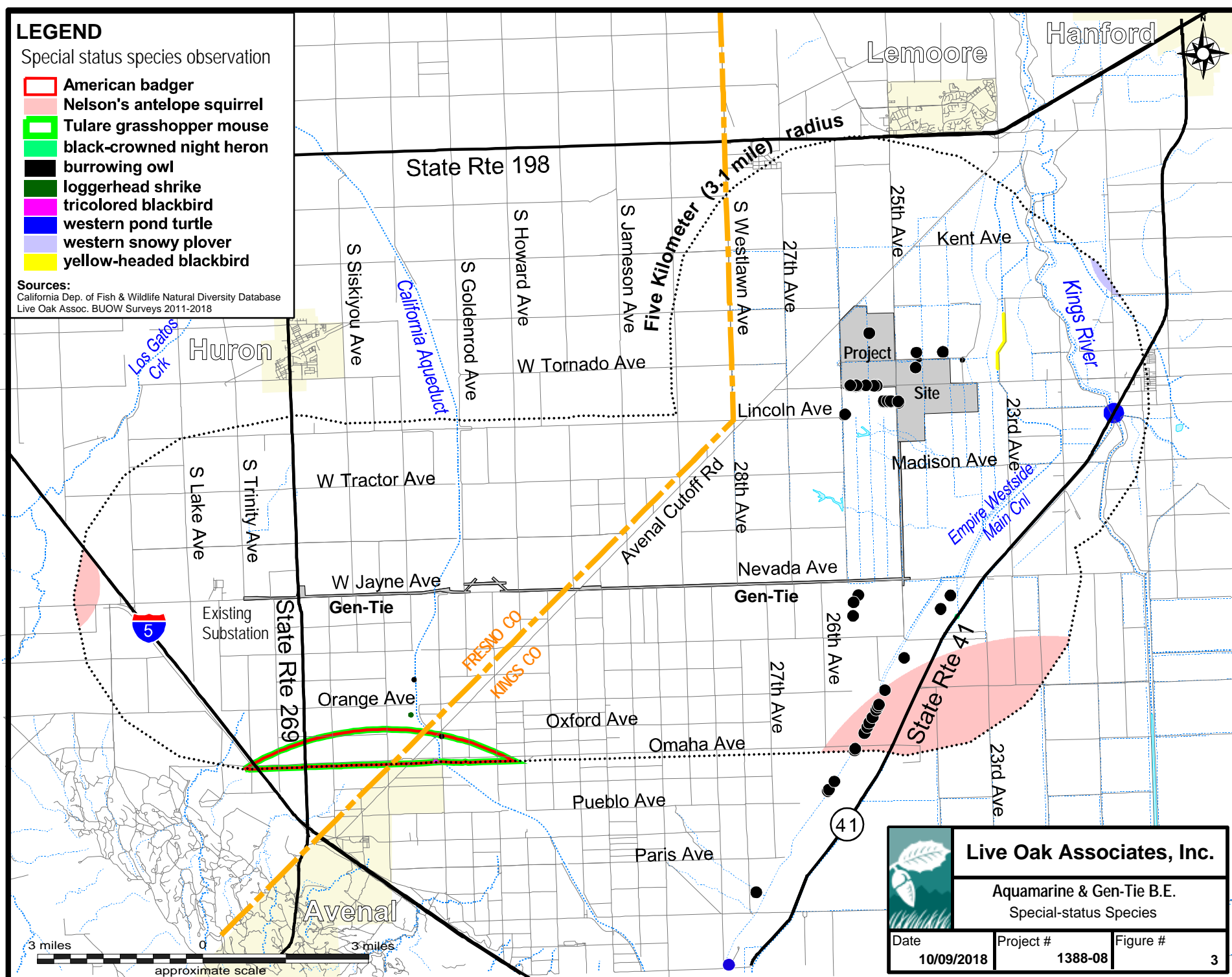
LEGEND


Special status species observation

- American badger
- Nelson's antelope squirrel
- Tulare grasshopper mouse
- black-crowned night heron
- burrowing owl
- loggerhead shrike
- tricolored blackbird
- western pond turtle
- western snowy plover
- yellow-headed blackbird


Sources:


California Dep. of Fish & Wildlife Natural Diversity Database
Live Oak Assoc. BUOW Surveys 2011-2018



 Live Oak Associates, Inc.		
Aquamarine & Gen-Tie B.E. Special-status Species		
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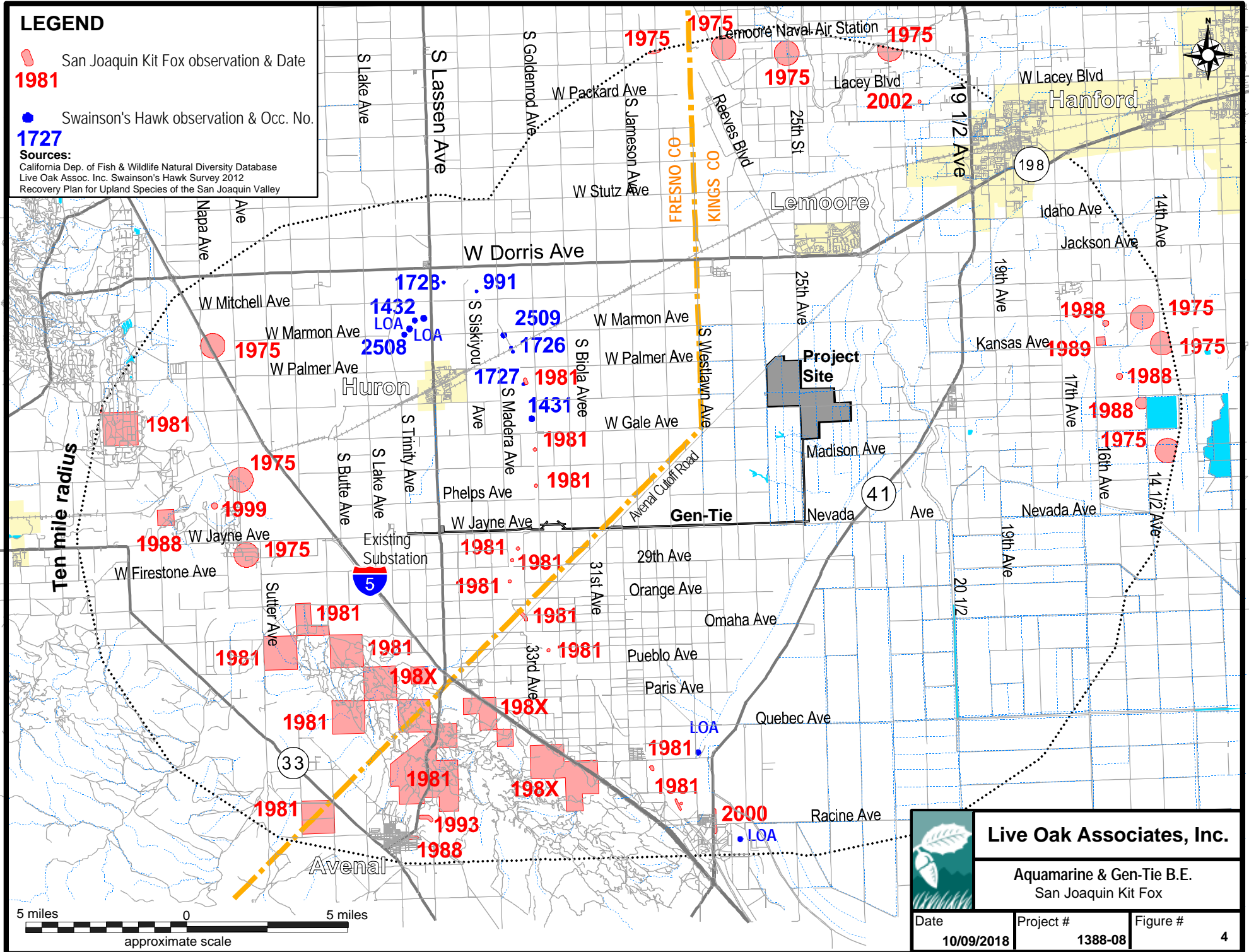
LEGEND

 San Joaquin Kit Fox observation & Date
1981

 Swainson's Hawk observation & Occ. No.
1727

Sources:

California Dep. of Fish & Wildlife Natural Diversity Database
Live Oak Assoc. Inc. Swainson's Hawk Survey 2012
Recovery Plan for Upland Species of the San Joaquin Valley



Live Oak Associates, Inc.

Aquamarine & Gen-Tie B.E.
San Joaquin Kit Fox

Date

10/09/2018

Project #

1388-08

Figure #

4

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR

PLANTS (adapted from CDFW 2018 and CNPS 2018)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence in the Project Site
California jewelflower (<i>Caulanthus californicus</i>)	FE, CE, CRPR 1B.1	<u>Habitat</u> Chenopod scrub, valley and foothill grassland, pinyon-juniper woodland. <u>Elevation</u> : 61-1000 meters. <u>Blooms</u> : February–May.	Absent. Suitable habitat for this species is absent from the Project Site and Gen-Tie corridor. Any suitable habitat that may have once been present has been highly modified for human use.
Kern mallow (<i>Eremalche parry</i> ssp. <i>kernensis</i>)	FE, CRPR 1B.2	<u>Habitat</u> On dry, open sandy to clay soils; often at edge of balds in Chenopod scrub, Pinyon and juniper woodland, Valley and foothill grassland. <u>Elevation</u> : 70 – 1290 meters. <u>Blooms</u> : January - May.	Absent. Suitable habitat for this species is absent from the Project Site and Gen-Tie corridor. Any suitable habitat that may have once been present has been highly modified for human use.
San Joaquin woollythreads (<i>Monolopia congdonii</i>)	FE, CRPR 1B.2	<u>Habitat</u> : Chenopod scrub, valley and foothill grassland. <u>Elevation</u> : 60-800 meters. <u>Blooms</u> : February-May.	Absent. Suitable habitat for this species is absent from the Project Site and Gen-Tie corridor. Any suitable habitat that may have once been present has been highly modified for human use.

ANIMALS (adapted from CDFW 2018 and USFWS 2018)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence in the Project Site
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	Occurs in vernal pools of California.	Absent. Suitable habitat in the form of vernal pools is absent from the Project Site and Gen-Tie corridor.
Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FT	Lives in mature elderberry shrubs of California's Central Valley and Sierra Foothills.	Absent. Suitable habitat in the form of elderberry shrubs is absent from the Project Site.
California tiger salamander (<i>Ambystoma californiense</i>)	FT, CT	Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites.	Absent. No historic or current records of this species are known within the region. Intensively cultivated lands provide unsuitable habitat for this species.
Giant garter snake (<i>Thamnophis gigas</i>)	FT, CT	Habitat requirements consist of (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and	Unlikely. Marginal breeding and overwintering habitat is available along the irrigation canals within the Project Site. However, the nearest recorded observation is more than 3 miles from the site (CNDDB 2018).

		refuge from flood waters during the snake's dormant season in the winter.	
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TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR

ANIMALS – cont'd.

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence in the Project Site
Blunt-nosed leopard lizard (<i>Gambelia silus</i>)	FE, CE, CP	Frequents grasslands, alkali meadows and chenopod scrub of the San Joaquin Valley from Merced south to Kern County.	Absent. Habitats required by this species are absent from the project site, and Gen-Tie corridor and vicinity.
Swainson's hawk (<i>Buteo swainsoni</i>)	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	Present. Foraging habitat is available throughout the project area. Breeding habitat is absent from the site and within a half-mile of the site, which is the typical construction-free buffer required around an active nest. Swainson's hawks were observed flying over the site during the April 10, 2018 site visit; they are known to occur over and adjacent to the site, per previous surveys conducted by LOA as well.
Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	FC, CE	Breed in large blocks of riparian habitats, particularly cottonwoods and willows.	Absent. Dense riparian habitat required by this species is absent from the Project Site and Gen-Tie corridor.
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	FT, CSC	Uses human-made agricultural wastewater ponds and reservoir margins. Breeds on barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, ponds, and riverine sand bars.	Possible. Breeding and foraging habitat is available along agricultural canals within the Project Site, along the irrigation basins and ditches of the Gen-Tie route and along the banks of the California Aqueduct.
Tricolored Blackbird (<i>Agelaius tricolor</i>)	CC, CSC	Breeds near fresh water, primarily emergent wetlands, with tall thickets. Forages in grassland and cropland habitats.	Possible. Foraging habitat for this species is present within the Project Site in the form of cattails in the canals to the east of the site, however presence of breeding habitat on the site itself would depend on the type of crop planted from season to season. The Aquamarine site has typically been cultivated for winter wheat in the wet season and left fallow during the dry season. Tricolored blackbirds are known to nest in wheat fields. Habitat is less suitable along the Gen-tie route and California Aqueduct, due to lack of suitable vegetation.
Nelson's antelope squirrel (<i>Ammospermophilus nelsoni</i>)	CT	Frequents open shrublands and annual grassland habitats.	Absent. Habitats required by this species are absent from the Project Site, the Gen-Tie corridor, and surrounding agricultural lands due to intensive agricultural use.

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR

Giant kangaroo rat (<i>Dipodomys ingens</i>)	FE, CE	Inhabits grasslands on gentle slopes generally less than 10°, with friable, sandy-loam soils.	Absent. Habitats required by this species are absent from the Project Site, the Gen-Tie corridor, and surrounding agricultural lands due to intensive agricultural use.
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Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

ANIMALS – cont'd.

Species	Status	Habitat	*Occurrence in the Project Site
Fresno kangaroo rat (<i>Dipodomys nitratoide exilis</i>)	FE, CE	Inhabits grassland on gentle slopes generally less than 10°, with friable, sandy-loam soils.	Absent. Habitats required by this species are absent from the Project Site, the Gen-Tie corridor, and surrounding agricultural lands due to intensive agricultural use.
Tipton kangaroo rat (<i>Dipodomys nitratoide nitratoide</i>)	FE, CE	Inhabits arid land with grassland or salt scrub on level or near-level terrain on the San Joaquin Valley floor with alluvial fan and floodplain soils.	Absent. Habitats required by this species are absent from the Project site, the Gen-Tie corridor, and vicinity.
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>)	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat.	Possible. Some burrows observed in the surrounding area were of suitable size for the kit fox. However, nearly all these burrows were within the vicinity of California ground squirrels or actively used by ground squirrels. The Project Site, the Gen-Tie corridor and the surrounding area have been highly modified for agricultural use and, as a result, provide only marginal foraging and breeding habitat for the kit fox. There are no documented sightings of this species on the Project Site, the Gen-Tie corridor, or in the surrounding area, but there have been numerous documented sightings within a ten-mile radius of the Project Site and Gen-tie (see Figure 4), between 1975 and 2002 (CNDDDB 2018). Therefore, kit foxes are unlikely to breed within the Project Site or Gen-Tie corridor, but may occasionally forage within the Project Site, and may use the Project Site and Gen-Tie corridor for dispersal movements.

ANIMALS (adapted from CDFW 2018 and USFWS 2018)*State Species of Special Concern*

Western spadefoot (<i>Scaphiopus hammondi</i>)	CSC	Primarily occurs in grasslands, but also occurs in	Absent. Vernal pools required for breeding are absent from the Project
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		valley and foothill hardwood woodlands. Requires vernal pools or other temporary wetlands for breeding.	Site and Gen-Tie corridor. Terrestrial habitat required for aestivation is absent from cultivated fields.
Western pond turtle (<i>Actinemys marmorata</i>)	CSC	Intermittent and permanent waterways including streams, marshes, rivers, ponds and lakes.	Unlikely. While marginal habitat, in the form of the canals, exists within the Aquamarine Project Site, estivation and breeding habitat is absent from the project site. The Gen-tie route supports a few irrigation basins, however, these basins lack appropriate upland habitat, therefore, it would be unlikely to for western pond turtles to occur along the Gen-Tie route.

TABLE 2. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR**ANIMALS – cont'd.***State Species of Special Concern*

Species	Status	Habitat	*Occurrence in the Project Site
Temblor Legless Lizard (<i>Anniella alexanderae</i>)	SCS	The Temblor legless lizard (previously called silvery legless lizard) occurs mostly underground in warm moist areas with loose soil and substrate and is known only from two sites west of Highway 33 at the base of the Temblor Range between McKittrick and Taft in Kern County.	Absent. The Project Site is outside of this species' range.
Coast horned lizard (<i>Phrynosoma blainvillii</i>)	CSC	Grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	Absent. Habitats required by this species are absent because they have been heavily modified for human use. The nearest documented observation of this species is more than 27 miles to the northwest of the Project Site and Gen-Tie corridor (CNDDDB 2018).
California glossy snake (<i>Arizona elegans occidentalis</i>)	CSC	Occurs in arid areas with grassland, scrub, chaparral, and rocky washes. This species is nocturnal and spends the day in burrows.	Absent. Habitats required by this species are absent from the Project Site, the Gen-Tie corridor, and vicinity.
San Joaquin whipsnake (<i>Masticophis flagellum ruddocki</i>)	CSC	Open, dry habitats with little or no tree cover. Found in valley grasslands and saltbush scrub in the San Joaquin Valley.	Absent. Habitats required by this species are absent from the Project Site, the Gen-Tie corridor, and vicinity.
American white pelican (nesting) (<i>Pelecanus erythrorhynchos</i>)	CSC	Nests on islands in large lakes or on ephemeral islands in shallower wetlands.	Unlikely. Nesting habitat is absent from the Project Site and Gen-Tie corridor. This species has observed flying in the general area in previous years; however, the species is unlikely to stop and nest within the Project Site or Gen-Tie corridor.
White-faced ibis (<i>Plegadis chihi</i>)	CSC	Salt and freshwater marsh as well as grain and alfalfa fields.	Possible. Marginal foraging habitat required for this species is present in the form of the agricultural fields within the Project Site and Gen-Tie corridor. Breeding habitat is absent.
Northern harrier (<i>Circus cyaneus</i>)	CSC	Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats.	Possible. Harriers were observed foraging over agricultural fields within the general area during previous surveys, and foraging habitat exists on the Project Site and Gen-Tie corridor. However, breeding habitat is absent.
White-tailed kite (<i>Elanus leucurus</i>)	CP	Open grasslands and agricultural areas throughout central California.	Possible. Suitable foraging habitat occurs for this species within the Project Site and Gen-Tie corridor;

			however, breeding habitat is absent.
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TABLE 2: LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR

ANIMALS – cont’d.

State Species of Special Concern

Species	Status	Habitat	*Occurrence in the Project Site
Mountain plover (<i>Charadrius montanus</i>)	CSC	Forages in short grasslands and freshly plowed fields of the Central Valley.	Possible. The Project Site and Gen-Tie corridor provide potential winter foraging habitat for this species; however, the species does not breed in this region.
Burrowing owl (<i>Athene cunicularia</i>)	CSC	Frequents open, dry annual or perennial grasslands, deserts, and scrublands characterized by low growing vegetation. Dependent upon burrowing mammals, most notably the California ground squirrel, for nest burrows.	Present. The site visit in November of 2016 identified a burrowing owl on the Project Site in a white 18” pipe that goes under a farm road in the northwest portion of the site. Based on the number of pellets and whitewash, the owl had been using this location for quite some time prior to the site visit. Currently, suitable habitat onsite consists mainly of man-made ‘burrows’, such as pipes.
Burrowing owl (Cont’d)			In addition, multiple burrowing owls were observed within the Project Site along dry agricultural canals and dry banks of larger wet canals, including the canal along the south side of Laurel Avenue. As a side note, maintenance activities along these canals can temporarily displace burrowing owls until ground squirrels recolonize the canal banks. During the November 2016 site visit, the banks of the canal south of Laurel Avenue had recently been managed, however, it had been recolonized by the time of the 2018 site visits. As burrowing owls are known to be in the area, it is possible they may occur along portions of the Gen-Tie route and the California Aqueduct.
Long-eared owl (nesting) (<i>Asio otus</i>)	CSC	Occur on edge habitats including in clumps of trees or edges of open forests that are adjacent to grasslands, shrublands, wetlands, marshes, and farmlands. Need stick nests built by other birds in trees.	Possible. Although the Aquamarine site does not support suitable nesting habitat for this species except for the potential for nesting to occur on telephone poles, small clumps of suitable trees do exist along the Gen-tie route. Long-eared owls may use the Aquamarine site as foraging area.
Black swift (<i>Cypseloides niger</i>)	CSC	Migrants found in many habitats of state; in Sierra nests are often associated with waterfalls.	Absent. The Project Site and gen-tie corridor do not provide suitable breeding or foraging habitat for this species.
Vaux’s swift (<i>Chaetura vauxi</i>)	CSC	Migrants move through the foothills of the western Sierra in spring and late summer. Some individuals breed in the region.	Absent. The Project Site and Gen-Tie corridor do not provide suitable breeding or foraging habitat for this species.

TABLE 2: LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR**ANIMALS – cont'd.***State Species of Special Concern*

Species	Status	Habitat	*Occurrence in the Project Site
Loggerhead shrike (<i>Lanius ludovicianus</i>)	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Can often be found in cropland.	Present. This species was observed on the Project Site during the November 2016 and 2018 site visits. The Aquamarine site may support marginal nesting habitat within vegetated canals of the site, and shrubs and trees along the Gen-tie route would also support suitable nesting habitat.
Tulare grasshopper mouse (<i>Onychomys torridus</i>)	CSC	Arid shrubland communities in hot, arid grassland and scrub desert associations. These include blue oak woodlands at 450 m (1476 feet); upper Sonoran subshrub scrub community; alkali sink and mesquite associations on the valley floor; and grasslands associations on the sloping margins of the San Joaquin Valley and Carrizo Plain region.	Absent. Suitable shrubland habitat is not present within the Project Site or the Gen-Tie corridor.
Short-nosed kangaroo rat (<i>Dipodomys nigratoides brevinasus</i>)	CSC	Occur in lighter, powdery soils such as the sandy bottoms and banks of arroyos and other sandy areas with slightly to highly saline soils on gently sloping and rolling low hill-tops with shrubs.	Absent. Habitats required by short-nosed kangaroo rats are absent from the study area and surrounding agricultural lands due to intensive agricultural use.
Townsend's Big-eared bat (<i>Corynorhinus townsendii</i>)	CSC	Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats.	Possible. Suitable foraging habitat for this species is present within the Project Site and Gen-Tie corridor; however, roosting habitat is absent.
Pallid bat (<i>Antrozous pallidus</i>)	CSC	Roosts in rocky outcrops, cliffs, and crevices with access to open habitats for foraging. May also roost in caves, mines, hollow trees and buildings.	Possible. Suitable foraging habitat for this species is present within the Project Site and Gen-Tie corridor; however, roosting habitat is absent.
California mastiff bat (<i>Eumops perotis ssp. californicus</i>)	CSC	Frequents open, semi-arid to arid habitats, including conifer, and deciduous woodlands, coastal scrub, grasslands, palm oasis, chaparral and urban. Roosts in cliff faces, high buildings, trees and tunnels.	Possible. Suitable foraging habitat for this species is present within the Project Site and Gen-Tie corridor; however, roosting habitat is absent.

TABLE 2: LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE VICINITY OF THE AQUAMARINE PROJECT SITE AND GEN-TIE CORRIDOR

ANIMALS – cont’d.

State Species of Special Concern

Species	Status	Habitat	*Occurrence in the Project Site
American badger (<i>Taxidea taxus</i>)	CSC	Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils.	Possible. No burrows of the size and shape suitable for this species were observed on the Project Site or the Gen-Tie corridor. It is possible this species may establish burrows within the project site; however, it is unlikely that badgers would breed onsite and within the site’s vicinity.
Ringtail (<i>Bassariscus astutus</i>)	CP	Riparian and heavily wooded habitats near water.	Absent. Habitat for this species is absent from the Project Site and Gen-Tie corridor.

***Explanation of Occurrence Designations and Status Codes**

Present: Species observed within the Project Site at time of field surveys or during recent past.

Likely: Species not observed within the Project Site, but it may reasonably be expected to occur there on a regular basis.

Possible: Species not observed within the Project Site, but it could occur there from time to time.

Unlikely: Species not observed within the Project Site, and would not be expected to occur there except, perhaps, as a transient.

Absent: Species not observed within the Project Site, and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE Federally Endangered
 FT Federally Threatened
 FPE Federally Endangered (Proposed)
 FC Federal Candidate

CE California Endangered
 CT California Threatened
 CR California Rare
 CP California Fully Protected
 CSC California Species of Special Concern
 CC California Candidate

CNPS California Native Plant Society Listing
 1A Plants Presumed Extinct in California
 1B Plants Rare, Threatened, or Endangered in California and elsewhere
 2 Plants Rare, Threatened, or Endangered in California, but more common elsewhere

3 Plants about which we need more information – a review list
 4 Plants of limited distribution – a watch list

2.6 ENDANGERED, THREATENED, OR SPECIAL STATUS ANIMAL SPECIES MERITING FURTHER DISCUSSION

2.6.1 Swainson's Hawk (*Buteo swainsoni*).

Federal Listing Status: None; State Listing Status: Threatened.

The Swainson's hawk is designated as a California Threatened species. The loss of agricultural lands (i.e., foraging habitat) to urban development and additional threats such as riverbank protection projects have contributed to its decline.

Life history and ecology. Swainson's hawks are large, broad-winged, broad-tailed hawks. Male and female Swainson's hawks have similar body types, with a length generally between 17 and 22 inches and a wingspan between 47 and 57 inches. They weigh up to 2.5 pounds.

Swainson's hawks have a high degree of mate and territorial fidelity. They arrive at their nesting sites in March or April, and their nests, measuring three to four feet in diameter, can take up to two weeks to complete. The nest is likely to be a stick nest constructed in a tree. In the Central Valley, Swainson's hawks typically nest in large trees in or peripherally to riparian systems adjacent to suitable foraging habitats. The female will lay and incubate two to four eggs for approximately 28 to 35 days. The male helps with incubation when the female leaves the nest to feed. The young hatch sometime between March and July and do not leave the nest until some 4 to 6 weeks later. Other suitable nest sites include lone trees, groves of trees such as oaks, other trees in agricultural fields, and mature roadside trees. Swainson's hawks forage in large, open fields with abundant prey, including grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands.

Swainson's hawk survey history on the larger WSP study area: On June 21, 2010 LOA biologists Jeff Gurule and Geoff Cline observed a pair of Swainson's hawks soaring above and around the tailwater pond located 1.5 miles southwest of the Project Site. The two hawks vocalized an alarm call when first encountered flying low over the pond and then soared high into the air. The hawks were encountered again within 30 minutes flying low over the off-site tailwater pond. Although approximately 30 minutes was spent in a thorough search for a nest, no Swainson's hawk nest was observed in the trees associated with the tailwater pond. An active barn owl nest was found however. Although the behavior of the Swainson's hawks observed indicated the possibility that a nest may occur in the trees associated with the tailwater pond.

In 2011, surveys for Swainson's hawks were made on March 21 and April 5 by LOA ecologists Katrina Krakow and Nathan Hale, April 12 and 13 by Katrina Krakow, April 19 and 20 by Katrina Krakow and biologist Robert Shields, and May 3, and 17 by Katrina Krakow. The majority of surveys focused on the tailwater pond which has a row of riparian trees along its margins. Shorter surveys were made near the King's River along Jackson Road, approximately 4.5 miles northeast of the Project Site, where Swainson's hawks have been observed in previous years. A pair of Swainson's hawks were observed off of Jackson Road near the Kings River on 21 March, and 5, 12, and 13 April 2011. Only one individual was observed at a time (both individuals were observed separately) starting on April 19th, which may indicate the beginning of nesting, although no nest was located. On 3 May 2011, a Swainson's hawk was observed over the housing of the Lemoore Air Base along Highway 198, approximately 3.5 miles north of the Project Site. A pair of Swainson's hawks were observed over the tailwater pond beginning on 19 April 2011 by LOA ecologist Katrina Krakow and biologist Robert Shields, and only one individual was observed at a time (both individuals were observed separately) starting on 3 May by LOA ecologist Katrina Krakow, which may indicate the beginning of nesting for this pair. These individuals were observed interacting with a pair of red-tailed hawks, which were also observed only singularly near the pond. Two great horned owl nests were observed in trees along the south side of the pond, on 19 April, one owlet was observed in one nest and two owlets were observed in the other nest. However, as at least two pair of Swainson's hawks were observed either over or in the vicinity of the WSP study area, both observed pairs of this species most likely forage onsite, although, due to lack of suitable nest trees, they are not expected to nest on or within a half-mile of the Aquamarine Project Site.

Further multi-year surveys of the tailwater pond area were conducted by LOA biologists during subsequent breeding seasons 2012-2015. Although Swainson's hawks were reliably observed flying over the tailwater pond in each of these years, these surveys likewise failed to detect the presence of a Swainson's hawk nest within the trees surrounding the tailwater pond. The April 15, 2015 survey was the only survey that LOA biologists observed Swainson's hawks land in a tree at the tailwater pond. All other observations were of Swainson's hawks flying overhead.

In the spring of 2012, LOA conducted a Swainson's hawk nest survey of the Westlands Solar Park (WSP) in conjunction with the biological report prepared for the WSP Master Plan and Gen-Tie

Corridors Program EIR. The study area included the Project Site as well as accessible lands within a buffer of 10 miles from the WSP Master Plan area. These surveys took place on April 27 by Ms. Krakow and Ms. Jensen; May 3 by Ms. Krakow; and May 4 by Ms. Krakow and Mr. Cline. Accessible lands within the 10-mile radius were surveyed completely except for those lands previously surveyed by ESTEP Ecological Consulting (2011 and 2012). Four active Swainson's nests were observed, all occurring off-site. Active nests were revisited on May 24 by Ms. Krakow and Mr. Cline. Two nests were located to the northwest of the site in trees bordering a drainage located northwest of the Town of Huron, one nest was located to the southeast of the site just east of Kettleman City in a stand of eucalyptus trees, and one nest was located in a cottonwood tree located south of the southern limit of the WSP Master Plan area just off-site on the eastern side of the canal adjacent to the site near Quail Avenue. During the 2013-2015 spring surveys, this nest was observed to be in active use by a pair of breeding Swainson's hawks. This pair likely uses the WSP study area for foraging, and nesting on the Aquamarine site is unlikely due to absence of suitable nest trees. Although no known historic nests are along or within a half-mile of the Gen-Tie route, suitable nest trees do exist within a half-mile of the route. The four nests observed by LOA in 2012 were revisited on September 25, 2017 and April 9 and 10, 2018 (including a visit to nest #11 of the Estep report from 2017 on April 9, 10, and May 28, 2018). By September of 2017, nesting activity for the 2017 nesting season could not be confirmed, however, one nest was missing and presumed inactive for 2017. The 2018 nesting season appeared to be late, with surveys in April showing adults near known nesting areas, but not yet engaging in nesting activity. Active migration was observed on April 9, 2018 when over 100 Swainson's hawks were observed just off-site south of Nevada Avenue. On May 28, 2018, when the nest locations were revisited, only one of the five nest locations (one of which was previously missing) surveyed was an active nest, near Racine Avenue.

Potential to occur within the Project Site and Gen-Tie Corridor. Swainson's hawks are known to forage in areas surrounding the Project Site and Gen-Tie corridor. Groupings of trees and trees along the nearby Kings River, provide suitable nesting and perching habitat, and the fallow and agricultural lands within the Project Site provide suitable foraging habitat. Only one moderately sized tree exists within a half-mile of the Project Site, which would be considered to be poor quality as a nest tree. LOA had several observations of Swainson's hawks flying or foraging on the ground near the Project Site, including groups as large as 45 individuals. Therefore, Swainson's

hawks are present within the Project Site and likely forage onsite throughout the months of March through September; however, breeding habitat is absent.

Nesting on the Aquamarine site is unlikely due to absence of suitable nest trees. Although no known historic nests are along or within a half-mile of the Gen-Tie route, suitable nest trees do exist within a half-mile of the route, and therefore, Swainson's hawks may nest along the Gen-Tie route where suitable trees exist.

For a detailed cumulative analysis of impacts to Swainson's hawks, see Appendix D of this report.

2.6.2 Burrowing Owl (*Athene cunicularia*).

Federal Listing Status: None; State Listing Status: Species of Special Concern.

The burrowing owl is designated as a California Species of Special Concern. This designation was based on the species' declining population within the state over the past 40 years. The population decline is mainly due to habitat destruction resulting from development and agricultural practices.

Life history and ecology. The burrowing owl is a small, long-legged bird that averages a height of 9.5 inches, has an average wingspan of 23 inches, and weighs an average of 5.25 ounces. Burrowing owls are unique in that they are the only owl that regularly lives and breeds in underground nests. In California, these birds typically occur in the Central and Imperial Valleys, primarily utilizing ground squirrel burrows (or the burrows of other animals, e.g., badgers, prairie dogs and kangaroo rats) found in grasslands, open shrub lands, deserts, and, to a lesser extent, grazed and agricultural lands. Burrowing owls in this region are typically found at elevations below 250 ft. and exhibit strong site fidelity. Pairs have been known to return to the same area year after year, and some pairs are known to utilize the same burrow as the previous year. Burrowing owls are colonially nesting raptors, and colony size is indicative of habitat quality. It is not uncommon to find burrowing owls in developed and cultivated areas where California ground squirrels are active.

Burrowing owls feed on various small mammals including deer mice, voles, and rats. They also prey on various invertebrates including crickets, beetles, grasshoppers, spiders, centipedes, scorpions and crayfish. Peak hunting periods occur around dusk and dawn.

Burrowing Owl history on the larger WSP study area: Burrowing owls were observed utilizing existing burrows along canals in the eastern portions of the Project Site. The Project Site provides suitable habitat for this species in the form of California ground squirrel burrows present in fallow fields and canal banks. Field surveys did not consist of 100% coverage surveys and were conducted mainly as driving surveys on public roads, farm roads, and canal levees with short walking surveys when animals of plants of particular biological note were observed. Many of these owls were paired and presumably nesting with a minimum of 8 pair in 2011, a minimum of 12 pair in 2012, a minimum of 8 pair in 2014, and a minimum of 6 pair in 2018. Suitable nesting habitat for burrowing owls was present in the fallow fields and along the canal banks in the form of California ground squirrel burrows. As 100% coverage surveys were not conducted, the precise extent of burrowing owls within the WSP study area is unknown, however, LOA has identified 79.60% of the WSP study area to be either year-round suitable habitat (3,255.8 acres) or seasonably suitable habitat (13,245 acres) (see Appendix E of this report for details).

Potential to occur within the Project Site and Gen-Tie Corridor. LOA ecologist Katrina Krakow evaluated the site on November 8, 2016, May 4, 2017, April 9, 10, and May 28, 2018 for the potential for the site to support burrowing owls. One burrowing owl was observed onsite in the northwest portion of the site and flushed from a white 18" pipe that goes under a farm road in 2016, which was not observed in future site visits (2017 and 2018). Based on the number of pellets and whitewash, the owl has been using this location for quite some time prior to the 2016 site visit. On April 10, 2018, three pair of burrowing owls and one single burrowing owl were observed along the canal south of and paralleling Laurel Avenue; no burrowing owls were observed along the Gen-Tie route; however, they could occur along the route in the future. Currently, suitable habitat onsite consists mainly of man-made 'burrows', such as pipes well as ground squirrel burrows within and along the canals onsite. The Gen-Tie route also supports some ground squirrel burrows. The site provides suitable nesting/denning habitat in the form of California ground squirrel burrows along the edges of the agricultural fields and in and along the canals, and in the form of pipes in or on the ground, as well as foraging habitat within the agricultural fields for burrowing owls. Canal maintenance activities has the potential to impact locations of burrowing owls, as many large canals support burrowing owls, such as the canal south of Laurel Avenue, where several burrowing owls were identified in previous surveys in the area; during the November 2016 site visit, Ms. Krakow drove near this canal and found that it had recently been

managed and large piles of earth existed on either side of the canal. By the time of the 2018 site visits, this area had been recolonized by burrowing owls on the canal banks. In between maintenance activities and recolonization, the burrowing owls would take up temporary residence elsewhere.

The Gen-Tie route supports suitable burrow habitat for burrowing owls, and therefore, can be expected to occur in the future along the Gen-Tie route.

2.6.3 San Joaquin Kit Fox (*Vulpes macrotus mutica*).

Federal Listing Status: Endangered; State Listing Status: Threatened.

By the time the U.S. Fish and Wildlife Service listed it as an endangered species under the authority of the Federal Endangered Species Act on 11 March 1967, the San Joaquin kit fox had been extirpated from much of its historic range. In 1998, the USFWS adopted a final recovery plan for the San Joaquin kit fox. On 27 June 1971, the State of California listed the kit fox as a threatened species.

Life history and ecology. The San Joaquin kit fox, the smallest North American member of the dog family (Canidae), historically occupied the dry plains of the San Joaquin Valley, from San Joaquin County to southern Kern County (Grinnell et al. 1937). Critical habitat has yet to be established for the San Joaquin kit fox. Local surveys, research projects, and incidental sightings indicate that kit foxes currently occupy available habitat on the San Joaquin Valley floor and in the surrounding foothills.

Kit foxes prefer habitats of open or low vegetation with loose soils. In the northern portion of their range, they occupy grazed grasslands and, to a lesser extent, valley oak woodlands. In the southern and central portion of the Central Valley, kit foxes are found in valley sink scrub, valley saltbrush scrub, upper Sonoran subshrub scrub, and annual grassland (USFWS 1998). Kit foxes may also be found in grazed grasslands, urban settings, and in areas adjacent to tilled or fallow fields (USFWS 1998).

Kit fox diets vary geographically, seasonally, and annually. In the central portion of their range, which includes lands around the Project Site, known prey includes white-footed mice, insects, California ground squirrels, black-tailed hares, San Joaquin antelope squirrels, kangaroo rats, desert cottontails, and ground-nesting birds (Archon 1992; Jensen 1972).

The kit fox requires underground dens to raise pups, regulate body temperature, and avoid predators and other adverse environmental conditions (Golightly and Ohmart 1984). In the central portion of their range, they usually occupy burrows excavated by small mammals, such as ground squirrels. Denning habitat consists of ground squirrel complexes in which some burrows have been enlarged to 4 to 6 inches in diameter for the length of a human arm (approximately 2 ft.).

Potential to occur within the Project Site and Gen-Tie Corridor. Lands surrounding the Project Site consist of cultivated and fallow agricultural fields as well as undeveloped rangeland further out to the south and southwest in the Kettleman Hills. The Project Site itself has been heavily managed for agricultural uses for decades. Agricultural lands are not generally suitable for the San Joaquin kit fox.

A few burrows were observed that were of suitable dimensions for kit fox, but most of these burrows were or appeared to be occupied by California ground squirrels, a burrowing owl, or were pipes either installed in the ground or laying on top of the ground; however, protocol-level surveys consisting of 100% visual coverage were not conducted for the Project Site. Having been modified for agricultural use, the Project Site provides a limited prey base especially in the cultivated fields and, therefore, constitutes poor foraging habitats for kit fox. No kit fox, or their sign, was observed during any of the site visits by LOA ecologists between 2011 and 2018.

Of primary interest for this assessment are kit fox records from the vicinity of the project site. According to the CNDDB there have been a total of 40 historical (1975-2002) sightings within the ten miles of the site (Figure 4) (CDFW 2018). All of these sightings occur near the border of the 10-mile radius. Based on the site's location and the distribution of kit fox occurrences in its vicinity, the site may only occasionally be used for regional movements of individual kit fox. These sightings occurred to the east, west, south, and north of the Project Site. Multiple large irrigation canals and drainage ditches run through the Project Site and vicinity which may act as movement corridors; however, should a kit fox utilize these corridors, the fox would have to travel through miles of marginal to poor habitat before reaching the Project Site, which itself holds little habitat value.

In summary, the Project Site offers marginal habitat primarily in fallowed fields; the surrounding lands provide similar habitat; and 40 historical kit fox sightings occur within ten miles of the

Project Site, but not within the Project Site itself. Considering the highly disturbed condition of the Project Site and Gen-Tie corridor, their isolation from extant kit fox populations, and their marginal to poor suitability as foraging or denning habitat, it is unlikely any kit fox have taken up residence within the Project Site or Gen-Tie corridor, although the California Aqueduct, which the Gen-Tie route crosses, may be used as local movement corridor should kit foxes move into the area. The Project Site may, however, be used by occasional dispersing kit foxes. The Aquamarine solar facility is planned to include the installation of wildlife friendly fencing in order to allow kit fox to move unimpeded through the solar facility. All existing irrigation canals and drainage ditches will be avoided by the solar facilities and are planned to continue operations as they currently do. Therefore, any kit foxes would not be prevented from moving through the Project Site after completion of the solar facilities.

2.6.4 Other Migratory Birds and their Nests. Federal Listing Status: Protected; State Listing Status: Protected.

Other migratory birds include most bird species with the exception of house sparrow (*Passer domesticus*) and European starling, among a few other non-native birds. Migratory birds and their nests are protected under the Federal Migratory Bird Treaty Act of 1918 and California Fish and Game Code (Sections 3503 and 3513). Between approximately February 1 and August 31, migratory birds nest throughout California and the Central Valley on the ground and in grasses, shrubs, and trees.

Potential to occur onsite. Ground nesting birds such as burrowing owl (see Section 3.3.7) and killdeer (*Charadrius vociferous*), among other disturbance-tolerating birds, may utilize the ground and agricultural vegetation of the site for nesting.

2.7 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the California Regional Water Quality Control Board (RWQCB). See Section 3.2.4 of this report for additional discussion of these agencies' roles and responsibilities.

The nearest known Water of the U.S. is the Kings River to the north and east of the Project Site. Two large irrigation canals run through the site along with several smaller canals and drainage ditches; however, these canals and ditches do not receive water from the Kings River, which is at a lower elevation than the Project Site. Artificial waterways such as canals are typically not claimed by the agencies unless they receive water from a Known Water of the U.S., and then return water to a Known Water of the U.S. Thus, even if the canals and ditches on the Project Site received water from a Known Water of the U.S., the Kings River, those waters do not return to the Kings River. Therefore, it is unlikely that canals and ditches would fall under the jurisdiction of the USACE. However, only the USACE can make a jurisdictional determination of waters. Furthermore, waters, while likely not regulated by the USACE may be claimed as jurisdictional by the RWQCB or CDFW under the broader definition of Waters of the State under the Porter-Cologne Water Quality Act, which encompasses any surface or groundwater within the boundaries of the state. Thus, although the canals and ditches may not fall under federal jurisdiction, the RWQCB may assert jurisdiction over those portions of the canal and ditches that function as wetlands. The CDFW typically only asserts jurisdiction over ponds, lakes, and natural drainages or manmade features that replace natural drainages and, therefore, is unlikely to regulate alterations to the manmade canals and ditches mentioned above.

The Gen-Tie corridor will cross over the California Aqueduct and possibly other canals, ditches or drainage features. While it is unlikely that any aquatic features within the gen-tie corridor are waters of the United States, it is possible that any such features could be considered waters of the state of California and within the jurisdictions of the CDFW and RWQCB.

To summarize, regulated waters do not occur onsite. The canals and drainage features on the Project Site and within the gen-tie corridor are unlikely to be regulated by the USACE; however, the RWQCB and CDFW may assert jurisdiction over some of these features. Jurisdiction would need to be evaluated on a case-by-case basis. It is important to note that these three agencies are the final arbiters and would need to be consulted regarding their jurisdiction over some or all of these features.

3 IMPACTS AND MITIGATIONS

3.1 SIGNIFICANCE CRITERIA

Approval of general plans, area plans, and specific projects is subject to the provisions of the California Environmental Quality Act (CEQA). The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are carried out. CEQA is concerned with the significance of a proposed project's impacts. For example, a proposed development project may require the removal of some or all of a Project Site's existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc., may replace those species formerly occurring on the Project Site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed.

Whenever possible, public agencies are required to avoid or minimize environmental impacts by implementing practical alternatives or mitigation measures. According to Section 15382 of the CEQA Guidelines, a significant effect on the environment means a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest."

Specific project impacts to biological resources may be considered "significant" if they would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a “mandatory findings of significance” if the project has the potential to:

“Substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory.”

3.2 RELEVANT GOALS, POLICIES, AND LAWS

3.2.1 Threatened and Endangered Species

State and federal “endangered species” legislation has provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as “species of special status.” Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the “take” of a listed species. “Take” is defined by the state of California as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill” (California Fish and Game Code, Section 86). “Take” is more broadly defined by the federal Endangered Species Act to include “harm” (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, as “responsible agencies” under CEQA, the CDFW and the USFWS both review CEQA documents involving projects which may have an

impact on state- and/or federally-protected species in order to determine the adequacy of their treatment of protected species issues and to make project-specific recommendations for their conservation.

3.2.2 Migratory Birds

State and federal laws also protect most birds. The Federal Migratory Bird Treaty Act (16 U.S.C., sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

3.2.3 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Game Code, Section 3503.5, which states that it is “unlawful to take, possess, or destroy any birds in the order *Falconiformes* or *Strigiformes* (birds of prey) 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 could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFW.

3.2.4 Wetlands and Other Jurisdictional Waters

Natural drainage channels and adjacent wetlands may be considered “Waters of the United States” (hereafter referred to as “jurisdictional waters”) subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE). The extent of jurisdiction has been defined in the Code of Federal Regulations but has also been subject to interpretation of the federal courts. Jurisdictional waters generally include:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or

natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;

- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs (a)(1)-(4) (i.e., the bulleted items above).

As determined by the United States Supreme Court in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (the SWANCC decision), channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. However, the U.S. Supreme Court decisions *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers* (referred together as the *Rapanos* decision) impose a "significant nexus" test for federal jurisdiction over wetlands. In June 2007, the USACE and U.S. Environmental Protection Agency (USEPA) established guidelines for applying the significant nexus standard. This standard includes: 1) a case-by-case analysis of the flow characteristics and functions of the tributary or wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters; and 2) consideration of hydrologic and ecologic factors (USEPA and USACE 2007).

The USACE regulates the filling or grading of such waters under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. Wetlands are habitats with soils that are intermittently or permanently saturated, or inundated. The resulting anaerobic conditions select for plant species known as hydrophytes that show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils saturated intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987).

All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE (Wetland Training Institute, Inc. 1991). Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No Section 404 permit can be issued until the California Regional Water Quality Control Board issues a Water Quality Certification (or waiver of such certification) under Section 401 of the Clean Water Act, certifying that the proposed activity will meet state

water quality standards. The filling of isolated wetlands, over which the USACE has disclaimed jurisdiction under the SWANCC decision, is still regulated by the RWQCB under the Porter-Cologne Water Quality Act. Under the Porter-Cologne Act, it is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB may impose waste discharge requirements (WDRs) if fill material is to be placed into the Waters of the State. In the wake of the SWANCC decision discussed above, the State Water Resources Control Board, in coordination with the CDFW, is currently in the process of preparing policy guidance for the definition and delineation of wetlands subject to State jurisdiction, as well as waste discharge requirements applicable to the filling of such wetlands. Based on the draft wetland protection policies, the State's definition of wetlands is expected to closely follow the federal definition of wetlands under Section 404 of the Clean Water Act, except that the State definition will apply to isolated wetlands (i.e., areas no longer under federal jurisdiction) and may apply to surface waters lacking vegetation (i.e., un-vegetated areas experiencing prolonged soil saturation and/or prolonged inundation). While the state definition of a wetland has yet to be finalized, it appears that all surface waters of the state, whether natural or man-made, vegetated or un-vegetated could be defined as a wetland subject to the jurisdiction to the state of California.

The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the General Construction Activity Storm Water Permit. All projects with federal funding must also comply with Executive Order 11990 (Protection of Wetlands).

The California Department of Fish and Wildlife (CDFW) has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code (2003). Activities that would disturb these drainages are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question. Since there are no natural drainage channels on the site, no Streambed Alteration Agreement would be required from CDFW.

3.2.5 Local Policies or Habitat Conservation Plans

The Resource Conservation Elements of the 2035 Kings County General Plan contains a number of goals and policies on biological resources. These County policies are outlined below.

Wetland and Riparian Areas. The County's goal is to conserve the functions and values of wetland communities and riparian areas while allowing compatible uses where appropriate.

Fish and Wildlife Habitat. The County's goal is to protect, restore, and enhance habitats in Kings County that support fish and wildlife species so that populations are maintained at viable levels.

Vegetation. The County's goal is to protect the valuable vegetation resources of each County. The Open Space and Conservation Element of the Fresno County General Plan contains a number of policies related to Natural Resources. These policies are directed specifically to the protection of special habitat areas such as wetlands and riparian areas, as well as fish and wildlife habitat.

3.3 POTENTIALLY SIGNIFICANT PROJECT IMPACTS/MITIGATION

The Aquamarine Solar project involves the conversion of approximately 1,825 acres of agricultural fields to solar generation facilities and the following sections assume that the entire project site will be affected by the project.

The Gen-Tie line would consist of a series of tubular steel monopoles placed at up to ¼ mile intervals along a total corridor length of about 15 miles. The area subject to disturbance at each of the 97 planned tower locations (57 in Kings County and 40 in Fresno County) would be about one acre, and an additional area of approximately 130 acres would be subject to temporary disturbance at the construction staging area and several pulling and tensioning sites planned for stringing conductor cables. The total area subject to temporary disturbance during Gen-Tie construction would be about 227 acres, including 125 acres in Kings County and 102 acres in Fresno County. Upon completion of the Gen-Tie line, the area subject to permanent displacement at each transmission tower would be approximately 700 square feet, and the total combined area of permanent displacement along the Gen-Tie corridor would be approximately 0.91 acres in Kings County and approximately 0.65 acres in Fresno County. The monopoles are planned to be placed within or alongside existing agricultural fields, and the planning and design of the Gen-Tie lines would allow sufficient flexibility to adjust tower locations in order avoid impacts to wetlands, riparian zones, and other sensitive habitats.

Potentially significant project impacts to biological resources and mitigations are discussed below.

3.3.1 Loss of Habitat for Special Status Plants

Potential Impacts. Three special-status vascular plant species are known to occur in the vicinity of the Project Site, California jewel-flower (*Caulanthus californicus*), San Joaquin woolly threads (*Monolopia congdonii*), and round leaved filaree (*California macrophylla*) (see Table 1). Due to the many decades of agricultural disturbance of the Project Site and Gen-Tie corridor, habitat for these three plant species are absent. Therefore, the planned solar project and Gen-Tie line would not affect regional populations of these species and potential impacts would be less-than-significant.

Mitigation. Mitigation measures are not warranted.

3.3.2 Loss of Habitat for Special Status Animals

Potential Impacts. Of the 36 special-status animal species potentially occurring in the region, 21 species would be absent or unlikely to occur within the Project Site or Gen-Tie corridor due to unsuitable habitat conditions. These include the vernal pool fairy shrimp, valley elderberry longhorn beetle, California tiger salamander, western spadefoot, western pond turtle, Temblor legless lizard, coast horned lizard, blunt-nosed leopard lizard, giant garter snake, California glossy snake, San Joaquin whipsnake, American white pelican (nesting), black swift, Vaux's swift, western yellow-billed cuckoo, Nelson's antelope squirrel, giant kangaroo rat, Fresno kangaroo rat, Tipton kangaroo rat, Tulare grasshopper mouse, and ringtail. Construction of the Aquamarine solar project and Gen-Tie line would have no effect on loss of habitat for these species because there is little or no likelihood that they are present.

An additional 15 species may regularly or occasionally utilize the Project Site and Gen-Tie corridor for foraging, including the western snowy plover, mountain plover, white-faced ibis, Swainson's hawk, northern harrier, white-tailed kite, western burrowing owl, long-eared owl, loggerhead shrike, tricolored blackbird, Townsend's big-eared bat, pallid bat, California mastiff bat, American badger, and San Joaquin kit fox. The Project Site does not provide regionally important foraging habitat for these species. Migrant species such as the mountain plover pass through or over many types of habitats en route to breeding or wintering habitat. White-faced ibis may possibly forage in agricultural fields of the Project Site from time to time. Considerable habitat suitable for migratory movements and winter foraging would continue to be available for

these species on other lands within the region following development. Therefore, development of the solar project would result in a less-than-significant impact on these species.

The three bat species listed above, including the Townsend's big-eared bat, pallid bat, and California mastiff bat may forage over the site, however, roosting habitat is absent from the site and Gen-tie route for these species. Although the former cotton gin site is planned to be used as a temporary construction staging site for the construction of the Gen-Tie line, the existing buildings on that site are not planned to be used for storage or staging purposes.

Mitigation. For species that are subject to potentially significant impacts due to construction of the Aquamarine Solar project and Gen-Tie line, mitigation measures are identified below for each as follows: raptors and migratory birds (Mitigation 3.3.3); San Joaquin kit fox (Mitigation 3.3.4); American badger (Mitigation 3.3.5); Swainson's hawk (Mitigation 3.3.6) and; burrowing owl (Mitigation 3.3.7).

3.3.3 Disturbance to Active Raptor and Migratory Bird Nests

Potential Impacts. In addition to the Swainson's hawk and burrowing owl (discussed below in Sections 3.3.6, 3.3.7, and 3.3.8), several other raptor species such as the northern harrier, prairie falcon, peregrine falcon, and red-tailed hawk are known to forage near the site. Additionally, the Project Site and Gen-Tie corridor area provides nesting habitat for a number of migratory bird species, including, but not limited to, the snowy plover, black-necked stilt, great-horned owl, common raven, loggerhead shrike, house finch, Brewer's blackbird, and tricolored blackbird. Nearly all native bird species are protected by the federal Migratory Bird Treaty Act. The canal and ditch habitat, as well as power poles and barren ground on the Project Site and the Gen-Tie corridor, provide potential nesting habitat for these species. If birds were to nest in these areas in the future prior to construction, such project-related activities could result in the abandonment of active nests or direct mortality to these birds. Construction activities that adversely affect the nesting success of raptors or result in mortality of individual birds constitute a violation of state and federal laws (see Section 3.2.2 and 3.2.3) and would be considered a significant impact under CEQA.

Mitigation. In order to minimize construction disturbance to active raptor and other bird nests, the following measure(s) will be followed as informed by a 2014 early consultation letter from CDFW as necessary prior to the construction of the Aquamarine Solar project and Gen-Tie line:

Mitigation 3.3.3a (Pre-construction surveys). If tree removal, site preparation, grading, or construction is planned to occur within the breeding period (i.e., between February 1 and August 31), a qualified biologist will conduct pre-construction surveys for active nests of migratory birds within 10 days of the onset of these activities. If construction activity is planned to commence outside the breeding period, no pre-construction surveys are required for nesting birds and raptors.

Mitigation 3.3.3b (Monitoring Active Nests). Should any active nests be discovered in or near proposed construction zones, a qualified biologist shall continuously monitor identified nests for the first 24 hours prior to any construction related activities to establish a behavioral baseline. Once work commences, continuously monitor all nests to detect any behavioral changes as a result of the Project. If behavioral changes are observed, stop the work causing that change and consult with the California Department of Fish and Wildlife for additional avoidance and minimization measures.

Mitigation 3.3.3c (Establish Buffers). Alternatively, should any active nests be discovered in or near proposed construction zones, the biologist will establish a 250-foot construction-free buffer around the nest for non-listed birds, 500-foot buffer for unlisted raptors, and a half-mile for listed bird species. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged. Variance from these setback distances may be allowed if a qualified biologist provides compelling biological or ecological reason to do so and if CDFW is notified in advance of implementation of a no disturbance buffer variance.

Mitigation 3.3.3d (Tailgate Training). All construction and operations workers on each solar project site shall be trained by a qualified biologist. The tailgate training shall include a description of the Migratory Bird Treaty Act, instructions on what to do if an active nest is located, and the importance of capping pipes and pipe-like structures standing upright in order to avoid birds falling into the pipes and getting stuck.

Implementation of the above measures would ensure that construction of the solar project and Gen-Tie line would have no impact on nesting raptors and migratory birds and that the project would be in compliance with state and federal laws protecting nesting birds.

3.3.4 Impacts to San Joaquin Kit Fox

Potential Impacts. The entire Project Site and Gen-Tie corridor consist of agricultural habitat. Of primary interest for this assessment are kit fox records from the vicinity of the project site. According to the CNDDDB there have been a total of 40 historical (1975-2002) sightings within the ten miles of the site (Figure 4) (CDFW 2018). All of these sightings occur near the border of the 10-mile radius. Based on the site's location and the distribution of kit fox occurrences in its vicinity, the Project Site and Gen-Tie corridor may only occasionally be used for regional movements of individual kit fox. These sightings occurred to the east, west, south, and north of the Project Site. Several large irrigation canals run through the Project Site which may act as movement corridors; however, should a kit fox utilize these corridors, the fox would have to travel through miles of marginal to poor habitat before reaching the Project Site, which itself holds little habitat value. Although a few burrows were observed during the 2016-2018 surveys that were of suitable dimensions for kit fox, most of these burrows were or appeared to be occupied by California ground squirrels, a burrowing owl, or open pipes (both installed in the ground and laying on top of the ground). As discussed in Section 2.6.3, a majority of the Project Site and Gen-Tie corridor provide poor habitat and fallow fields and canals offer marginal habitat for this species. While it is unlikely kit fox have, or would take up residence within the Project Site or Gen-Tie corridor under current site conditions, kit foxes from populations reported from the surrounding areas may pass through and possibly forage within the Project Site and Gen-Tie corridor from time to time during regular dispersal movements. To be prudent, the following measures are identified:

Mitigation. The following measures shall be implemented in conjunction with the construction of the project site.

Mitigation Measure 3.3.4a (Pre-construction surveys). Pre-construction surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance, construction activities, and/or any project activity likely to impact the San Joaquin kit fox. These surveys shall be conducted in accordance with the USFWS Standard

Recommendations. The primary objective is to identify kit fox habitat features (e.g., potential dens and refugia) on the solar project site and evaluate their use by kit foxes. If an active kit fox den is detected within or immediately adjacent to the area of work, the USFWS shall be contacted immediately to determine the best course of action.

Mitigation Measure 3.3.4b (Avoidance). Should kit fox be found to be using the Project Site or Gen-Tie corridor during preconstruction surveys, the construction activity shall avoid the habitat occupied by kit fox and the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be notified.

Mitigation Measure 3.3.4c (Tailgate Training). All workers on the Aquamarine Solar project and Gen-Tie line shall attend a tailgate training that includes a description of the species, a brief summary of their biology, and minimization measures and instructions on what to do if a San Joaquin kit fox is observed on a solar project site or gen-tie corridor.

Mitigation Measure 3.3.4d (Minimization of Potential Disturbance to Kit Fox). Whether or not kit foxes are found to be present, all permanent and temporary construction activities and other types of project-related activities shall be carried out in a manner that minimizes potential disturbance to kit foxes. Minimization measures include, but are not limited to: restriction of project-related vehicle traffic to established roads, construction areas, and other designated areas; inspection and covering of structures (e.g., pipes), as well as installation of escape structures, to prevent the inadvertent entrapment of kit foxes; restriction of rodenticide and herbicide use; and proper disposal of food items and trash.

Mitigation Measure 3.3.4e (Mortality Reporting). The Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be notified in writing within three working days in case of the accidental death or injury to a San Joaquin kit fox during project-related activities. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and any other pertinent information.

- a. *Wildlife-friendly Fencing.* The perimeter fencing surrounding each phase of the Aquamarine Solar project shall consist of wildlife-friendly or permeable fencing that allows San Joaquin kit fox and other wildlife to move through the site unimpeded. The bottom of the perimeter fencing shall be 5 to 7 inches above the ground, as measured from the top of the ground to the lowest point of the fence. The bottom of the fence

edges shall be knuckled (wrapped back to form a smooth edge) to allow wildlife to pass through safely. The fencing shall not be electrified.

Implementation of these measures would reduce impacts to the San Joaquin kit fox to a less-than-significant level and would minimize the risk that construction activities during the development of the Aquamarine Solar project and Gen-Tie line would result in mortality to individual kit foxes. Should kit fox be found within the solar project site or Gen-Tie corridor, the applicant may wish to contact the USFWS for implementation of a Safe Harbor Agreement. If allowed, this agreement will allow the applicant “assurances that additional land use restrictions as a result of their voluntary conservation actions would not be imposed by the USFWS” (USFWS, 1998).

3.3.5 Impacts to American Badgers

Potential Impacts. Given the observations of American badgers, a California Species of Special Concern, on nearby lands with similar habitats to those of the Project Site and Gen-Tie corridor, the potential exists that the American badger may reside within the Project Site and gen-tie corridor. No badgers or badger burrows were observed in the area during any of the surveys of the Project Site and Gen-Tie corridor conducted from 2011 through 2018. However, the surveys were conducted primarily through driving field edges with limited foot coverage of the Project Site and Gen-Tie corridor, and took place during the day when badgers are not typically active above ground. Potential badger habitat was found on the Project Site and Gen-Tie corridor in the form of fallow fields. While the occurrence of badgers is expected to be unlikely, it cannot be ruled out. Therefore, the project has the potential to result in a significant impact to American badgers.

Mitigations. Implementation of the following measures prior to the construction of the Aquamarine Solar project and Gen-Tie line will reduce impacts to American badgers from direct mortality to a less-than-significant level.

Mitigation Measure 3.3.5a (Pre-construction Surveys). During the course of the preconstruction surveys for other species, a qualified biologist shall also determine the presence or absence of badgers prior to the start of construction. If badgers are found to be absent, a report shall be written to the applicant so stating and no other mitigations for the protection of badgers shall be warranted.

Mitigation Measure 3.3.5b (Avoidance and Monitoring). If an active badger den is identified during pre-construction surveys within or immediately adjacent to an area subject to construction, a construction-free buffer of up to 300 feet shall be established around the den. Once the biologist has determined that badger has vacated the burrow, the burrow can be collapsed or excavated, and ground disturbance can proceed. Should the burrow be determined to be a natal or reproductive den, and because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor shall be present onsite during construction activities in the vicinity of the burrows to ensure the buffer is adequate to avoid direct impact to individuals or natal/reproductive den abandonment. The monitor will be required to be present until it is determined that young are of an independent age and construction activities would not harm individual badgers.

Mitigation Measure 3.3.5c (Tailgate Training). All workers on the solar project and gen-tie line shall attend a tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if an American badger is observed.

Implementation of the above measures would reduce potential impacts to the American badger to a less-than-significant level.

3.3.6 Impacts to Nesting and Foraging Habitat for Swainson's Hawk

Potential Impacts. Swainson's hawks are known to nest in the general vicinity of the Project Site and gen-tie corridor, with the nearest previously observed Swainson's hawk nests located 2 miles east of the Project Site and 3 miles north of the Gen-Tie corridor. Suitable nesting trees are not present within the Project Site or within a half-mile of the site (the typical construction-free buffer distance). Within the Gen-Tie corridor, larger trees associated with agricultural and residential structures could provide nesting habitat, but the most likely habitat for nesting Swainson's hawks occurs in large Gooding's willows in riparian habitat around the tailwater pond located 1.5 miles southwest of the Project Site. Construction activities occurring near an active Swainson's hawk nest could adversely affect nesting success or result in mortality of individual birds constitute a violation of state and federal laws (see Section 3.2.2 and 3.2.3) and would be considered a significant impact under CEQA.

Swainson's hawks are known to forage in the vicinity of the Project Site and Gen-Tie corridors. As part of its biological assessment for the Program EIR on the Westlands Solar Park Master Plan and Gen-Tie Corridors Plan, conducted in 2017, LOA completed a comprehensive analysis of potential impacts to Swainson's hawk foraging habitat associated with development of the WSP Master Plan area and all other solar projects within a 10-mile radius of the WSP plan area. The analysis identified all known Swainson's hawk nests that were previously observed during surveys by LOA or others. In 2018, LOA biologists conducted follow-up surveys to identify currently active nests. LOA biologists also reviewed and updated their detailed 2017 analysis of foraging habitat within a 10-mile radius of the WSP plan area and concluded that the abundant habitat that would remain after development of the WSP, and all other cumulative projects (including projects proposed since 2017) within this 10-mile radius, would be more than sufficient to support all of the known Swainson's hawk nests within this radius, with surplus capacity to support additional nesting pairs. (The full analysis is contained in Appendix D of this report.)

Therefore, it was concluded that full buildout of the WSP plan area would not significantly impact Swainson's hawk foraging habitat. As discussed, this biological report constitutes a technical report for the MND on the Aquamarine solar project and Gen-Tie line. Since the MND is a subsequent CEQA document that is being tiered off the Program EIR for the WSP Master Plan and Gen-Tie Corridors Plan, the biological analysis in the PEIR applies to the MND and this biological report, and is incorporated into them by reference. As such, the conclusions of the Program EIR with respect to impacts to foraging habitat resulting from WSP development, as well as cumulative impacts associated with WSP development and other projects within a 10-mile radius of the WSP plan area, are fully applicable to the Aquamarine Solar project and Gen-Tie line. Accordingly, the conclusions of less-than-significant impact and less-than-significant cumulative impact to Swainson's hawk foraging habitat from the WSP PEIR apply equally to this analysis. Therefore, the project-specific impacts and the cumulative impacts to Swainson's hawk foraging habitat resulting from construction of the Aquamarine Solar project and the Gen-Tie line would be less than significant.

Implementation of the following mitigation will reduce impacts to nesting Swainson's hawks to a less-than-significant level.

Mitigation. There is an absence of potential nest trees within a half-mile of the Aquamarine site, however, potential nest trees do occur along the Gen-tie route; therefore, prior to construction, the following measures shall be implemented.

Mitigation 3.3.6a (Pre-construction Surveys). During the nesting season prior to the construction of the Gen-Tie line within a half-mile of a potential nest tree, preconstruction surveys shall be conducted within the construction zones and adjacent lands to identify any nesting pairs of Swainson's hawks. These surveys will conform to the guidelines of CDFW as presented in *RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY*, Swainson's Hawk Technical Advisory Committee, May 31, 2000. No preconstruction surveys are required for construction activity located farther than a half-mile from a potential nest tree.

Mitigation 3.3.6b (Establish Buffers). Should any active nests be discovered in or near proposed construction zones, the qualified biologist shall establish a suitable construction-free buffer around the nest. This buffer shall be identified on the ground with flagging or fencing, and shall be maintained until the biologist has determined that the young have fledged.

Mitigation Measure 3.3.6c (Tailgate Training). All workers on the construction of the Gen-Tie line shall attend tailgate training that includes a description of the species, a brief summary of its biology, and minimization measures and instructions on what to do if a Swainson's hawk is observed on or near the construction zone.

Implementation of the above measure would reduce impacts to nesting Swainson's hawks to a less-than-significant level.

3.3.7 Impacts to Burrowing Owls

Potential Impacts. LOA ecologist Katrina Krakow evaluated the Aquamarine project site and Gen-Tie corridor on November 8, 2016, May 4, 2017, and April 9, 10, and May 28, 2018 for their potential to support burrowing owls. One burrowing owl was observed in the northwest portion of the Aquamarine site north of Laurel Avenue and it was flushed from a white 18" pipe that goes under a farm road in November 2016; this burrow was unoccupied on all further site visits. Based on the number of pellets and whitewash, the owl had been using this location for quite some time prior to the site visit. Currently, suitable habitat onsite consists of man-made 'burrows', such as

pipes as well as ground squirrel burrows within and along the canals onsite. The Gen-Tie route also supports some ground squirrel burrows. The site provides suitable nesting/denning habitat in the form of California ground squirrel burrows along the edges of the agricultural fields and in and along the canals and ditches, and in the form of pipes in or on the ground, as well as foraging habitat within the agricultural fields for burrowing owls. Canal maintenance activities have the potential to impact locations of burrowing owls, as large canals support burrowing owls, such as the canal south of Laurel Avenue, where several burrowing owls were identified in previous surveys in the area; during the November 2016 site visit, Ms. Krakow drove near this canal and found that it had recently been managed and large piles of earth existed on either side of the canal. By the time of the 2018 site visits, this area had been recolonized by burrowing owls on the canal banks.

The development of the Project Site and Gen-Tie corridor could result in the loss of foraging and breeding habitat for burrowing owls. Known locations of burrowing owl burrows along the onsite canals will be avoided, as the project will not be impacting the canals, and the canals will continue to be managed as they are currently managed, which will also benefit other species using the canal system to move through the area. Adequate suitable foraging habitat exists to the east of the Aquamarine Project site to support these owls. For any burrowing owls occurring elsewhere within the Project Site, both breeding and foraging habitat could be lost; this would constitute a significant impact to burrowing owl foraging and breeding habitat.

The Gen-Tie line would result in very little loss of foraging habitat and likely no loss of breeding habitat for burrowing owls, although Gen-Tie construction could result in disturbance to any nesting burrowing owls in the vicinity.

Ground disturbance from project construction may also result in the mortality of burrowing owls, as they are known to retreat into their burrows ahead of approaching grading activity. These small raptors are protected under the federal Migratory Bird Treaty Act and the California Fish and Game Code. Mortality of individual birds would be a violation of state and federal law. The mortality of individual burrowing owls and the loss of a large area of known breeding and foraging habitat would constitute a significant environmental impact.

Mitigation. Prior to the construction of the Project and Gen-Tie, the following measures shall be implemented which will reduce impacts to the burrowing owl to a less-than-significant level:

Mitigation Measure 3.3.7a (pre-construction surveys). Pre-construction surveys shall be conducted for burrowing owls by a qualified biologist no more than 10 days in advance of the onset of ground-disturbing activity. These surveys shall be conducted according to methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) or the most recent CDFW guidelines. The surveys shall cover all areas of suitable burrowing owl habitat within the construction zones.

Mitigation Measure 3.3.7b (Avoidance of active nests during breeding season). If pre-construction surveys are undertaken during the breeding season (February through August) and active nest burrows are located within or near construction zones, a construction-free buffer of 250 feet shall be established around all active owl nests. The buffer areas shall be enclosed with temporary fencing, and construction equipment and workers shall not be allowed to enter the enclosed setback areas. Buffers shall remain in place for the duration of the breeding season. After the breeding season (i.e., once all young have left the nest), passive relocation of any remaining owls may take place, but only under the conditions described below.

Mitigation Measure 3.3.7c (Avoidance of occupied burrows during non-breeding season, and passive relocation of resident owls). During the non-breeding season (September through January), any burrows occupied by resident owls in areas planned for construction shall be protected by a construction-free buffer with a radius of 250 feet around each active burrow. Passive relocation of resident owls is not recommended by CDFW where it can be avoided. If passive relocation is not avoidable, resident owls may be passively relocated according to a relocation plan prepared by a qualified biologist.

Mitigation Measure 3.3.7d (Tailgate Training). All construction workers shall attend tailgate training that includes a description of the species, a brief summary of their biology, and minimization measures and instructions on what to do if a burrowing owl is observed within or near a construction zone.

Mitigation Measure 3.3.7e (Mitigation for Loss of Breeding and/or Foraging Habitat). If it is determined that burrowing owl nest(s) are located on or near the project site or gen-tie corridor, the

biologist shall coordinate with the project applicant to determine whether these nests are to be unavoidably relocated. If so, measure #1 below (off-site conservation easement) would apply. If the onsite or nearby nests are to remain in place, the biologist shall determine whether sufficient foraging habitat is available on adjacent or nearby lands, and if so, no further mitigation is required. (Approximately 200 acres of year-round foraging habitat within about 2 miles of the burrowing owl burrow is required to support a burrowing owl pair.) If it is determined that there is insufficient nearby foraging habitat, the biologist shall determine the amount of off-site foraging habitat that is required to sustain the burrowing owl nest. In this case, the potential impact to foraging habitat shall be either avoided through implementation of measure #2 below (onsite buffer zone), or compensated through implementation of measure #1 (conservation easement) or measure #3 (long-term agreement on adjacent lands) below:

- 1) Establishment of a conservation easement with a 1:1 ratio for foraging/breeding habitat preservation. These easements would include habitats determined to be suitable for foraging and/or breeding year-round and seasonal use.
- 2) Establishment of permanent buffer zones of adequate size around current burrowing owl locations. These buffer zones would require adequate management for the life of the project and buffer zones to ensure the buffer area remains suitable for burrowing owls. Annual monitoring of the suitability of management activities may be required by CDFW.
- 3) Short or long-term compensation for foraging habitat by providing farmers in adjacent lands incentives to plant particular crops known to be suitable forage habitat for burrowing owls (i.e., winter wheat, alfalfa, etc.) and to enact a farmer burrowing owl safety program where farmers are trained how to reduce burrowing owl mortalities on their lands and farm roads. A 1:1 ratio would be required to be in the program as long as the project is active.

Compliance with the above mitigation measures would reduce impacts to burrowing owls to a less-than-significant level.

3.3.8 Impacts to Wildlife Movement Corridors

Potential Impacts. It is likely that some species use the canal and ditches on the Project Site as movement corridors, including San Joaquin kit fox. The Project Site likely has some small value for the regional movements of some wildlife species, however, the canal and ditch system has greater value when placed in a regional context. Since the development of the Aquamarine Solar

project would not affect existing canals, which would continue to be operated and managed as they are under current conditions, it is expected that wildlife that currently uses the canals for movement will continue to use the canal system to move through the site at project build-out.

To allow for ground movement of wildlife through the Project Site, all fencing enclosing the Aquamarine solar facility is planned to consist of “wildlife friendly” fencing with a continuous 5- to 7-inch separation from the top of the ground to the lowest point of the bottom of the fence along the entire fence. Such fencing will not be electrified.

In the vicinity of the Gen-Tie corridor, the California Aqueduct is likely used as a movement corridor for local wildlife. However, given the very light footprint of the Gen-Tie line, it is unlikely that it would affect local wildlife movement along the Aqueduct or any other linear feature.

Therefore, wildlife currently using the Project Site and Gen-Tie corridor for movement is expected to continue to use the Project Site after buildout, as wildlife friendly fencing will be used and the canal system will be retained within the Project Site in order to allow for wildlife movement through the Project Site.

Impacts to movement corridors for local wildlife are less-than-significant.

Mitigations. Mitigation for impacts to wildlife movements is not warranted.

3.3.9 Disturbance to Native Wildlife Nursery Sites

Potential Impacts. The aquatic habitat associated with the irrigation canals and ditches within the Project Site and near the Gen-Tie corridor could provide nursery sites for native wildlife. Since these features would be avoided by the Aquamarine Solar project and the Gen-Tie line, the potential impacts to wildlife nursery sites would be less-than-significant.

Mitigation. No mitigation is warranted.

3.3.10 Disturbance to Waters of the United States and Riparian Habitats

Potential Impacts. Onsite waters, as contained in irrigation canals, appear not to meet the jurisdictional requirements of the USACE as Waters of the United States (see Section 2.7). However, only the USACE can make a jurisdictional determination. The construction of the

Aquamarine solar project is not planned or expected to encroach upon or physically alter any onsite or off-site canals. The project will avoid all permanent canals.

The Gen-Tie corridors will cross over the California Aqueduct and possibly other canals, ditches or drainage features. While it is unlikely that any aquatic features within the Gen-Tie corridor are waters of the United States, it is possible that any such features could be considered waters of the state of California and within the jurisdictions of the CDFW and RWQCB. Based on review of preliminary engineering plans for the Gen-Tie line, none of the planned monopoles or work areas is located in the vicinity of a water of the United States or California, and the transmission lines would span any such features.

However, should construction be planned to occur in areas that would result in the placement of fill in any canals, a wetland delineation would be required to determine the extent of USACE jurisdiction over such features. If the waters to be filled are determined to be Waters of the U.S. the following permits may be required 1) a Clean Water Act permit from the USACE, 2) a Water Quality Certification from the RWQCB, and/or 3) a Lake or Stream Alteration Agreement from the CDFW. These permits are usually issued on the condition that a mitigation plan be prepared and approved by the applicable state and federal regulatory agencies noted above. Because the solar project and gen-tie line are planned to avoid potential Waters of the U.S. and riparian areas, potential impacts to Waters of the U.S. and riparian habitat would constitute a less-than-significant adverse impact under CEQA.

Mitigation. Potential impacts to Waters of the U.S. and riparian habitat would be avoided; therefore, no mitigation is warranted.

3.3.11 Local Policies or Habitat Conservation Plans

Potential Impacts. The Aquamarine Solar project and Gen-Tie would be in compliance with the provisions of Kings County General Plan policies. In particular, the project's avoidance of onsite canals would assure that biological resources of concern to Kings County would be avoided and preserved.

The USFWS has adopted the *Recovery Plan for Upland Species of the San Joaquin Valley* (USFWS 1998) which covers 34 species of plants and animals that occur in the San Joaquin Valley. The majority of these species occur in arid grasslands and scrublands of the San Joaquin

Valley and the adjacent foothills and valleys. The plan includes information on recovery criteria, habitat protection, umbrella and keystone species, monitoring and research program, adaptive management, and economic and social considerations. The only species addressed in the recovery plan that potentially occurs in the Project Site vicinity is the San Joaquin kit fox, although no sightings of this species have been recorded in the immediate vicinity of the Project Site or Gen-Tie corridor and no sightings have been recorded in the vicinity since 2002, as discussed above. The Recovery Plan does not identify the Project Site, Gen-Tie corridor, or any other lands in the vicinity as areas that should be protected as Specialty Reserve Areas, Wildlife-Compatible Farmland to be Maintained, or Areas Where Connectivity and Linkages Should be Promoted.

Neither the Project Site nor Gen-Tie corridor are covered by any existing Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP), or any other conservation plan adopted at the local, regional, state, or federal level.

Mitigation. No mitigations are warranted.

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APPENDIX A: VASCULAR PLANTS OF THE PROJECT SITE

The plants species listed below were observed on the site during the field surveys conducted by Live Oak Associates on November 8, 2016. The U.S. Fish and Wildlife Service wetland indicator status of each plant has been shown following its common name.

OBL - Obligate
 FACW - Facultative Wetland
 FAC - Facultative
 FACU - Facultative Upland
 UPL - Upland
 +/- - Higher/lower end of category
 NR - No review
 NA - No agreement
 NI - No investigation

ASTERACEAE - Sunflower Family

<i>Lactuca serriola</i> *	Prickly lettuce	FAC
<i>Sonchus asper</i> *	Prickly sowthistle	UPL

CHENOPODIACEAE – Goosefoot Family

<i>Salsola tragus</i> *	Russian thistle	UPL
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MALVACEAE – Mallow Family

<i>Malvella leprosa</i>	Alkali mallow	FACU
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POACEAE - Grass Family

<i>Cynodon dactylon</i> *	Bermuda grass	FAC
<i>Polypogon monspeliensis</i> *	Rabbitsfoot grass	FACW

* Introduced non-native species

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR ON THE PROJECT SITE

The species listed below are those that may reasonably be expected to use the habitats of the project site routinely from time to time. The list was not intended to include birds that are vagrants or occasional transients. Terrestrial vertebrate species observed in or adjacent to the project site during surveys conducted by LOA ecologist on November 8, 2016, and May 4, April 9 and 10 of 2018 have been noted with an asterisk.

CLASS: AMPHIBIA (Amphibians)

ORDER: SALIENTIA (Frogs and Toads)

FAMILY: BUFONIDAE (True Toads)

*Western Toad (*Bufo boreas*)

FAMILY: HYLIDAE (Treefrogs and relatives)

Pacific Chorus Frog (*Pseudacris regilla*)

FAMILY: RANIDAE (True Frogs)

*Bullfrog (*Rana catesbeiana*)

CLASS: REPTILIA (Reptiles)

ORDER: TESTUDINES (Turtles)

FAMILY: EMYDIDAE (Box and Water Turtles)

Pond Slider (*Trachemys scripta*)

ORDER: SQUAMATA (Lizards and Snakes)

SUBORDER: SAURIA (Lizards)

FAMILY: PHRYNOSOMATIDAE

Side-blotched Lizard (*Uta stansburiana*)

FAMILY: TEIIDAE (Whiptails and relatives)

Western Whiptail (*Cnemidophorus tigris*)

SUBORDER: SERPENTES (Snakes)

FAMILY: COLUBRIDAE (Colubrids)

Coachwhip (*Masticophis flagellum*)

Glossy Snake (*Arizona elegans*)

Gopher Snake (*Pituophis melanoleucus*)

Common Kingsnake (*Lampropeltis getulus*)

Long-nosed Snake (*Rhinocheilus lecontei*)

Common Garter Snake (*Thamnophis sirtalis*)

*Gophersnake (*Pituophis catenifer*)

FAMILY: VIPERIDAE (Vipers)

Western Rattlesnake (*Crotalus viridis*)

CLASS: AVES (Birds)

ORDER: CICONIIFORMES (Herons, Storks, Ibises and Relatives)

FAMILY: ARDEIDAE (Herons and Bitterns)

*Great Blue Heron (*Ardea herodias*)

Black-crowned Night Heron (*Nycticorax nycticorax*)

*Cattle Egret (*Bubulcus ibis*)

*Great Egret (*Ardea alba*)

*Snowy Egret (*Egretta thula*)

FAMILY: CATHARTIDAE (American Vultures)

*Turkey Vulture (*Cathartes aura*)

ORDER: ANSERIFORMES (Screamers, Ducks and Relatives)

FAMILY: ANATIDAE (Swans, Geese and Ducks)

*Ring-necked Duck (*Aythya collaris*)

Bufflehead (*Bucephala albeola*)

Mallard (*Anas platyrhynchos*)

Northern Shoveler (*Anas clypeata*)

Cinnamon Teal (*Anas cyanoptera*)

Canvasback (*Aythya valisineria*)

Ruddy Duck (*Oxyura jamaicensis*)

*Canada Goose (*Branta canadensis*)

ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)

FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)

White-tailed Kite (*Elanus leucurus*)

*Northern Harrier (*Circus cyaneus*)

*Red-tailed Hawk (*Buteo jamaicensis*)

Ferruginous Hawk (*Buteo regalis*)

Sharp-shinned Hawk (*Accipiter striatus*)

Cooper's Hawk (*Accipiter cooperii*)

*Swainson's Hawk (*Buteo swainsoni*)

FAMILY: FALCONIDAE (Caracaras and Falcons)

*American Kestrel (*Falco sparverius*)

Merlin (*Falco columbarius*)

ORDER: GRUIFORMES (Cranes, Rails and Relatives)

FAMILY: RALLIDAE (Rails, Gallinules and Coots)

*Common Moorhen (*Gallinula galeata*)

*American Coot (*Fulica americana*)

ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and relatives)

FAMILY: CHARADRIIDAE (Plovers and relatives)

*Killdeer (*Charadrius vociferus*)

ORDER: COLUMBIFORMES (Pigeons and Doves)

FAMILY: COLUMBIDAE (Pigeons and Doves)

Rock Dove (*Columba livia*)

*Mourning Dove (*Zenaidura macroura*)

ORDER: STRIGIFORMES (Owls)

FAMILY: TYTONIDAE (Barn Owls)

Common Barn Owl (*Tyto alba*)

FAMILY: STRIGIDAE (Typical Owls)

*Burrowing Owl (*Athene cunicularia*)

*Great Horned Owl (*Bubo virginianus*)

Western Screech Owl (*Otus kennicottii*)

ORDER: APODIFORMES (Swifts and Hummingbirds)

FAMILY: TROCHILIDAE (Hummingbirds)

Black-chinned Hummingbird (*Archilochus alexandri*)

*Anna's Hummingbird (*Calypte anna*)

Rufous Hummingbird (*Selasphorus rufus*)

ORDER: PICIFORMES (Woodpeckers and relatives)

FAMILY: PICIDAE (Woodpecker and Wrynecks)

Northern Flicker (*Colaptes chrysoides*)

Nuttall's Woodpecker (*Picoides nuttallii*)

ORDER: PASSERIFORMES (Perching Birds)

FAMILY: TYRANNIDAE (Tyrant Flycatchers)

*Black Phoebe (*Sayornis nigricans*)

*Say's Phoebe (*Sayornis saya*)

*Western Kingbird (*Tyrannus verticalis*)

FAMILY: LANIIDAE (Shrikes)

*Loggerhead Shrike (*Lanius ludovicianus*)

FAMILY: CORVIDAE (Jays, Magpies, and Crows)

Western Scrub Jay (*Aphelocoma coerulescens*)

American Crow (*Corvus brachyrhynchos*)

*Common Raven (*Corvus corax*)

FAMILY: ALAUDIDAE (Larks)

*Horned Lark (*Eremophila alpestris*)

FAMILY: HIRUNDINIDAE (Swallows)

Cliff Swallow (*Hirundo pyrrhonota*)

*Barn Swallow (*Hirundo rustica*)

FAMILY: TURDIDAE

American Robin (*Turdus migratorius*)

FAMILY: MIMIDAE (Mockingbirds and Thrashers)

*Northern Mockingbird (*Mimus polyglottos*)

FAMILY: STURNIDAE (Starlings)

*European Starling (*Sturnus vulgaris*)

FAMILY: MOTACILLIDAE (Wagtails and Pipits)

*American Pipit (*Anthus rubescens*)

FAMILY: BOMBYCILLIDAE (Waxwings)

Cedar Waxwing (*Bombycilla cedrorum*)

FAMILY: PARULIDAE (Wood Warblers and Relatives)

Yellow-rumped Warbler (*Dendroica coronata*)

FAMILY: EMBERIZIDAE (Wood Warblers, Sparrows, Blackbirds, and relatives)

Savannah Sparrow (*Passerculus sandwichensis*)

*White-crowned Sparrow (*Zonotrichia leucophrys*)

FAMILY: ICTERIDAE (Blackbirds, Orioles and Allies)

*Red-winged Blackbird (*Agelaius phoeniceus*)

Tricolored Blackbird (*Agelaius tricolor*)

*Western Meadowlark (*Sturnella neglecta*)

*Brewer's Blackbird (*Euphagus cyanocephalus*)

Brown-headed Cowbird (*Molothrus ater*)

FAMILY: PASSERIDAE (Old World Sparrows)

*House Finch (*Carpodacus mexicanus*)

*House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA (Mammals)

ORDER: DIDELPHIMORPHIA (Marsupials)

FAMILY: DIDELPHIDAE (Opossums)

Virginia Opossum (*Didelphis virginiana*)

ORDER: INSECTIVORA (Insectivores)

Ornate Shrew (*Sorex ornatus*)

ORDER: CHIROPTERA (Bats)

FAMILY: PHYLLOSTOMIDAE (Leaf-nosed Bats)

Southern Long-nosed Bat (*Leptonycteris curasoae*)

FAMILY: VESPERTILIONIDAE (Evening Bats)

Yuma Myotis (*Myotis yumanensis*)

California Myotis (*Myotis californicus*)

Pale Big-eared Bat (*Corynorhinus townsendii pallescens*)

Townsend's Western Big-eared Bat (*Corynorhinus townsendii townsendii*)

Western Pipistrelle (*Pipistrellus hesperus*)

Big Brown Bat (*Eptesicus fuscus*)

Pallid Bat (*Antrozous pallidus*)

FAMILY: MOLOSSIDAE (Free-tailed Bat)

California Mastiff Bat (*Eumops perotis* ssp. *californicus*)

Brazilian Free-tailed Bat (*Tadarida brasiliensis*)

ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)

FAMILY: LEPORIDAE (Rabbits and Hares)

*Desert Cottontail (*Sylvilagus audubonii*)

Black-tailed (Hare) Jackrabbit (*Lepus californicus*)

ORDER: RODENTIA (Rodents)

FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)

*California Ground Squirrel (*Spermophilus beecheyi*)

FAMILY: GEOMYIDAE (Pocket Gophers)

*Botta's Pocket Gopher (*Thomomys bottae*)

FAMILY: MURIDAE (Old World Rats and Mice)

Western Harvest Mouse (*Reithrodontomys megalotis*)

Deer Mouse (*Peromyscus maniculatus*)

Norway Rat (*Rattus norvegicus*)

House Mouse (*Mus musculus*)

California Vole (*Microtus californicus*)

ORDER: CARNIVORA (Carnivores)

FAMILY: CANIDAE (Foxes, Wolves, and relatives)

Coyote (*Canis latrans*)

Gray Fox (*Urocyon cinereoargenteus*)

FAMILY: PROCYONIDAE (Raccoons and relatives)

*Raccoon (*Procyon lotor*)

FAMILY: MEPHITIDAE (Skunks)

Striped Skunk (*Mephitis mephitis*)

FAMILY: FELIDAE (Cats)

Bobcat (*Lynx rufus*)

Feral Cat (*Felis domesticus*)

APPENDIX C: SELECTED PHOTOS OF PROJECT SITE



Figure 1. Disked site.



Figure 2. Burrowing owl observed onsite.



Figure 3. Pipe used by burrowing owl onsite in 2016.



Figure 4. Canal to the west of the site.



Figure 5. Canal to the east of the site.

APPENDIX D: CUMULATIVE IMPACT ANALYSIS FOR POTENTIAL IMPACTS TO SWAINSON'S HAWK FORAGING HABITAT IN THE VICINITY OF THE AQUAMARINE SOLAR PROJECT SITE OR GEN-TIE CORRIDOR

The purpose of this study is to provide information to complete the Cumulative Impacts Assessment for the project in support of Section 15130 of the California Environmental Quality Act (CEQA) Guidelines. These guidelines require that cumulative impacts of a project are discussed when a project's incremental effects are cumulatively considerable (15065(a)(3)). A cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts (15355). CEQA guidelines define cumulatively considerable as follows: "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probably future projects."

In accordance with CEQA Guidelines, the following discussion of cumulative impacts reflects the standards of practicality and reasonableness, and focuses on the cumulative impact to which the identified other projects contribute to the cumulative impact. A list of past, present, and probable future projects producing related or cumulative impacts was provided by Bert Verrips and the County of Kings in September 2018.

This analysis focuses on the project's possible cumulative effects on the Swainson's hawk (SWHA) (*Buteo swainsonii*), a California threatened species that relies largely on agricultural lands to meet its foraging needs. The objectives of this study include using available data to:

- 1) Identify past, current and probable future projects for cumulative impacts assessment.
- 2) Determine distribution and abundance of nesting Swainson's hawk in the Study Area.
- 3) Determine foraging habitat requirements in the Study Area.
- 4) Assess the cumulative impacts of the proposed Westlands Solar Park (WSP) on the distribution and abundance of foraging habitat.

INCORPORATION BY REFERENCE OF ANALYSIS FROM WSP PROGRAM EIR

This biological report constitutes a technical report for the MND on the Aquamarine Solar Project and Gen-Tie Line. Since the MND is a subsequent CEQA document that is being tiered off the Program EIR for the WSP Master Plan and Gen-Tie Corridors Plan, the biological analysis in the

PEIR applies to the MND and this biological report, and is incorporated into them by reference. As such, the analysis and conclusions of the Program EIR with respect to cumulative impacts to foraging habitat resulting from WSP development, together with other projects within a 10-mile radius of the WSP plan area, are fully applicable to the Aquamarine Solar project and Gen-Tie line which constitute individual project elements of the WSP Master Plan.

STUDY AREA

For this study the Study Area, or geographic scope, assessed for the cumulative impact is defined by a 10-mile radius surrounding the approved WSP Master Plan area, which covers approximately 21,000-acres. This radius was selected because published studies have identified this radius as the flight distance between active nests sites and suitable foraging habitats (Estep 1989, Babcock 1995). The area encompassed by the 10 mile radius is 443,207 acres (approximately 692 square miles).

The WSP plan area is located in the center of the Study Area approximately nine miles southwest of the City of Lemoore, CA. The entire project site consists of cultivated fields, fallow fields/pastures, agricultural roads, and irrigation canals and ditches.

With the exception of the City of Lemoore, the Naval Air Station Lemoore, and the census designated places of Lemoore Station, Stratford and the east side of Huron, the surrounding lands are similar to the Project Site with fallow/idle cropland, active agricultural fields, and grass/pasture dominating the landscape (USDA 2018). Avenal, Huron, Kettleman City, Lemoore, Lemoore Station, Naval Air Station Lemoore, and Stratford are located entirely within the Study Area. California state highway 41 is approximately 0.4 miles east and highway 198 is approximately 2 miles north of the site.

A few natural features are located within the Study Area. Natural Resource Conservation Service Wetlands Reserve Program land is located approximately 5 miles to the northeast of the WSP Master Plan area and the Arroyo Pasajero Westside Detention Basin is located approximately 5 miles to the west of the Master Plan area, which contain more natural habitats and may be subject to flooding. Bureau of Land Management Areas of Critical Environmental Concern are located approximately 4 miles west and southwest of the site. Portions of the North Fork, South Fork and

Clarke Fork of the Kings River are present within the Study Area, most of which contain riparian habitat and more natural riverine features. Irrigation canals and ditches are also located throughout the Study Area.

RECENT AND PROPOSED PROJECTS OF THE STUDY AREA

As of September 2018, 23 solar projects located outside the Westlands Solar Park were identified within the Study Area for this cumulative impact assessment. Acreages for these solar projects were calculated using aerial imagery and information obtained from Kings and Fresno Counties. Projects within Kings County include the Sun City, Sand Drag, and Avenal Park complex (360 acres); American Kings (978 acres); Sunpower Henrietta (836 acres); Kansas South (230 acres); Aurora Solar (186 acres); Kansas (200 acres); Mustang and Orion complex (1,280 acres); Kent South (200 acres); Kettleman Solar (220 acres); Lemoore 14 (60.39 acres); 2275 Hattesen (15.70 acres); Java Solar (96.14 acres); Mustang 2 (1,760 acres); Slate (2,230 acres); Daylight Legacy (2,103 acres); and NAS Lemoore Solar (930 acres). Projects within Fresno County include and PG&E Huron (~240 acres); PG&E Gates (57 acres); Westlands Solar Farm (92 acres); and EC&R Solar (1,580 acres). These 23 projects together encompass approximately 13,654.23 acres of the Study Area. With the addition of the planned WSP solar development (20,928 acres), the total area covered by the cumulative projects is approximately 34,582.23 acres (rounded up to 34,583 acres). For the purpose of this analysis, this total acreage amount conservatively assumes that all of the cumulative development acreage constitutes suitable SWHA foraging habitat.

METHODS

In order to assess SWHA foraging habitat all known active nests or historically active nests were recorded within the Study Area. The total population in the Study Area was determined querying the California Natural Diversity Database (CNDDDB) (CDFW 2018) for observations recorded in 2017 in addition to using data from project field surveys conducted by Live Oak Associates (LOA) and Estep in 2017 (Estep 2017). All nests identified in 2017 from the CNDDDB, LOA, and Estep records are assumed to be active for the purpose of this analysis.

Foraging Habitats

Land uses and habitat types were identified using the 2017 United States Department of Agriculture (USDA) National Agricultural Statistics Service Cropland Data Layer (CDL) (USDA

2018; Han et al. 2012; Boryan et al. 2011). The CDL is a raster, geo-referenced, crop-specific land cover data layer created annually for the continental United States using moderate resolution satellite imagery and extensive agricultural ground truthing (USDA 2018). For the purposes of this study, the CDL layer was limited to the Study Area which included 58 cover types.

Foraging habitat associations were based on 6 cover type categories, instead of the 58 specific cover types identified in the 2017 CDL because agricultural crop management is a dynamic process; crop types may change annually and seasonally. These were used to characterize relative foraging habitat suitability on the landscape (Estep 2012). The six land use/cover type categories used for the Study Area include:

- Alfalfa
- Irrigated Cropland
- Orchard/Vineyard
- Developed/Open Water
- Pasture/Barren
- Natural woodlands

Foraging habitat classes were based on Biology, Movements, and Habitat Relationships of the Swainson's Hawk in the Central Valley of California (Estep 1989) and California Partners in Flight Riparian Bird Conservation Plan: Swainson's Hawk (*Buteo swainsoni*) (Woodbridge 1998). Based on these documents, alfalfa, irrigated cropland, and pasture/barren, were determined to constitute suitable foraging habitat for the Swainson's hawk.

Data Preparation

Habitat and land use cover type acreages were calculated using a built-in map calculator. The Study Area includes roads and highways which are not classified habitat types in the CDL; therefore, acreages may minimally exceed the actual acreage for any given class. For the purposes of this study, this effect is considered negligible because it accounts for a very small percentage of the Study Area and does not affect habitat distribution and abundance.

RESULTS

Nest Proximity

A total of 36 SWHA nests were documented within the Study Area from surveys completed by LOA and Estep in 2017 (Estep 2017). Figure 1 shows the nest distribution across the Study Area. The nearest SWHA nest is approximately 120 feet east of the southern tip of the WSP Master Plan area along the Blakeley Canal and 11 other nests are within five miles of the WSP Master Plan area. Twenty-four SWHA nests are between five and ten miles of the WSP Master Plan area.

Land Use Cover Types

There are six cover type categories in the 443,207-acre Study Area and five cover type categories in the WSP project site. Relative abundance for each cover type category and their SWHA forage value is listed Table 1 and described below.

Table 1. Land Cover Type Acreage and Percent Total of WSP Study Area and Project Site (USDA 2018).			
Land Cover Type Category	SWHA Forage Value	Study Area Acres (Percent of Total)	Project Site Acres (Percent of Total)
Alfalfa	High	13,033.2 (2.94%)	338.9 (1.63%)
Pasture/Barren	Medium-High	119,462 (26.95%)	2,789.7 (13.46%)
Irrigated Cropland	Medium	174,860.6 (39.45%)	12,906.1 (62.26%)
Orchard/Vineyard	Low-None	104,588.2 (23.6%)	4,226.36 (20.39%)
Developed/Open Water	None	31,207.9 (7.04%)	467.4 (2.25%)
Natural and Non-Native Forest	None	55.3 (0.01%)	0 (0%)
Total		443,207.2 (100%)	20,728.7 (100%)

Alfalfa. Alfalfa is considered to have the highest foraging value for SWHA (Estep 1989, 2012). This crop remains in fields for up to 5 years. Alfalfa management includes mowing and irrigation which can expose rodent prey and make prey more accessible to SWHA (Estep 2012).

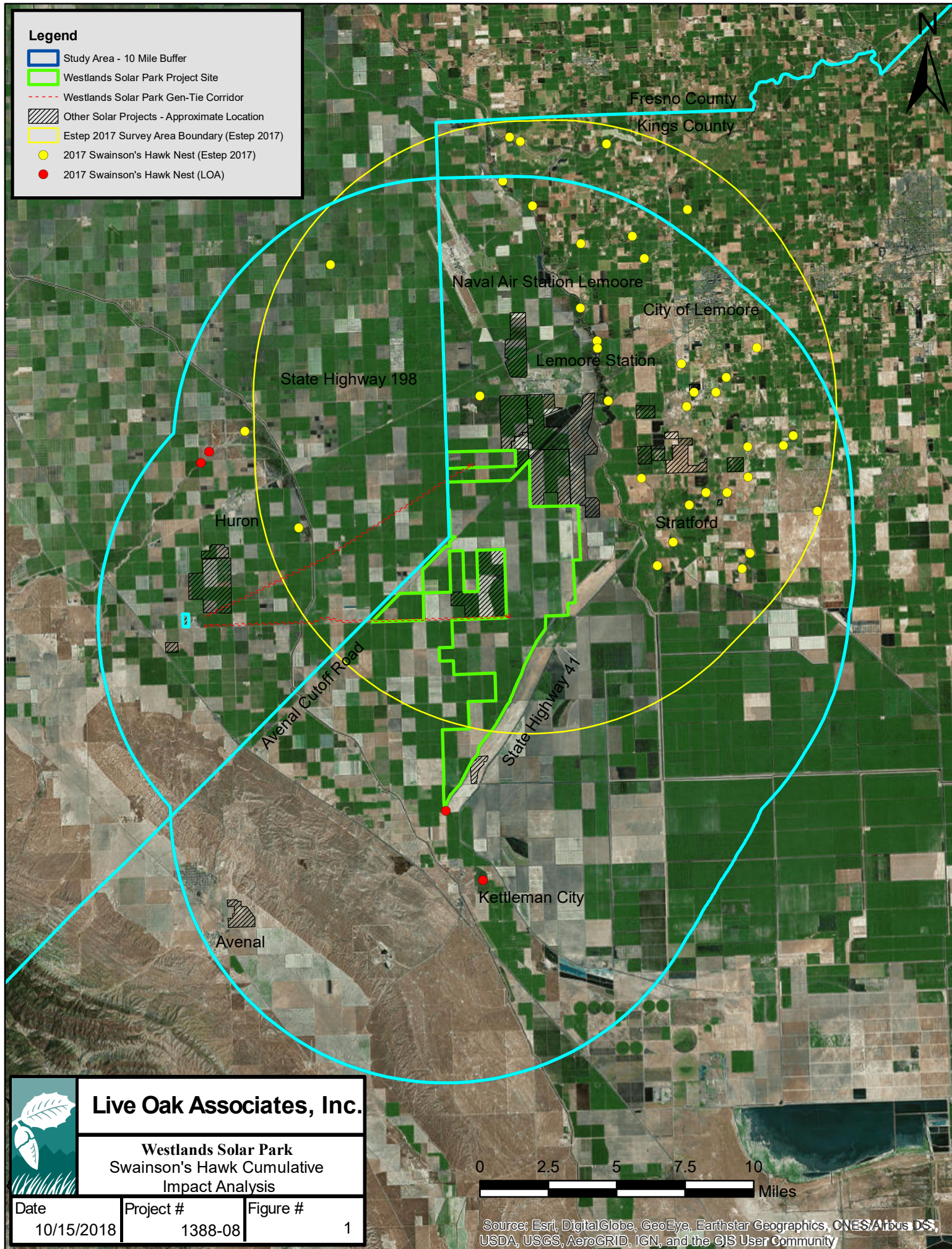
Pasture/Barren. This cover type category includes barren, fallow/idle cropland, grass/pasture, herbaceous wetlands, and shrubland. Other grassland surrogates such as herbs are also included in this category. Fallow/idle croplands represent the majority of this cover type. This cover type may provide medium to high forage value to SWHA depending upon prey availability.

Irrigated Cropland. The majority of this cover type category includes crops such as cotton, tomatoes, winter wheat. Other crops include barley, cantaloupes, carrots, corn, dry beans, durum wheat, garlic, honeydew melons, lettuce, oats, onions, other crops, other hay/non-alfalfa, peppers, rice, rye, safflower, sod/grass seed, sorghum, spring wheat, triticale, and watermelons are also included; however, these represent a very small percentage of the total. This cover type may provide medium foraging habitat value to SWHA (Estep 1989). Foraging value for this type may be dependent upon timing of harvest and planting.

Orchard/Vineyards. This cover type category includes almonds, cherries, citrus, grapes, nectarines, oranges, other tree crops, peaches, pecans, pistachios, plums, pomegranates, and walnuts, and represents little to no foraging value to SWHA due to a lack of accessibility for SWHA (Woodbridge 1998). Due to the little to no foraging value, this habitat is not included as foraging habitat for this analysis.

Developed/Open Water. This cover type category represents developed areas with low, moderate and high intensities such as the towns of Avenal, Huron, Kettleman City, Lemoore, Lemoore Station, Naval Air Station Lemoore, and Stratford and rural developments (e.g., cattle corrals and other infrastructure). This cover type contributes no forage value, however trees located on these properties may provide nesting habitat. Open water also represents no forage value to SWHA. A small percentage of the open water mapped in the CDL may be flooded fields, a temporary feature. Therefore, this cover type may be overrepresented; however, this effect is considered negligible in comparison to the overall Study Area.

Natural and Non-Native Forest. This cover type category is represented by evergreen forest, mixed forest, and woody wetlands. These areas may provide nesting habitat for SWHA; however, they provide no forage habitat value for SWHA.



Foraging Habitat Cumulative Analysis

Estep (1989, 2012) has proposed that if a cumulative loss of agricultural foraging habitat, from the proposed project and other projects, results in a reduction of surplus habitat to less than 70% relative to pre-project conditions, then the cumulative impact is deemed significant. Surplus habitat represents the number of available foraging acres that exceed the minimum required available foraging acres to support known Swainson's hawk nesting pairs. The significance threshold is derived from reviewing habitat land cover data to estimate the existing foraging habitat baseline condition and including the existing Swainson's hawk population foraging habitat requirements to estimate the required foraging habitat necessary to support the nesting population (Estep 1989, 2012). This methodology is used for this study.

Estep (1989) calculated that an area of 6,820 acres of foraging habitat is required for each nesting pair. The total foraging habitat acreage required for the nesting population is calculated by multiplying the number of pairs in the Study Area by 6,820 acres. Table 2 presents the Study Area analysis for foraging habitat requirements for 36 pairs located in the Study Area.

Table 2. Cumulative impact analysis for SWHA foraging habitat within the Study Area		
Foraging Habitat	Acres	Percent
(a) Available Foraging Habitat within Study Area	307,356	-
(b) Unadjusted Foraging Habitat required to support 36 SWHA pairs	245,520	-
(c) Adjusted Foraging habitat required to support 36 SWHA pairs (adjusted for 30% range overlap)	171,864	-
(d) Surplus SWHA foraging habitat (a-c)	135,492	-
(e) Cumulative impact of development of WSP Master Plan area and 23 other solar projects (on foraging habitat)*	34,583	-
(f) Remaining available foraging habitat following cumulative impacts (a-e)	272,773	87.9%
(g) Remaining available surplus SWHA foraging habitat following cumulative impacts (d-e)	100,909	74.5%

*This conservatively assumes that all of the cumulative development acreage constitutes suitable SWHA foraging habitat.

Cumulative analysis for foraging habitat shows that there is a greater amount of foraging habitat available than that required to support 36 nesting pairs. Following Estep (2012), the total foraging habitat required was adjusted down to account for foraging habitat overlap within the Study Area. Estep (2012) considers the availability of the surplus foraging habitat acres in addition to the required foraging habitat to be sufficient to support a growing population. If available foraging

habitat required to sustain the nesting population plus at least 70% (i.e. 94,845 acres) of the existing surplus habitat remains, the habitat removal resulting from the project and the other projects in the Study Area is not expected to significantly affect either the existing population or substantially affect opportunities for future population expansion. Therefore, the cumulative impacts would be considered less-than-significant.










There are currently 23 approved or constructed solar projects within the Study Area (including the WSP Master Plan area) with a total area of approximately 34,492 acres. Table 2 shows that the impact areas of the proposed WSP project and the 23 other solar projects do not reach or go below the 70% threshold of significance (94,845 acres) as defined by Estep (2012). The remaining available surplus habitat (100,909 acres) exceeds the 70% threshold of significance. Therefore, the cumulative impact to Swainson's hawk foraging habitat is less-than-significant.

APPENDIX E: BURROWING OWL ANALYSIS FOR THE WSP MASTER PLAN AREA





LOA used 2017 cropland data (USDA 2018) to prepare a map of potentially suitable habitat for burrowing owls within two miles of the WSP Master Plan Area (Figure 1). Crops were categorized into four categories according to their suitability to support burrowing owl burrow and foraging habitat (USDA 2018; Figure 1):

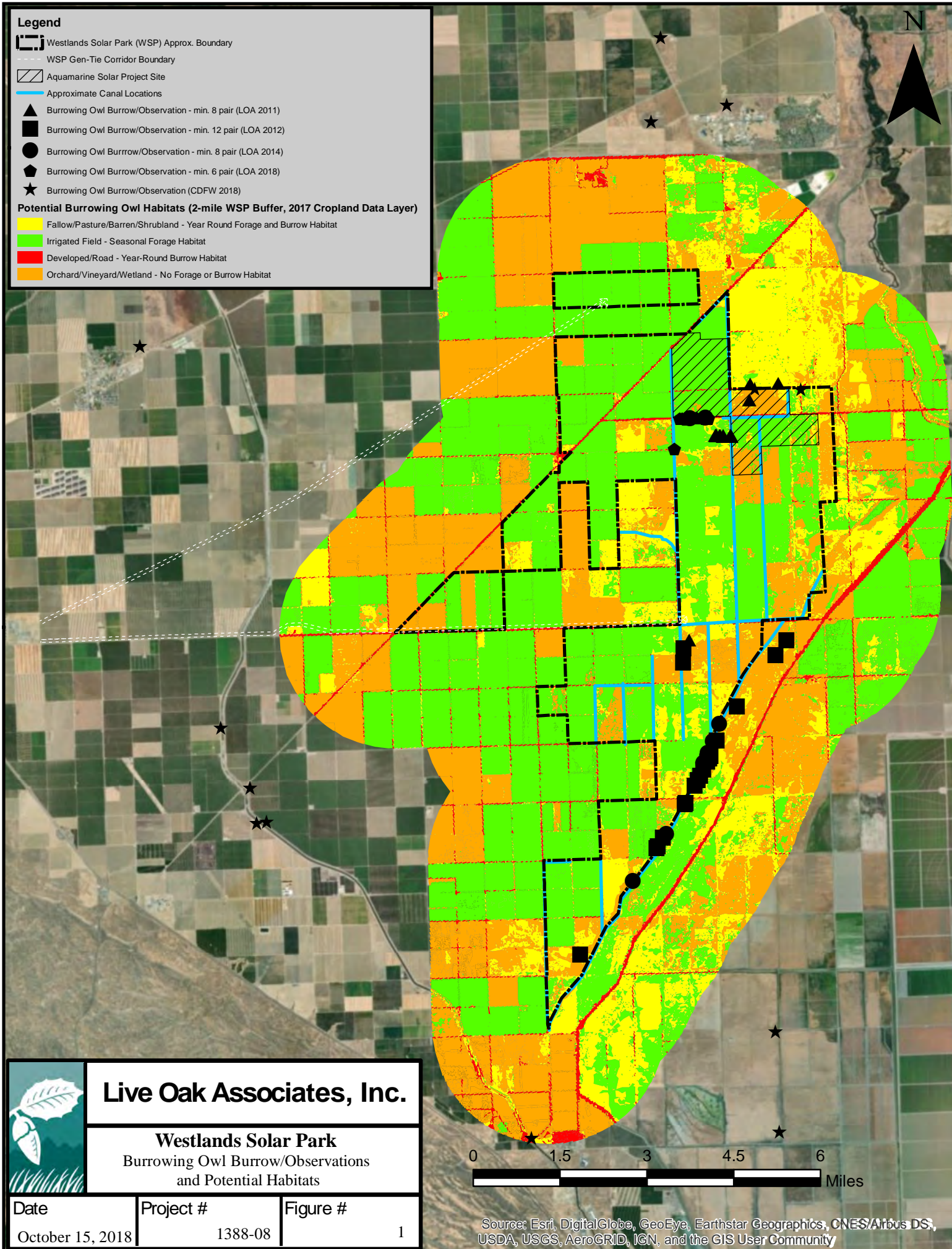
- 1) *Fallow/Pasture/Barren/Shrubland - Year-Round Forage and Burrow Habitat.* Potentially suitable crop/habitat types to support burrowing owl forage and burrow habitat year-round as identified in the cropland data include barren, fallow/idle cropland, grass/pasture, and shrubland.
- 2) *Irrigated Field - Seasonal Forage Habitat.* Potentially suitable crop/habitat types to support burrowing owl seasonal forage habitat include alfalfa, barley, cantaloupes, carrots, corn, cotton, double crop barley/corn, double crop winter wheat/corn, double crop winter wheat/sorghum, dry beans, garlic, herbs, honeydew melons, lettuce, oats, onions, other crops, other hay/non-alfalfa, safflower, sod/grass seed, sorghum, spring wheat, tomatoes, triticale, watermelons, and winter wheat.
- 3) *Developed/Road - Year-Round Burrow Habitat.* As this category within the Project Site is limited to roadways, this category also provides year-round burrow habitat, as burrowing owls are known to use roadsides for burrow habitat; these habitat types include developed/high intensity, developed/low intensity, developed/medium intensity, and developed/open space.
- 4) *Orchard/Vineyard/Wetland - No Forage or Burrow Habitat.* This category includes almonds, cherries, grapes, herbaceous wetlands, open water, pecans, pistachios, pomegranates, walnuts, and woody wetlands.

Legend

-  Westlands Solar Park (WSP) Approx. Boundary
-  WSP Gen-Tie Corridor Boundary
-  Aquamarine Solar Project Site
-  Approximate Canal Locations
-  Burrowing Owl Burrow/Observation - min. 8 pair (LOA 2011)
-  Burrowing Owl Burrow/Observation - min. 12 pair (LOA 2012)
-  Burrowing Owl Burrow/Observation - min. 8 pair (LOA 2014)
-  Burrowing Owl Burrow/Observation - min. 6 pair (LOA 2018)
-  Burrowing Owl Burrow/Observation (CDFW 2018)

Potential Burrowing Owl Habitats (2-mile WSP Buffer, 2017 Cropland Data Layer)

-  Fallow/Pasture/Barren/Shrubland - Year Round Forage and Burrow Habitat
-  Irrigated Field - Seasonal Forage Habitat
-  Developed/Road - Year-Round Burrow Habitat
-  Orchard/Vineyard/Wetland - No Forage or Burrow Habitat



For the WSP Master Plan area, LOA identified 3,255.8 acres (15.70 % of Plan Area) of habitat suitable for burrowing owls year-round, 13,245 acres (63.90 % of Plan Area) suitable seasonally, and 4,227.9 acres (20.40 % of Plan Area) of unsuitable habitat (Table 1; Figure 1).

Table 1. Land Cover Type Acreage and Percent Total of WSP Master Plan Area and a 2-mile Buffer (USDA 2018)

Habitat Type	Habitat Value for BUOW	WSP Plan Area Acres (Percent of Total)	WSP Plan Area and a 2-mile Buffer Acres (Percent of Total)
Fallow/Pasture/Barren/Shrubland	Year-round forage and burrow habitat	2,789.7 (13.46%)	13,054.4 (16.21%)
Irrigated Field	Seasonal forage habitat	13,245.0 (63.90%)	38,197.0 (47.44%)
Developed/Road	Year-round burrow habitat	466.1 (2.25%)	2,882.7 (3.58%)
Orchard/Vineyard/Wetland	No forage or burrow habitat	4,227.9 (20.40%)	26,380.7 (32.77%)
Total		20,728.7 (100%)	80,514.8 (100%)

The development of WSP solar projects could result in the loss of foraging and breeding habitat for burrowing owls. Known locations of burrowing owl burrows along canals will be avoided, as the project will not be impacting the canals, and the canals will continue to be managed as they are currently managed, which will also benefit other species using the canal system to move through the Plan Area. The majority of burrowing owls observed were along the eastern edge and northeast boundaries of the Plan Area. Adequate suitable foraging habitat exists outside of the Plan Area near most of these locations, which should be able to support these owls. For any burrowing owls occurring within the Plan Area but outside the canal systems, both breeding and foraging habitat could be lost; this would constitute a significant impact to burrowing owl foraging and breeding habitat.