Appendix E

Biological Resources Technical Report

HELIX Environmental Planning

Aramis Solar Energy Generation and Storage Project

Biological Resources Technical Report

September 2020 | IPO-01.03

Prepared for:

Alameda County Planning Department
224 West Winton Avenue
Hayward, CA 94544

Prepared by:

HELIX Environmental Planning, Inc.
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1.0 INTRODUCTION

HELIX Environmental Planning, Inc. (HELIX) has prepared this Biological Resources Technical Report (BTR) on behalf of the Aramis Solar Energy Generation and Storage Project (project) proposed by IP Aramis, LLC (a subsidiary of Intersect Power, LLC) (Proponent). The purpose of this report is to provide Alameda County (County), trustee agencies, and the public with current data on biological resources necessary for processing the project under the California Environmental Quality Act (CEQA). This report includes information on the current biological resources in and adjacent to the project site, including vegetation and land cover, aquatic resources, general flora and fauna, and natural communities. It also includes an analysis of the potential for regionally occurring special-status species to occur in the project site, potential project impacts to biological resources, and proposed measures to avoid, minimize, and offset impacts to biological resources.

1.1 PROJECT LOCATION

The 410-acre project site is located in unincorporated Alameda County, approximately 2.5 miles north of Livermore (Appendix A: Figure 1). The project site is located within Section 17 of Township 02 South, Range 02 East and un-surveyed land of the Las Positas Land Grant, Mount Diablo Base and Meridian. The project site is located within the "Tassajara, CA" and "Livermore, CA" USGS 7.5-minute quadrangles (Appendix A: Figure 2). The project site is located on portions of four privately-owned parcels – Assessor's Parcel Numbers (APNs) 903-0006-001-02 (eastern 269 acres of a 523-acre parcel), 903-0007-002-01 (52 acres), 903-0006-003-07 (38 acres), and 902-0001-005-00 (51 acres). The project site is made up of a 103-acre northern section (APNs 903-0007-002-01 [52 acres] and 902-0001-005-00 [51 acres]), a 269-acre central section (eastern portion of APN 903-0006-001-02), and a 38-acre southern section (APN 903-0006-003-07) (Appendix A: Figure 3). The northern section is north of Manning Avenue and the central and southern sections are south of Manning Avenue. The project site lies at an elevation of roughly 500 to 700 feet above mean sea level (amsl).

1.2 DESCRIPTION OF THE PROPOSED PROJECT

IP Aramis, LLC (a subsidiary of Intersect Power, LLC) is the project applicant and is seeking a Conditional Use Permit (CUP) from Alameda County to construct, operate, and maintain a solar photovoltaic (PV) facility for at least 50 years. The project would generate 100 megawatts (MW) of PV power on the 410-acre site. The project would provide solar power to utility customers by interconnecting to the nearby electricity grid at Pacific Gas and Electric Company's (PG&E's) existing Cayetano 230 kilovolt (kV) substation located adjacent and interior to the project site. The project would serve East Bay Community Energy (EBCE), Clean Power San Francisco (CPSF), and/or PG&E customers by providing local generation capacity under a long-term contract. A site plan is included as Appendix A: Figure 4.

The proposed project includes a utility-scale solar energy generation and battery energy storage system and a parcel subdivision. The solar facility would be comprised of the PV modules and associated energy collection system; substation; battery energy storage system; and a generation intertie line to connect to the existing PG&E Cayetano substation.

The project applicant has designed the facility so that all structures would be located outside of the 100-year floodplain of Cayetano Creek as determined through hydrologic modeling and a minimum of 50 feet from the banks of Cayetano Creek or its tributaries. The dedication of an easement to Alameda

County (or the Livermore Parks & Recreation District, which manages open space and trail development in conjunction with the East Bay Regional Parks District) is proposed along Cayetano Creek in the project area, outside of the development footprint of the solar facility, for their use to construct a public hiking trail in the future, if desired. The construction of a public hiking trail along Cayetano Creek is not proposed as part of this project.

Selected elements of the project description pertinent to the discussion of biological resources are included below.

1.2.1 Project Components

1.2.1.1 Parcel Subdivision

APN 903-0006-001-02 is a 536-acre parcel. Approximately 150 acres of the western portion of this parcel are steeply sloped and have high biological resource value; this area is proposed to be subdivided to legally separate it from the real property affiliated with the proposed project development.

1.2.1.2 Solar Photovoltaic System

The proposed project would include PV modules connected in strings mounted onto a single-axis tracker racking system, which would in turn be affixed to steel piles. The module strings would track the sun during the day, from east to west, to optimize power generation of the facility. Modules would be connected by low-voltage underground or above-ground electrical wiring to a central inverter station or to string inverters located throughout the facility, where the electricity would be converted from direct current (DC) to alternating current (AC). The system would then step up the voltage of the electricity to a medium voltage (MV) of 34.5 kV (or lower suitable voltage) to collect the energy generated to a project substation. The substation would step up the MV collected energy to the interconnection voltage via one or more step up transformers. The substation would meter and project the energy pursuant to the Interconnection Agreement and Power Purchase Agreement(s) with the utility and offtaker(s), respectively.

The maximum height of modules would be approximately 8 feet in their stow position. The maximum height of the electrical poles would be 100 feet.

1.2.1.3 Project Substation and Gen-Ties

The project substation would provide the necessary circuit breakers, switches, protection relays, and other necessary equipment to reliably and safely protect the electrical infrastructure.

The project substation is adjacent to the west of the existing PG&E Cayetano substation, allowing the gen-tie to be short and overhead with a possibility of underground construction as well. Overhead lines would be constructed on either tubular steel poles or wood H-fames and may be constructed to be single-circuit or double-circuit. The heights of the overhead poles could vary from 30 to 100 feet, depending on the entry angle required by the interconnecting utility.

The northern section of the project site (north of Manning Road) would be electrically connected to the central and southern sections via medium-voltage distribution lines. Medium voltage distribution lines would be routed either overhead or underground.

1.2.1.4 Energy Storage

A battery storage system would be located on-site and adjacent to the west of the existing PG&E Cayetano substation. The battery storage system could be designed to accept excess electrical load from the distribution system, and subsequently dispatch stored electricity during times of peak demand. Additionally, the storage system could be designed to charge from the facility during low demand hours and subsequently discharge during high demand hours. Batteries would be contained in several locking metal electrical enclosures. Low-voltage wiring from battery enclosures would be underground and converted as a bi-directional inverter station and transformed at the shared transformer. The system would fit in four 100-foot by 180-foot buildings which would be sited near the Operations and Maintenance (O&M) building.

1.2.1.5 Support Facilities

The renewable energy system components would be enclosed by security fencing. Locked gates would provide two points of ingress/egress. Access pathways within the fence line would provide access for routine maintenance of the system. A meteorological station would collect site-specific weather data. A fiber optic telecommunications line required by the interconnecting utility would be integrated with the gen-tie line. An electrical control enclosure would be included on site for the operations electrician to monitor and manage the system.

Shielded, downward directional security lighting would be located at the control enclosure and O&M building for emergency repairs. Night lighting would not be required except during scheduled maintenance periods and emergency repairs. Signage would be limited to what is required by the interconnecting utility and County and would conform to County guidelines.

1.2.2 Concomitant Agricultural Uses

The project applicant plans to maintain a majority of the site in limited agricultural operation for the duration of the life of the solar facility. Solar facilities have a minimal development footprint, which allows for concomitant sheep grazing. Because the solar panels (modules) are installed on a system of racks, the ground below the modules remains undeveloped. Additional areas within the project site include grassy areas between the rows and undeveloped portions of the site that will remain as open space for the life of the project. The undeveloped areas would be available for sheep grazing and may be intermittently grazed or left fallow. Pollinator-friendly plant species would be used in landscaping and seed mixes to promote honeybee forage.

1.2.3 Construction Activities and Schedule

The duration of project construction would be approximately 9 months. Project construction activities would consist of site preparation, installation of interconnection facilities and battery storage system, cable installation, pile and skid installation, tracker and module installation, and lastly, site cleanup. Project construction would be completed in four phases, including Phase 1 site preparation (30 work days), Phase 2 PV installation (150 work days), Phase 3 electrical, battery storage system, and gen-tie installation (75 work days), and Phase 4 general construction operations, site clean-up and restoration (175 work days). Phase 4 would span the entire construction duration and be overlapped by Phases 1, 2, and 3. It is anticipated that the construction of Phases 2, and 3 would overlap. All construction staging areas would be located within the development footprint of the solar facility.

Limited excavation activities would be associated with trenching or boring for utilities, building structure foundations, and installing footings where required for structural safety. Most excavation activities would be less than 6 feet in depth; however, some excavations, such as those for the installation of electricity collector poles and dead-end structures, may reach depths of approximately 20 feet depending on site-specific soil conditions. All excavated material would be retained and utilized on the project site (no export of excavated material would occur).

Construction of the solar facility would commence as early as October 2021 or as late as February 2022 depending on final construction plans and building permit requirements. Construction would last for approximately 9 months. Construction of the various project components discussed above could occur simultaneously, sequentially, or some combination thereof.

Construction equipment would operate between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday, for up to a maximum of eight hours per piece of equipment, daily. Weekend construction work is not expected to be required, but may occur on occasion, depending on schedule considerations. All construction work, including any weekend work, would comply with the policies and requirements established in the Noise Element of the County General Plan.

1.2.4 Vegetation and Agricultural Management

The project operations would promote continued agricultural use of the project site, promote wool production, promote honeybee forage vegetation and the control of invasive weeds, promote pollination services and honey production, maintain soil capability and minimize agricultural water use, and manage onsite fuel load of vegetation.

The vegetative cover would generally be kept low to prevent shading of solar panels, to minimize and manage buildup of combustible fuel loads which could otherwise result in a fire hazard, and to facilitate emergency and maintenance vehicle access. This would be accomplished by using low-growing species on the site and maintaining vegetation with grazing during the growing season and could include mechanical methods such as mowing, trimming, and hoeing. Grazing would occur from January until the end of the growing season in May, at which time the sheep would be removed from the site. During the grazing season, the grazing may be controlled by enclosing the sheep in temporary enclosures within the targeted grazing area and would be moved progressively throughout the site. The proposed program for concomitant agricultural land uses during operation of the solar facility would be outlined in an Agricultural Management Plan (AMP) prepared for the project. The AMP would be implemented to sustain agricultural operations throughout the project site for the duration of the life of the project. The project operator would work with commercial beekeepers and sheep operators to both ensure the project is developed for viable sheep and bee operations and to provide for routine, periodic access to the project site when forage conditions are favorable.

1.2.5 Decommissioning of Solar Facilities

The solar facility is anticipated to have an operating life of at least 50 years. Once the operating life of the facility is over, it would be either repowered or decommissioned. If repowering were to be pursued, it would require the facility owner to obtain all required permit approvals. Project decommissioning would occur in accordance with the termination or expiration of the CUP and would involve the removal of above-grade facilities, buried electrical conduit, and all concrete foundations in accordance with a

Decommissioning Plan. Equipment would be repurposed off-site, recycled, or disposed of in a landfill as appropriate.

After the operating life of the solar facility is complete, the battery storage system would be decommissioned along with the rest of the solar facility. Batteries may be disposed of as hazardous waste, or recycled, depending on available technology. Lithium-ion batteries and their constituent parts would likely be recycled. Lithium-ion batteries contain a variety of valuable metals in addition to lithium, and recycling of these batteries is expected to become increasingly commonplace with the increased use of batteries in consumer goods and electric vehicles. Some batteries may have the capacity at the end of the operating life of the project to be reused. The chemical components of flow batteries may either be disposed of as hazardous waste (i.e., neutralization of the liquid within the battery), or they may comprise valuable elements which would also be recycled or reused.

Decommissioning activities would involve exposure and disturbance of soils; therefore, measures for erosion and sediment control would be implemented in accordance with a separate Stormwater Pollution Prevention Plan (SWPPP) that would be required for decommissioning.

1.2.6 Applicant Proposed Measures

1.2.6.1 Agricultural Management Plan

Project operations will adhere to a County-approved Agricultural Management Plan (AMP) to ensure consistency of the facility with adjacent agricultural land uses. The AMP would fulfill the following project objectives:

- Promote continued agricultural use of the project site
- Promote wool production
- Promote honey-bee forage vegetation and the control of invasive weeds
- Promote pollination services and honey production
- Maintain soil capability and minimize agricultural water use
- Manage onsite fuel load of vegetation

The project owner will work with commercial beekeepers and sheep operators to both ensure the project is developed for viable sheep and bee operations and to provide for routine, periodic access to the project site when forage conditions are favorable.

1.2.6.2 Stormwater Management Plan

Prior to issuance of Building Permits, the project owner will submit to the County pre- and post-construction site drainage calculations prepared by a qualified hydrologist or civil engineer and supported by a 2-dimensional hydrologic model to understand whether the project would generate increased runoff. If an increase in runoff is projected, then sizing and location of appropriate detention basins or other stormwater best management practices will be recommended to mitigate any projected increase in offsite runoff and to protect downstream properties against adverse impacts.

A SWPPP will be prepared by qualified engineer, and the approved stormwater management practices in the SWPPP will be carried out by on-site construction and operations personnel to ensure that off-site stormwater sedimentation would not occur.

2.0 REGULATORY SETTING

Policies, regulations, and plans pertaining to the protection of biological resources on the project site are summarized in the following sections.

2.1 FEDERAL REQUIREMENTS

2.1.1 Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) enforces the provisions stipulated within the Federal Endangered Species Act of 1973 (FESA; 16 United States Code [USC] 1531 et seq.). Species identified as federally threatened or endangered (50 CFR 17.11, and 17.12) are protected from take, defined as direct or indirect harm, unless a Section 10 permit is granted to an entity other than a federal agency or a Biological Opinion with incidental take provisions is rendered to a federal lead agency via a Section 7 consultation. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally-listed species may be present in the study area and determine whether the proposed project will jeopardize the continued existence of or result in the destruction or adverse modification of critical habitat of such species (16 USC 1536 (a)[3], [4]). Other federal agencies designate species of concern (species that have the potential to become listed), which are evaluated during environmental review under the National Environmental Policy Act (NEPA) or CEQA although they are not otherwise protected under FESA.

2.1.2 Executive Order 13186: Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA; 16 USC, Sec. 703, Supp. I, 1989) regulates and prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 CFR §10.13. The MBTA protects whole birds, parts of birds, and bird eggs and nests and prohibits the possession of all nests of protected bird species whether they are active or inactive. An active nest is defined as having eggs or young, as described by the Department of the Interior in April 16, 2003 Migratory Bird Permit Memorandum. Nest starts (nests that are under construction and do not yet contain eggs) are not protected from destruction. This international treaty for the conservation and management of bird species that migrate through more than one country is enforced in the United States by the USFWS. Additionally, as discussed below, §3513 of the California Fish and Game Code states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA. This provides CDFW with enforcement authority for project-related impacts that would result in the "take" of bird species protected under the MBTA. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 CFR 20. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors).

2.1.3 The Bald and Golden Eagle Protection Act

The bald eagle and golden eagle are federally protected under the Bald and Golden Eagle Protection Act (16 USC 668–668c). It is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export, or import at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest, or egg of these eagles unless authorized by the Secretary of the Interior. Violations are subject to fines and/or imprisonment for up to one year. Active nest sites are also protected from disturbance during the breeding season.

2.2 STATE REQUIREMENTS

2.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Sections 2050 to 2097) is similar to the FESA. The California Fish and Wildlife Commission is responsible for maintaining lists of threatened and endangered species under CESA. CESA prohibits the take of listed and candidate (petitioned to be listed) species. "Take" under California law means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch capture, or kill (California Fish and Game Code, Section 86). The California Department of Fish and Wildlife (CDFW) can authorize take of a state-listed species under Section 2081 of the California Fish and Game Code if the take is incidental to an otherwise lawful activity, the impacts are minimized and fully mitigated, funding is ensured to implement and monitor mitigation measures, and CDFW determines that issuance would not jeopardize the continued existence of the species. A CESA permit must be obtained if a project will result in the "take" of listed species, either during construction or over the life of the project. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

2.2.2 California Code of Regulations Title 14 and California Fish and Game Code

The official listing of endangered and threatened animals and plants is contained in the California Code of Regulations Title 14 §670.5. A state candidate species is one that the California Fish and Game Code has formally noticed as being under review by CDFW to include in the state list pursuant to Sections 2074.2 and 2075.5 of the California Fish and Game Code.

Legal protection is also provided for wildlife species in California that are identified as "fully protected animals." These species are protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species at any time. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by these species. CDFW has informed non-federal agencies and private parties that they must avoid take of any fully protected species in carrying out projects. However, Senate Bill 618 (2011) allows the CDFW to issue permits authorizing the incidental take of fully protected species under the CESA, so long as any such take authorization is issued in conjunction with the approval of a Natural Community Conservation Plan that covers the fully protected species (California Fish and Game Code Section 2835).

2.2.3 California Environmental Quality Act

Under the California Environmental Quality Act of 1970 (Public Resources Code Section 21000 et seq.), lead agencies analyze whether projects would have a substantial adverse effect on a candidate, sensitive, or special-status species (Public Resources Code Section 21001(c)). These "special-status" species generally include those listed under FESA and CESA, and species that are not currently protected by statute or regulation, but would be considered rare, threatened, or endangered under the criteria included CEQA Guidelines Section 15380. Therefore, species that are considered rare are addressed under CEQA regardless of whether they are afforded protection through any other statute or regulation. The California Native Plant Society (CNPS) inventories the native flora of California and ranks species according to rarity; plants ranked as 1A, 1B, 2A and 2B are generally considered special-status species

under CEQA.[1] The East Bay Chapter of the CNPS maintains a database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties. Plants from the database with a rank of "A" were considered special-status species under CEQA for the purpose of this report.

Although threatened and endangered species are protected by specific federal and state statutes, State CEQA Guidelines Section 15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare if it can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. Section 15380(d) of the State CEQA Guidelines allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFW (i.e., candidate species) would occur. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agency has an opportunity to designate the species as protected, if warranted.

2.2.4 California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (California Fish and Game Code Sections 1900-1913) requires all state agencies to use their authority to carry out programs to conserve endangered and otherwise rare species of native plants. Provisions of the act prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use (other than changing from one agricultural use to another), which allows CDFW to salvage listed plants that would otherwise be destroyed.

CNPS is a non-governmental conservation organization that has developed a list of plants of special concern in California. The following explains the designations for each plant species (CNPS 2020).

- Rank 1A – Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
- Rank 1B – Plants Rare, Threatened, or Endangered in California and Elsewhere
- Rank 2A – Plants Presumed Extirpated in California, but Common Elsewhere
- Rank 2B – Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere
- Rank 3 – Plants About Which More Information is Needed- A Review List
- Rank 4 – Plants of Limited Distribution – A Watch List

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants with a Ranking of 1A through 2B may be considered to meet the definition of endangered, rare, or threatened species under Section 15380(d) of CEQA (see above), and impacts to these species may be considered "significant."

In addition, CDFW recommends, and local governments may require, protection of species which are regionally significant, such as locally rare species, disjunct populations, essential nesting and roosting habitat for more common wildlife species, or plants with a CNPS Ranking of 3 and 4. For example, the East Bay Chapter of the CNPS maintains a database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties. The following information is taken from the East Bay Chapter of the CNPS website (https://ebcnps.org/ebrare-plant-database/). The ranking system is first based on how many regions a plant occurs in, then on several other criteria including size of populations, limited or

[1] The California Rare Plant Rank system can be found online at https://www.cnps.org/rare-plants.

threatened habitat, stressed or declining populations, small geographical range, range limits, and other population threats. In addition, ranks are based on how many specific sites a plant occurs in within a region. In most cases, plants occurring in five or fewer regions (A-ranked plants) also have very few specific sites or individual locations within those regions. In a few cases, however, plants occurring in only a few regions have several specific sites within some of those regions, and/or several individual locations within those specific sites. In those cases, a species is sometimes given a lower rank. In addition to the A-ranked species, a two-tiered Watch List of B and C ranked plants tracks local native species that are not currently considered rare or endangered in the East Bay but that could become so if certain conditions persist such as over-development, water diversions, excessive grazing, weed or insect invasions, etc. B ranked species occur in 6 to 9 regions in the two counties or are otherwise subject to threat, and C ranked species currently occur in 10 to 15 regions in the two counties but have potential threats. A-ranked plants from the database were considered special-status species under CEQA for the purpose of this report because they are considered rare or endangered in the East Bay. The ranking system taken from (https://ebcnps.org/ebrare-plant-database/) is defined below:

- *A1x, *A1 or *A2: Species in Alameda and Contra Costa counties listed as rare, threatened or endangered statewide by federal or state agencies or by the state level of CNPS.

- A1: Species currently known from 2 or less regions in Alameda and Contra Costa Counties (but not rare statewide).

- A2: Species currently known from 3 to 5 regions in the two counties (but not rare statewide), or, if more regions, meeting other important criteria such as small populations, stressed or declining populations, small geographical range, limited or threatened habitat, etc.

- A1x: Species previously known from Alameda or Contra Costa Counties, but now believed to have been extirpated, and no longer occurring here.

- A?: Species that have been reported in the two-county area but identification is questionable and the species may not actually occur here.

2.2.5 Nesting Birds

California Fish and Game Code Subsections 3503 and 3800 prohibit the possession, take, or needless destruction of birds, their nests, and eggs, and the salvage of dead nongame birds. California Fish and Game Code Subsection 3503.5 protects all birds in the orders of Falconiformes and Strigiformes (birds of prey). Fish and Game Code Subsection 3511 states that fully protected birds or parts thereof may not be taken or possessed at any time. Fish and Game Code Subsection 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act. The Attorney General of California has released an opinion that the Fish and Game Code prohibits incidental take.

2.2.6 California Food and Agriculture Code Section 403

This section directs the California Department of Food and Agriculture (CDFA) to prevent the introduction and spread of injurious pests including noxious weeds.

CDFA Code Section 7271 designates the CDFA as the lead department in noxious weed management responsible for implementing state laws concerning noxious weeds. Representing a statewide program, noxious weed management laws and regulations are enforced locally in cooperation with the County Agricultural Commissioner.

Under state law, noxious weeds include any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the director, by regulation, designates to be a noxious weed (CDFA Code Section 5004).

2.3 LOCAL PLANS AND POLICIES

2.3.1 Alameda County General Plan

The Alameda (East County) County General Plan (Plan) is governed by the East County Area Plan (ECAP) and includes several policies intended to promote conservation of existing high-value biological resources in the county and protect sensitive resources and special-status plants and wildlife. In addition to biological resources, the Plan also identifies policies to preserve and protect other resources such as open space, agricultural lands, and sensitive viewsheds. The Alameda General Plan lists the area of the project site as Large Parcel Agriculture that is outside of the Urban Growth area. The Alameda County General Plan outlines several policies intended for the protection of biological resources, including the following, which apply to the project:

Policy 121: The County shall secure open space lands, through acquisition of easements or fee title, specifically for the preservation and protection of indigenous vegetation and wildlife.

Policy 122: The County shall encourage that wetland mitigation be consolidated in areas that are relatively large and adjacent to or otherwise connected to open space. To the extent possible, these areas should be included in, adjacent to, or linked through open space corridors with lands designated as "Resource Management" that are managed specifically for the preservation and enhancement of biological resources.

Policy 123: Where site-specific impacts on biological resources resulting from a proposed land use outside the Urban Growth Boundary are identified, the County shall encourage that mitigation is complementary to the goals and objectives of the ECAP. To that end, the County shall recommend that mitigation efforts occur in areas designated as "Resource Management" or on lands adjacent to or otherwise contiguous with these lands in order to establish a continuous open space system in East County and to provide for long term protection of biological resources.

Policy 124: The County shall encourage the maintenance of biological diversity in East County by including a variety of plant communities and animal habitats in areas designated for open space.

Policy 125: The County shall encourage preservation of areas known to support special status species.

Policy 126: The County shall encourage no net loss of riparian and seasonal wetlands.

Policy 127: The County shall encourage the preservation of East County’s oak woodland plant communities.

Policy 130: The County shall preserve an open space corridor connecting the Bird's Beak Preserve with lands designated "Resource Management." This open space corridor shall vary in width between 50 and 150 feet.

Policy 132: The County shall designate a zone of approximately 200 yards around the perimeter of the defined Bird's Beak Preserve in North Livermore as a Special Management Area. Within this zone, all proposed land uses and project designs shall be evaluated regarding their potential to affect the viability of the Springtown valley sink scrub habitat, and mitigation shall be incorporated into the approval of detailed development plans within this 200 yard zone to avoid the impact. Mitigation may take the form of clustering development to avoid sensitive areas, management practices, land swap with the Federal Communications Commission (FCC) Monitoring Station, or other appropriate measures.

2.3.2 East Alameda County Conservation Strategy

The East Alameda County Conservation Strategy (EACCS) is a collaborative effort between willing land-owners, local agencies and resources agencies for the preservation of endangered species and their habitat through conservation. The EACCS ensures that environmental review provides for assessment of areas in east Alameda County for their habitat conservation value and to establish guiding principles for conservation. The EACCS is intended to guide these agencies to work with willing landowners for long-term conservation stewardship that would offset and mitigate impacts from local land use, transportation and other infrastructure projects. All conservation on private lands is voluntary.

The EACCS study area encompasses the cities of Dublin, Livermore, and Pleasanton, and unincorporated Alameda County areas surrounding these cities, including the project site. The western boundary of the EACCS study area follows the western edge of the Alameda Creek watershed, and the northern, southern, and eastern boundaries follow the Alameda County line with its adjacent counties. The EACCS study area includes the proposed project site (ICF 2010). Although participation in the EACCS by applicant is voluntary, Alameda County participates in the strategy and considers it to be the best available information when considering the impacts of a proposed project.

2.3.3 East Bay Regional Conservation Investment Strategy

On September 22, 2016, the Governor signed Assembly Bill 2087 which created CDFW's Regional Conservation Investment Strategy (RCIS) pilot program (Program). The Program went into effect on January 1, 2017 and is administered by CDFW's Habitat Conservation Planning Branch in Sacramento. On July 21, 2017 the Governor signed Senate Bill 103 which makes two changes to Assembly Bill 2087: (1) it removes the January 1, 2020 "sunset" provision; and (2) it allows a RCIS to be exempt from the "cap" (i.e., the limit of eight RCISs that may be approved by CDFW) if a state water or transportation infrastructure agency requests approval of the RCIS.

The new Program encourages a voluntary, non-regulatory regional planning process intended to result in higher-quality conservation outcomes and includes an advance mitigation tool. The Program uses a science-based approach to identify conservation and enhancement opportunities that, if implemented, will help California's declining and vulnerable species by protecting, creating, restoring, and reconnecting habitat and may contribute to species recovery and adaptation to climate change and resiliency.

The Program consists of three components: regional conservation assessments (RCAs), RCISs, and mitigation credit agreements (MCAs).

An RCIS is a voluntary, non-regulatory, and non-binding conservation assessment that includes information and analyses relating to the conservation of focal species, their associated habitats, and the conservation status of the RCIS land base. Any public agency may develop an RCIS. An RCIS establishes biological goals and objectives at the species level and describes conservation actions and habitat enhancement actions that, if implemented, will contribute to those goals and objectives. Those actions will benefit the conservation of focal species, habitats, and other natural resources and they may be used as a basis to provide advance mitigation through the development of credits (see MCA section below) or to inform other conservation investments. Examples of potential RCIS conservation and habitat enhancement actions include, but are not limited to:

- Land acquisition and protection
- Habitat creation and restoration
- Restoration of creeks and rivers
- Restoration of habitat on public land
- Installation of wildlife crossings and fish passage barrier removal

The development of RCISs does not create, modify, or impose regulatory requirements or standards, regulate land use, establish land use designations, or affect the land use authority of a public agency. If approved by CDFW, an RCIS may be valid for up to 10 years. CDFW may extend the duration of an approved or amended RCIS for an additional 10 years provided the RCIS is updated to include new scientific information and the RCIS continues to meet the Program's requirements as outlined in Fish and Game Code (Chapter 9, Section 1850, et seq.).

The Coastal Conservancy is the East Bay RCIS project proponent and the East Bay RCIS area comprises all of Contra Costa and Alameda Counties. The East Bay RCIS presents conservation goals and objectives for the RCIS area. Incorporated into those goals and objectives are conservation priorities for land acquisition, restoration, and enhancement. These conservation priorities are intended to be used in multiple ways. First, conservation organizations can use these priorities to inform the work they do, ensuring that their efforts align with the goals in the RCIS. This alignment includes the pursuit of funding for land acquisition, restoration, and enhancement. Second, the conservation priorities presented in this RCIS can also inform project permitting and regulatory processes by providing project proponents, regulatory agencies, and those agencies with local land use authority information to identify priority conservation actions that can be used to meet project mitigation needs.

This East Bay RCIS was developed to complement other key planning efforts that overlap the RCIS area. Primarily, it builds on existing efforts to develop a Regional Advance Mitigation Planning (RAMP) for the Bay Area with a focus on transportation projects, and utilizing the Conservation Lands Network data developed through a Bay Area Open Space Council planning effort. This RCIS was also developed to be consistent and coordinated with the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCC HCP/NCCP), addressing species and geographic locations that are not covered by that plan and including conservation actions that complement the ECCC HCP/NCCP's conservation strategy. Additionally, the RCIS considers species recovery plans, city general plans, the EACCS, and other relevant plans and policies.

While the East Bay RCIS is a voluntary program, where possible, the project will protect and enhance habitat for common and special-status species while achieving the project objectives. In general, the project site was chosen because it provides relatively low quality habitat for wildlife and will sustain wildlife populations throughout the life of the project by maintaining vegetative cover and bee forage as well as wildlife corridors and allow for wildlife movement across the site.

2.4 JURISDICTIONAL WATERS

2.4.1 Federal Requirements

Any person, firm, or agency planning to alter or work in "waters of the U.S.," (WOTUS) including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA; 33 USC 1344). Permits, licenses, variances, or similar authorization may also be required by other federal, state, and local statutes. Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from USACE (33 USC 403).

On April 21, 2020, the U.S. Environmental Protection Agency (USEPA) and USACE published the Navigable Waters Protection Rule(NWPR) to define "Waters of the United States" in the Federal Register. On June 22, 2020, the NWPR: Definition of "Waters of the United States" became effective in 49 states, including California, and in all US territories.

The NWPR regulates traditional navigable waters and perennial or intermittent tributary systems, and defines four categories of regulated waters including:

- The territorial seas and traditional navigable waters;
- Perennial and intermittent tributaries to those waters;
- Certain lakes, ponds, and impoundments; and
- Wetlands adjacent to jurisdictional waters.

The NWPR also defines 12 categories of exempted aquatic resources:

1. Waters not listed as WOTUS
2. Groundwater
3. Ephemeral features
4. Diffuse stormwater run-off
5. Ditches not identified as WOTUS
6. Prior converted cropland
7. Artificially irrigated areas
8. Artificial lakes and ponds
9. Water-filled depressions incidental to mining or construction activity
10. Stormwater control features
11. Groundwater recharge, water reuse, and wastewater recycling structures
12. Waste treatment systems

With non-tidal waters, in the absence of adjacent wetlands, the extent of USACE jurisdiction extends to the ordinary high-water mark (OHWM) – the line on the shore established by fluctuations of water and

indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Wetlands are defined in 33 CFR Part 328 as:

> "*those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*"

Federal and state regulations pertaining to waters of the U.S., including wetlands, are discussed below.

Clean Water Act (CWA; 33 USC 1251-1376). The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. must obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Control Board (RWQCB) administers the certification program in California and may require State Water Quality Certification before other permits are issued.

Section 402 establishes a permitting system for the discharge of any pollutant (except dredged or fill material) into waters of the U.S. This system is the National Pollutant Discharge Elimination System (NPDES) program, administered by the USEPA, that has granted oversight authority in California to the State Water Resources Control Board (SWRCB) through its RWQCBs.

Section 404 establishes a permit program administered by USACE that regulates the discharge of dredged or fill material into waters of the U.S. (including wetlands). Implementing regulations by USACE are found at 33 CFR Parts 320-332. The Section 404 (b)(1) Guidelines were developed by the USEPA in conjunction with USACE (40 CFR Part 230), allowing the discharge of dredged or fill material for non-water dependent uses into special aquatic sites only if there is no practicable alternative that would have less adverse impacts.

2.4.2 State Requirements

2.4.2.1 Waters of the State

Any action requiring a CWA Section 404 permit, or a Rivers and Harbors Act Section 10 permit, must also obtain a CWA Section 401 Water Quality Certification. The State of California Water Quality Certification (WQC) Program was formally initiated by the SWRCB in 1990 under the requirements stipulated by Section 401 of the Federal CWA. Although the Clean Water Act is a Federal law, Section 401 of the CWA recognizes that states have the primary authority and responsibility for setting water quality standards. In California, under Section 401, the State and Regional Water Boards are the authorities that certify that issuance of a federal license or permit does not violate California's water quality standards (i.e., that they do not violate Porter-Cologne and the Water Code). The WQC Program currently issues the WQC for discharges requiring USACE permits for fill and dredge discharges within Waters of the United States, and now also implements the State's wetland protection and hydromodification regulation program under the Porter Cologne Water Quality Control Act.

On April 2, 2019, the SWRCB adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: (1) a wetland definition; (2) a framework for

determining if a feature that meets the wetland definition is a water of the state; (3) wetland delineation procedures; and (4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Office of Administrative Law approved the Procedures on August 28, 2019, and the Procedures become effective May 28, 2020. The SWRCB circulated final implementation Guidance on the Procedures in April 2020.

Under the Procedures and the State Water Code (Water Code §13050(e)), "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." Unless excluded by the Procedures, any activity that could result in discharge of dredged or fill material to Waters of the State, which includes Waters of the U.S. and non-federal Waters of the State, requires filing of an application under the Procedures.

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act, Water Code Section 13000 et seq.) is California's statutory authority for the protection of water quality in conjunction with the federal CWA. The Porter-Cologne Act requires the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires dischargers of pollutants or dredged or fill material to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, NPDES permits, Section 401 water quality certifications, or other approvals. Projects that do not require a federal permit may still require review and approval by the RWQCB. The RWQCB focuses on ensuring that projects do not adversely affect the "beneficial uses" associated with waters of the State. In most cases, the RWQCB requires the integration of water quality control measures into projects that will require discharge into waters of the State. For most construction projects, the RWQCB requires the use of construction and post-construction best management practices.

2.4.2.2 California Fish and Game Code Section 1602 – Lake and Streambed Alteration Program

Diversions or obstructions of the natural flow of, or substantial changes or use of material from the bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFW, pursuant to Section 1602 of the California Fish and Game Code. The CDFW requires notification prior to commencement of any such activities, and a Streambed Alteration Agreement (SAA) pursuant to Fish and Game Code Sections 1601-1603, if the activity may substantially adversely affect an existing fish and wildlife resource.

3.0 METHODS

Studies conducted in preparation of this BTR included a desktop evaluation and background research to identify sensitive biological communities and/or special-status species with the potential to occur on or near the project site, as well as biological field surveys to document baseline conditions and special-status species and/or their habitats on and adjacent to the site. These included biological reconnaissance surveys, wetland assessments, a habitat assessment and two full seasons of protocol surveys for California red-legged frog (*Rana draytonii*) (CRLF), a habitat assessment for California tiger salamander (*Ambystoma californiense*) (CTS), protocol surveys for burrowing owl (*Athene cunicularia*), and focused botanical surveys. Methods are presented in the following sections.

3.1 DATABASE AND LITERATURE REVIEW

The most current available lists of special-status species known to occur and/or having the potential to occur in the project region were reviewed to determine their potential to occur on the project site or otherwise be affected by project-related activities on the project site.

For the purposes of this analysis, special-status species are defined as those species meeting one or more of the following criteria:

- Listed as Threatened or Endangered under FESA;
- Listed as Threatened or Endangered under CESA;
- Under review for listing under FESA or CESA (Candidate);
- "Fully Protected" under California Fish and Game Code Section 3511, 4700, 5050, or 5515;
- Included on the list of Species of Special Concern (SSC) by the CDFW;
- Included on the Watch List of species that may qualify as SSC by the CDFW;
- Having a California Rare Plant Rank (CRPR) of 1A (presumed extinct in California and rare elsewhere), 1B (rare in California and elsewhere), 2A (presumed extinct in California but more common elsewhere), 2B (rare in California but more common elsewhere), or 3 (more information needed); or
- Included on the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties with a Rank of "A."

The following lists were reviewed and are included in Appendix B:

- The Sacramento Fish and Wildlife Office list of threatened and endangered species that may occur in the project site and/or may be affected by the project (USFWS 2020a).
- The CNPS list of special-status plants documented in the *Tassajara* and *Livermore* 7.5-minute quads (CNPS 2020).
- East Bay Chapter of the CNPS database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties occurring within the Morgan Territory (Dmg) area (Lake 2020).
- The California Natural Diversity Database (CNDDB; CDFW 2020 list of special-status species documented in the *Tassajara* and *Livermore* 7.5-minute quads.

Table C-1 in Appendix C presents the general habitat requirements, status, the potential for the species to occur, and rationale for each species evaluated. Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties that are not otherwise included on the CNPS statewide list, USFWS list, or the CNDDB (considered locally rare plants) are not evaluated in detail in Table C-1 in Appendix C due to the high volume of species reported in the database. However, each of these locally rare plant species was evaluated for the potential to occur in the project site based on elevation and habitat requirements and

species with the potential to occur in habitats present on the project site and similar elevations to the project site are documented in Table C-2 in Appendix C. Species determined to have no potential to occur in the project site or be otherwise affected by activities in the site were excluded from further evaluation. Species having the potential to occur in the project site and/or be affected by project activities are evaluated in detail in Section 5 of this BTR.

The USFWS National Wetlands Inventory (USFWS 2020) was reviewed to determine the presence of wetlands and water features in the project area.

3.1.1 Biological Surveys

Numerous biological surveys have been conducted by HELIX and staff from Surf to Snow (previously Californian Environmental Services) over the last 2.5 years. Biological surveys conducted at the project site are summarized in Table 1; Dr. Gretchen Padgett-Flohr and Jennifer Gonterman are with Surf to Snow and the remaining biologists are with HELIX. A list of plant and animal species observed during the general biological surveys (not including protocol surveys) is included in Appendix D. Biological surveys are described briefly below and protocol survey reports are included as appendices to this BTR. Protocol survey reports include lists of species observed during species-specific surveys.

Table 1
BIOLOGICAL SURVEYS CONDUCTED FOR THE PROPOSED PROJECT

Survey Dates	Personnel	Tasks Performed
December 6, 2017	Stephen Stringer, M.S.	Biological reconnaissance survey; CRLF and CTS habitat assessment
January 30, 2018	Gretchen Padgett-Flohr, Ph.D., Stephen Stringer, M.S. and Jennifer Gonterman	CRLF protocol survey (daytime)
January 31, 2018	Stephen Stringer, M.S.	CRLF protocol survey (daytime)
January 31, 2018	Stephen Stringer, M.S. and Jennifer Gonterman	CRLF protocol survey (nighttime)
March 15, 2018	Stephen Stringer, M.S. and Jennifer Gonterman	CRLF protocol survey (nighttime); botanical survey
March 29, 2018	Stephen Stringer, M.S. and Jennifer Gonterman	Botanical survey; CRLF protocol survey (nighttime)
April 23, 2018	Stephen Stringer, M.S. and Jennifer Gonterman	Botanical survey; CRLF protocol survey (nighttime)
May 3, 2018	Stephen Stringer, M.S. and Jennifer Gonterman	Botanical survey; CRLF protocol survey (nighttime)
July 31, 2018	George Aldridge, Ph.D. Patrick Martin	CRLF daytime and nighttime protocol survey; reconnaissance biological survey; wetland assessment; botanical survey
August 1, 2018	George Aldridge, Ph.D. Patrick Martin	Reconnaissance biological survey; wetland assessment; botanical survey
February 6, 2020	George Aldridge, Ph.D. Stephanie McLaughlin, M.S.	Burrowing owl habitat assessment
February 6, 2020	Patrick Martin Haile Goeman	CRLF protocol survey (daytime); wetland assessment
February 25, 2020	Patrick Martin Stephanie McLaughlin, M.S.	Burrowing owl survey
February 26, 2020	Patrick Martin Stephanie McLaughlin, M.S.	Burrowing owl survey
March 9, 2020	Patrick Martin Stephanie McLaughlin, M.S.	CRLF protocol survey (daytime and nighttime)
March 17, 2020	Patrick Martin Haile Goeman	CRLF protocol survey 4 (nighttime)
April 6, 2020	Patrick Martin Haile Goeman	CRLF protocol survey (nighttime)
April 22/23, 2020	Stephanie McLaughlin, M.S. Haile Goeman	Burrowing owl survey
April 28, 2020	Patrick Martin	CRLF protocol survey (nighttime)
May 21/22, 2020	Patrick Martin Stephanie McLaughlin, M.S.	Burrowing owl survey
June 17/18, 2020	Patrick Martin	Burrowing owl survey
June 18, 2020	Stephen Stringer	Botanical survey; general biological reconnaissance survey
July 14, 2020	Patrick Martin	CRLF protocol survey (daytime and nighttime)

3.1.2 General Biological Reconnaissance

Biological reconnaissance surveys were conducted at the project site by HELIX Principal Biologist Stephen Stringer, M.S., HELIX Senior Botanist/Biologist George Aldridge, Ph.D., and HELIX Senior Wildlife Biologist Patrick Martin. Mr. Stringer conducted biological reconnaissance surveys on December 6, 2017 and June 18, 2020. Dr. Aldridge and Patrick Martin conducted biological reconnaissance surveys of the project site on July 31 and August 1, 2018. Biological reconnaissance surveys included habitat mapping and a plant and wildlife inventories. Boundaries of biological habitats were primarily determined based on the composition of dominant plant species. Transects were walked of the entire site to gain 100 percent visual site coverage. Habitat types were documented and animal species (and sign) observed on site were documented. The biological reconnaissance surveys included searching for mammal burrows and dens of fossorial animals. Representative photos of the site are provided in Appendix E.

3.1.3 Botanical Surveys

HELIX Principal Biologist Stephen Stringer, M.S. conducted botanical surveys on the site on March 15, and 29, April 23, and May 3, 2018. HELIX Senior Botanist/Biologist George Aldridge, Ph.D. conducted botanical surveys of the project site on July 31 and August 1, 2018. An additional botanical survey was conducted by Mr. Stringer on June 18, 2020. Botanical inventories were conducted in compliance with the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFW 2000), and CNPS' botanical survey guidelines (CNPS 2001). Transects were walked of the entire site to gain 100 percent visual site coverage and then surveys were focused in areas that provided potential habitat for special-status plants. Habitat types were documented, and plant species observed on site were documented.

3.1.4 California Red-Legged Frog Habitat Assessment and Protocol Surveys

A habitat assessment and two full seasons of protocol surveys for CRLF were conducted (see Table 1). The report detailing these surveys is included as Appendix F. The methods used for this CRLF site assessment and protocol surveys were derived from the USFWS *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005). The site assessment included a review of available resources to provide an overview of the upland and aquatic habitats present within the project site and surrounding vicinity. The CDFW California Natural Diversity Database (CDFW 2020 and the *Recovery Plan for the California Red-legged Frog* (*Rana aurora draytonii*; USFWS 2002) were reviewed for information regarding known existing and historic populations of CRLF in the project region.

The habitat assessment for CRLF was conducted by HELIX Principal Biologist Stephen Stringer, M.S. on December 6, 2017 and focused on aquatic habitats along ephemeral and intermittent streams. Three criteria were used to assess the likelihood of CRLF presence in or within the vicinity of the project site: (1) the location of the project site with respect to the current and historic range of CRLF, (2) the presence/absence of known records of CRLF within a one-mile radius of the project site, and (3) the habitat types occurring within the project site and within a one-mile radius.

All aquatic habitats on the project site were identified and assessed for the potential to support CRLF. Habitats were determined to meet the criteria for suitable CRLF breeding habitat if they met the criteria for aquatic habitat in the literature (USFWS 2002 and 2005). Such habitats include low-gradient

freshwater bodies, including ponds, marshes, sag ponds, dune ponds, stock ponds, lagoons, seeps, springs, and backwaters within streams and creeks with still or slow moving fresh water deeper than 2.3 feet (0.7 meter) with dense, shrubby emergent or overhanging vegetation that provides egg deposition sites and cover for adult frogs and that persists for a minimum of 20 weeks following the breeding season (November through April).

Two full seasons of protocol surveys for CRLF were conducted in all suitable aquatic habitats on the site; once in 2018 and again in 2020. Protocol surveys in 2018 were conducted from January 30 to July 31, 2018 and protocol surveys in 2020 were conducted from February 6, 2020 to July 14, 2020. A total of eight surveys were conducted for CRLF at the project site during winter, spring and summer of 2018 and an additional eight surveys were conducted during the winter, spring and summer of 2020. The CRLF protocol surveys were conducted by HELIX Principal Biologist Stephen Stringer, M.S., HELIX Senior Botanist/Biologist George Aldridge, Ph.D., HELIX Senior Wildlife Biologist Patrick Martin (CRLF permitted biologist TE-778195-14), HELIX Biologist Stephanie McLaughlin, M.S., and HELIX Biologist Halie Goeman in addition to CRLF permitted biologists from Surf to Snow, Gretchen Padgett-Flohr, Ph.D., and Jennifer Gonterman (TE-006112-7), as detailed in Table 1. All suitable aquatic habitat identified during the site assessment as having the potential to support CRLF was surveyed during each survey event.

3.1.5 California Tiger Salamander Habitat Assessment

A habitat assessment for CTS was conducted concurrently with the habitat assessment for CRLF on December 6, 2017 and focused on a search for any potential breeding habitat for CTS on or adjacent to the site. Because there are no wetlands outside of drainages on or adjacent to the site, the habitat assessment focused on aquatic habitats along ephemeral and intermittent streams.

3.1.6 Burrowing Owl Protocol Surveys

A habitat assessment and protocol surveys for burrowing owl were conducted in 2020. A habitat assessment of the site was conducted on February 6, 2020 and the site was determined to provide suitable breeding and foraging habitat for burrowing owl. Breeding season burrowing owl surveys were then conducted according to the guidelines prepared by CDFW in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The Property was surveyed a total of four times during the burrowing owl breeding season (Table 1) by HELIX biologists with extensive experience at burrowing owl surveys. The burrowing owl protocol survey report is included as Appendix G.

3.2 ASSESSMENT OF WETLANDS AND OTHER WATERS

An assessment of potential wetlands and other waters of the U.S. and State on the project site was conducted on July 31 and August 1, 2018 by Dr. Aldridge and Patrick Martin. On February 6, 2020 an additional assessment of potential wetlands and other waters of the U.S. was completed by Mr. Martin and HELIX biologist Halie Goeman. The presence of wetlands and other waters were determined based on the USACE three parameter method described in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0*; USACE 2008). A total of 10 data points were taken in the project site. Aquatic resources in the project site were also evaluated for their potential to qualify as waters of the State subject to RWQCB jurisdiction and/or CDFW jurisdiction. A map of aquatic resources and data point locations in the project site are mapped in Appendix A: Figure 5 and the wetland datasheets are provided in Appendix H.

3.3 INVASIVE SPECIES

Plant species observed in the project site were compared to the list of invasive plants in California maintained by the California Invasive Plant Council (Cal-IPC; 2006) and the list of noxious weeds maintained by the CDFA (2010). Several invasive and noxious weed species listed by Cal-IPC and CDFA occur in the project site, as would be expected due its highly disturbed nature. Invasive and noxious weeds are identified on the plant species observed list in Appendix D and discussed further in Section 4.6.3.

CDFA List "C" species warrant state-endorsed holding action and eradication only when found in a nursery; actions to retard spread outside of nurseries is conducted at the discretion of the commissioner; and warrant rejection only when found in a crop seed for planting or at the discretion of the commissioner. In addition, the Cal-IPC categorizes plants as "high, moderate, or limited," reflecting the level of each species' negative ecological impact in California. Each plant on the list received an overall rating of high, moderate, or limited based on the following evaluation criteria:

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

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

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

4.0 RESULTS: ENVIRONMENTAL SETTING

4.1 EXISTING LAND USE

The project site lies in a rural area of northern Alameda County and is surrounded primarily by undeveloped land supporting grazing, agricultural and rural residential uses. Los Vaqueros Reservoir lies 3 miles north and the city limits of Livermore and I-580 lie approximately 2.5 miles south of the project site. Other communities in the area include the community of Tassajara located an estimated 5 miles west of the project site and the City of Dublin, located southwest of the project site.

The project site is currently in use for cattle grazing and production of dryland grain crops. Dryland grain crop occurs in the northern parcel north of Manning Road and in the two southern parcels. The central parcel south of Manning Road is used for cattle grazing and exhibits evidence of prior agricultural use (e.g., disking/furrowing), likely production of feed for cattle such as hay crops. One or more travel trailers occupied by the caretaker(s) are typically present in the northern portion of the central parcel,

accessed from a driveway from Manning Road. A review of aerial photographs (Google Earth 2020) and landowner interviews indicates that the project site has been in use for cattle grazing and production of dryland grain crops for nearly one hundred years.

4.2 CLIMATE

The climate of Alameda County is Mediterranean, characterized by wet, cool winters and dry, hot summers. The nearest weather station is the Livermore Municipal Airport, located approximately 3.8 miles southwest of the project site in Alameda County. Mean daily maximum and minimum temperatures are 88 degrees and 57 degrees Fahrenheit in July, and 58 and 38 degrees Fahrenheit in January (NRCS 2020a). The mean annual precipitation is 14.0 inches, with nearly 100 percent occurring as rain from September through May. The weather station at the Livermore Municipal Airport received 11.3 inches of rainfall in the 2019/2020 rain season from (October to September) or about 81 percent of normal (NRCS 2020a). During the 2018/2019 rain year, the weather station received 13.7 inches of precipitation, which is nearly average. In the 2017/2018 rain year, the nearby weather station received 25.6 inches of precipitation, which is approximately 183 percent of normal (NRCS 2020a).

4.3 TOPOGRAPHY

Alameda County is in central California and spans the Coastal Mountain Range. The County's boundaries are the San Francisco Bay on the west and Contra Costa County on the north, Santa Clara County to the south and San Joaquin County to the east. The eastern part of Alameda County in Livermore Valley is characterized by rolling foothills and annual grasslands. The project site is in a valley and is surrounded by peaks of the Coastal Mountains reaching a height of approximately 2,000 feet.

4.4 SOILS

Soils in the project site are loamy to clay in five soil mapping units (NRCS 2020b) and a soil map is provided in (Appendix A: Figure 6):

Clear Lake clay loam, drained, 0 to 2 percent slopes, MLRA 14 is a poorly drained basin alluvium derived from igneous, metamorphic and sedimentary rock. Clear lake clay loam has a depth of greater than 80 inches to the restrictive layer and a depth of 36 to 72 inches to the water table. This soil is considered prime farmland if it is irrigated. Clear Lake clay loam is rated as a hydric soil (NRCS 2018c).

Diablo clay, very deep, 3 to 15 percent slopes is a well-drained alluvium derived shale and siltstone. Diablo clay has a depth of greater than 80 inches to the water table and the restrictive layer. This soil is considered prime farmland of statewide importance. Diablo clay is rated as a hydric soil because of hydric inclusions (NRCS 2018c).

Linne clay loam, 3 to 15 percent slopes is a well-drained residuum and is derived from shale and sandstone. Linne clay loam has a depth of greater than 80 inches to the water table and is described as having a paralithic bedrock restrictive layer at depths of 20–40 inches. This soil is nonsaline to very slightly saline and is considered farmland of statewide importance. Linne clay loam is rated as a hydric soil because of hydric inclusions (NRCS 2018c).

Linne clay loam, 15 to 30 percent slopes, MRLA 15 is a well-drained residuum and is derived from calcareous shale. Linne clay loam has a depth of greater than 80 inches to the water table and is

described as having a paralithic bedrock restrictive layer at depths of 35 to 50 inches. This soil is not considered prime farmland. Linne clay loam is rated as a hydric soil because of hydric inclusions (NRCS 2018c).

Linne clay loam, 30 to 45 percent slopes, eroded is a somewhat poorly drained alluvium derived from sedimentary rock. Solano loam has a depth of 36 to 48 inches to the water table and a depth of greater than 80 inches to the restrictive layer. This soil is strongly saline and is not considered prime farmland. Linne clay loam is rated as a hydric soil (NRCS 2018c).

4.5 HYDROLOGY

The project site spans the Lower Arroyo Las Positas watershed (HUC12 180500040302) and the Upper Arroyo Las Positas watershed (HUC12 180500040203). Both watersheds are a part of the San Francisco Bay watershed (HUC8 18050004). Cayetano Creek is a natural stream that has been manipulated and impounded upstream and downstream of the project site, which has altered its flow regime. There are three branches of Cayetano Creek that occur adjacent to the project site; both minor branches only flow very infrequently during heavy precipitation events. Cayetano Creek ultimately drains to Alameda Creek and the San Francisco Bay.

The project site is not irrigated and consists almost entirely of annual grassland or dry cropland, which consists mostly of annual grasses. This site has been cultivated to grow hay and/or graze cattle for nearly a century. Water that may collect in depressional upland areas is from precipitation, which ultimately drains to Cayetano Creek adjacent to the site. One unnamed ephemeral stream on the property north of Manning Road transitions to an upland swale, and water terminates in uplands. There are no natural or manmade water conveyance features that direct flows to or from the site; flows entering or leaving the site would be limited to sheet flow or other forms of overland flow.

4.6 GENERAL BIOLOGICAL RESOURCES

4.6.1 Vegetation Communities/Land Cover Types within the Project Site

Five vegetation communities/land cover types are present in the project site: developed, annual grassland, dryland grain crop, upland swale, and ephemeral stream (Appendix A: Figure 5).

4.6.1.1 Developed

Developed areas, which comprise 2.82 acres in the project site, consist of areas that are graveled or supported buildings with associated ornamental vegetation. There are two areas in the project site that are classified as developed. The first developed area, at 1815 Manning Road and about 400 feet from Manning Road, is a former and abandoned homestead that is presently used by the property caretaker using one or more travel trailers, in the northern portion of the central parcel with trees that include black locust (*Robinia pseudoacacia*) and Peruvian pepper trees (*Schinus molle*). The other developed area is in the southeastern corner of the central parcel and is a graveled staging area with equipment being used for a gas line installation through the region. These isolated areas are heavily disturbed and consist mostly of bare ground or landscaped vegetation. Landscaped vegetation may provide habitat for wildlife such as nesting birds.

4.6.1.2 Annual Grassland

Annual grassland, which totals 267.77 acres in the project site, comprises the majority of the land cover in the central parcel and includes primarily grazed fields and field margins. Agricultural operations observed within the annual grassland in the central project consist of cattle grazing with cattle actively grazing the project site during many of the surveys. This annual grassland community appears to have been functioning for agricultural use for nearly a century based on historical aerial imagery (Google Earth 2020). Most of the annual grassland in the project site is dominated by wild oats (*Avena fatua*), soft brome (*Bromus hordeaceus*), yellow star-thistle (*Centaurea solstitialis*) and ripgut brome (*Bromus diandrus*). Other portions of the annual grassland community are dominated by a mix of Italian rye grass (*Festuca perennis*), black mustard (*Brassica nigra*), medusahead (*Elymus caput-medusae*) and soft brome. The annual grassland seems to lack a significant population of fossorial mammal species as evidenced by very few California ground squirrels (*Otospermophilus beecheyi*) observed during the survey. Burrowing mammals were detected in the annual grassland but were very rare compared to areas adjacent to the project site along Cayetano Creek and the dryland grain cropland in the northern parcel north of Manning Road.

4.6.1.3 Dryland Grain Crop

Dryland grain crop, which comprises 138.76 acres in the project site, occupies most of the northern parcel on the project site, north of Manning Road and the two southern parcels. This habitat is dominated by oats and other annual grasses and is harvested for hay production. During the survey on August 1, 2018, the cropland in the northern parcel was harvested, and hay bales were stacked on the project site. On February 6, 25 and 26, 2020 the southern parcels on the project site were tilled and planted with oats or some other dryland grain crop. The dryland grain crop is not irrigated and functions in a similar fashion to annual grasslands in the central parcel and provides habitat for fossorial wildlife such as California ground squirrel, which were abundant during the survey. This cropland appears to have been functioning for agricultural use for nearly a century based on historical aerial imagery (Google Earth 2020). This vegetation community is dominated by oats but also contains weedy non-crop species such as soft brome, Italian rye grass, pineapple weed (*Matricaria discoidea*), and other annual grasses and forbs.

4.6.1.4 Upland Swale

An upland swale is a low area on the landscape that appears to briefly channel water during periods of precipitation. Uplands swales support vegetation that is consistent with upland areas such as annual grassland and dryland grain cropland in the project site (as discussed in Section 4.6.1.2 and 4.6.1.3), although more hydrophytes were observed in this area than the surrounding communities. One upland swale is present on the northern parcel and comprises 0.39 acre in the project site. Vegetation in this community is dominated by wild oat and Italian ryegrass, but also supports burclover (*Medicago polymorpha*), yellow star-thistle and pineapple weed.

4.6.1.5 Ephemeral Stream

An ephemeral stream is characterized as a feature with a bed and a bank that channels water from uplands and typically only flows during periods of precipitation. Ephemeral streams have a brief hydroperiod which is not supported by groundwater, and flow in the streams stops after precipitation events have ceased or shortly thereafter. Ephemeral streams typically do not support wetlands due to

their brief hydroperiods, although they typically have an incised bank. In the project site, there is one ephemeral stream totaling 0.08 acre that crosses the northwest corner of the northern parcel (north of Manning Road), which transitions into an upland swale as it re-enters the site. This ephemeral stream terminates in uplands and is not a tributary to any other streams. The ephemeral stream in the project site supports vegetation consistent with vegetation described in the annual grassland (Section 4.6.1.2) and is dominated by weedy non-crop species such as soft brome, Italian rye grass, yellow star-thistle, dove weed, and other annual grasses and forbs.

4.6.2 Vegetation Communities/Land Cover Types Adjacent to the Project Site

4.6.2.1 Intermittent Stream (Cayetano Creek and its Tributaries)

Cayetano Creek lies on APN 903-0006-001-02 just beyond the western boundary of the project site and generally parallels the western project site boundary. Three ephemeral tributaries to Cayetano Creek also occur on APN 903-0006-001-02 and empty into Cayetano Creek adjacent to the western boundary of the site. The project site was designed to avoid impacts to Cayetano Creek and its tributaries, splitting the central parcel into four disjunct segments. Because these drainages are adjacent to the project site, they are discussed below.

The segment of Cayetano Creek adjacent to the site flows intermittently. Cayetano Creek was observed flowing during the biological surveys conducted during winter and spring. Groundwater supports some of the flow characteristics of Cayetano Creek, with water persisting after rain events. Sections of Cayetano Creek adjacent to the project site support wetlands in the stream channel that consist of broad-leaved cattail (*Typha latifolia*), California bulrush (*Schoenoplectus californicus*), tall flatsedge (*Cyperus eragrostis*), saltgrass (*Distichlis spicata*), and common spikerush (*Eleocharis macrostachya*). Most of Cayetano Creek adjacent to the project site does not support wetland vegetation, with most of the vegetation consistent with vegetation in the annual grassland vegetation community (Section 4.6.1.2). Adjacent to the project site, Cayetano Creek does not appear to be altered, rerouted or otherwise heavily disturbed by agricultural practices. Water impoundments or diversions upstream may decrease the amount of water available in the stream, although impoundments upstream are few and small. Cattle trails are present in the stream and along its banks, and this stream does experience heavy grazing from cattle in most years. The banks of this stream are steeply incised with a narrow stream channel. The tributaries to Cayetano Creek adjacent to the project site are ephemeral and appear to only flow for a short duration during and immediately after significant storm events. These tributaries support vegetation consistent with vegetation described in the annual grassland (Section 4.6.1.2) and are dominated by weedy non-crop species such as soft brome, Italian rye grass, yellow star-thistle, dove weed, and other annual grasses and forbs.

4.6.3 Invasive Species

A total of 16 non-native species included on CDFA's category C list and/or having a rating of "high" or "moderate" on the Cal-IPC list were identified on the project site (Appendix D). There are no species both rated as "high" for invasiveness and listed in category C, on the project site. Several species rated as "high" on the Cal-IPC list are present on the site including fennel (*Foeniculum vulgare*), yellow star-thistle (*Centaurea solstitialis*), perennial pepperweed (*Lepidium latifolium*), and medusa head (*Elymus caput-medusae*). Other more widespread invasive species, such as wild oats, ripgut brome and hare barley (*Hordeum murinum*), are rated "moderate" for invasiveness and not listed in category C. All of

these species would be expected to occur on site as they are fairly common in the area on agricultural parcels and disturbed areas.

4.6.4 Wildlife

The annual grassland and dryland grain crop fields, which comprise the vast majority of the site, provide relatively poor habitat for non-volant terrestrial wildlife due to human presence and agriculture uses including disking of the soil, planting and harvesting in the dryland grain crop fields and trampling and denuding of the vegetation by cattle. In general, resident wildlife on the site are limited to relatively common and disturbance-tolerant species such as California ground squirrel, Botta's pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), Audubon's cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), western fence lizard (*Sceloporus occidentalis*), and pacific gophersnake (*Pituophis catenifer catenifer*). A variety of resident birds were also observed on the site typical of agricultural habitats including black phoebe (*Sayornis nigricans*), American robin (*Turdus migratorius*), house sparrow (*Passer domesticus*), northern mockingbird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*), red-wing blackbird (*Agelaius phoeniceus*), loggerhead shrike (*Lanius ludovicianus*), and savanna sparrow (*Passerculus sandwichensis*).

The banks of Cayetano Creek adjacent to the site support some fossorial (burrowing) mammals such as California ground squirrel and Botta's pocket gopher, which provide forage for other fossorial predators such as long-tailed weasel (*Mustela frenata*) and American badger (*Taxidea taxus*). Most fossorial mammals on the project site were observed in the northern parcel, north of Manning Road. Areas outside of the project boundary on surrounding grazed hillslopes primarily east, west and north of the project site currently support higher numbers of fossorial mammals as observed during numerous biological surveys. Coyotes have also been detected hunting and pursuing California ground squirrel outside of the project boundary and are likely raiding the chicken farm adjacent to the project site as evidenced by depredated chickens along the project boundary. Small patches of seasonal freshwater emergent wetland vegetation in Cayetano Creek adjacent to the site provide habitat for amphibians such as Sierran treefrog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*). Mule deer (*Odocoileus hemionus*) have also been observed adjacent to the project site moving along Cayetano Creek.

The annual grassland and dryland grain crop habitats in the project site do provide foraging habitat for raptors such as red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), golden eagle (*Aquila chrysaetos*), and barn owl (*Tyto alba*); although in general, higher quality foraging habitat is present in grasslands in the hills north, east and west of the site because the height of the vegetation as observed during biological surveys was generally much shorter in the surrounding grasslands than the grassland on site making prey more accessible. Foraging habitat is also present in the dryland grain crop for special-status non-raptor species such as tri-colored blackbird (*Agelaius tricolor*) and a variety of common bat species that could roost in trees or structures surrounding the site. Trees and shrubs on and adjacent to the project site also provide nesting habitat for raptors and other birds. Tree cavities in valley oak trees along Cayetano Creek adjacent to the site likely support a variety of cavity nesting birds such as American kestrel (*Falco sparverius*) and oak titmouse (*Baeolophus inornatus*). The majority of the raptors and other special-status birds that have potential foraging habitat on the site do not have suitable nesting habitat on the site and would not be expected to take up residence on the site. For these species, the site represents occasional foraging opportunities. Potential habitat on the site for special-status species, including foraging habitat for raptors, other special-status birds, and bats is discussed in detail in Sections 5.2, 5.3, and 5.4.

4.7 SPECIAL-STATUS SPECIES

Based on species ranges and habitat affinities, a total of 15 regionally occurring special-status species (Table 2) are either known to occur or have the potential to occur in the project site (this analysis is described in Section 3.1). Special-status species observed onsite include long-eared owl (*Asio otus*), golden eagle, white-tailed kite, Swainson's hawk, northern harrier, Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), and loggerhead shrike; however, no nesting locations of special-status species were observed on the project site. Red-tailed hawk was observed building a nest on February 26, 2020 in a valley oak tree west of Cayetano Creek outside the project site and one barn owl (*Tyto alba*) was observed in an oak tree cavity and was also likely nesting along the creek adjacent to the site. No other special-status plant or wildlife species were observed on the project site. Burrowing owl was observed adjacent to the northern parcel north of Manning Road, outside of the project site. Special-status species with the potential to occur on the project site are discussed in detail in Section 5.

Table 2
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROJECT SITE

Scientific Name Common Name	Regulatory Status[1]	Status in the Project Site[2]	Suitable Habitat in the Project Site
Amphibians			
Ambystoma californiense California tiger salamander	FT/ST/--	Habitat present (dispersal and upland refugia)	There is no suitable breeding habitat on the project site. Cayetano Creek and other ephemeral streams do not provide breeding habitat for this species. Suitable ponds near the project site provide habitat and known records of breeding California tiger salamander. California tiger salamander could occur moving through the project site and use Cayetano Creek and other ephemeral streams as aquatic non-breeding habitat during periods of dispersal.
Rana draytonii California red-legged frog	FT/--/SSC	Habitat present (dispersal and upland refugia)	There is no suitable breeding habitat on the project site. Cayetano Creek or other ephemeral streams do not provide breeding habitat for this species. Suitable ponds near the project site provide habitat and known records of breeding CRLF. CRLF could occur moving through the project site and use Cayetano Creek and other ephemeral streams as aquatic non-breeding habitat during periods of dispersal.
Birds			
Accipiter cooperi Cooper's hawk	--/--/WL	Present (foraging)	The project site provides suitable foraging habitat for Cooper's hawk, but nesting habitat is absent from the site. Cooper's hawk was observed foraging over the site during biological surveys. This species is discussed under *Foraging Habitat for Special-Status Birds*.

Table 2 (cont.)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROJECT SITE

Scientific Name Common Name	Regulatory Status[1]	Status in the Project Site[2]	Suitable Habitat in the Project Site
Agelaius tricolor Tricolored blackbird	--/SC/--	Habitat present (foraging)	The project site and adjacent areas lack suitable breeding habitat for tricolored blackbird, but potential foraging habitat is present. Tricolored blackbird was not observed on the site during numerous biological surveys. This species is discussed under *Foraging Habitat for Special-Status Birds*.
Ammodramus savannarum Grasshopper sparrow	--/--/SSC	Habitat present (nesting and foraging)	The project site consists of open habitat with non-native annual grasses and forbs that could provide nesting habitat for this species.
Asio otus Long-eared owl	--/--/SSC	Present (foraging)	Long-eared owl was detected during night surveys in Cayetano Creek. This species could use trees adjacent to the project site for nesting. There are no CNDDB records for this species in Alameda County. This owl was observed foraging in the creek and perching on annual vegetation on the top of the bank.
Athene cunicularia Burrowing owl	--/--/SSC	Habitat present (nesting and foraging)	The project site provides foraging habitat and potential nesting/wintering habitat for burrowing owl. Mammal burrows are abundant north of Manning Road, and burrowing owl pellets and feathers have been observed along the fence line of the northern project boundary and along Cayetano Creek. On June 17, 2020 two juvenile burrowing owls were observed at a burrow just east of the project site and appear to be recently fledged owls.
Aquila chrysaetos Golden eagle	--/--/FP	Present (foraging)	Golden eagles were routinely observed foraging over the project site during surveys in 2018 and 2020. Annual grassland and dryland grain crop with small mammal prey provide suitable foraging habitat. There are no suitable nest trees on the project site and no potential nests have been observed on the site.
Buteo regalis Ferruginous hawk	--/--/WL	Present (foraging)	The project site provides suitable foraging habitat for ferruginous hawk, but this species does not nest in California. Ferruginous hawk was observed foraging over the site during biological surveys. This species is discussed under *Foraging Habitat for Special-Status Birds*.

Table 2 (cont.)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROJECT SITE

Scientific Name Common Name	Regulatory Status[1]	Status in the Project Site[2]	Suitable Habitat in the Project Site
Buteo swainsoni Swainson's hawk	--/ST/--	Present (foraging)	The project site is outside of the nesting range of Swainson's hawk but provides some foraging opportunities. Swainson's hawk was observed foraging on the project site. This species is discussed under *Foraging Habitat for Special-Status Birds*.
Circus cyaneus Northern harrier	--/--/SSC	Present (foraging); Habitat present (nesting)	Nesting habitat for northern harrier is present in the project site in annual grasslands and along Cayetano Creek. Fields provide suitable foraging habitat. Both a male and female were observed on site during surveys in February and March 2020.
Elanus leucurus White-tailed kite	--/--/FP	Present (foraging)	Habitat is present for this species since potential nesting trees are adjacent to the project site, which is surrounding by annual grassland. Trees that could provide nesting habitat for this species are abundant near the project site and this species is likely to occur foraging over the project site in annual grasslands. White-tailed kite was observed on site during surveys in 2020. There is one record of this species nesting within a 5-mile radius of the project site.
Lanius ludovicianus Loggerhead shrike	--/--/SSC	Present (nesting and foraging)	Open habitat with perching sites along fences and some shrubs and small trees provides suitable nesting and foraging habitat for this species. This species was observed foraging in the project site during most surveys. On June 17, 2020 a pair of loggerhead shrikes were observed passing through the site and feeding recently fledged young.
Mammals			
Taxidea taxus American badger	--/--/SSC	Habitat present (denning and foraging)	The site has potential habitat since fossorial prey is present in the project site north of Manning Road but scarce south of Manning Road. The surrounding grazed hills provide good habitat since there is a healthy population of California ground squirrel in the area outside of the project boundary. The nearest CNDDB record is located approximately 4.5 miles west from the project site, which documents a mother badger with young (CDFW 2020). Badger burrows or badger excavations were not observed on the project site.

Table 2 (cont.)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROJECT SITE

Scientific Name Common Name	Regulatory Status[1]	Status in the Project Site[2]	Suitable Habitat in the Project Site
Vulpes macrotis mutica San Joaquin kit fox	FE/ST/--	Habitat present (dispersal and foraging)	Marginal denning habitat is present for this species since friable soils are absent. Fossorial prey is present in dryland grain crop vegetation community. However, potential kit fox burrows or excavations were not observed during surveys. The project site is at the northwestern extent of this species' known range. There are several CNDDB records for this species within a 5-mile radius of the project site, with the nearest located approximately 2.7 miles north of the project site. The record documents a natal den from 1989. Subsequent surveys using scent tracking dogs have not identified kit fox in Alameda County.

[1] Regulatory Status is FESA listing/CESA listing/Other state status. FE=Federal Endangered; FT = Federally Threatened; ST=State Threatened; FP=Fully Protected; SSC=Species of Special Concern; WL = Watch List.

[2] Status in the project site is based on results of studies discussed in Section 3.1.

5.0 RESULTS: EVALUATION OF POTENTIAL BIOLOGICAL RESOURCES IMPACTS

5.1 GUIDELINES FOR DETERMINING IMPACT SIGNIFICANCE

The following threshold criteria from the Alameda County CEQA Environmental Checklist Form were used to evaluate potential effects on biological resources. Based on these criteria, the project would have a significant effect on biological resources if it 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 CDFW or USFWS.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.

- 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.

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

5.2 POTENTIAL FOR IMPACTS TO SPECIAL-STATUS SPECIES

5.2.1 Special-status Plants

No special-status plants were determined to have the potential to occur on the site due to lack of habitat and the disturbed nature of the site. No special-status plants were observed on the site during focused botanical surveys conducted during the blooming season of target special-status plants. Therefore, special-status plants are presumed absent from the site. No impacts to special-status plants would occur as a result of the proposed project.

5.2.2 Special-status Amphibians

5.2.2.1 California Tiger Salamander

Federal status – Threatened
State status – Threatened

Species Description

The historic range of California tiger salamander (*Ambystoma californiense*) (CTS) was endemic to the San Joaquin-Sacramento River Valleys, bordering foothills and coastal valleys in what was considered a contiguous distribution (USFWS 2017). Currently, the population extends from Petaluma in Sonoma County (Sonoma DPS), east to the Colusa and Yolo County line, with an isolated population near Gray Lodge Wildlife area north of the Sutter Buttes, and south through the Central Valley to Santa Barbara County (Santa Barbara DPS) (Jennings and Hayes 1994). Today the species is known to occur in about 23 counties and is found primarily in low elevation grassland-oak woodland plant communities of Central California (USFWS 2017).

CTS occupies a distinct habitat of both aquatic and terrestrial components that consist of aquatic breeding and non-breeding areas embedded within a matrix of habitats used for dispersal, or refugia. Breeding aquatic habitat consists typically of ephemeral freshwater bodies, such as ponds, vernal pools, constructed ponds and other stock ponds. Permanent bodies of water are occasionally used for breeding, but permanent water bodies must be free of potential predators to eggs and larva, such as fish and American bullfrog (*Lithobates catesbeianus*). Non-breeding habitat is located in uplands away from ponds, typically in mammal burrows, where CTS will spend most of their life (USFWS 2017). A complex of upland habitat with burrowing mammals and breeding ponds are necessary habitat components required for this species to persist (USFWS 2017). During the onset of fall precipitation, CTS will emerge from their burrows and migrate to breeding habitat. Eggs are laid along the margins of ponds individually or in small clusters on vegetation or other debris (Jennings and Hayes 1994). The breeding season typically occurs from November through April (USFWS 2017) and is likely influenced by local precipitation and ambient temperature. Females typically lay eggs between December and early April. Larvae typically metamorphose in three to six months and juveniles begin to move out of the natal

pond in late spring or early summer, and rarely overwinter (USFWS 2017). When juveniles leave their natal ponds, they distribute into uplands in search of suitable underground refugia, which typically consists of mammal burrows excavated by California ground squirrel and Botta's pocket gopher (USFWS 2017). Very little is known of CTS behavior while underground. The project site is not located within federally designated critical habitat.

Survey History

No CTS were observed on or adjacent to the project site during any biological surveys, including two full seasons (16 surveys) of protocol surveys for CRLF, which were conducted by individuals with federal recovery permits for CTS (Stephen Stringer, Jennifer Gonterman, Patrick Martin). None of the streams in or adjacent to the project site, including Cayetano Creek and its tributaries adjacent to the central and southern parcels and the ephemeral drainage adjacent to the northern parcel, meet the habitat requirements for CTS breeding because they are too shallow (if they have water at all) and do not provide water of sufficient depth for a long enough duration to support larval development of CTS. CTS could potentially use these streams for dispersal between other more suitable habitats off-site.

There are 35 CNDDB records that document occurrences of CTS within 3.1 miles of the project site. Most of the CNDDB records are recent and document breeding ponds or vernal pool complexes situated in annual grasslands that also provide upland habitat. The closest reported occurrence (Occurrence No. 238) of CTS to the project site is located adjacent to the southeastern portion of the project site and east of North Livermore Avenue and represents an observation of several adults during protocol surveys which were conducted in 1997 (CDFW 2020). Dublin Ranch Conservation Area east of the project site also has several breeding ponds (CDFW 2020). There are several other records near the project site with potential breeding habitat visible on aerial imagery (Google Earth 2020).

Habitat Suitability

The project site does not provide suitable breeding habitat for CTS and is not being used by CTS for breeding based on the results of 16 protocol surveys for CRLF within aquatic habitats on and adjacent to the site over two wet seasons. The project site provides potential dispersal habitat for CTS since the project site is within the current range of CTS and there are several records documenting their presence within a one-mile radius of the project site. Potential dispersal by CTS could occur on or adjacent to the site, primarily within and adjacent to Cayetano Creek and its tributaries. However, no CTS were observed during protocol surveys for CRLF, several of which were conducted during light rain events to target amphibians moving through uplands. Upland refuge sites are scarce on the central parcel on the project site and are limited to cracks in the clay soil or in California ground squirrel burrows, which are primarily located in the northern parcel north of Manning Road. Ground squirrel burrows are more abundant adjacent to the project site along Cayetano Creek and in the hills north of the northern parcel north of Manning Road.

Potential for Adverse Effects

In the absence of the proposed mitigation measures, potential adverse effects to CTS could include take of individuals using upland areas for dispersal and/or refugia during construction, operations, and decommissioning.

CTS has the potential to use the project site seasonally due to its proximity to known breeding habitat and the known upland migration distance of CTS. However, breeding habitat for CTS is absent and

potentially suitable upland refuge habitat in the form of mammal burrows is mostly limited to the portion of the project site north of Manning Road. Soil cracks in the surface of the soil may provide temporary refuge during migration between breeding ponds and other upland areas. Because habitat is so limited on the project site, there is only a low potential for CTS to occur on the project site either dispersing through the site or using the site for upland refugia at the time of construction and decommissioning and be harmed by construction equipment or personnel.

Conversion of the project site from grassland and dry cropland to a solar generation facility would not permanently eliminate the potential for CTS to use the site for dispersal and upland refugia and would not constitute a significant impact to this species. After construction has stopped and the site has been revegetated, the solar array is not expected to impede any migration route for CTS, as the project will continue to support grassland and fossorial mammals at a level comparable to conditions prior to construction. The project was sited to utilize lower quality grassland and avoid impacts to higher quality grassland habitats and streams that could provide dispersal corridors for this species. The setback of the solar array from Cayetano Creek would maintain an important wildlife corridor and dispersal habitat. Approximately 150 acres of APN 903-0006-001-02 was removed from the development footprint during the planning phase in part because of its biological value. This area is proposed to be subdivided to legally separate it from the real property affiliated with the proposed project development. The project will impact low quality grassland habitat next to heavily travelled roads and other development that is not expected to provide quality habitat for CTS. In addition, the site will be revegetated following construction of the solar arrays and would still be expected to provide dispersal habitat for CTS. No compensatory mitigation for potential impacts to CTS upland habitat is considered necessary because grassland habitat would be preserved on site under the panels and the project once operational would not eliminate the potential for CTS to use the site for dispersal and upland refugia.

In the absence of proposed mitigation measures, the project would have the potential for adverse effects on CTS including potential take of individuals during project construction, operation, and decommissioning. This would be a significant impact. Implementation of the recommended mitigation measures for CTS contained in Section 6 (MM BIO-2) would avoid take of this species and would reduce impacts to CTS to less than significant.

5.2.2.2 California Red-legged Frog

Federal status – Threatened
State status – Species of special concern

Species Description

The historic range of CRLF extends from Baja California, Mexico, north to the vicinity of Redding inland, and at least to Point Reyes, California coastally (Jennings and Hayes 1994). Today the species is known to occur in about 238 streams or drainages in 23 counties and is found primarily in wetlands and streams in the coastal drainages of Central California. Records of the species are known from Riverside County to Mendocino County along the Coast Range, from Calaveras County to Butte County in the Sierra Nevada, and in Baja California, Mexico. CRLF are still locally abundant within portions of the San Francisco Bay area (including Marin County) and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse ranges (USFWS 2010a). In the Sierra Nevada, CRLF historically occupied portions of the lower elevations west of the crest from Shasta County south to Tulare County. Almost all known CRLF

populations have been documented at elevations below 3,500 feet amsl with some historical sightings documented at elevations up to 5,200 feet amsl.

Within its range, CRLF occupies a distinct habitat of both aquatic and terrestrial components that consist of aquatic breeding and non-breeding areas embedded within a matrix of habitats used for dispersal, or refugia. Breeding and non-breeding aquatic habitat consists of low-gradient freshwater bodies, including ponds, marshes, sag ponds, dune ponds, stock ponds, lagoons, seeps, springs, and backwaters within streams and creeks. This species does not inhabit water bodies that exceed 70 degrees Fahrenheit if there are no cool, deep portions (USFWS 2002). Important characteristics of aquatic breeding habitat include still or slow moving fresh water (with salinities of less than 7.0 parts per thousand) deeper than 2.3 feet (0.7 meter) with dense, shrubby emergent or overhanging vegetation that provides egg deposition sites and cover for adult frogs (Jennings and Hayes 1994; USFWS 2002) and that persists for a minimum of 20 weeks following the breeding season to allow tadpoles to mature (USFWS 2010a). The breeding season typically occurs from November through April (USFWS 2002) and is likely influenced by local precipitation and ambient temperature. Females typically lay eggs between December and early April. Tadpoles typically metamorphose in 11 to 20 weeks, from July to September, but may overwinter in some sites. The largest populations of CRLF are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) intermixed with cattails. Adults feed primarily on aquatic and terrestrial invertebrates, but may feed on tadpoles, smaller frogs, small mammals, and fish. Juvenile frogs are active diurnally and nocturnally, and adult frogs are largely nocturnal (USFWS 2002).

CRLF are generally found in or near water but may disperse into uplands during the wet season to migrate to breeding habitat or for foraging, or in response to receding water during the driest time of the year. Well-vegetated terrestrial areas within a riparian corridor may provide important sheltering habitat when temperatures are cold in the winter or when water is unavailable during dry periods. CRLF spend considerable time resting and foraging in riparian vegetation when it is present (USFWS 2002). The use of the adjacent riparian corridor during summer is most often associated with drying of creeks in mid- to late-summer (Rathbun in litt., 1994 in USFWS 1996). During dry periods, CRLF remain close to water and often disperse upstream or downstream from their breeding habitat to forage or seek aestivation sites if water is not available (USFWS 2002). This habitat may include shelter under boulders, rocks, logs, industrial debris, agricultural drains, water troughs, small mammal burrows, incised stream channels, or areas with moist leaf litter (Jennings and Hayes 1994; USFWS 2002). Most CRLF do not disperse farther than the nearest suitable cold-shelter or aestivation habitat. CRLF have been found up to 200 feet from water in adjacent dense riparian vegetation (USFWS 2010a).

During periods of wet weather, individuals may disperse through uplands to migrate between aquatic breeding sites and have been observed making straight-line point to point migrations rather than using stream corridors (USFWS 2002). Movements of up to two miles have been reported (Fellers and Kleeman 2007), but one mile represents a more typical dispersal distance for breeding migration. Most overland movements occur at night (USFWS 2002).

The primary constituent elements of habitat for CRLF are aquatic and upland areas where suitable breeding and non-breeding habitat is interspersed throughout the landscape and is interconnected by unfragmented dispersal habitat. Specifically, to be considered to have the primary constituent elements, an area must include two (or more) suitable breeding locations, a permanent water source, associated uplands surrounding these water bodies up to 300 feet from the water's edge, all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet in width (USFWS 2002).

Survey History

Two full seasons of protocol surveys for CRLF were conducted on the project site. Surveys were conducted in two locations including Cayetano Creek and its tributaries adjacent to the central and southwest parcels and one ephemeral drainage in the northwest corner of the northern parcel. These were the only features in and adjacent to the site that were determined to provide potential aquatic habitat for CRLF. A total of eight surveys were conducted between January 30 and July 31 of 2018 and an additional eight surveys were conducted from February 6 to July 14 of 2020. For further information on CRLF protocol surveys, see Appendix F.

The segment of Cayetano Creek adjacent to the site is a natural stream with intermittent flow, receiving most of its water from a combination of precipitation and groundwater. The stream channel is mostly vegetated with herbaceous upland species consistent with annual grasses and forbs in annual grassland habitat. Portions of the stream support wetland vegetation, which consists of broad-leaved cattail, California bulrush, tall flatsedge, saltgrass, and common spikerush and other emergent vegetation. The stream channel is an average of 5 to 6 feet in width and has an estimated maximum depth of 3 to 4 feet, although the top of bank width is approximately 20 feet wide. The maximum water depth observed during any of the CRLF surveys was only a few inches in 2018 and approximately 12 inches in 2020 in several small short-lived pools. Pools along the stream are small and shallow and are mostly located at the southern and northern reaches of the stream. There are no pools or deep-water areas within the stream that could support breeding CRLF. Amphibian species observed in the stream during the surveys included Sierran treefrog and western toad. CRLF survey data sheets are included in Appendix F.

No CRLF were observed in the Cayetano Creek or its tributaries during any of the protocol surveys. The stream does not meet the habitat requirements for CRLF breeding because it is too shallow and does not provide water of sufficient depth for a long enough duration to support breeding CRLF. CRLF could potentially use the stream for dispersal between other more suitable habitats offsite since the stream holds moisture and hydrophytes into the summer.

There are 5 documented locations where CRLF have been reported in the CNDDB within a one-mile radius of the project site (CNDDB 2020). There are 9 additional reported occurrences on the Byron Hot Springs quad that show up with a one-mile radius search, but these records are non-specific records that cover the entire quad. The actual location of these reported occurrences appears to be outside of the one-mile radius and these records are not reported here.

The closest reported occurrence (Occurrence No. 297) of CRLF to the project site is located less than 0.5 mile southeast of the project site where juveniles were observed dispersing from Altamont Creek in non-native annual grassland in January of 1997. The next closest record (Occurrence No. 1382) is approximately 0.6 miles west of the western project boundary south of Manning Road and along a branch of Cayetano Creek (CDFW 2020). That record is of two adult CRLF and approximately 50 tadpoles that were observed in May 2013 in a riparian area dominated by willow. The creek was not flowing, but a remnant pool with a depth of between 2-3 feet provided habitat for California red-legged frog (CDFW 2020). The branch of Cayetano Creek where the CRLF have been reported has stretches of dense riparian vegetation and holds water into at least late August in at least some years based on aerial imagery (Google Earth 2020; imagery date 8/31/2017), whereas the segment of Cayetano Creek adjacent to the project site has very sparse riparian vegetation consisting primarily of single trees and rarely holds any water past spring based on survey results and a review of aerial imagery (Google Earth 2020).

Habitat Suitability

The project site is located adjacent to Critical Habitat Unit CCS-2B, Mount Diablo, which is in Alameda County and Contra Costa County, north of Interstate 580. This Critical Habitat was considered occupied at the time of the April 16, 2010 ruling, and is in the San Francisco Bay watershed. The western portion of APN 903-0006-001-02, which is being split off as a separate parcel and is not part of the project site, is within designated Critical Habitat Unit CSS-2B. The project site was chosen in part because it is not located within the designated Critical Habitat and does not support breeding habitat surrounded by high quality upland habitat.

Based on the results of the site assessment for CRLF, the project site lacks suitable breeding habitat for CRLF but provides potential upland dispersal habitat for CRLF since the project site is within the current range of CRLF, federally designated Critical Habitat occurs adjacent to the project site to the north, east, and west, this species is documented breeding within one mile of the project site in the CNDDB, and there are other pools within one mile of the project site that provide potential breeding habitat for CRLF. Potential dispersal by CRLF could occur through the uplands on the site as well as through segments of Cayetano Creek and its tributaries adjacent to the site. However, no CRLF were observed in or adjacent to the site during two seasons of CRLF protocol surveys or any other biological surveys. The project site does not provide suitable breeding habitat and is not being used by CRLF for breeding.

The project site is located within a larger geographic area that provides high quality habitat for CRLF and supports populations of CRLF breeding in constructed and natural ponds within a grassland matrix with dispersal habitat consisting of uplands as well as intermittent and ephemeral drainages. The project site itself does not provide breeding habitat for CRLF and is not a high quality dispersal corridor. Although the project site supports annual grassland and provides potential for upland dispersal, it is peripheral to designated Critical Habitat and these higher quality habitats for CRLF and is on the edge of developed areas that are less suitable. The central and southern parcels in the project site are bordered by North Livermore Ave. on the east and the central parcel is also bordered by Manning Road on the north; these roadways may pose dispersal barriers to CRLF as does the chicken farm that separates the central and southern parcels. Although the potential for CRLF to disperse through the uplands or use the site for upland refugia (particularly in portions of the site adjacent to Cayetano Creek and its tributaries) cannot be ruled out, the site otherwise lacks suitable habitat for CRLF and would not be expected to be highly utilized by this species as evidenced by the lack of sightings.

Potential for Adverse Effects

In the absence of the proposed mitigation measures, potential adverse effects to CRLF could include take of individuals using upland areas for dispersal and/or refugia during construction, operations, and decommissioning.

CRLF has the potential to use the project site seasonally for upland dispersal or refugia due to its proximity to known breeding habitat and the known upland migration distance of CRLF. However, breeding habitat for CRLF is not present on the site. Potentially suitable upland refugia in the form of mammal burrows is mostly limited to the northern parcel north of Manning Road. Soil cracks in the surface of the soil may provide temporary refuge during migration between breeding ponds and other upland areas. Because habitat is so limited on the project site, there is only a low potential for CRLF to occupy the project site prior to commencement of the project or to occur in the project site as migrating individuals dispersing through the site during construction and decommissioning.

Conversion of the project site from grassland and dry cropland to a solar generation facility would not permanently eliminate the potential for CRLF to use the site for dispersal and upland refugia and would not constitute a significant impact to this species. After construction has stopped and the site has been revegetated, the solar array is not expected to impede dispersal or access to upland refugia for CRLF, as the project will continue to support grassland and fossorial mammals at a level comparable to conditions prior to construction. The project was sited to utilize lower quality grassland and avoid impacts to higher quality grassland habitats and streams that could provide dispersal corridors for this species. The setback of the solar array from Cayetano Creek would maintain an important wildlife corridor and dispersal habitat. Approximately 150 acres of APN 903-0006-001-02 was removed from the development footprint during the planning phase in part because of its biological value. This area is proposed to be subdivided to legally separate it from the real property affiliated with the proposed project development. The project will impact low quality grassland habitat next to heavily travelled roads and other development that is not expected to provide quality habitat for CRLF In addition, the site will be revegetated following construction of the solar arrays and would still be expected to provide dispersal habitat and upland refugia for CRLF. No compensatory mitigation for potential impacts to CRLF upland habitat is considered necessary because grassland habitat would be preserved on site under the panels and the project once operational would not eliminate the potential for CRLF to use the site for dispersal and upland refugia.

In the absence of proposed mitigation measures, the project would have a low potential for adverse effects on CRLF including potential take of individuals during project construction, operation, and decommissioning. This would be a significant impact. Implementation of the recommended mitigation measures for CRLF contained in Section 6 (MM BIO-2) would avoid take of this species and would reduce impacts to CRLF to less than significant.

5.2.3 Special-status Birds

Species descriptions in this section are taken from Shuford and Gardali (2008), or from other sources as noted.

5.2.3.1 Grasshopper Sparrow

Federal status – none
State status – species of special concern

Species Description

Grasshopper sparrow are summer residents of the San Joaquin Valley and nest in along the foothills and lowlands up to 5,000 feet amsl. They use dense grasslands, forb, and scattered shrubs of grassland habitats. In addition to natural habitats, grasshopper sparrow can be found in urban habitats such as at the margins of airports and golf courses and in vacant urban lots. Grasshopper sparrow forage in adjacent grasslands and other suitable habitats primarily for invertebrates and seeds. Grasshopper sparrow are reliant on dense vegetation for cover while foraging and nesting. Grasshopper sparrow nest on the ground in tall grasses and commonly perch on fence posts, shrubs or tall vegetation for singing.

Survey History

Grasshopper sparrow was not observed in the project site during any of the biological surveys. The nearest CNDDB reported occurrence (Occurrence No. 21) of grasshopper sparrow is located 1.6 miles

east of the project site. The reported occurrence describes breeding pairs in a grassland preserve with surrounding land uses consisting of rural residential homes, shooting range and cattle grazed land (CDFW 2020).

Habitat Suitability

The entire project site provides marginal potential foraging and nesting habitat for grasshopper sparrow. The project site is dominated by annual grasses and forbs. Fence posts, tall annual weeds and sparse shrubs provide perches for singing. However, the project site is actively grazed by cattle, and areas that are heavily grazed do not provide habitat for this species, since grazing removes foraging and cover sites for nesting. Potential threats to grasshopper sparrow in the project site include harvesting of oats in the northern and southern parcels and cattle grazing in the central parcel. Both existing land practices may diminish the quality of the grassland habitat and or result in mortality of individuals or nests located in the annual grass dominated vegetation communities, rendering the site inhospitable for this species.

Potential for Adverse Effects

In the absence of proposed mitigation measures, potential adverse effects of the proposed project (construction only) on grasshopper sparrow could include harm to individual grasshopper sparrow, nest disturbance/loss of active nests, and loss of potential habitat. Grasshopper sparrow nesting was not observed in the project site and there are no known occupied grasshopper sparrow nesting locations in the project site (reported in the CNDDB or other sources).

No mitigation is proposed or necessary for loss of potential habitat for this species. Higher quality habitat for grasshopper sparrow is abundant in the project region. The recommended mitigation measures for nesting birds and raptors contained in Section 6 (MM BIO-6) would reduce impacts to this species to less than significant.

5.2.3.2 Golden Eagle

Federal status – The Bald and Golden Eagle Protection Act
State status – Fully Protected (nesting and wintering)

Species Description

Golden eagle is an uncommon permanent resident and migrant throughout California. Golden eagle nests on cliffs or in large trees in open habitats. Preferred habitats are in steep mountainous terrain with canyons and ledges for nesting. Golden eagles are year-round residents of California and typically do not migrate but may move to lower or higher elevations depending on the season. Golden eagle nests are usually located on cliffs, but they will also use large trees with a commanding view of the landscape as well as electrical towers for nesting. Golden eagle requires open areas for hunting, such as rolling foothills, grasslands, deserts, shrublands and early successional stages of forest habitats. Golden eagles primarily feed on rodents and lagomorphs; however, they will feed on a variety of prey including other small mammals, birds, reptiles, carrion and on occasion domestic calves and lambs (Zeiner et al. 1990).

Survey History

The project is in the Livermore area, which has been documented to have one of the highest territory densities ever documented for this species at one pair per 19 km^2 (Hunt et al. 1998). Golden eagle was

observed soaring over the project site during most biological surveys conducted in 2018 and 2020. During the surveys, golden eagles were observed flying from west to east during the late morning and then returning in the afternoon (traveling east to west). Golden eagles were observed soaring high over the project site and then foraging low over the surrounding hillslopes (out of the project site) pursuing California ground squirrel. There are several reported occurrences in the CNDDB of golden eagle nests within a 5-mile radius of the project site (CDFW 2020). The nearest CNDDB record (Occurrence No. 70) is located approximately 2 miles north of the project site near Vaquero Reservoir. Another CNDDB record (Occurrence No. 84) is located 4 miles west of the project site along Camino Tassajara Road. Both records document nests in oak trees (CDFW 2020), which are situated similarly to valley oak trees adjacent to the project site along Cayetano Creek. HELIX biologist Patrick Martin is familiar with the golden eagle nest (CNDDB Occurrence No. 84) and observed activity at this nest in 2017 while conducting surveys for the County of Contra Costa. Golden eagle flights over the project site appear to originate from the general direction of this nest along Camino Tassajara Road and may be birds nesting in that location that are travelling to forging grounds north and east of the project site.

Habitat Suitability

There is no suitable nesting habitat for golden eagle on the project site. The site itself is treeless (except for three or four small horticultural trees around the former homestead in the central parcel) and consists entirely of grazed annual grassland and on some portions, dryland grain crop fields. Several large valley oak trees are located along Cayetano Creek adjacent to the site and other potentially suitable nesting habitat surrounding the project site includes other large oak trees and large stands of eucalyptus trees. However, because the large trees are situated around rural residential homes, which typically are not suitable nest locations for golden eagle, golden eagle is not expected to nest adjacent to the project site. No raptor nests that could support a golden eagle were detected in any of the large valley oak trees adjacent to the site during the surveys. One of these large valley oak trees adjacent to the site was found to have a red-tailed hawk nest during surveys in 2018 and 2020. The project site provides potential foraging habitat for golden eagle. Prey is present in the project site, with several occupied California ground squirrel burrows observed on the project site concentrated in the northern parcel. Black-tailed jackrabbit and Audubon's cottontail are also present in the annual grassland community on the central parcel.

Potential for Adverse Effects

Nesting

Although large valley oak trees are present adjacent to the project site, they are not considered likely to be used by golden eagle due to their proximity to the nearby residential uses, including the caretaker's travel trailer. Because there are no potential nest trees on the project site, implementation of the project would not remove golden eagle nesting habitat. Project construction and decommissioning activities within 660 feet of a nest could potentially disturb nesting golden eagles if this species was to use trees adjacent to the project site for nesting. The recommended mitigation measures for nesting raptors and migratory birds contained in Section 6 (MM BIO-6) would reduce impacts to nesting golden eagle to less than significant.

Foraging Habitat

The project site provides suitable foraging habitat for golden eagle, which will be impacted as a result of converting grassland to a solar generation facility, although some habitat may remain around the

perimeter of the site in undeveloped areas. Golden eagles were observed soaring over the project site; however, no attempts at capturing prey were observed on the project site. Golden eagle was observed unsuccessfully pursuing California ground squirrel on hills west and northeast of the site where this species was observed flying low over the ground and attempting to swoop down onto unsuspecting ground squirrels. Other species such as black-tailed jackrabbit and Audubon's cottontail are more abundant than ground squirrels on the project site and could provide forage for golden eagle on the project site. Golden eagles are known to have territories that range from 9 to 74 square miles (Zeiner et al. 1990), which encompasses a vast area for foraging. Impacts to foraging habitat for golden eagle will be less than significant due to the abundance of more suitable foraging habitat in the region. No mitigation is proposed for loss of potential foraging habitat for golden eagle.

5.2.3.3 Long-eared Owl

Federal status – none
State status – species of special concern

Species Description

Long-eared owl nests and roosts in conifer, oak and riparian habitat. Typically, nests are located in open forests, or in dense forests on the edge of grasslands or another open habitat. This species will use old hawk or corvid nests, squirrel nests, woodrat nests or mistletoe brooms. This species forages in open habitat and rarely in wooded areas, and typically perches in dense areas relying on camouflage to remain undetected. This species has long wings and flies buoyantly and low over the ground and feeds almost exclusively on small mammals but will opportunistically take birds and rabbits.

Survey History

Long-eared owl was detected on-site and evidence of other long-eared owl perch locations were also identified. During CRLF nighttime surveys, this species was detected by eye-shine perched on vegetation along Cayetano Creek adjacent to the project site. Small rodent prey was also detected by eye shine and appeared to be abundant in the annual grassland where the long-eared owl was foraging. Additionally, whitewash and large owl pellets were observed at other locations along Cayetano Creek adjacent to the project site that are consistent with long-eared owl pellets and were located similarly along the creek where the long-eared owl was observed to be perched while foraging. Long-eared owl nesting was not observed on the project site and there are no known occupied nest locations in or immediately adjacent to the project site (reported in the CNDDB sources). However, other accounts from eBird document observations of long-eared owl in the Livermore area.

There are no CNDDB reported occurrences for long-eared owl within a 5-mile radius of the project site or within Alameda County.

Habitat Suitability

The entire project site provides potential foraging habitat for long-eared owl, and large trees along Cayetano Creek adjacent to the site provide potential nesting habitat. Annual grassland and dryland grain crop habitat in the project site provide abundant habitat for prey resources. No suitable nest trees for long-eared owl occur in the project site.

Potential for Adverse Effects

In the absence of proposed mitigation measures, potential adverse effects of the proposed project on long-eared owl during construction and decommissioning could include harm to individual long-eared owls, nest disturbance, and loss of foraging habitat.

If dispersing or transient long-eared owls were to occupy nests adjacent to the project site prior to construction of the project or decommissioning, such activities could result in direct impacts to long-eared owl individuals through nest disturbance. Project construction activities would include road construction, trenching for low-voltage collection lines, boring for support posts, and installation of solar panel arrays. These activities would be considered low-intensity impacts because the construction disturbance (noise, presence of equipment and personnel) would be comparable in nature to the agricultural practices in the region but could impact long-eared owl if present through noise, vibration, and the presence of construction equipment and personnel. This would be a significant impact.

Foraging habitat for long-eared owl will largely be lost as a result of converting grassland to a solar generation facility, although some habitat may remain around the perimeter of the site in undeveloped areas and this species may be able to forage between rows of panels or under panels. HELIX biologists have observed other species of owls, such as great horned owls, perching on solar panels and searching for small mammal prey. Impacts to foraging habitat for long-eared owl will be less than significant due to the abundance of foraging habitat in the region and the generally low levels of long-eared owl populations in the region. No mitigation is proposed for loss of potential foraging habitat for long-eared owl. The recommended mitigation measures for nesting raptors and migratory birds contained in Section 6 (MM BIO-6) would reduce potential impacts to nesting individuals to less than significant.

5.2.3.4 Burrowing Owl

Federal status – none
State status – species of special concern

Species Description

Burrowing owls are often found in open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. Burrowing owls occur at elevations ranging from 200 feet below mean sea level to over 9,000 feet amsl. In California, the highest elevation where burrowing owls are known to occur is 5,300 feet amsl in Lassen County. In addition to natural habitats, burrowing owls can be found in urban habitats such as at the margins of airports and golf courses and in vacant urban lots. Burrowing owls forage in adjacent grasslands and other suitable habitats primarily for insects and small mammals, and less often for reptiles, amphibians, and other small birds.

Burrowing owls nest in burrows in the ground and commonly perch on fence posts or mounds near the burrow. The owls often use ground squirrel burrows or badger dens or artificial burrows such as abandoned pipes or culverts. Although the more northern burrowing owl populations migrate seasonally, burrowing owls are year-round residents of the San Joaquin Valley. In the San Joaquin Valley, the nesting season for burrowing owl can begin as early as February 1 and continues through August 31.

Survey History

Burrowing owls or sign was not observed in the project site during biological surveys conducted in 2018. However, several burrowing owl pellets and feathers were observed along the northern boundary of the project site and throughout Cayetano Creek adjacent to the project site during burrowing owl protocol surveys in 2020. However, burrowing owl pellets were not observed in association with any burrows or owls and were likely a result of transient owls passing through the site or the creek represents an area used by burrowing owls to forage. On June 17 and 18, 2020, two juvenile burrowing owls were observed at a burrow east of the northern parcel approximately 200 feet from the project boundary (see Appendix A: Figure 5). Both owls were observed making short flights during daylight hours and returning to the burrow over two days. A follow up survey conducted on July 14, 2020 confirmed that four juvenile burrowing owls were at this burrow. Mature burrowing owls were not observed at this burrow. These owls likely originated from a nest nearby and are dispersing away from the nest. Burrowing owl pellets and feathers detected earlier in the 2020 survey season indicate that burrowing owls forage in the project site although no burrowing owls were observed while conducting nighttime surveys for CRLF.

No other indication of burrowing owl was detected. Burrowing owls were not observed at any of the California ground squirrel burrows or at any of the culverts or abandoned pipes located in the project site. Additionally, very little burrow habitat was observed in the project site in the central and southern parcels south of Manning Road. A few burrows located south of Manning Road were limited to Cayetano Creek and its banks outside of the project site. Most burrow habitat for this species was detected on the northern parcel north of Manning Road with several California ground squirrel burrows located throughout the project site.

There are eight CNDDB reported occurrences of burrowing owl within a 2-mile radius of the project site with the nearest reported occurrence (Occurrence No. 257) located approximately 0.55 mi southeast where burrowing owls were documented nesting in grazed grassland with ground squirrel burrows in spring/summer of 1997. The next closest record (Occurrence No. 46) is located approximately 1.2 miles southeast of the project site. This observation documents two burrowing owls during the winter along the road. Another CNDDB record (Occurrence No. 642) documents a pair of burrowing owl nesting in a preserve approximately 1.25 miles east of the project site in 2016 (CDFW 2020).

Habitat Suitability

The project site provides potential foraging habitat for burrowing owl primarily in the dryland grain crop in the northern and southern parcels; much of the central parcel is comprised of tall grass, which is typically avoided by burrowing owl. Mammal burrows are present adjacent to the project site along Cayetano Creek, along the fence line of the northern parcel north of Manning Road, and in the dryland grain crop north of Manning Road providing potential nesting habitat for burrowing owl. Annual grassland habitat in the central parcel south of Manning Road is nearly devoid of burrowing mammals and the grassland consists of tall grass which is typically avoided by burrowing owl. No burrows showing sign of occupancy by burrowing owl were detected anywhere inside the project site boundaries, although suitable burrows are present.

Potential for Adverse Effects

In the absence of proposed mitigation measures, potential adverse effects of the proposed project on burrowing owl during project construction and decommissioning could include harm to individual

burrowing owls, nest disturbance/loss of occupied burrows, and loss of foraging habitat. Burrowing owl nesting was not observed in the project site and there are no known occupied burrowing owl nesting locations in the project site (reported in the CNDDB or other sources). However, burrowing owls were observed approximately 200 feet east of the eastern boundary of the northern parcel.

If dispersing or transient burrowing owls were to occupy mammal burrow(s) in or adjacent to the project site prior to construction of the project or decommissioning, such activities could result in direct impacts to burrowing owl individuals through harm because of contact with construction equipment or personnel and/or indirect impacts because of habitat destruction or loss of burrows. Project construction activities would include road construction, trenching for low-voltage collection lines, boring for support posts, and installation of solar panel arrays. These activities would be considered low-intensity impacts because the construction disturbance (noise, presence of equipment and personnel) would be comparable in nature to the agricultural practices in the region but could impact burrowing owl if present through noise, vibration, and the presence of construction equipment and personnel. This would be a significant impact.

Foraging habitat will be impacted as a result of converting grassland to a solar generation facility, however, foraging habitat for burrowing owl will be available among the panels and in open undeveloped areas on the facility. Impacts to foraging habitat for burrowing owl will be less than significant due to the abundance of more suitable and higher quality foraging habitat in the region and the continued presence of foraging habitat within the project site. No mitigation is proposed for loss of potential foraging habitat. The recommended mitigation measures for burrowing owl contained in Section 6 (MM BIO-3) would reduce impacts to nesting burrowing owl to less than significant.

5.2.3.5 Northern Harrier

Federal status – none
State status – species of special concern

Species Description

Northern harrier is widespread throughout North America from southern Canada to northern Mexico and is a year-round resident in California. Population sizes increase during the non-breeding season due to over-wintering migrants. Northern harrier is also considered to be somewhat nomadic and will range widely even during nesting season. Northern harriers breed in a variety of open habitats including marshes, wet meadows, weedy shorelines, grasslands, weed fields, pastures, sagebrush flats, desert sinks, and croplands. Northern harriers nest on the ground in patches of dense, tall vegetation in undisturbed areas. Breeding occurs from March to August. Northern harriers feed on a wide variety of vertebrate prey, including rodents, songbirds, waterfowl, and lizards.

Survey History

Northern harrier was observed on the project site during several biological surveys in 2020. Both a male and female pair were observed foraging regularly over the central parcel on the project site. Annual grassland habitat in the project site provides habitat for nesting and foraging. Small mammal prey is abundant on portions of the project site and adjacent areas and could support this species. No northern harrier nests or breeding behaviors were observed during surveys in 2020. The nearest CNDDB reported occurrence of northern harrier documents a nesting pair located approximately 4 miles west of the project site in the foothills (CDFW 2020).

Habitat Suitability

Grazed annual grassland and dryland grain crop vegetation communities in the project site provide suitable foraging habitat for northern harrier. The project site provides suitable nesting habitat throughout the grassland where tall vegetation is present and suitable nesting habitat is adjacent to the project site along Cayetano Creek.

Potential for Adverse Effects

In the absence of proposed mitigation measures, project construction and decommissioning activities have the potential to affect northern harrier. Construction and/or decommissioning would not affect foraging northern harrier as it is a highly mobile bird species and individual birds foraging or otherwise occurring in the site could readily avoid construction areas or contact with construction equipment or personnel. Therefore, no impacts to individual harriers is anticipated unless this species nests on the site. If northern harrier were to nest on the site, impacts to nesting could occur through noise, vibration, and the presence of construction equipment and personnel. Potential impacts to nesting harriers would be a significant impact.

The recommended mitigation measures for nesting raptors and migratory birds contained in Section 6 (MM BIO-6) would reduce impacts to northern harrier to less than significant.

5.2.3.6 White-tailed Kite

Federal status – none
State status – fully protected

Species Description

White-tailed kite is a year-round resident in California in coastal areas and lowlands in the Central Valley. Population sizes increase during the non-breeding season due to over-wintering migrants. White-tailed kite prefers open stages of habitats dominated by herbaceous species (Zeiner et al. 1990). White-tailed kite will nest in tall trees adjacent to foraging habitat (Zeiner et al. 1990). White-tailed kites feed mainly on small mammals such as voles (*Microtus* spp.) but will take other small vertebrate and invertebrate prey.

Survey History

White-tailed kite was observed in the project site during biological surveys in 2020. Two white-tailed kites were observed foraging in the annual grassland habitat on the site and perching in the large valley oak trees west of the site along Cayetano Creek. There are no suitable nest trees for white-tailed kite on the project site. However, suitable large valley oaks trees that provide potential nesting habitat for white-tailed kite are present adjacent to the site along Cayetano Creek although no white-tailed kite nests were observed in any of these trees. Only one raptor nest was observed in the large valley oak trees adjacent to the project site, which was being used by a red-tailed hawk on February 26, 2020.

There are no reported occurrences of white-tailed kite nesting in or adjacent to the site. The nearest CNDDB reported occurrence (Occurrence No. 81) of white-tailed kite documents a nesting pair located approximately 4.5 miles west of the project site (CDFW 2020). The record documents a nesting pair from 1992 using an oak tree.

Habitat Suitability

Annual grassland that is currently managed for cattle grazing and dryland grain crop fields in the project site provides suitable foraging habitat for white-tailed kite. Suitable nesting habitat is adjacent to the project site along Cayetano Creek where there several large valley oak trees rooted in the bank of the stream. The lands surrounding the project site consists primarily of a mix of active cattle grazed land, annual grassland and dryland grain crop fields that have been historically cultivated for agriculture and is subject to routine disturbance. These lands provide abundant suitable foraging habitat for white-tailed kite.

Potential for Adverse Effects

In the absence of mitigation measures, project construction and decommissioning activities have the potential to affect white-tailed kite. Construction and/or decommissioning would not affect foraging white-tailed kite as it is a highly mobile bird species and individual birds foraging or otherwise occurring in the site could readily avoid construction areas or contact with construction equipment or personnel. Therefore, no impacts to individual white-tailed kite is anticipated unless this species nests adjacent to the site. If white-tailed kite were to nest adjacent to the site, impacts to nesting could occur through noise, vibration, and the presence of construction equipment and personnel. Potential impacts to nesting white-tailed kite would be a significant impact.

Foraging habitat will be impacted as a result of converting grassland to a solar generation facility, however, foraging habitat for white-tailed kite will be available among the panels and in open undeveloped areas on the facility. Impacts to foraging habitat for white-tailed kite will be less than significant due to the abundance of more suitable and higher quality foraging habitat in the region, the low populations levels of this species in the region, and continued availability of foraging habitat at the site. The recommended mitigation measures for nesting raptors and migratory birds contained in Section 6 (MM BIO-6) would reduce impacts to white-tailed kite to less than significant.

5.2.3.7 Loggerhead Shrike

Federal status – none
State status – species of special concern

Species Description

The range of the loggerhead shrike extends throughout the United States and southern Canada, and it is a year-round resident throughout most of its California range. This species prefers open habitats with scattered shrubs, trees, posts, or other perches. It can be found in shrublands or open woodlands with bare ground, or sparse herbaceous cover and is often found in open cropland. Loggerhead shrikes hunt in open areas of short grasses, forbs, or bare ground, and impale prey on thorns or barbed wire. Prey includes large insects, as well as various small reptiles, amphibians, rodents, and birds.

Suitable breeding habitat includes shrublands or open woodlands with grass cover or bare ground. Loggerhead shrikes in the Central Valley typically use riparian edges where they generally place their nests 1 to 2 meters (3.3 to 6.6 feet) above ground in shrubs or trees. Loggerhead shrike habitat includes alfalfa fields, grasslands, non-rice crops, oak groves, orchards, pastures, ponds and seasonally wet areas, riparian areas, disturbed areas, rural residential development, tree groves, and canals.

Survey History

Several loggerhead shrikes were observed foraging in the project site during surveys in 2018 and 2020. These individuals were typically perched on fences or vegetation; no active nests of this species were observed. Several inactive stick nests were observed in small shrubs and trees adjacent to the project site along Cayetano Creek that could belong to loggerhead shrike. On June 17, 2020, a pair of loggerhead shrikes were observed feeding recently fledged offspring in a valley oak tree along Cayetano Creek adjacent to the site. The loggerhead shrikes were also very defensive around their fledglings. No active nest was observed at this location. The loggerhead shrikes and young were not present the following day on June 18, 2020.

There are no CNDDB reported occurrences of loggerhead shrike nesting in a 5-mile radius of the project site.

Habitat Suitability

The project site provides suitable nesting, perching and hunting habitat for loggerhead shrike. Grazed grasslands and barbed wire fences provide foraging habitat. Perennial shrubs are present in the project site, although they are sparse and scattered along the perimeter of the project site and along Cayetano Creek. Loggerhead shrike could occur nesting and several individuals have been detected foraging during surveys in 2018 and fledglings were observed in June of 2020.

Potential for Adverse Effects

In the absence of mitigation measures, project construction and decommissioning activities have the potential to affect loggerhead shrike. Construction and/or decommissioning would not affect foraging loggerhead shrike as it is a highly mobile bird species and individual birds foraging or otherwise occurring in the site could readily avoid construction areas or contact with construction equipment or personnel. Therefore, no impacts to individual loggerhead shrike is anticipated unless this species nests on the site. If loggerhead shrike were to nest on the site, impacts to nesting could occur through noise, vibration, and the presence of construction equipment and personnel. Potential impacts to nesting loggerhead shrike would be a significant impact.

Foraging habitat will be impacted as a result of converting grassland to a solar generation facility, however, foraging habitat for loggerhead shrike will be available among the panels and in open undeveloped areas on the facility. Impacts to foraging habitat for loggerhead shrike will be less than significant due to the abundance of more suitable and higher quality foraging habitat in the region, the low populations levels of this species in the region, and continued availability of foraging habitat on-site. The recommended mitigation measures for nesting raptors and migratory birds contained in Section 6 (MM BIO-6) would reduce impacts to loggerhead shrike to less than significant.

5.2.4 Special-status Mammals

5.2.4.1 American Badger

Federal status – none
State status – species of special concern

Species Description

American badger occurs throughout most of California in a wide range of habitats but prefers open stages of forest and scrub habitats with friable soils. American badger dens are typically located in open areas with sparse vegetation. American badger will use many dens in a season, reusing the same den or excavating new dens each night. Common signs of use include a dirt ramp leading to the entrance, flattened grass around the entrance, scat, and tracks. The home range of a badger typically ranges from 400 to 600 acres but may range to as high as 1,549 acres (Zeiner et al. 1990).

Survey History

American badger or their burrows were not observed in the project site during any of the numerous biological surveys, including protocol surveys for burrowing owl which included searching for mammal burrows. The project site contains no known dens. A staple diet of the American badger, the California ground squirrel, and their burrows are abundant in the northern parcel north of Manning Road although they are relatively scarce in the central and southern parcels located south of Manning Road. Surrounding hillslopes outside of the project boundary support a heavy population of California ground squirrels in cattle grazed annual grasslands. Both coyote and golden eagle were observed foraging in these areas. There are several CNDDB reported occurrences of American badger near the project site, with the nearest CNDDB reported occurrence (Occurrence No. 64) located approximately 2 miles northeast of the project site along North Vasco Road. This record is of a badger observed dead on the road in 1995.

Habitat Suitability

Although this species does not currently occupy the site and no evidence of this species was detected, the entire project site is potentially suitable foraging and dispersal habitat for American badger, and marginal denning habitat is present on the site where California ground squirrel burrows are present. Since the annual grassland in the central and southern parcels south of Manning Road was virtually devoid of California ground squirrel burrows, foraging habitat for badger is likely poor in those parcels. However, fossorial prey that could support American badger such as California ground squirrel, Botta's pocket gopher and other rodents are abundant in the northern parcel north of Manning Road and in the surrounding area. American badger likely occupies the landscape in the vicinity of the project site since they have been documented in the CNDDB, and the surrounding annual grasslands and dry farmed lands are contiguous with annual grassland and dryland grain crops on the project site.

Potential for Adverse Effects

American badger has the potential to use the project site since habitat with fossorial prey species is present and there are documented accounts of this species in the area. However, no occupied dens or direct observations of American badger or sign, such as tracks, or badger excavations were observed in the project site. There is a potential for American badger to occupy the project site prior to commencement of the project or to occur in the project site as transient individuals either foraging or dispersing through the site during construction and decommissioning. Wildlife friendly fencing has been incorporated into the proposed project to allow for dispersal of small to medium sized species such as American badger. Therefore, this species would not be precluded from foraging on the site. Because American badger is a highly mobile animal, other than potential denning, it would be able to avoid contact with construction equipment and personnel and any operational staff or maintenance

operations. In the absence of proposed mitigation measures, the project would have a low potential for adverse effects on American badger if it were to den on the project site. This would be a significant impact.

Implementation of the recommended mitigation measures for American badger contained in Section 6 (MM BIO-4) would avoid take of this species and would reduce impacts to American badger to less than significant.

5.2.4.2 San Joaquin Kit Fox

Federal status – endangered
State status – threatened

Species Description

San Joaquin kit fox was listed as "threatened with extinction" under the Endangered Species Preservation Act of October 15, 1966 (16 U.S.C. 668aa(c); 32 FR 4001) and is currently listed as "Endangered" under the Endangered Species Act of 1973 (16 U.S.C. 1531-1544).

San Joaquin kit fox inhabits a wide range of open and shrubby habitats, including grassland, scrublands, agricultural areas where dens are available (e.g., unplowed fields, row crops, vineyards, or orchards), non-irrigated pastures, vernal pool grasslands, playas, and alkali meadows. San Joaquin kit fox dens are typically located on slopes less than 40 degrees, and pupping dens are usually on level ground; den entrances are typically 8 to 10 inches in diameter. San Joaquin kit foxes use many dens in a season, and occupied dens often show no signs of use. Common signs of use include a dirt ramp leading to the entrance, flattened grass around the entrance, scat, tracks, and prey remains.

The largest extant populations of San Joaquin kit fox are at the western margins of the Central Valley and the eastern Coast Ranges. Population centers occur in western Kern County (Elk Hills and Pixley National Wildlife Refuge), eastern San Luis Obispo County (Carrizo Plain), western Fresno County and eastern San Benito County (Ciervo-Panoche Natural Area), Southern Monterey County (Fort Hunter-Liggett and Camp Roberts), western Merced County, and eastern Contra Costa County. These population centers generally form a meta-population lying west of Interstate 5 and/or south of Allensworth, with only isolated occurrences in the remainder of the valley. By 2006, San Joaquin kit fox was determined to be largely eliminated from the central San Joaquin Valley (USFWS 2010b).

Survey History

No San Joaquin kit fox, potential dens, or their sign, was observed in the project site during any of the biological surveys, including transects of the site to search for dens of fossorial animals during protocol burrowing owl surveys as well as general biological reconnaissance surveys. The project site supports several ground squirrel burrows but contains no suitable San Joaquin kit fox dens. All burrows observed in the project site were either occupied by California ground squirrel, collapsed and inactive or had recent sign of use by California ground squirrel. Scat that likely belonged to coyote was observed along a cattle trail in Cayetano Creek adjacent to the site and consisted of red fur (cattle) and vegetation. Coyotes, a potential predator and competitor of kit fox were abundant with six individuals observed during the day north of the northern parcel outside of the project site. Another potential fox predator, golden eagle, was also observed foraging over the project site routinely.

There are several CNDDB reported occurrences of San Joaquin kit fox within a 5-mile radius of the project site. The nearest CNDDB reported occurrence (Occurrence No. 571) is located approximately 2.7 miles north of the project site. This record from 1989 documents a natal den near North Vasco Road (CDFW 2020). The most recent account of this species in Alameda County is an observation documented in the CNDDB (Occurrence No. 58) from 2002 of one individual moving through an area dominated by annual grassland and rocky outcrops near Brushy Peak (CDFW 2020), approximately 4.5 miles northeast of the project site. This CNDDB record did not document a den or breeding foxes.

The project site is in an area described as a satellite population at the northern and western extent of the San Joaquin kit fox range, which is in decline with no known breeding (USFWS 2010b). The project site is not in a core area or a linkage area between known occupied populations of San Joaquin kit fox (USFWS 2010b). There are very few studies documenting the status of this species in the northern portions of this species range, with very few recent accounts of this species persisting at detectable levels (USFWS 2010b).

A study conducted in 2003 using detection dogs surveyed public and private lands to detect the presence of this species in the northern extent of their range. Previous studies in the southern parts of the San Joaquin kit fox range using dog detection and DNA analysis were successful at identifying San Joaquin kit fox populations (Smith et al. 2006). The use of dog detection to identify fox scat, can identify old scat and recent scat and identify whether fox has occupied an area briefly or for a longer duration. The study collected all potential fox scat and used DNA analysis to identify scat to species. The study only identified San Joaquin kit fox in Merced County, and did not detect kit fox scat in Alameda County or any other northern counties examined. The only fox scat detected during the study in Alameda County was red fox scat, which is potentially detrimental for San Joaquin kit fox. Red fox, in addition to coyotes, are potential competitors and predators of San Joaquin kit fox. Additionally, red fox has been known to kill kit fox and may also spread disease to kit fox. In some areas, red fox has been known to replace the ecological niche of the kit fox. Although the dog detection study did not detect kit fox in most of their historical range in the north, that does not mean they still do not persist. San Joaquin kit fox may persist at very low levels that are difficult to detect, or the population may consist of transient individuals that are dispersing from other isolated populations.

Habitat Suitability

The entire project site is suitable foraging and dispersal habitat for San Joaquin kit fox. Potential prey species consisted primarily of California ground squirrel, which were abundant in the northern parcel north of Manning Road and in areas surrounding the project site. California ground squirrels established large burrow complexes irregularly throughout the project site, with most burrows north of Manning Road. Stream banks adjacent to the project site along Cayetano Creek and field margins in the northern parcel north of Manning Road support ground squirrel burrows, which could provide marginal denning habitat for kit fox. The project site is generally poor quality denning habitat for San Joaquin kit fox. Soils in the project site consist primarily of clay or loam and were relatively hard and cracked and not the best habitat for kit fox (Clark et al. 2007). Dense vegetation in grasslands also makes kit fox more susceptible to ambush predation from species such as bobcat (*Lynx rufus*) (Clark et al. 2007). No potential San Joaquin kit fox dens were observed on the site. All burrows belonged to California ground squirrels and were either occupied or collapsed.

A pack of six coyotes was observed foraging on the outskirts of the northern edge of the project site and coyote scat was abundant throughout the project site. Coyote was also observed excavating ground

squirrel burrows and chasing ground squirrels west of the project boundary. The project site is also within the range of gray fox, but gray fox typically does not occupy the same habitat as kit fox. The presence of several coyotes, golden eagle, the potential presence of red fox and the presence of hard clay to clay loam soils that cover most of the project site would make the project site less favorable for San Joaquin kit fox. Hard clay soils on the project site also reduce the kit fox's ability to dig refuge sites from potential canid and avian predators. Because the project site largely lacks suitable soils for San Joaquin kit fox, supports numerous predators of this fox, is in an area where populations of this fox species are in very low levels (if this species persists at all in the area), and no dens were observed on the site, San Joaquin kit fox is generally considered to be absent from the project site. At best, San Joaquin kit fox would be expected to occasionally use the site for dispersal or foraging if there are populations in the region but would not be expected to linger on the site for any extended period of time.

Potential for Adverse Effects

Conversion of the project site from suitable foraging and dispersal habitat to a solar generation facility would not eliminate the potential for San Joaquin kit fox to use the site for foraging and dispersal and would not constitute a significant impact to this species. Wildlife friendly fencing has been incorporated into the proposed project to allow for dispersal of small to medium sized species such as San Joaquin kit fox. Because San Joaquin kit fox is a highly mobile animal and the site does provide suitable foraging and dispersal habitat, there is a low potential for San Joaquin kit fox to occupy the project site prior to commencement of the project or to occur in the project site as transient individuals either foraging or dispersing through the site during construction, operation, and decommissioning. In the absence of proposed mitigation measures, the project would have a low potential for adverse effects on San Joaquin kit fox. This would be a significant impact.

Implementation of the recommended mitigation measures for San Joaquin kit fox contained in Section 6 (MM BIO-5) would avoid take of this species and would reduce impacts to San Joaquin kit fox to less than significant.

5.2.5 Foraging Habitat for Special Status Birds

5.2.5.1 Tricolored Blackbird

Federal status – none
State status – Candidate Threatened

Tricolored blackbird forages on the ground in croplands, grassy fields, flooded land, and edges of ponds for insects (Shuford and Gardali 2008). With the loss of natural flooding cycles of foraging habitat in the Central Valley, breeding tricolored blackbirds forage primarily in managed habitats (Tricolored Blackbird Working Group 2007). Preferred foraging habitat is typically in vegetation that is less than 15 centimeters tall (Shuford and Gardali 2008) and within 3-4 miles of their breeding colony sites (Tricolored Blackbird Working Group 2007).

The project site and surrounding areas provide suitable foraging habitat for tricolored blackbird. Tricolored blackbirds have not been observed in the project site during the numerous biological surveys and there is no breeding habitat within the site. However, the site is dominated by dryland grain cropland and annual grassland, which may provide foraging habitat for colonies that may be breeding near the project site. The nearest CNDDB record (CNDDB Occurrence No. 840) for tricolored blackbird is

located approximately 1.3 miles east of the project site. The CNDDB record documents several years of tricolored blackbirds foraging and breeding in stock ponds and seasonal wetlands set in annual grassland habitat, which was last documented in 2014 (CDFW 2020).

On the project site, foraging habitat for tricolored blackbird is likely limited to the areas that consist of dryland grain crops after they have been harvested, since the rest of the site consists of herbaceous annual vegetation that is much taller than 15 centimeters. Most vegetation in the annual grassland habitat is approximately 60 to 90 centimeters. The closely related red-winged blackbird (*Agelaius phoeniceus*) was observed foraging and nesting in annual grassland along Cayetano Creek and its tributaries, however no tricolored blackbirds were observed in association with the red-winged blackbirds.

Impacts to potential foraging habitat for tricolored blackbird that could occur as a result of the proposed project are considered less than significant because suitable foraging habitat for tri-colored blackbird is limited on the site, this species has never been observed foraging on the site during numerous biological surveys conducted over a period of approximately 2.5 years, foraging habitat is abundant in the region and the herbaceous understory will be maintained after the installation of the solar array will continue to function as potential foraging habitat for tricolored blackbirds.

5.2.5.2 Swainson's Hawk

Federal status – none
State status – Threatened

Swainson's hawk is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. Swainson's hawk breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley and forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Swainson's hawks breed in California and winter in Argentina, Mexico, and South America. Swainson's hawks usually arrive in the Central Valley between March 1 and April 1 and migrate south between September and October. Swainson's hawks usually nest in trees adjacent to suitable foraging habitat. Swainson's hawk nests are usually located in trees near the edges of riparian stands, in lone trees or groves of trees in agricultural fields, and in mature roadside trees. Valley oak, Fremont cottonwood, walnut, and large willow with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. Suitable foraging areas for Swainson's hawk include native grasslands or lightly grazed pastures, alfalfa and other hay crops, idle land, certain grain and row croplands, and ruderal lands. Swainson's hawks primarily feed on voles; however, they will feed on a variety of prey including small mammals, birds, and insects.

The project site and surrounding areas provide suitable foraging habitat for Swainson's hawk, which was observed soaring over the project site on April 6, 2020. The project is not within the current nesting range for Swainson's hawk per the California Wildlife Habitat Relationship (CWHR) program (Zeiner et al. 2011). Although Swainson's hawk have recently been identified breeding outside of their current known range in Santa Clara County (Philips et al. 2014), no detections of nesting Swainson's hawk have been reported in the CNDDB or on other public databases in or near the Livermore Valley. There is a total of seven CNDDB records within a 10-mile radius of the project site, which is the standard accepted travel distance foraging Swainson's hawk will make from a nest (CDFW 1994). The nearest documented record for Swainson's hawk is approximately 3.9 miles southwest of the project site in the City of Livermore.

The CNDDB record states that a pair was observed at a nest from April through May in 2017 but does not specify the success of the nest or whether nestlings were observed in the nest or whether Swainson's hawk constructed the nest (CDFW 2020). Additionally, this is the only record of a Swainson's hawk at a nest in the Livermore Valley. In the region of the project site, Swainson's hawk typically nest in the Central Valley per their known range (Zeiner et al. 2011). There are no other nest sites in the Livermore Valley and all other accounts of nesting Swainson's hawk within a 10-mile radius are in the Central Valley or in the Sacramento-San Joaquin Delta (CDFW 2020).

Although the project site is within the foraging range of reported Swainson's hawk occurrences, Swainson's hawks are not expected to regularly use the project site for foraging. Over numerous biological surveys conducted over an approximately 2.5-year period, Swainson's hawk were only observed twice at the project site. Each time consisted of a single adult soaring over the site, presumably foraging in the annual grassland and dryland grain crops. Swainson's hawk was not observed capturing prey in or adjacent to the project site on either occasion. Since Swainson's hawk have not been documented successfully nesting in the area of the project, and the project site is outside of this species recognized breeding range per CWHR, this species is not expected to nest in close proximity to the project site.

Impacts to potential foraging habitat for Swainson's hawk that could occur as a result of the proposed project are considered less than significant because the site is at the edge of the known range of this species and therefore this species would not be expected to nest in close proximity to the site or use the site substantially for forage, as evidenced by the low level of observed site use by the species over numerous biological surveys. In addition, as discussed in Section 5.3, the site is expected to continue to provide suitable foraging habitat for Swainson's hawk upon installation of the solar generating facility and revegetation of the site. The recommended raptor foraging measures (MM BIO-7) would reduce impacts to foraging habitat to less than significant.

5.2.5.3 Cooper's Hawk and Ferruginous Hawk

Cooper's hawk and ferruginous hawk are two CDFW watch list bird species that were observed foraging over the project site on February 26, 2020. Ferruginous hawks only winter in California and will not nest in the project boundary and Cooper's hawks typically nest in riparian habitat, which is not present. Impacts to potential foraging habitat for Cooper's hawk and ferruginous hawk that could occur as a result of the proposed project are considered less than significant because of the abundance of suitable foraging habitat for these species in the project region. In addition, as discussed in Section 5.3, the site is expected to continue to provide suitable foraging habitat for raptors upon installation of the solar generating facility and revegetation of the site. The recommended raptor foraging measures (MM BIO-7) would reduce impacts to foraging habitat to less than significant.

5.2.6 Migratory Birds and Raptors

5.2.6.1 Nesting Impacts

The project site and adjacent areas provide nesting habitat for a variety of native birds common to the region and a total of 45 bird species were observed on and adjacent to the site (see Appendix D). The structures and associated trees along Manning Road adjacent to the site provide potential nesting habitat for species that nest or roost in buildings and trees. Large trees adjacent to the project site along Cayetano Creek also provide nesting habitat for red-tailed hawk and other raptors, which have been

observed in the project site. Active nests were not observed during surveys, although fledgling red-tailed hawks were observed perching in the trees outside the site along Cayetano Creek and in the surrounding area. Grassland habitat also provides habitat for ground nesting birds such as western meadowlark, red-wing blackbird, and a variety of sparrows.

Project activities during construction and decommissioning would not directly disturb trees or shrubs but could result in noise and other indirect disturbance that has potential to cause nest failure and project activities will affect herbaceous vegetation, which could contain nests. In the absence of proposed mitigation, destruction of nests, eggs, or nestlings by vegetation clearing or ground-disturbing activities or indirect impacts to birds nesting offsite that resulted in forced fledging or nest abandonment could occur if construction commenced during the avian breeding season (February through August). There is also the potential for small birds to enter hollow vertical piles in the solar arrays and in fence posts. Birds could become entrapped and unable to extricate themselves, potentially resulting in mortality. This could occur with both common and special-status bird species. Such impacts would be considered a violation of the California Fish and Game Code and would be a significant impact.

The recommended mitigation measures for nesting birds (MM BIO-6) would reduce impacts to nesting migratory birds and raptors during construction and decommissioning activities to less than significant.

5.2.6.2 Potential Avian Impacts Resulting from Photovoltaic Solar Generating Facilities

It is acknowledged that solar generating facilities have been documented to result in bird mortality, however these studies are primarily conducted in the deserts of the southwest and include other types of solar facilities, such as solar thermal (power towers) facilities that injure birds due to collisions with the high towers and concentrated rays injuring the birds, and not just solar PV facilities. A publication by the U.S. Department of Energy reviewed the state of knowledge concerning avian mortality at utility-scale solar facilities (Walston et al. 2015). The report included discussion of the potential for solar PV generating facilities to cause death and injury to waterfowl that mistake fields of PV panels for waterbodies – a phenomenon called the "lake effect." The report concluded that few empirical data are available on the number of birds killed or injured at solar generating facilities generally, and by the lake effect specifically. In addition, the authors state that no scientific studies testing the reality of the lake effect had been conducted up to the time of publication.

Waterfowl were not observed in or near the project site since the site is dry and does not provide habitat for waterfowl. Waterfowl are not expected to be common in the project site or pass over since there are no bodies of water in the project site and only seasonally flooded cattle ponds near the project site. The surrounding landscape consists of cattle grazed land in rolling hills. The segment of Cayetano Creek adjacent to the site supports a few small intermittent seasonal wetlands and does not support riparian vegetation. Most of Cayetano Creek supports annual grasses that are consistent with the surrounding grassland, which is dominated by non-native annual grasses. The segment of Cayetano Creek adjacent to the site generally does not provide habitat for avian species associated with aquatic habitats. Waterfowl may be attracted to nearby reservoirs or seasonal wetlands such as Los Vaqueros Reservoir located three miles north of the project site and Valley sink scrub habitat, which consists of seasonal wetlands, located approximately 1.3 miles southeast of the project site. However, as stated previously, no waterfowl were observed on the project site during numerous biological surveys.

HELIX biologists have conducted studies of utility scale solar PV generation facilities related to bird use and potential mortality in the Central Valley. The purpose of the studies was to provide quantitative

data on overall bird use and large-bird mortality, if any, as well as the effectiveness of an avian deterrent measures implemented to reduce avian collisions with solar panels in utility scale solar PV generation sites of 1,000 acres and larger. To date, these studies have shown that resident and migratory birds use the PV array for foraging and that the solar sites are not a significant source of avian mortality (HELIX 2018, unpublished data).

Although impacts to birds due to collisions with solar panels or objects such as electrical lines or towers is not anticipated to be a significant source of mortality or result in a significant impact as discussed above, mitigation measures are being incorporated to reduce any such impacts and also study whether the solar facility is causing avian mortality once constructed and operational. The recommended avian protection measures (MM BIO-7) would reduce avian impacts during operation of the facility to less than significant.

5.3 RAPTOR FORAGING HABITAT

This section discusses how conversion of the annual grassland and dryland grain crops on the site to a solar generating facility could affect the suitability of the site for use by foraging raptors. It has been previously thought that lands supporting linear rows lined with tall vegetation (e.g., vineyards) are considered unsuitable foraging habitat for raptors because the extent to which raptors would attempt to capture prey between rows of tall vegetation was considered negligible. Similarly, solar generation facilities–which are generally similar to vineyards in overall structure–are typically considered unsuitable foraging habitat. However, studies indicate that both vineyards and solar generation facilities that are appropriately managed can provide foraging habitat value for Swainson's hawk, which is a wide-ranging species that forages in open areas (Estep 2013; Swolgaard et al*.* 2008).

Although this section focuses on studies that were done to evaluate Swainson's hawk use of solar generating facilities for foraging specifically, this analysis can be applied to foraging raptors in general. Swainson's hawk is a far-ranging species that forages on the wing and typically requires large open tracts of land for foraging, although it will also capture prey along the ground (e.g., insects). Many other raptors are site and wait style predators that require much smaller areas to forage and will perch on trees, utility poles or structures and capture unsuspecting prey. For these reasons, Swainson's hawk is a good species to use as a surrogate for general raptor foraging requirements, because if Swainson's hawks can use a solar generating facility for foraging, most other raptor species could as well. In fact, it may be somewhat conservative to use Swainson's hawk for a discussion of overall raptor foraging as other species would be even better suited to forage in a solar generating facility based on their life history requirements. Due to the amount of studies that have been conducted on the use of solar facilities by Swainson's hawks for foraging and the reasons mentioned above, this analysis of potential impacts to raptor foraging considers studies done on the ability for Swainson's hawk to forage in a solar generating facility to generally discuss impacts to foraging raptors as a whole.

Because much of the typical solar generation facility is composed of open areas, there is potential for use of solar projects by Swainson's hawks and other raptors for foraging, particularly if the facility is managed to optimize habitat for prey and the area between the panels is managed as perennial grassland vegetation of a suitable height. For example, considering the proposed project at the most horizontal position the panels would cover approximately 50 percent of the ground surface within the portions of the project site covered by panels. As previously mentioned, other land uses with a similar structure, such as vineyards, have also been demonstrated to be used by foraging raptors, so this concept is not completely new. To test the hypothesis that solar arrays provide foraging habitat for

Swainson's hawks, Estep (2013) conducted a pilot study in Sacramento County in 2012 to evaluate the foraging use of solar arrays by Swainson's hawks and other raptor species relative to the surrounding agricultural landscape.

In that study, three PV solar generation facilities in Sacramento County, ranging from 105 to 200 acres in size, were evaluated for foraging use by Swainson's hawks and other raptors. All three of the solar generation facilities evaluated in the foraging study are located within a diverse agricultural landscape of similarly sized parcels to the solar facilities. The study was conducted after the three facilities had been constructed, operation had commenced, and grass cover had been established. The three facilities were being managed to allow establishment of grasses beneath and between the solar panels. The grass cover at these sites is maintained between 4 and 12 inches in height through a sheep grazing program. The grass ground cover is managed to promote the establishment of rodent populations to provide foraging habitat for raptors as well as refugia for rodents to assist with re-establishment of rodent populations on adjacent farmlands following cultivation.

Results of the study indicated that the solar array fields were used for foraging by Swainson's hawks similar to other moderate to high value agricultural cover types and the presence of the solar facilities did not appear to affect the overall use of the landscape by Swainson's hawks or other raptors. As one element of an otherwise diverse agricultural matrix, the solar array fields provided a consistent and an apparently reasonably accessible source of prey, particularly for Swainson's hawks and American kestrels. Surprisingly, the study also indicated that the solar arrays were used at a higher rate than would be expected based on their availability in the landscape, meaning that Swainson's hawks appeared to be selectively foraging within solar arrays over other crop types. The key to this was the fact that the solar sites were managed to provide a continual source of prey that was accessible to the hawks consistently throughout the spring and summer breeding season versus the seasonal availability of prey in agricultural crops due to the planting, growth, and harvesting regime.

Although this was a relatively simple short-term study (i.e., a 5-month study) designed to determine foraging use by Swainson's hawk in 100-200-acre solar arrays within a diverse agricultural matrix, it demonstrated that solar arrays do provide available foraging habitat for Swainson's hawk and are used by this species for foraging. The study also suggests that conversion of otherwise suitable foraging habitat to solar arrays does not necessarily constitute a complete loss of foraging habitat for Swainson's hawk and that properly managed solar arrays could provide important foraging habitat for Swainson's hawk during periods when surrounding agricultural crops are not suitable.

In 2017, HELIX biologists conducted a study of Swainson's hawk foraging at a large-scale solar generation facility in Kings County (HELIX 2018). The study showed that Swainson's hawk will forage in a large-scale solar generation facility (>1,000 acres). The study compared Swainson's hawk foraging use of the 1,100-acre solar facility to an approximately 4,800-acre off-site area that included active and fallow agricultural lands. HELIX found that Swainson's hawk foraged in the operational solar generation facility at a higher intensity (determined by the minutes of forage per unit area) than in surrounding lands. This result is consistent with the findings of Estep (2013), suggesting that solar generation facilities managed to promote raptor foraging may provide higher-value foraging habitat than active and idle agricultural lands.

The results of these studies indicate that solar generation facilities can be used for foraging by Swainson's hawks and other raptors similar to other moderate to high value agricultural cover types. As one element of an otherwise diverse agricultural matrix, the solar generation facilities provided a

consistent and an attractive source of prey. The key to this was the fact that the solar generation facilities were managed to provide a continual source of prey that was accessible to the hawks consistently throughout the spring and summer breeding season versus the seasonal availability of prey in agricultural crops due to the planting, growth, and harvesting regime (Estep 2013).

Estep (2013) notes that to encourage raptor foraging use of solar arrays, the management of a grassland substrate to promote rodent populations, including maintaining vegetation at a height that promotes visibility and access to prey, is of key importance. Most crop types are available for a short period of time during the breeding season due to the planting, growing and harvesting regime, whereas a managed grassland can provide a consistent and available source of prey throughout the spring and summer breeding season.

During operation of the proposed project, the applicant plans to maintain the project site with vegetation and seasonally graze livestock (sheep) between and under the solar panels for the duration of operation of the solar facility, pursuant to an AMP. The mixture of grassland and forbs managed by targeted sheep grazing is expected to provide high value and consistently available habitat conditions for small mammal prey species (ground squirrels, rabbits, voles, pocket gophers, deer mice and house mice). The AMP would include vegetation management methods to ensure that the vegetation composition and structure provides a combination of areas with lower vegetation heights and density to provide accessibility to foraging raptors, and areas with denser, taller vegetation to attract and maintain prey on the site, thus enhancing the site for raptor foraging use.

Management conditions would include ensuring that the vegetation cover is not reduced to the extent that vegetation would not naturally regenerate; there are openings in the vegetation to allow foraging access for raptors; and there are areas where the vegetation would be allowed to grow taller. In general, vegetation heights below the panels should be allowed to be higher to provide cover for prey species, and the vegetation heights between the panels should be maintained at a suitable height to provide foraging accessibility. Suitable grass height to promote foraging for Swainson's hawk and other raptors is generally less than 12 inches, and optimally 4 to 8 inches.

With the proposed site management, many raptor species are expected to continue using the site for foraging and for some species the foraging quality of the site may improve due to more regular availability of prey. HELIX biologists have observed several raptor species foraging in utility scale solar generation facilities including northern harrier, American kestrel, great horned owl, and red-tailed hawk (HELIX 2018). The recommended raptor foraging measures (MM BIO-7) would reduce impacts to foraging habitat to less than significant.

5.4 REGIONALLY OCCURRING BATS

The project site does not provide habitat for special-status bats that may occur in the region, such as pallid bat (*Antrozous pallidus*) or Townsend's big-eared bat (*Corynorhinus townsendii*), and roosting habitat for bat species is absent from the project site. Water resources for bats are also very limited in the region of the project and are likely only limited to artificial water impoundments along drainages or in seasonal wetland complexes. Over the course of numerous biological surveys conducted for the project, including a total of 10 nighttime surveys for CRLF and four evening surveys for burrowing owl, no bat roosts were detected and no bats were observed emerging from trees or structures in or adjacent to the project site. However, the project site may provide foraging habitat for a variety of common bat species such as Brazilian free-tailed bat (*Tadarida brasiliensis*), big brown bat (*Eptesicus*

fuscus), or California myotis (*Myotis californicus*). Brazilian free-tailed bat specifically is a wide-ranging bat species that prefers open habitats and may actively forage over the project site if it is present in the project region. Structures adjacent to the project site such as barns, abandoned houses or other outbuildings as well as large trees adjacent to the site along Cayetano Creek could provide roosting habitat for common bat species adjacent to the site that could forage on the site.

Based on the design of the project with buried utilities and the low profile of the solar arrays and the retention of the grassland habitat under the PV arrays, impacts to bats that may occur in the region are expected to be less than significant. PV solar projects pose little risk to bats, particularly among PV arrays. Based on the data presented in the Sunshine Valley Bird and Bat Conservation Strategy (WEST 2017), no bat fatalities were reported during the early implementation of three PV solar projects in California (WEST 2017). Bats detected in the PV arrays were either using the structures or fences for roosting (WEST 2017). Since habitat for roosting bats is absent from the project site, bats have not been observed on the project site during numerous surveys conducted at the ideal time to observe emerging and foraging bats, and the abundance of other suitable foraging habitat in the region, impacts to regionally occurring bat species resulting from the proposed project would be less than significant.

5.5 SENSITIVE NATURAL COMMUNITIES

There is one 0.08-acre ephemeral drainage in the northwest corner of the northern parcel on the project site that is a potential waters of the State and could be considered a sensitive natural community (Appendix A: Figure 5). The proposed project as designed could result in fill of this feature. Potential impacts to the ephemeral drainage are discussed in Section 5.6 and mitigation is proposed to reduce impacts to the feature to less than significant. There are no other sensitive natural communities on the project site. The site consists almost entirely of annual grassland and other agricultural land that supports a mixture of non-native and native species and lacks native or naturalized vegetation communities. Cayetano Creek and its tributaries adjacent to the site are sensitive natural communities. However, the project has been designed to avoid impacts to these features.

5.6 JURISDICTIONAL WATERS AND WETLANDS

HELIX conducted a routine assessment of wetlands and "other waters" of the U.S. and State on July 31, 2018, August 1, 2018 and February 6, 2020, in accordance with the USACE *Wetlands Delineation Manual*, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0), *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States*, and SWRCB policies and regulations. HELIX collected 10 data points which documented upland areas in streams and swales. HELIX delineated five aquatic features: one ephemeral stream, one intermittent stream (Cayetano Creek), and three ephemeral tributaries to Cayetano Creek totaling 5.13 acres. With the exception of one ephemeral stream in the northwest corner of the northern parcel (north of Manning Road) that totals approximately 0.08 acre in size, the project boundaries have been modified to exclude aquatic features from within the project site. Ephemeral drainages are not considered waters of the U.S. but may be waters of the State subject to RWQCB jurisdiction and also subject to CDFW jurisdiction under Section 1600 of the Fish and Game Code. The project as designed could impact the ephemeral drainage. Therefore, the project could result in impacts to waters of the State and waters under CDFW jurisdiction. However, no impacts to potentially jurisdictional waters of the U.S. are anticipated from the project. If the project were to result in impacts to waters of the State, that would be a significant impact.

With the implementation of the recommended mitigation measures for potential impacts to waters of the State (MM BIO-8), impacts to jurisdictional waters would be less than significant.

5.7 WILDLIFE NURSERIES AND MOVEMENT CORRIDORS

A wildlife corridor is a link of wildlife habitat, generally native vegetation, which joins two or more larger areas of similar wildlife habitat. Corridors are critical for the maintenance of ecological processes including facilitating the movement of animals and the continuation of viable populations. Historically, the grasslands in eastern Alameda County were connected through the lowland valleys and stream systems through the Livermore Valley. The majority of this area has been converted to urban and agricultural uses, fragmenting and separating grassland habitat. In addition, I-580 serves as a barrier between the northern and southern parts of the county, with only a few linkages (under crossings) under the freeway between Livermore and the Alameda/Contra Costa County line.

The project site is not included in any corridors mapped by the California Essential Habitat Connectivity project and does not provide any unique movement or dispersal habitat relative to surrounding lands for several miles in all directions. The project site and surrounding lands, which consist predominately of annual grassland and dryland grain crop, currently provide extensive open, dispersal habitat for wildlife movement in the region. No significant impacts to wildlife corridors would occur as a result of the proposed project. In addition, a gap will be maintained between the perimeter fence and the ground to allow passage of small to mid-sized mammals as included in the recommended mitigation under fencing guidelines for San Joaquin kit fox (MM BIO-5). Impacts to wildlife corridors resulting from the proposed project would be less than significant.

5.8 LOCAL POLICIES

The Alameda (East County) County General Plan includes several policies intended to promote conservation of existing high-value biological resources in the county and protect sensitive resources and special-status species. The project site has been subject to a long history of agricultural land use that has severely reduced its biological value compared to undisturbed natural habitats. The Alameda General Plan lists the area of the project site as Large Parcel Agricultural that is outside of the Urban Growth area. The East Alameda County Conservation Strategy and East Bay Regional Conservation Investment Strategy are voluntary plans to promote conservation of natural resources. The project has potential for impacts to special-status species, and includes avoidance, minimization, and mitigation measures that will reduce impacts to special-status species (Section 6). Therefore, the project would not conflict with local policies and ordinances protecting biological resources. No impacts to local policies or plans were identified and no additional mitigation is required.

5.9 HABITAT CONSERVATION PLANS/NATURAL COMMUNITY CONSERVATION PLANS

The project does not fall under the purview of any Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs). The project site is in the Pacific Gas and Electric Bay Area HCP coverage area, although this HCP is for the maintenance and operation of PG&E facilities and not for the installation of large utility scale solar projects. Therefore, the project would not conflict with any provisions of an adopted HCP/NCCP and no mitigation is required.

The project is located within the EACCS area and the project has been designed to be incorporated into previously disturbed agricultural land. The project site will be managed and operated in a similar capacity for grazing of livestock and honey production from bees with the inclusion of PV solar arrays for the next 50 years. Through the implementation of project design and mitigation measures, the project site will continue to provide habitat for wildlife that already occur in the project site, which falls in line with the goals and purpose of the EACCS.

5.10 POTENTIAL FOR SPREAD OF INVASIVE SPECIES

Ongoing agricultural activities on a project site likely reduce the spread of invasive species compared to leaving the land fallow because active agriculture regularly removes established vegetation and replaces it with a crop monoculture. Abandoned fields typically become overgrown with invasive species, including host plants for agricultural pests. Converting active agricultural land to solar PV generation has the potential to result in increased establishment of weedy species by reducing the frequency of disturbance. The project is expected to comply with all weed abatement policies and orders of the Alameda County Department of Agriculture and Weights and Measures. This would reduce potential impacts from the spread of invasive species to less than significant. No mitigation for invasive species is required.

6.0 PROPOSED MITIGATION MEASURES

6.1 GENERAL MITIGATION MEASURES

The following general mitigation measures should be implemented to reduce impacts to biological resources. Specific mitigation measures are included in following sections and some measures may be repeated in the specific measures.

MM BIO-1a Prior to the issuance of grading or building permits, and for the duration of construction activities, the project proponent/operator shall demonstrate that it has in place a Construction Worker Environmental Awareness Training and Education Program for all new construction workers at the project site. All construction workers shall attend the Program prior to participating in construction activities. Any employee responsible for the operations and maintenance or decommissioning of the proposed project facilities shall also attend the Environmental Awareness Training and Education Program prior to starting work on the project.

The Program will be developed and presented by a biologist meeting the qualifications of an authorized biologist as defined by USFWS or designee. The training may be presented in video form. The Program shall include:

- Information on the life history of the American badger, burrowing owl, grasshopper sparrow, loggerhead shrike, golden eagle and other raptors, as well as other wildlife and plant species that may be encountered during construction activities, and the legal protection status of each species (including all nesting birds);

- A description of CRLF, CTS and its habitat, the avoidance and minimization measures that are being implemented to conserve the CRLF and CTS as they relate to the project, and the boundaries within which work may occur;

- A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the previously referenced people and anyone else who may enter the project site;

- The definition of "take" under the Federal Endangered Species Act and the California Endangered Species Act;

- Measures the project proponent/operator is implementing to protect the species; and

- Specific measures that each worker shall employ to avoid take of wildlife species, and penalties for violation of the Federal Endangered Species Act or California Endangered Species Act.

The worker environmental awareness training material will be kept on-site for the duration of operations and all personnel will be instructed on the importance of CRLF and CTS, how to identify these amphibians, and what to do if CRLF or CTS is found on the facility.

MM BIO-1b Environmental tailboard trainings shall take place on an as-needed basis in the field. The environmental tailboard trainings will include a brief review of the biology of the covered species and guidelines that must be followed by all personnel to reduce or avoid negative effects to these species during construction activities. Directors, Managers, Superintendents, and the crew foremen and forewomen will be responsible for ensuring that crewmembers comply with the guidelines.

MM BIO-1c Contracts with contractors, construction management firms, and subcontractors shall obligate all contractors to comply with these mitigation measures.

MM BIO-1d The following shall not be allowed at or near work sites: trash dumping, firearms, open fires (such as barbecues) not required by the activity, hunting, and pets.

MM BIO-1e Vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed areas to the extent practicable.

MM BIO-1f Off-road vehicle travel shall be prohibited outside of designated project areas.

MM BIO-1g Vehicles shall not exceed a speed limit of 15 mph on unpaved roads within natural land cover types, or during off-road travel.

MM BIO-1h Vehicles or equipment shall not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area is constructed.

MM BIO-1i Vehicles shall be washed only at approved areas. No washing of vehicles shall occur at job sites.

MM BIO-1j To discourage the introduction and establishment of invasive plant species, seed mixtures/straw used within natural vegetation shall be either rice straw or weed-free straw.

MM BIO-1k Pipes, culverts, and similar materials greater than four inches in diameter, shall be stored so as to prevent covered wildlife species from using these as temporary refuges, and these materials shall be inspected each morning for the presence of animals prior to being moved.

MM BIO-1l Erosion control measures shall be implemented to reduce sedimentation in wetlands and drainages adjacent to the site that could be occupied by special-status animal and plant species when activities are the source of potential erosion problems. Plastic mono-filament netting (erosion control matting) or similar material containing netting shall not be used at the project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

MM BIO-1m Stockpiling of material shall occur such that direct effects to special-status species are avoided.

MM BIO-1n Grading shall be restricted to the minimum area necessary.

MM BIO-1o Prior to ground disturbing activities adjacent to sensitive habitats, project construction boundaries and access areas shall be flagged and temporarily fenced during construction to reduce the potential for vehicles and equipment to stray into adjacent habitats.

6.2 MITIGATION FOR POTENTIAL EFFECTS ON CALIFORNIA RED-LEGGED FROG AND CALIFORNIA TIGER SALAMANDER

In the absence of the proposed mitigation measures, potential adverse effects to CTS and CRLF could include take of individuals using upland areas for dispersal and/or refugia during construction, operations, and decommissioning. No impacts to potential breeding habitat would occur. For further analysis see *Potential for Adverse Effects* under the California Tiger Salamander and California Red-legged Frog discussions in Sections 5.2.2.1 and 5.2.2.2.

MM BIO-2a If construction commences during the wet season and active dispersal period for these species (between approximately October 16 and May 14, depending on the precipitation year), preconstruction surveys for CRLF and CTS would be conducted in the project site approximately two weeks prior to the initiation of construction and decommissioning activities to ensure that CRLF and CTS are not actively using the project site or adjacent areas as a dispersal corridor. Preconstruction surveys would be conducted by a qualified biologist familiar with all life stages of the amphibians and

would cover all aquatic habitats on and immediately adjacent to the project site (Cayetano Creek and its tributaries) that are suitable for CRLF and CTS dispersal.

MM BIO-2b If any life stage of CRLF and/or CTS (e.g., egg, egg mass, larvae, tadpole, juvenile, or adult) is detected within the project site during any surveys or monitoring for the project during construction or decommissioning, USFWS and CDFW shall be notified within 48 hours. The biologist shall monitor the CRLF or CTS to make sure the amphibian is not harmed and that it leaves the site on its own. Construction activities will not be allowed within 100 feet of the animal. Handling of listed species without a take permit pursuant to the FESA is not allowed.

MM BIO-2c Activities associated with construction and decommissioning conducted within 200 feet of on-site drainages shall be limited to a period outside of the active season for CRLF and CTS (approximately May 15 to October 15, depending on the precipitation year). This construction window is during the dry season in which creek levels are lower to dry, providing limited aquatic dispersal habitat for CRLF. The dry season is defined generally as that time between April 15 and the first qualifying rain event on or after October 15 defined as precipitation of more than one half of an inch for 24 hours. Any extension of the work window outside of the May 15 to October 15 timeframe due to abnormally dry conditions would require coordination with the USFWS.

MM BIO-2d Construction and decommissioning activities within 200 feet of on-site drainages shall be restricted to daylight hours to avoid CRLF and CTS that may be present in the project site during the time they are most active–between dusk and dawn. Construction and decommissioning activities shall cease one half hour before sunset and shall not begin prior to one half hour before sunrise.

MM BIO-2e Construction and decommissioning activities and clearing within the project site shall be confined to the minimal area necessary to facilitate construction activities. To ensure that construction equipment and personnel do not affect sensitive habitat outside of designated work areas, orange barrier fencing shall be erected to clearly define the habitat to be avoided. This will delineate the ESA on the project. The integrity and effectiveness of ESA fencing and erosion control measures shall be inspected daily. Corrective actions and repairs shall be carried out immediately for fence breaches and ineffective erosion control BMPs.

MM BIO-2f To prevent CRLF and CTS from moving through the project site during construction and decommissioning, temporary exclusion fencing shall be placed along the boundary of the project site by October 15th of the year prior to commencement of construction and decommissioning. This will allow any CRLF or CTS potentially using the project site for upland refugia to leave the project site to access breeding habitat, but not return. The fence shall be made of a material that does not allow amphibians to pass through, with one-way exit holes, and the bottom will be buried to a depth of two inches so that frogs cannot crawl under the fence. To avoid entanglement of amphibians and other wildlife, the use of plastic monofilament netting is prohibited. Exclusion fencing shall be removed within 72 hours of the completion of work.

MM BIO-2g A biologist meeting the qualifications of an authorized biologist as defined by USFWS or designee shall survey the project site immediately prior to installation of temporary exclusion fencing to ensure that this species is not present within the site. Once the temporary exclusion fencing is installed, the work area within the exclusion fence shall be surveyed again immediately prior to the onset of construction activities. If listed species are found in the project site during preconstruction surveys, construction activities shall not start within a 100-foot radius until the species has left the area of its own volition. Handling of CRLF or CTS without a take permit pursuant to the FESA is not allowed.

MM BIO-2h A qualified biological monitor shall be present daily during initial construction and decommissioning activities including but not limited to equipment mobilization, site clearing, vegetation removal, and grading/ground disturbance to verify that no CRLF or CTS enter the project site during construction or are harmed. Daily monitoring can be reduced to weekly inspections at the discretion of the biological monitor once site grading has been completed and no habitat/refugia is present for CRLF or CTS on the site.

- Any mammal burrows providing potential refugia for CRLF or CTS shall be scoped to search for these animals. If CRLF or CTS are found, the burrow shall be flagged and avoided by a suitable buffer as determined by the biological monitor.

- If CRLF or CTS are found during construction or decommissioning, work shall immediately stop within 100 feet and the listed amphibian shall be allowed to move out of harm's way on its own accord. The biological monitor shall monitor the CRLF or CTS to make sure the amphibian is not harmed and that it leaves the site on its own. Handling of listed species without a take permit pursuant to the FESA is not allowed. Sightings of special-status species shall be reported to CNDDB.

- Prior to the start of daily construction and decommissioning activities during initial ground disturbance, the biological monitor shall inspect the perimeter fence to ensure that it is neither ripped nor has holes and that the base is still buried. The fenced area shall also be inspected to ensure no amphibians are trapped. If listed amphibians are found inside or outside of the fence, work shall immediately stop, and the animal shall be allowed to leave the project site on its own accord. Any listed species shall be closely monitored until they move away from the construction area.

- A permitted biologist shall be contracted to trap and move CRLF and CTS to nearby suitable habitat if they are found inside the project area and do not leave the project site of their own accord.

MM BIO-2i To ensure that amphibian diseases are not conveyed between work sites by the USFWS-approved biologist or biological monitor, the fieldwork code of practice developed by the Declining Amphibian Population Task Force shall be followed at all times.

MM BIO-2j Standard construction BMPs shall be implemented throughout construction and decommissioning, in order to avoid and minimize adverse effects to the water quality

within the project site. Appropriate erosion control measures shall be used (e.g., hay bales, filter fences, vegetative buffer strips or other accepted equivalents) to reduce siltation and contaminated runoff from the project site. The integrity and effectiveness of the BMPs shall be inspected on a daily basis by the resident engineer or site foreman. Corrective actions and repairs shall be carried out immediately.

MM BIO-2k Construction by-products and pollutants such as petroleum products, chemicals, or other deleterious materials should not be allowed to enter into streams or other waters. A plan for the emergency clean-up of any spills of fuel or other materials should be available when construction equipment is in use.

MM BIO-2l Equipment shall be re-fueled and serviced at designated construction staging areas. All construction material and fill shall be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. The preferred distance is 100 feet from the wetted width of a stream. In addition, a silt fence shall be installed to collect any discharge, and adequate materials should be available for spill clean-up and during storm events.

MM BIO-2m Construction vehicles and equipment shall be monitored and maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. Leaking vehicles and equipment shall be removed from the site.

MM BIO-2n Building materials storage areas containing hazardous or potentially toxic materials such as herbicides and petroleum products shall be located outside of the 100-year flood zone, have an impermeable membrane between the ground and the hazardous material, and shall be bermed to prevent the discharge of pollutants to ground water and runoff water. The bermed area shall at a minimum have the capacity to store the volume of material placed in it.

MM BIO-2o All disturbed soils shall undergo erosion control treatment prior to October 15 and/or immediately after construction is terminated. Appropriate erosion control measures shall be used (e.g., hay bales, filter fences, vegetative buffer strips or other accepted equivalents) to reduce siltation and contaminated runoff from project sites. Erosion control blankets shall be installed on any disturbed soils steeper than a 2:1 slope or steeper.

MM BIO-2p During project activities, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.

MM BIO-2q To prevent inadvertent entrapment of animals during construction, all excavated, steep walled holes or trenches more than one foot deep shall be covered at the close of each working day with plywood or other suitable material or provided with one or more escape ramps constructed of earth fill or wooden planks. At the beginning of each working day and before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist, or an on-site designee identified by the USFWS-approved biologist, shall immediately place escape ramps or other appropriate structures to allow the

animal to escape, or USFWS shall be contacted for guidance and notified of the incident. All holes and trenches more than one foot deep shall be filled or securely covered prior to October 15.

MM BIO-2r No monofilament plastic shall be used for erosion control.

6.3 MITIGATION FOR POTENTIAL EFFECTS ON BURROWING OWL

In the absence of proposed mitigation measures, potential adverse effects of the proposed project on burrowing owl during project construction and decommissioning could include harm to individual burrowing owls, nest disturbance/loss of occupied burrows, and loss of foraging habitat. For further analysis see *Potential for Adverse Effects* under the Burrowing Owl discussion in Section 5.2.3.4.

MM BIO-3a If feasible, construction-related ground disturbance activities shall begin outside of the burrowing owl nesting season (February 1 through August 31) and during construction the site shall be maintained in a manner that is inhospitable to burrowing owl such as keeping the site free of vegetation, ground squirrel control (the use of poison baits or other substances that could be potentially harmful to San Joaquin kit fox shall not be allowed), and maintaining regular site disturbance by construction equipment and personnel. This will discourage burrowing owl from occupying the project site. If feasible, decommissioning-related ground disturbing activities shall begin outside of the burrowing owl nesting season (February 1 through August 31).

MM BIO-3b No more than 14 days prior to initiation of ground disturbing activities associated with project construction or decommissioning, a qualified biologist shall conduct a pre-construction survey of the project site and surrounding areas to a distance of 150 meters in accordance with the methods outlined in the CDFW Staff Report on Burrowing Owl Mitigation (2012) or most recently adopted guidance. The first pre-construction survey will cover all areas within 150 meters of the portion of the site in which construction/decommissioning is scheduled to start. Surveys will be phased based on the construction/decommissioning schedule such that the surveys are conducted no more than 14 days ahead of the start of ground disturbance in new areas. If construction/decommissioning activities in portions of the site cease for a period of 14 days, those portions of the site shall be resurveyed for burrowing owls prior to the resumption of construction/decommissioning activities. If no occupied breeding or wintering owl burrows are identified, no further mitigation shall be required. If occupied burrows are identified on the site or within 150 meters, one of the following actions shall be taken: (1) permanent avoidance of the burrow or (2) establishment of a temporary avoidance buffer followed by passive relocation and compensatory mitigation for loss of habitat in conjunction with the measures below:

- If an occupied wintering burrow is discovered during pre-construction surveys, a 50-meter buffer area shall be established around the burrow until the owl leaves on its own (if the burrow is more than 50 meters offsite and/or more than 50 meters from the work area, no buffer is necessary). Ground-disturbing work conducted during the nonbreeding (winter) season (September 1 to January 31) can proceed near the occupied burrow so long as the work occurs no closer than 50 meters to the burrow, and the burrow is not directly affected by the project activity. A smaller

buffer may be established in consultation with CDFW and monitored at the discretion of a qualified biologist. If the 50-meter buffer cannot be maintained for the duration of occupancy by the owl, owls may be excluded from an occupied wintering burrow in accordance with the conditions of the project's *Burrowing Owl Exclusion Plan*, which shall be submitted for approval by CDFW prior to passive relocation of any burrowing owls.

- If an occupied nesting burrow is discovered during pre-construction surveys, an avoidance buffer of 200 meters shall be established around the burrow location and maintained until a qualified biologist has determined that the nest has fledged or is no longer active (a 200-meter avoidance buffer is appropriate for low-intensity impacts near nesting burrows during breeding season [CDFW 2012]). No project activities shall take place within the 200-meter buffer during the time in which it is in place. A smaller buffer may be established in consultation with CDFW and monitored at the discretion of a qualified biologist.

- If an occupied burrow cannot be avoided, and the burrow is not actively in use as a nest, a 200-meter buffer shall be established until the burrowing owls can be excluded from burrows in accordance with the project's *Burrowing Owl Exclusion Plan*, which shall be submitted for approval by CDFW prior to passive relocation of any burrowing owls. The Burrowing Owl Exclusion Plan is based on the recommendations made in the Staff Report on Burrowing Owl Mitigation (CDFW 2012) or most recently adopted guidance and shall include the following information for each proposed passive relocation:

    - Confirmation by site surveillance that the burrow(s) is empty of burrowing owls and other species;
    - Type of scope to be used and appropriate timing of scoping;
    - Occupancy factors to look for and what shall guide determination of vacancy and excavation timing;
    - Methods for burrow excavation;
    - Removal of other potential owl burrow surrogates or refugia on-site;
    - Methods for photographic documentation of the excavation and closure of the burrow; and
    - Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take. Methods for assuring the impacted site shall continually be made inhospitable to burrowing owls and fossorial mammals.

MM BIO-3c If an occupied burrow is identified off-site within 150 meters and passive exclusion is deemed necessary to protect the owls, burrowing owls may be excluded from burrows in accordance with the project's *Burrowing Owl Exclusion Plan*, which shall be submitted for approval by CDFW prior to passive relocation of any burrowing owls. If burrowing owls cannot be excluded from an off-site burrow and it is not feasible to maintain an avoidance buffer as stated above, coordination shall be conducted with CDFW to determine appropriate measures to minimize impacts to off-site burrowing owls. Such

measures could include, but are not limited to: (1) installation of barriers between the construction or decommissioning area and the occupied burrows to block noise and views of construction or decommissioning equipment and personnel, and (2) regular monitoring by a qualified biologist to determine if construction or decommissioning activities are resulting in disturbance of the owls that could lead to nest abandonment or harm to adult owls or their young. If such disturbance was occurring, the biological monitor would have the authority to halt construction or decommissioning activities until further modifications could be made to avoid disturbance of the owls.

MM BIO-3d If burrowing owl pairs are passively relocated, compensatory mitigation for lost wintering/breeding habitat shall be provided either through dedication of 6 acres of suitable habitat (per pair of relocated owls) at an off-site location in accordance with the conditions of the project's *Burrowing Owl Exclusion Plan* or through purchase of credits at a CDFW-approved mitigation bank in the region. No compensatory mitigation is required for passive relocation or eviction of transient, unpaired owls.

MM BIO-3e If permanent avoidance buffers are established, such areas shall be managed for the duration of the project to preserve current values as foraging habitat for burrowing owl. Management shall include: (1) exclusion of all project activities throughout the construction, operation, and decommissioning phases, including staging, parking, driving, or dumping; (2) vegetation management by grazing or mowing to preserve open, low-growing vegetation; (3) fencing to discourage human incursion; (4) signage identifying the area as a biologically sensitive area managed for burrowing owl, and; (5) a worker education and awareness program for all personnel working on the site including contractors and sub-contractors.

6.4 MITIGATION FOR POTENTIAL EFFECTS ON AMERICAN BADGER

In the absence of proposed mitigation measures, potential adverse effects of the proposed project on American badger could occur if this species were to den on the project site prior to project construction or decommissioning. For further analysis see *Potential for Adverse Effects* under the American badger discussion in Section 5.2.4.1.

MM BIO-4a A qualified biologist shall conduct a preconstruction survey for American badger no more than 14 days prior to the beginning of ground disturbance related to construction and decommissioning activities, or any other project activity likely to impact American Badger (such as staging, mowing, vegetation clearing), to determine if there are any American badger dens on the project site. If there are no American badger dens on the project site, no further mitigation is necessary. If American badger dens are located within the work area and cannot be avoided, a qualified biologist shall determine if the dens are occupied. If unoccupied, the dens shall be collapsed under the supervision of the biologist. If occupied, the biologist shall determine if it is a natal/pupping den or a solitary badger den. Dens of solitary badger may be collapsed under the supervision of the biologist once the animal has vacated the den. Natal/pupping dens shall be avoided by establishment of an exclusion zone around the den determined by the qualified biologist until the young are old enough to leave the den and survive on their own.

6.5 MITIGATION FOR POTENTIAL EFFECTS ON SAN JOAQUIN KIT FOX

Conversion of the project site from suitable foraging and dispersal habitat to a solar generation facility would not eliminate the potential for San Joaquin kit fox to use the site for dispersal and would not constitute a significant impact to this species. Wildlife friendly fencing has been incorporated into the proposed project to allow for dispersal of small to medium sized species such as San Joaquin kit fox. Because San Joaquin kit fox is a highly mobile animal and the site does provide suitable foraging and dispersal habitat, there is a low potential for San Joaquin kit fox to occupy the project site prior to commencement of the project or to occur in the project site as transient individuals either foraging or dispersing through the site during construction and decommissioning. In the absence of proposed mitigation measures, the project would have a low potential for adverse effects on San Joaquin kit fox.

MM BIO-5a A qualified biologist shall conduct a preconstruction survey no more than 14 days prior to the beginning of ground disturbance and/or construction/decommissioning activities, or any other project activity likely to impact San Joaquin kit fox, to determine if potential San Joaquin kit fox dens are present in or within 500 feet of the project site (inaccessible areas outside of the project site can be surveyed using binoculars or spotting scopes from public roads). The surveys shall be conducted in all areas of suitable habitat for San Joaquin kit fox. Surveys need not be conducted for all areas of suitable habitat at one time; they may be phased so that surveys occur within 14 days prior to disturbance of any particular portion of the site. If potential dens are observed and avoidance of the dens is determined to be feasible, the following minimum buffer distances shall be established prior to construction/decommissioning activities (consistent with USFWS 2011):

  - Potential den: 50 feet
  - Atypical den: 50 feet
  - Known den: 100 feet
  - Natal/pupping den: at least 500 feet – **USFWS must be contacted**.

- Buffer establishment shall follow the *USFWS Standardized Recommendations for* Protection *of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011) under "Exclusion Zones."

- If San Joaquin kit fox or occupied San Joaquin kit fox dens are observed on the site, USFWS must be contacted.

MM BIO-5b If avoidance of the potential dens is not feasible, the following measures are required to avoid potential adverse effects to the San Joaquin kit fox:

- If the qualified biologist determines that potential dens are inactive, the biologist shall excavate these dens by hand with a shovel to prevent foxes from re-using them during construction.

- If the qualified biologist determines that a potential non-natal den may be active, an on-site passive relocation program may be implemented with prior concurrence from the USFWS. This program shall consist of excluding San Joaquin kit foxes from

occupied burrows by installation of one-way doors at burrow entrances, monitoring of the burrow for one week to confirm usage has been discontinued, and excavation and collapse of the burrow to prevent reoccupation. After the qualified biologist determines that the San Joaquin kit foxes have stopped using active dens within the project boundary, the dens shall be hand-excavated with a shovel to prevent re-use during construction with prior concurrence from USFWS.

MM BIO-5c In addition, the following avoidance and minimization measures for San Joaquin kit fox shall be implemented during construction/decommissioning of the project (USFWS 2011):

a. Project-related vehicles shall observe a daytime speed limit of 20 mph and a nighttime speed limit of 10 mph throughout the project site, except on County roads and state and federal highways. Additionally, vehicles shall not exceed a speed limit of 15 mph on unpaved roads within natural land cover types or during off-road travel. Off-road traffic shall be prohibited outside of designated project areas.

b. To prevent inadvertent entrapment of kit foxes or other animals during the construction or decommissioning phases of the project, all excavated, steep-walled holes or trenches more than 2-feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks should be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW should be contacted as noted under Measure l referenced below.

c. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

d. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from a construction or project site.

e. No firearms shall be allowed on the project site.

f. No pets, such as dogs or cats, shall be permitted on the project site to prevent harassment, mortality of kit foxes, or destruction of dens.

g. Use of rodenticides, herbicides, poison baits, or other substances potentially harmful to San Joaquin kit fox shall be restricted. This is necessary to prevent

primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. Use of such compounds should observe label and other restrictions mandated by the USEPA, CDFA, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the USFWS. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

h. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name and telephone number shall be provided to the Service.

i. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion, will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas shall be determined on a site-specific basis in consultation with the USFWS, CDFW, and revegetation experts.

j. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox should immediately report the incident to their representative. This representative should contact the CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916) 445-0045. They shall contact the local warden or the wildlife biologist at (530) 934-9309. The USFWS should be contacted at Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, CA 95825, (916) 414-6620 or (916) 414-6600.

k. The Sacramento Fish and Wildlife Office and CDFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.

l. New sightings of kit fox shall be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the USFWS at the address listed under measure l.

m. Fencing of the project site, with the exception of the project substation and energy storage areas, shall incorporate wildlife-friendly fencing design. Fencing plans may use one of several potential designs that would allow kit foxes to pass through the fence while still providing for project security and exclusion of other unwanted species (i.e., domestic dogs and coyotes). Raised fences or fences with entry/exit points of at least 6 inches in diameter spaced along the bottom of the fence to allow

species such as San Joaquin kit fox access into and through the project site would be appropriate designs.

6.6 MITIGATION FOR POTENTIAL EFFECTS ON NESTING BIRDS AND RAPTORS

The project site and adjacent areas provide suitable nesting habitat for special-status bird species including grasshopper sparrow, golden eagle, long-eared owl, northern harrier, and white-tailed kite. For further analysis see *Potential for Adverse Effects* under the discussions of these species.

In addition, the project site provides nesting and foraging habitat for a variety of native birds common to the Coast Range, such as western meadowlark, western kingbird, oak titmouse, and American kestrel. The structures and associated trees along Manning Road provide potential nesting habitat for species that nest or roost in buildings. Large trees in the project site along Cayetano Creek and the perimeter of the project site provide nesting habitat for red-tailed hawk and other raptors, which have been observed in the project site. Active nests were not observed during surveys, although fledgling red-tailed hawks were observed perching in the trees and in the surrounding area. Grassland habitat also provides habitat for ground nesting birds such as western meadowlark and a variety of sparrows.

Project activities would not directly disturb trees or shrubs but could result in noise and other indirect disturbance that has potential to cause nest failure. In the absence of proposed mitigation measures, destruction of nests, eggs, or nestlings by vegetation clearing or ground-disturbing activities during the avian breeding season (February through August) could occur and would be considered a violation of the Bald and Golden Eagle Protection Act (golden eagle only) and California Fish and Game Code.

MM BIO-6a If project (construction/decommissioning) ground-disturbing or vegetation clearing, and grubbing activities commence during the avian breeding season (February 1 through August 31), a qualified biologist shall conduct a pre-construction nesting bird survey no more than 7 days prior to initiation of project activities. The survey area shall include suitable raptor nesting habitat within 300 feet of the project boundary (inaccessible areas outside of the project site can be surveyed from the site or from public roads using binoculars or spotting scopes). Pre-construction surveys are not required in areas where project activities have been continuous since prior to February 1, as determined by a qualified biologist. Areas that have been inactive for more than 14 days during the avian breeding season must be re-surveyed prior to resumption of project activities. If no active nests are identified, no further mitigation is required. If active nests are identified, the following measure is required:

- A suitable buffer (e.g., 660 feet for golden eagle, 300 feet for common raptors; 100 feet for passerines) shall be established by a qualified biologist around active nests and no construction/decommissioning activities within the buffer shall be allowed until a qualified biologist has determined that the nest is no longer active (i.e., the nestlings have fledged and are no longer reliant on the nest, or the nest has failed). Encroachment into the buffer may occur at the discretion of a qualified biologist. Any encroachment into the buffer shall be monitored by a qualified biologist to determine whether nesting birds are being impacted.

MM BIO-6: Should any vertical tubes, such as solar mount poles, chain link fencing poles, or any other hollow tubes or poles be used on the project site, the poles shall be capped immediately after installation to avoid entrapment of birds.

6.7 MITIGATION FOR POTENTIAL AVIAN EFFECTS DURING OPERATION OF THE SOLAR FACILITY

6.7.1 General Avian Protection Measures

The following general avian protection measures shall be implemented.

MM BIO-7a Project facility lighting shall be designed to provide the minimum illumination needed to achieve safety and security objectives. All lighting shall be directed downward and shielded to focus illumination on the desired areas only and avoid light trespass into adjacent areas. Lenses and bulbs shall not extend below the shields. This will prevent impacts to bird species nesting and foraging in riparian areas in Cayetano Creek and other sensitive habitats adjacent to the site.

MM BIO-7b Rodenticides shall not be used at the project site. Rodents will be controlled by encouraging raptor foraging. If additional rodent control is required to minimize impacts on adjacent agricultural operations, non-chemical methods will be employed.

MM BIO-7c During operations, trash–including microtrash that can be harmful to birds and other wildlife–shall be regularly removed from the project site to avoid impacts to birds using the project site. The area of trash cleanup will include both the project site within the fence lines, in addition to focused trash pickup along the fence on the interior and exterior sides of the fence.

6.7.2 Avian Collision Deterrent Measures

The follow measures shall be implemented to reduce avian impacts due to collisions with solar panels or other structures during operation of the solar facility.

MM BIO-7d The project shall be designed to underground electrical wiring to the maximum extent feasible. In particular, guy wires shall be avoided to the maximum extent feasible without compromising public safety.

MM BIO-7e In compliance with the Avian Power Line Interaction Committee's (APLIC) guidance, Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012), transmission lines and all electrical components shall be designed, installed, and maintained in accordance with APLIC (2012) guidance to reduce the likelihood of large bird electrocutions and collisions.

MM BIO-7f The Applicant shall implement the following measures to reduce the risk of bird collisions with PV panels.

- A qualified biologist shall prepare an Avian Monitoring Plan to assess and monitor the potential for avian collisions with solar panels on the site. The Plan will include

monitoring for levels of avian activity as well as avian mortality in treated and untreated (control) portions of the solar facility to determine if avian mortality is occurring and if there is any apparent difference in avian mortality between treated and untreated panels. The Plan will also include methods to install visual deterrents or cues to encourage bird avoidance of the Project site. Implementation of the Plan will provide quantitative data on the effectiveness of the avian deterrent in terms of overall bird use and large-bird mortality in treated portions of the project versus an untreated control.

- Within 30 days after project commissioning, avian deterrent materials shall be installed in a total of four 50-acre blocks to achieve coverage of a total of 200 acres within the Solar Facility on a 3-month trial basis to evaluate potential avian collision issues. These deterrents will be made of a material that is both reflective and highly visible, such that the material reflects ambient light and is stimulated by air movement. The effect of installation will create the visual impression of continuous and varied movement, which has been shown as an avian deterrent in agricultural applications. Examples of the types of material that could be used include plastic compact discs and reflective tape.

- Upon installation of deterrent measures, avian monitoring shall occur once per week for a total of 12 consecutive weeks; this shall be repeated for the first three consecutive years of operation. During each monitoring event, bird abundance in each block (4 treatment blocks and one untreated control block) will be quantified using a point count method and the number, species, and behavior of birds observed within each block will be recorded. Behaviors will be recorded for each species and will reflect the modal (or typical) behavior observed for all individuals of the species, not for each individual bird. The observer will also record temperature, average wind speed, and percent cloud cover at the start of each observation period.

- Mortality of large birds in each block shall be assessed by surveying the block for carcasses of large birds (crow-sized and larger). Carcass surveys will be performed. During the surveys, the location and species of each carcass will be recorded using a handheld GPS receiver, a photograph will be taken of the carcass, and the cause of mortality will be noted if apparent. Carcasses will not be collected or preserved.

- Overall bird abundance, species diversity, and large-bird mortality shall be compared among all blocks, and between the control block and the treatment blocks combined. Analysis may include t-Test comparisons of means for overall abundance and large-bird mortality; however, statistical power may be low depending on the overall level of bird activity at the site.

- Facility operator or agent shall provide a brief analysis of the effects of the deterrent measures on panel performance and the feasibility of maintaining avian deterrents for inclusion in the analysis.

- Following the initial 3-month period and based on the results of the Plan, visual deterrents shall either be discontinued if there is no significant difference between

avian mortality between the treatment and control blocks, adjusted to reduce performance issues and reexamined on a continuing three-month basis, or if adjustments are not deemed necessary to improve panel performance, deployed on the remainder of the site and maintained for the life of the project or until determined infeasible (based on the definition of "feasible" in CEQA Guidelines §15364) or ineffective by the Project owner in consultation with CDFW and the County.

MM BIO-7g Panels shall include, if feasible, a light-colored, UV-reflective, or otherwise non-polarizing outline, frame, grid, or border, which has been shown to substantially reduce panel attractiveness to aquatic insects (Horvath, 2010) and may reduce avian mortality by avoiding collisions with panel faces (NFL, 2014).

6.7.3 Raptor Foraging Measures

The follow measures shall be implemented to reduce impacts to raptor foraging during operation of the solar facility.

MM BIO-7h Dryland pasture shall be established on the site and used for grazing livestock (sheep) between and under the solar panels throughout the year, pursuant to an AMP. Portions of the site in and around the solar panels would be maintained as dryland pasture containing a combination of grassland species and non-invasive forbs and would be maintained for grazing for the duration of the life of the solar facility. The mixture of grassland and native forbs, managed by targeted sheep grazing, is expected to provide high value and consistently available habitat conditions for small mammal prey species (voles, pocket gophers, deer mice and house mice) preferred by raptors in the region.

MM BIO-7i The AMP shall include grazing management methods to ensure that the vegetation composition and structure provides a combination of areas with lower vegetation heights and density to provide accessibility to raptors, and areas with denser, taller vegetation to attract and maintain prey on the site. Management conditions shall include ensuring that the vegetation cover is not reduced to the extent that vegetation would not naturally regenerate; there are openings in the vegetation to allow foraging access for raptors; and there are areas where the vegetation would be allowed to grow taller. In general, vegetation heights below the panels should be allowed to be higher to provide cover for prey species (12 to 18 inches), and the vegetation heights between the panels should be maintained at a suitable height to provide foraging accessibility (<12 inches).

6.8 MITIGATION FOR POTENTIAL EFFECTS ON JURISDICTIONAL WATERS

The proposed project could result in impacts to an ephemeral drainage in the northwest corner of the northern parcel north of Manning Road that is a potential waters of the State and is also potentially subject to CDFW jurisdiction under Section 1600 of the Fish and Game Code. In the absence of proposed mitigation measures, the project could have the potential to result in a net loss of jurisdictional waters.

Mitigation for potential impacts to jurisdictional waters shall consist of avoidance of preserved jurisdictional waters on or adjacent to the site. In the event such waters cannot be avoided, the project applicant shall obtain the appropriate permits and provide compensatory mitigation at a minimum of a 1:1 ratio .

MM BIO-8a The project shall be designed to avoid impacts to jurisdictional waters on and adjacent to the site. If jurisdictional waters cannot be avoided, prior to the start of construction, the project applicant shall secure any required aquatic resources permits for impacts to jurisdictional waters of the State from the San Francisco Bay RWQCB and CDFW, and shall comply with all conditions of such permits including providing compensatory mitigation as required to achieve no net loss of wetlands or other waters.

MM BIO-8b For those waters of the State and CDFW jurisdictional areas that are not avoided by project construction, compensatory mitigation shall be provided. As approved by the San Francisco Bay RWQCB and CDFW, the project applicant may purchase mitigation credits from an approved mitigation bank at a minimum 1:1 ratio or implement another method of mitigation satisfactory to the San Francisco Bay RWQCB and CDFW.

MM BIO-8c Impacts shall also be minimized by the use of Best Management Practices (BMPs) to protect preserved waters of the U.S./State adjacent to the site and to ensure that water quality standards are not compromised in preserved wetlands and other waters within the watershed. These practices can include installing orange construction fencing buffers, straw waddles to keep fill from entering preserved/avoided wetlands and other waters, and other protective measures.

7.0 CUMULATIVE IMPACTS

Cumulative impacts would occur when a series of actions leads to the loss of biological resources in the vicinity of the project (the North Livermore Valley). The analysis of cumulative impacts to biological resources is based on impacts of the proposed project that could occur in combination with other developments in the vicinity of the subject property, including the nearby proposed Livermore Community Solar Farm and Oasis Fund projects. In the absence of design measures, other applicant proposed measures and proposed mitigation measures, the project would have the potential to result in a cumulative impact to biological resources in the region.

In the absence of the proposed mitigation measures, as well as measures taken by the applicant to site the project in an area that generally lacks high quality habitat for the majority of the special-status plant and wildlife species that occur in the region and the applicant proposed measures to revegetate the site to maintain wildlife habitat, the project would have the potential to result in a potentially significant cumulative impact on special-status species and other biological resources in concert with the impacts from other projects in the region.

Potential cumulative impacts could include (1) loss of high quality breeding and upland habitat for special-status amphibians (CRLF and CTS) or take of individuals leading to an incremental decline in the regional population of these species; (2) reduced nest success, nest failure, or other direct or indirect impacts to nesting birds as well as a complete loss of foraging habitat for special-status and common raptors and other resident and migratory birds that would have an incremental effect potentially leading to reduced populations of these birds in the region or lack of population expansion potential; (3) direct

impacts to American badger and/or San Joaquin kit fox or loss of dispersal and foraging habitat for these species that could lead to an incremental reduction in populations of these species; (4) a net loss of jurisdiction waters in the watershed; and (5) loss of potential movement corridors for special-status and common wildlife species leading to a cumulative potential for impacts to gene flow or genetic diversity among these species.

The project was sited to avoid impacts to high quality grassland habitats and streams that provide breeding habitat and high quality upland habitat for regionally-occurring special-status amphibians (CRLF and CTS). Approximately 150 acres of APN 903-0006-001-02 was removed from the development footprint during the planning phase in part because of its biological value. This area is proposed to be subdivided to legally separate it from the real property affiliated with the proposed project development. The project will impact low quality grassland habitat next to heavily travelled roads and other development that is not expected to provide quality habitat for CRLF and CTS. With the implementation of applicant proposed measures to revegetate the site and maintain herbaceous ground cover under the panels, upon construction of the solar generation facility and revegetation the site will provide grassland habitat for CRLF and CTS suitable for dispersal and refugia. Mitigation measures will also avoid take of individuals if present on the site by allowing them to leave but not return and by conducting pre-construction surveys to see if the site is being actively used as a dispersal corridor, avoiding construction within 200 feet of dispersal habitat during the active season of these species, biological monitoring and numerous other measures outlined in Section 6.2.

As opposed to completely eliminating the value of the site for foraging by developing an industrial type solar generating facility with no vegetation or wildlife habitat, the applicant has committed to maintaining foraging habitat for raptors and other birds on the site by maintaining vegetation under the solar panels that promotes a consistent source of prey and is a suitable height for raptor foraging. During operation of the proposed project, the applicant plans to maintain the project site with vegetation and seasonally graze livestock (sheep) between and under the solar panels for the duration of operation of the solar facility, pursuant to an AMP. The mixture of grassland and forbs managed by targeted sheep grazing is expected to provide high value and consistently available habitat conditions for small mammal prey species (ground squirrels, rabbits, voles, pocket gophers, deer mice and house mice). The AMP would include vegetation management methods to ensure that the vegetation composition and structure provides a combination of areas with lower vegetation heights and density to provide accessibility to foraging raptors, and areas with denser, taller vegetation to attract and maintain prey on the site, thus enhancing the site for raptor foraging use. Impacts to nesting raptors and other birds will be avoided by implementation of the measures in Section 6.6.

Direct impacts to American badger and San Joaquin kit fox will be avoided by implementation of the measures included in Section 6.4 and 6.5 and wildlife friendly fencing will be implemented by maintaining a gap under the fence to allow passage of small to mid-sized mammals. No direct impacts or loss of habitat for these species is anticipated.

No net loss of jurisdictional waters will occur with implementation of proposed measures in Section 6.8 and potential impacts to jurisdictional waters adjacent to the site will be avoided by implementation of BMPs as described in Sections 6.1 and 6.8. The project will not contribute to a cumulative loss of jurisdictional waters in the watershed.

The project was sited to avoid impacts to high quality grassland habitats and streams that could provide dispersal corridors or temporary refugia for wildlife. With the implementation of proposed measures to

revegetate the site upon completion of construction and incorporate wildlife friendly fencing, conversion of the project site from annual grassland and dryland grain cropland to a solar generation facility would not eliminate the potential for special-status amphibians or other wildlife to occupy, use or disperse through the site and would not constitute a cumulatively significant impact to wildlife movement corridors in the region. After construction has stopped and the site has been revegetated, the solar array is not expected to impede any migration route for wildlife, as the project site will support grassland vegetation as it did prior to construction.

Based on the above discussion, the proposed project as designed including the applicant proposed measures and proposed mitigation measures would result in a less than significant cumulative impact to special-status species and biological resources.

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Appendix A

Figures

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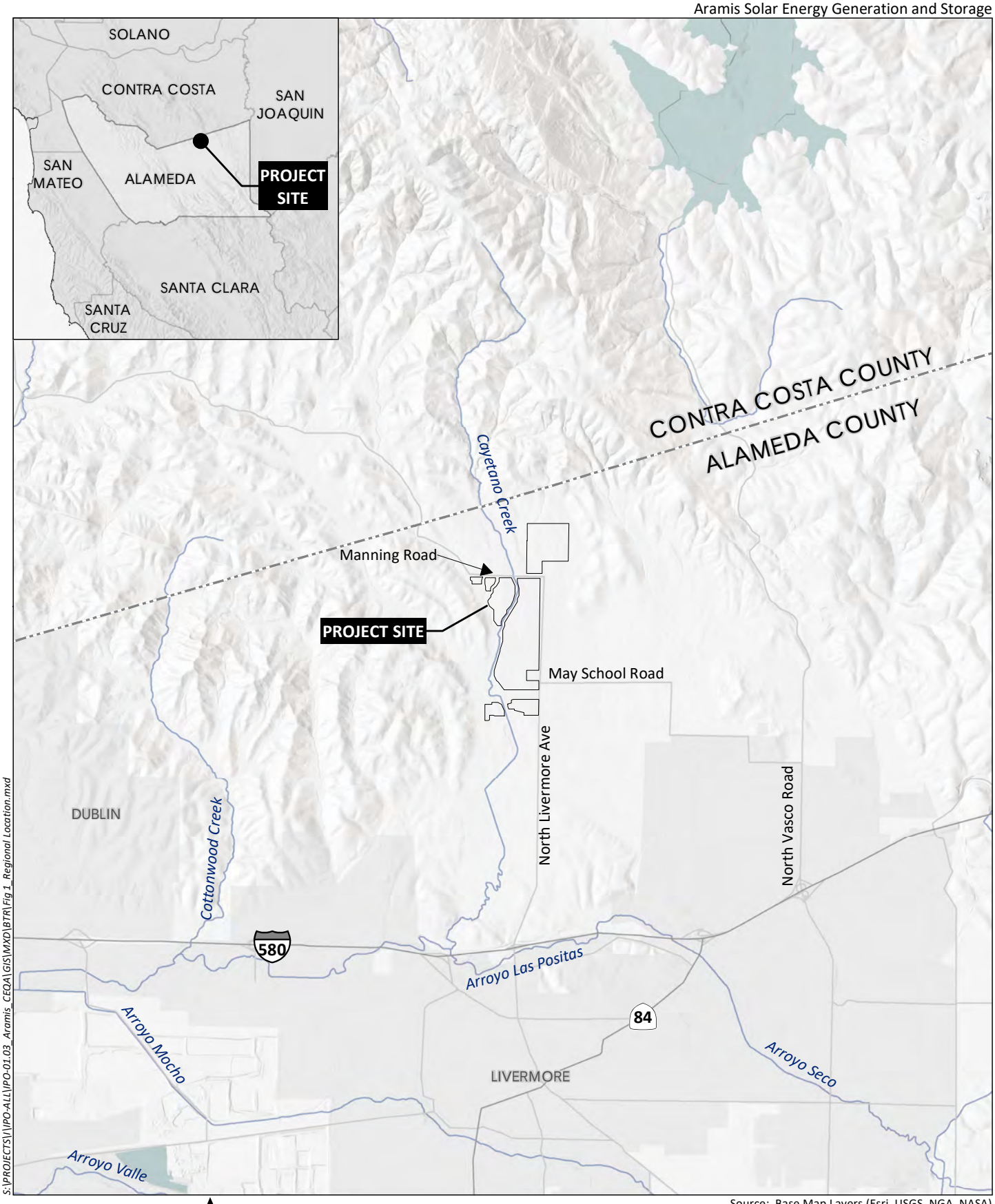


S:\PROJECTS\\IPO-ALL\IPO-01.03_Aramis_CEQA\GIS\MXD\BTR\Fig 1_Regional Location.mxd

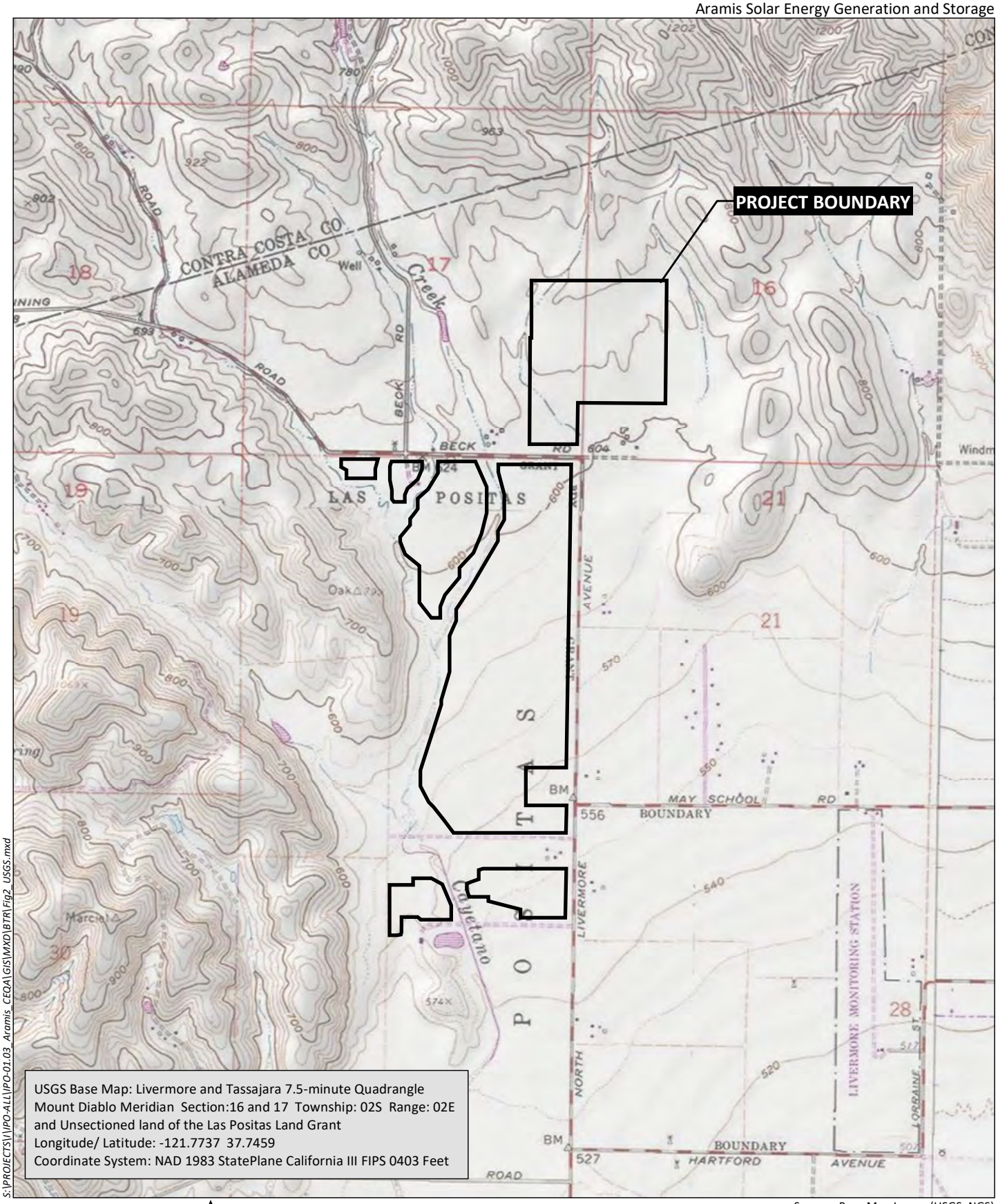
0 1.25 Miles

Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Regional Location

Figure 1



USGS Base Map: Livermore and Tassajara 7.5-minute Quadrangle
Mount Diablo Meridian Section:16 and 17 Township: 02S Range: 02E
and Unsectioned land of the Las Positas Land Grant
Longitude/ Latitude: -121.7737 37.7459
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

0 2,000 Feet

Source: Base Map Layers (USGS, NGS)

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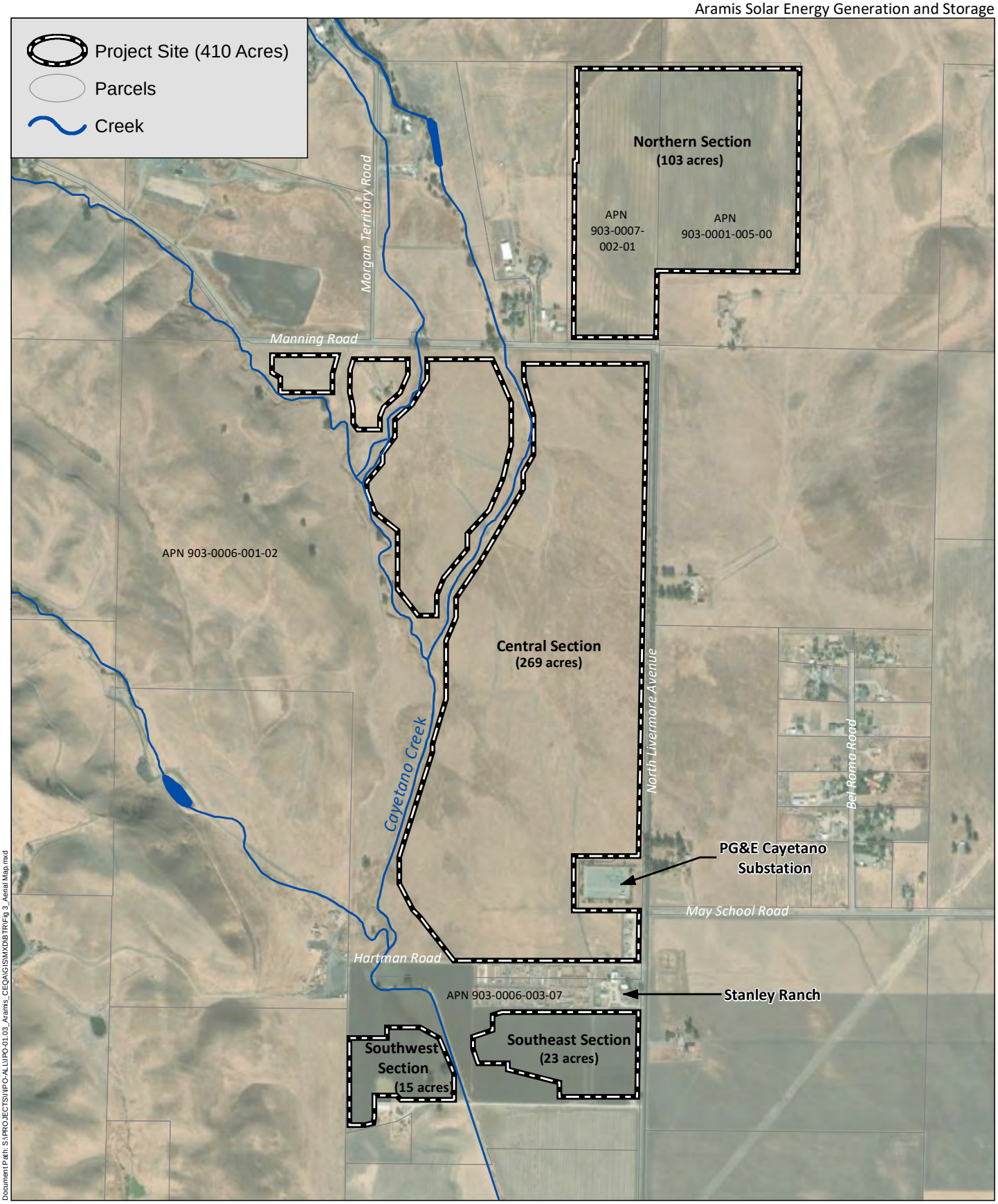
HELIX Environmental Planning

USGS 7.5-minute Quadrangle Map

Figure 2



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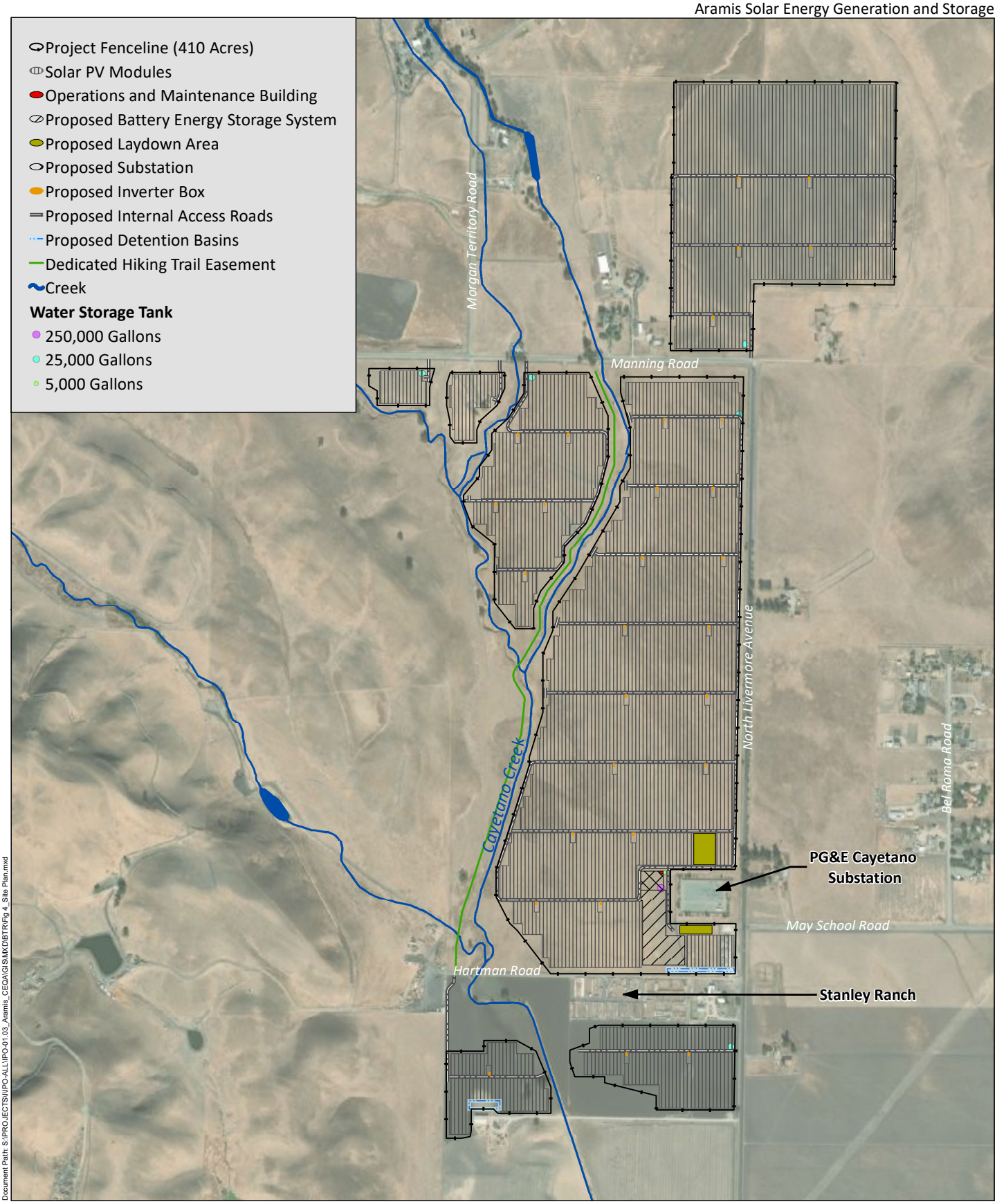
Source: Base Map Layers (DigitalGlobe 2018); Data (Alameda County 2017)

HELIX Environmental Planning

Aerial Map

Figure 3

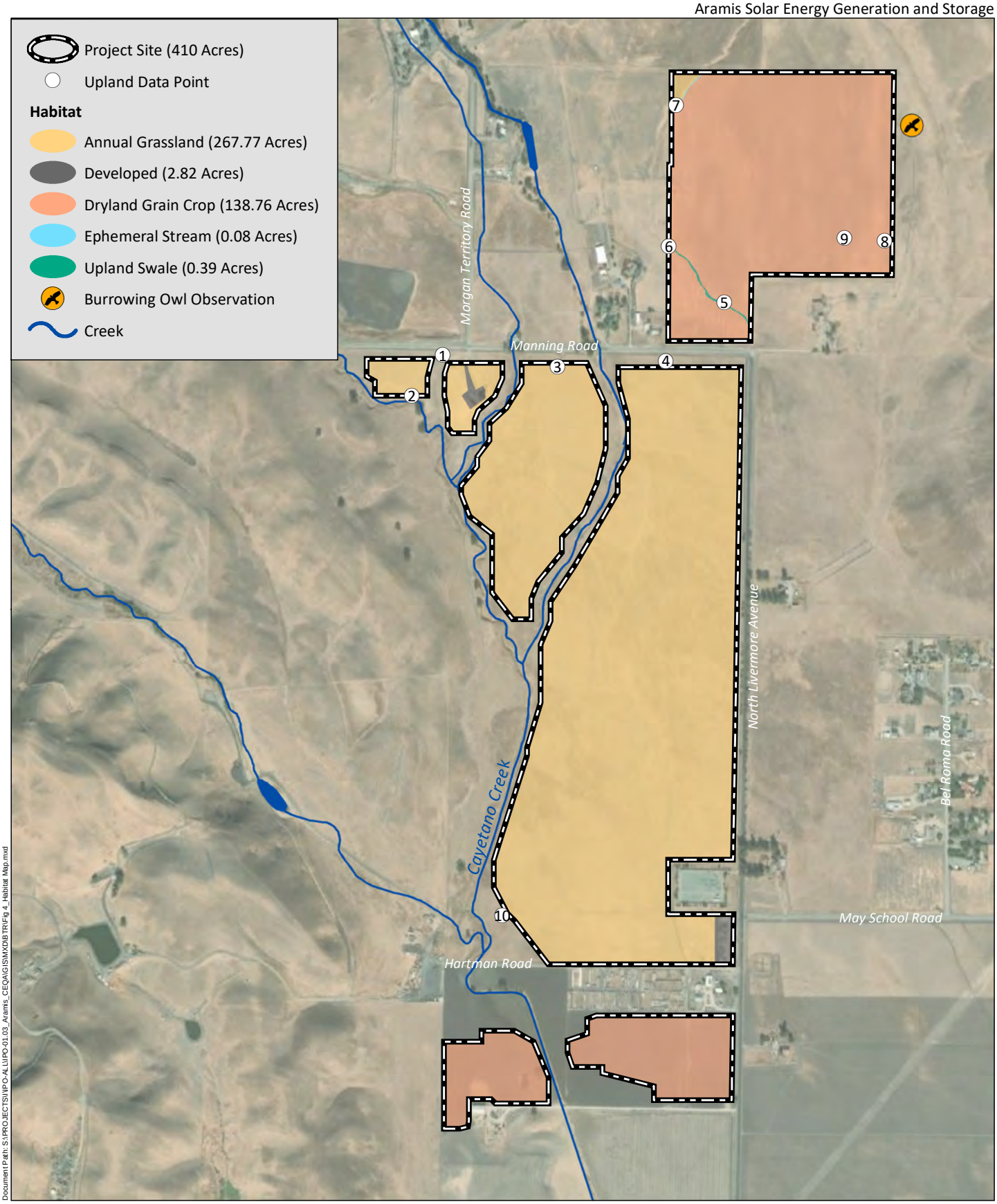


Source: Base Map Layers (DigitalGlobe 2018)

HELIX Environmental Planning

Site Plan

Figure 4



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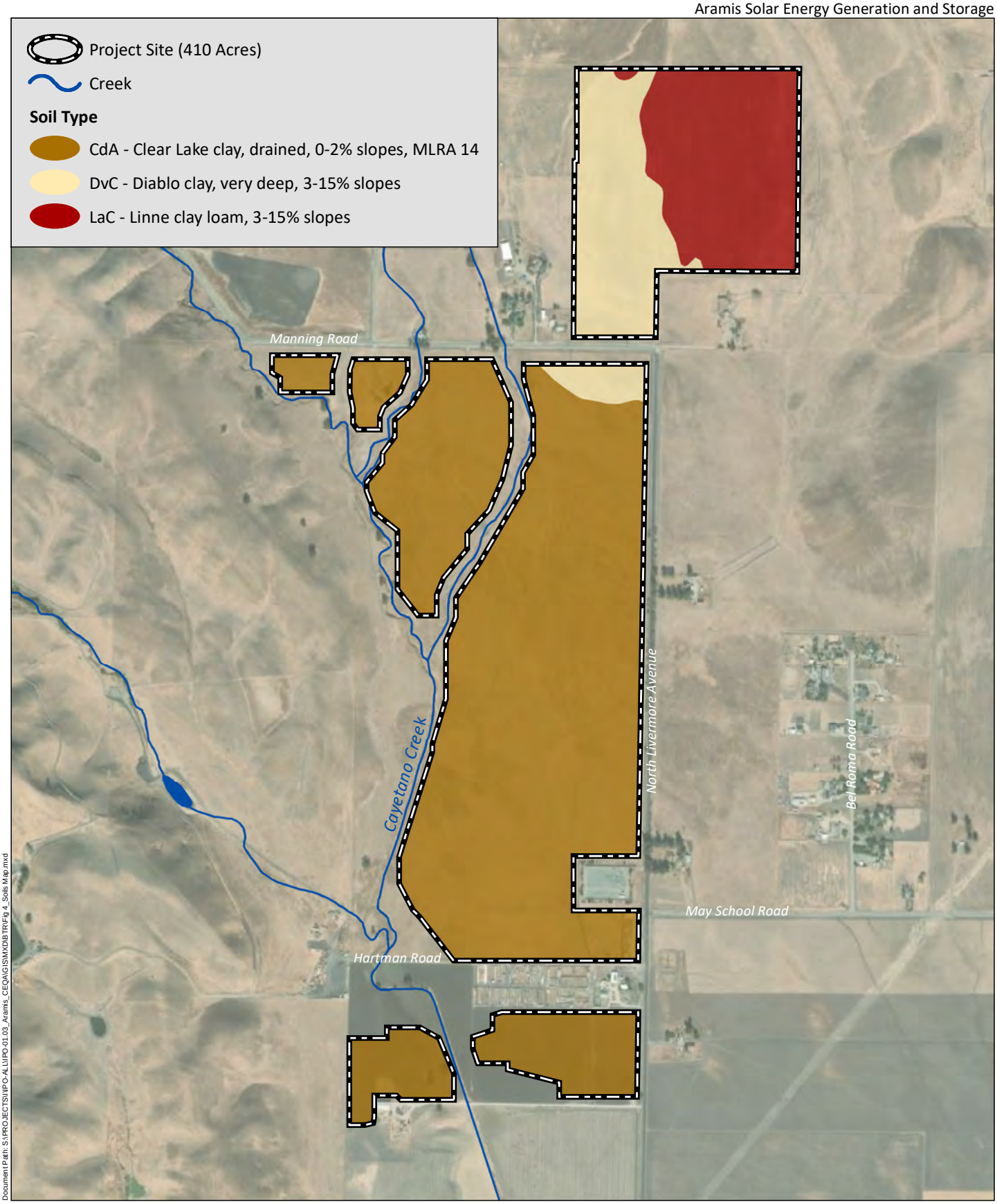
Source: Base Map Layers (DigitalGlobe 2018); Data (HELIX 2020)

HELIX Environmental Planning

Habitat Map

Figure 5



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Source: Base Map Layers (DigitalGlobe 2018): Data (NRCS 2020)

HELIX Environmental Planning

Soils Map

Figure 6

Appendix B

CNDDB, CNPS, and USFWS Lists of Regionally Occurring Special-Status Species

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Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Livermore (3712167) OR Tassajara (3712177))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01180	***Ambystoma californiense*** California tiger salamander	Threatened	Threatened	G2G3	S2S3	WL
AAABH01022	***Rana draytonii*** California red-legged frog	Threatened	None	G2G3	S2S3	SSC
AAABH01050	***Rana boylii*** foothill yellow-legged frog	None	Endangered	G3	S3	SSC
ABNKC06010	***Elanus leucurus*** white-tailed kite	None	None	G5	S3S4	FP
ABNKC11011	***Circus hudsonius*** northern harrier	None	None	G5	S3	SSC
ABNKC19120	***Buteo regalis*** ferruginous hawk	None	None	G4	S3S4	WL
ABNKC22010	***Aquila chrysaetos*** golden eagle	None	None	G5	S3	FP
ABNKD06071	***Falco peregrinus anatum*** American peregrine falcon	Delisted	Delisted	G4T4	S3S4	FP
ABNKD06090	***Falco mexicanus*** prairie falcon	None	None	G5	S4	WL
ABNSB10010	***Athene cunicularia*** burrowing owl	None	None	G4	S3	SSC
ABPAT02011	***Eremophila alpestris actia*** California horned lark	None	None	G5T4Q	S4	WL
ABPBXB0020	***Agelaius tricolor*** tricolored blackbird	None	Threatened	G2G3	S1S2	SSC
AMACC05030	***Lasiurus cinereus*** hoary bat	None	None	G5	S4	
AMACC08010	***Corynorhinus townsendii*** Townsend's big-eared bat	None	None	G3G4	S2	SSC
AMAFF08082	***Neotoma fuscipes annectens*** San Francisco dusky-footed woodrat	None	None	G5T2T3	S2S3	SSC
AMAJA03041	***Vulpes macrotis mutica*** San Joaquin kit fox	Endangered	Threatened	G4T2	S2	
AMAJF04010	***Taxidea taxus*** American badger	None	None	G5	S3	SSC
ARAAD02030	***Emys marmorata*** western pond turtle	None	None	G3G4	S3	SSC
ARADB21031	***Masticophis lateralis euryxanthus*** Alameda whipsnake	Threatened	Threatened	G4T2	S2	
CTT36210CA	***Valley Sink Scrub*** Valley Sink Scrub	None	None	G1	S1.1	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
CTT42110CA	***Valley Needlegrass Grassland*** Valley Needlegrass Grassland	None	None	G3	S3.1	
CTT62100CA	***Sycamore Alluvial Woodland*** Sycamore Alluvial Woodland	None	None	G1	S1.1	
ICBRA03030	***Branchinecta lynchi*** vernal pool fairy shrimp	Threatened	None	G3	S3	
ICBRA06010	***Linderiella occidentalis*** California linderiella	None	None	G2G3	S2S3	
IIHYM24250	***Bombus occidentalis*** western bumble bee	None	Candidate Endangered	G2G3	S1	
IIHYM24480	***Bombus crotchii*** Crotch bumble bee	None	Candidate Endangered	G3G4	S1S2	
NBMUS80010	***Anomobryum julaceum*** slender silver moss	None	None	G5?	S2	4.2
PDAST4M020	***Helianthella castanea*** Diablo helianthella	None	None	G2	S2	1B.2
PDAST4R0P1	***Centromadia parryi ssp. congdonii*** Congdon's tarplant	None	None	G3T1T2	S1S2	1B.1
PDBOR01050	***Amsinckia grandiflora*** large-flowered fiddleneck	Endangered	Endangered	G1	S1	1B.1
PDBOR0V0B0	***Plagiobothrys glaber*** hairless popcornflower	None	None	GX	SX	1A
PDBRA2R010	***Tropidocarpum capparideum*** caper-fruited tropidocarpum	None	None	G1	S1	1B.1
PDCAR0W062	***Spergularia macrotheca var. longistyla*** long-styled sand-spurrey	None	None	G5T2	S2	1B.2
PDCHE041F3	***Extriplex joaquinana*** San Joaquin spearscale	None	None	G2	S2	1B.2
PDCHE042L0	***Atriplex depressa*** brittlescale	None	None	G2	S2	1B.2
PDCHE042M0	***Atriplex minuscula*** lesser saltscale	None	None	G2	S2	1B.1
PDCPR07080	***Viburnum ellipticum*** oval-leaved viburnum	None	None	G4G5	S3?	2B.3
PDERI04040	***Arctostaphylos auriculata*** Mt. Diablo manzanita	None	None	G2	S2	1B.3
PDERI04273	***Arctostaphylos manzanita ssp. laevigata*** Contra Costa manzanita	None	None	G5T2	S2	1B.2
PDFAB400R5	***Trifolium hydrophilum*** saline clover	None	None	G2	S2	1B.2
PDLIN01030	***Hesperolinon breweri*** Brewer's western flax	None	None	G2	S2	1B.2

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDPLM0C0Q0	***Navarretia prostrata*** prostrate vernal pool navarretia	None	None	G2	S2	1B.2
PDSCR0J0J0	***Chloropyron palmatum*** palmate-bracted bird's-beak	Endangered	Endangered	G1	S1	1B.1
PMLIL0D160	***Calochortus pulchellus*** Mt. Diablo fairy-lantern	None	None	G2	S2	1B.2
PMPOA53110	***Puccinellia simplex*** California alkali grass	None	None	G3	S2	1B.2

Record Count: 45

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CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

19 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712167 and 3712177;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	annual herb	(Mar)Apr-May	1B.1	S1	G1
Arctostaphylos auriculata	Mt. Diablo manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar	1B.3	S2	G2
Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar(Apr)	1B.2	S2	G5T2
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	1B.2	S2	G2
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S1S2	G3T1T2
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Hesperolinon breweri	Brewer's western flax	Linaceae	annual herb	May-Jul	1B.2	S2	G2

Monardella antonina ssp. antonina	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	Jun-Aug	3	S1S3	G4T1T3Q
Navarretia prostrata	prostrate vernal pool navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G2
Plagiobothrys glaber	hairless popcornflower	Boraginaceae	annual herb	Mar-May	1A	SH	GH
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May(Jun)	1B.2	S2	G5T2
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	2B.3	S3?	G4G5

Suggested Citation

California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 13 July 2020].

California Native Plant Society's East Bay Chapter's Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties


Search | Add observations | Tools | Documentation


create excel file (limited to 600 records)
47 matching records

To see record details, click on the **Scientific Name**

Family	Scientific Name	notes	East Bay CNPS rarity rank	California rarity rank	habitat	comments	criteria	common name	elevation (Feet)	county	blooming period	cnddb element	last_updated	created
	Allium amplectens		A2	CEQA	Open Dry Slope, Serpentine or Serpentine-derived soils, Woodland, Miscellaneous		Small Populations	narrow-leaved onion	<5906	ALA, CCA	Apr-Jul			
	Arctostaphylos auriculata		*A2	1B.3 S2.2(CEQA) G2	Chaparral, Sand, Sandstone	(does not occur outside of CCA county)	Small Geographical Range	Mount Diablo manzanita	492-2133	CCA	Feb-Mar	PDERI04040		
	Arctostaphylos manzanita subsp. laevigata		*A2	1B.2 S2(CEQA) G5T2	Chaparral, Sand, Sandstone	(does not occur outside of CCA county)	Small Geographical Range	Contra Costa manzanita	787-3609	CCA	Feb-May	PDERI04273		
	Aspidotis californica		A1	CEQA	Rock, Tallus, Scree			California lace fern	66-4265	ALA, CCA	-		2020-05-13	
	Berberis aquifolium var. dictyota		A2	CEQA	Chaparral, Forest, Rock, Tallus, Scree, Scrub (Coastal or Interior), Woodland	Confusion with other vars	Small Populations	Jepson's mahonia	295-7218	ALA, CCA	Mar-May		2020-05-16	
	Calochortus pulchellus		*A2	1B.2 S2.1(CEQA) G2	Chaparral, Serpentine or Serpentine-derived soils, Woodland	More than 5 regions but: Rare, Threatened or Endangered statewide (does not occur outside of ALA and CCA counties)	Small Geographical Range	Mount Diablo fairy-lantern	656-2625	ALA?, CCA	Apr-Jun	PMLIL0D160		
	Calochortus splendens		A2	CEQA	Chaparral, Grassland (Annual or Perennial), Open Dry Slope		Narrow Range in ALA & CCA	splendid mariposa-lily	<9186	CCA	May-Jul		2020-05-23	
	Claytonia exigua subsp. glauca	(ssp. exigua is more common)	A1x	CEQA	Miscellaneous, Open Dry Slope, Sand, Sandstone, Serpentine or Serpentine-derived soils			claytonia	<3281	CCA	Apr-Jul		2020-06-22	
	Cryptantha decipiens		A2	CEQA	Grassland (Annual or Perennial), Sand, Sandstone, Scrub (Coastal or Interior)			GRAVEL CRYPTANTHA	646-15069	ALA,CCA	Mar-May		2015-02-14	2015-02-14
	Cryptantha microstachys		A2	CEQA	Chaparral, Woodland	ID confusion	Narrow Range in ALA & CCA Small Populations	Tejon cryptantha	164-6398	ALA, CCA	Apr-Jun		2020-06-28	
	Cryptantha nevadensis var. rigida		A1	CEQA	Rock, Tallus, Scree, Sand, Sandstone	ID confusion	N Limit Declining	Nevada cryptantha	262-7808	ALA	Mar-Jul		2020-05-16	
	Cryptantha rattanii		*A2	4.3 S3.3(CEQA) G3	Grassland (Annual or Perennial), Scrub (Coastal or Interior), Sand, Sandstone	ID confusion	Disjunct N Limit	Rattan's cryptantha, gravel cryptantha	492-2559	ALA, CCA	Apr-Jul	PDBOR0A2H0		
			A2	CEQA						CCA	May-Jul			

	Delphinium hansenii subsp. hansenii				Chaparral, Woodland			Hansen's larkspur	492-9843				2012-03-25	2004-08-22
	Delphinium parryi subsp. parryi		A2	CEQA	Chaparral, Woodland		Narrow Range in ALA & CCA	Parry's larkspur	656-5577	ALA	Apr-Jun		2020-06-10	
	Elymus stebbinsii		A1	CEQA	Chaparral, Forest, Open Dry Slope			Stebbins' wheat grass, Parish's wheat-grass	<7316	ALA, CCA	Jun-Jul		2020-01-20	
	Epilobium torreyi		A2	CEQA	Riparian	Overlooked?	Limited/Threatened Habitat	narrow-leaved boisduvalia	164-8530	ALA, CCA	May-Aug			
	Eriastrum abramsii		A1	CEQA	Open Dry Slope		Small Populations	Abram's eriastrum	<3937	ALA, CCA	Apr-Jun		2020-05-14	
	Fraxinus dipetala		A2	CEQA	Chaparral, Woodland, Miscellaneous	W limit?	Narrow Range in ALA & CCA Small Populations	California ash, flowering ash	328-4265	ALA?, CCA	Apr-Jun			
	Fremontodendron californicum		A1x	CEQA	Chaparral, Rock, Tallus, Scree, Woodland	Planted at many other sites		flannelbush	591-7612	CCA	Apr-Jul		2016-03-01	
	Galium andrewsii subsp. gatense		*A2	4.2 S3.2(CEQA) G5T3	Chaparral, Serpentine or Serpentine-derived soils, Woodland	More than 5 regions but: Rare, Threatened or Endangered statewide		phlox-leaf serpentine bedstraw, serpentine bedstraw	722-4757	ALA, CCA	Apr-Jun			
	Gilia achilleifolia subsp. unknown		A2	CEQA	Miscellaneous			California gilia		ALA; CCA	-			2000-11-20
	Gilia tricolor subsp. tricolor		A2	CEQA	Grassland (Annual or Perennial)	ID's correct? Ssp. rarely indicated, but ssp. diffusa is the more common one here.		birds-eye gilia	<3937	ALA, CCA	-		2020-06-20	
	Githopsis specularioides		A2	CEQA	Burns, Chaparral, Woodland	Overlooked?	Small Populations Fire Follower	common bluecup	197-4921	ALA, CCA	Apr-May		2020-06-10	
	Helianthella castanea		*A2	1B.2 S2(CEQA) G2	Chaparral, Grassland (Annual or Perennial), Woodland	More than 5 regions but: Rare, Threatened or Endangered statewide Occurs in transition areas between habitats Populations in southern ALA are intermediate to H. californica	Small Geographical Range Small Populations	Diablo helianthella	656-4265	ALA, CCA	Apr-Jun	PDAST4M020		
	Hesperolinon breweri		*A2	1B.2 S2.2(CEQA) G2	Grassland (Annual or Perennial), Serpentine or Serpentine-derived soils		Limited/Threatened Habitat Small Geographical Range	Brewer's western flax	98-2297	CCA	May-Jun	PDLIN01030		
	Juglans hindsii	(formerly J. californica var.	*A2	1B.1 S1.1(CEQA) G1	Riparian	More than 5 regions but: Rare, Threatened or Endangered statewide Most sites are planted. Confusion about how many natural populations exist Only natural populations	Limited/Threatened Habitat	northern California black walnut, Northern California black	<984	ALA, CCA	Apr-May	PDJUG02040		

						are protected								
	Lasthenia microglossa		A2	CEQA	Chaparral, Grassland (Annual or Perennial), Miscellaneous Wetlands, Woodland	Overlooked?	N Limit	small-ray goldfields	<3281	ALA, CCA	Mar-May		2020-06-20	
	Layia gaillardioides		A2	CEQA	Scrub (Coastal or Interior), Woodland		Declining	woodland layia	<4265	ALA, CCA	Mar-Aug		2020-06-28	
	Leptosiphon pygmaeus subsp. continentalis	(formerly Linanthus p. ssp. c.	A2	CEQA	Miscellaneous	Overlooked?		pygmy linanthus, pygmy leptosiphon	<5577	CCA	Mar-Jun			1998-10-20
	Minuartia pusilla		A1	CEQA	Chaparral, Forest			annual sandwort, least sandwort	<7874	ALA, CCA	-		2020-01-20	
	Muilla maritima		A2	CEQA	Alkali Areas, Grassland (Annual or Perennial), Miscellaneous Wetlands, Open Dry Slope, Scrub (Coastal or Interior), Serpentine or Serpentine-derived soils, Woodland	Very scattered, uncommon, . Frequently found in botanical 'hot spots' (Chris Thayer, notes 1993)	Small Populations Declining	common muilla	<7546	ALA, CCA	Mar-Jun		2020-06-28	
	Navarretia intertexta subsp. intertexta		A1	CEQA	Vernal Pool, Miscellaneous Wetlands		Limited/Threatened Habitat	needle-leaved navarretia	<6890	ALA	May-Jul			2000-02-09
	Osmorhiza brachypoda		A2	CEQA	Forest, Riparian, Woodland		N Limit	California cicely	656-6562	ALA, CCA	Mar-May		2020-06-20	
	Pectocarya pusilla		A2	CEQA	Grassland (Annual or Perennial), Miscellaneous, Woodland			little pectocarya	328-5906	ALA, CCA	Mar-Jun		2020-06-20	
	Pentachaeta alsinoides		A2	CEQA	Grassland (Annual or Perennial)	Overlooked	Declining	tiny pentachaeta	<1804	ALA, CCA	Mar-Jun			
	Piperia michaelii		*A2	4.2 S3.2(CEQA) G3	Forest, Scrub (Coastal or Interior), Woodland	More than 5 regions but: Rare, Threatened or Endangered statewide. ID confusion		Michael's rein-orchid	<2297	ALA, CCA	Apr-Aug	PMORC1X110	2016-02-29	
	Piperia unalascensis		A1	CEQA	Forest, Scrub (Coastal or Interior), Woodland	ID Questions		Alaska piperia, slender-spire orchid	<9843	ALA, CCA	May-Aug		2020-06-09	
	Plectritis congesta subsp. congesta		A1	CEQA	Coastal Bluff, Woodland	Taxonomic problems. ID questionable for all Plectritis spp.		sea blush	<5577	ALA, CCA	Mar-Jun		2020-01-20	
	Pogogyne zizyphoroides		A1	CEQA	Vernal Pool		Limited/Threatened Habitat Declining	Sacramento beardstyle	<1312	ALA	Mar-Jun		2020-05-16	
	Quercus xjolonensis		A1?	CEQA	Forest, Woodland	Many trees with characters of both Q. lobata and Q. douglasii, but few confirmed as this hybrid		blue oak x valley oak		ALA	-		2020-07-01	
			A2	CEQA	Grassland (Annual or	R. occid., R. canus, & R.	Narrow Range in ALA & CCA	western buttercup	<4921	ALA, CCA	Mar-Jul		2020-06-28	

	Ranunculus occidentalis var. occidentalis				Perennial), Woodland	calif. all meet in the E Bay and can often be hard to distinguish and may intermingle								
	Thysanocarpus radians		A2	CEQA	Miscellaneous		Narrow Range in ALA & CCA	ribbed fringe pod	<2625	CCA	Mar-Apr		2020-06-09	
	Trifolium dichotomum		A2	CEQA	Coastal Bluff, Grassland (Annual or Perennial), Miscellaneous, Open Dry Slope, Woodland	Near	S Limit	branched indian clover	<4265	ALA, CCA	Apr-Jun		2020-06-20	
	Trifolium olivaceum		A2	CEQA	Miscellaneous	Overlooked?	Declining	olive clover	<2625	ALA, CCA	Apr-May		2020-06-09	
	Triodanis biflora		A2	CEQA	Burns, Miscellaneous		Small Populations Declining Fire Follower	Venus' looking-glass	<6562	ALA, CCA	Apr-Jun		2020-05-23	
	Tropidocarpum gracile		A2	CEQA	Alkali Areas, Grassland (Annual or Perennial)	More than 5 locations but:	Small Populations Declining	slender tropidocarpum	<4757	ALA, CCA	Mar-May		2020-06-20	
	Vicia hassei		A2	CEQA	Grassland (Annual or Perennial), Scrub (Coastal or Interior)			slender vetch	<3937	ALA, CCA	Mar-May			

Query: whatShow=Species records;sorting=Scientific Name;elevBelow=300;elevUnits=Meters;ebrarity=any A
botanicalRegion=Morgan Territory Area
Your query took: 0.507 seconds.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2020-SLI-0538
Event Code: 08ESMF00-2020-E-07263
Project Name: Aramis

July 13, 2020

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2020-SLI-0538

Event Code: 08ESMF00-2020-E-07263

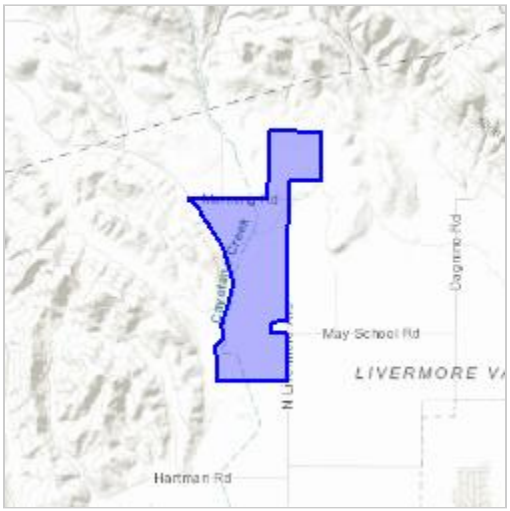
Project Name: Aramis

Project Type: ** OTHER **

Project Description: PV Solar Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.74616598468979N121.77424483179388W



Counties: Alameda, CA

Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Large-flowered Fiddleneck *Amsinckia grandiflora*	Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5558	
Palmate-bracted Bird's Beak *Cordylanthus palmatus*	Endangered
No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1616	

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix C

Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

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Appendix C
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Table C-1. Regionally-Occurring Special-Status Species with the Potential to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Plants			
Amsinckia grandiflora large-flowered fiddleneck	FE/SE/CRPR 1B.1	Annual herb. Grows in cismontane woodlands and valley and foothill grassland. Occurs at elevations from 270 – 550 meters (m) above mean sea level (amsl). Flowering period (March) April – May (CNPS 2020).	**Will not occur.** There is no suitable habitat in the project site and the site is below the lower elevation limit for this species. This site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Arctostaphylos auriculata Mt. Diablo manzanita	--/--/CRPR 1B.3	Perennial evergreen shrub. Grows in chaparral and cismontane woodlands in sandstone. Occurs at elevations from 135 – 650 m amsl. Flowering period January – March (April) (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. This species was not observed in the project site during botanical surveys conducted during the blooming season. No manzanita plants are present on the site.
Arctostaphylos manzanita ssp. *laevigata* Contra Costa manzanita	--/--/CRPR 1B.2	Perennial evergreen shrub. Grows in chaparral on rocky slopes. Occurs at elevations from 430 – 1,100 m amsl. Flowering period January – March (April) (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. This species was not observed in the project site during botanical surveys conducted during the blooming season. No manzanita plants are present on the site.
Astragalus tener var. *tener* alkali milkvetch	--/--/CRPR 1B.2	Annual herb. Grows in playas, valley and foothill grassland (adobe clay), vernal pools in alkaline conditions. Occurs at elevations from 1 – 60 m amsl. Flowering period March – June (CNPS 2020).	**Will not occur.** Suitable habitat is not present on the project site. Playas and vernal pools are absent. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			of non-native and invasive plant species and lacks mesic areas. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Atriplex cordulata var. *cordulata* heartscale	--/--/CRPR 1B.2	Annual herb. Grows in chenopod scrub, meadows, seeps, valley and foothill grasslands (sandy). Prefers saline/alkaline conditions. Occurs at elevations from 0 – 560 m amsl. Flowering period April – October (CNPS 2020).	**Will not occur.** There is no suitable habitat in the project site. This species was not observed in a focused rare plant survey conducted during the appropriate blooming period for this species. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species.
Atriplex depressa brittlescale	--/--/CRPR 1B.2	Annual herb. Grows in chenopod scrub, meadows, seeps, playas, valley and foothill grasslands, vernal pools. Prefers clay/alkaline conditions. Occurs at elevations from 1 – 320 m amsl. Flowering period April – October (CNPS 2020).	**Will not occur.** Suitable habitat is not present on the project site. Chenopod scrub, meadows, seeps, and playas are absent from the site. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed during a focused rare plant survey conducted during the appropriate blooming period for this species.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Atriplex minuscula lesser salt scale	--/--/CRPR 1B.1	Annual herb. Grows in chenopod scrub, playas, and valley and foothill grasslands. Prefers sandy/alkaline conditions. Occurs at elevations from 15 – 200 m amsl. Flowering period May – October (CNPS 2020).	**Will not occur.** There is no suitable habitat in the project site. Chenopod scrub and playas are absent. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in a focused rare plant survey conducted during the appropriate blooming period for this species.
Balsamorhiza macrolepis big-scale balsamroot	--/--/CRPR 1B.2	Perennial herb. Grows on slopes in chaparral, cismontane woodland, and valley and foothill grassland, sometimes in serpentinite soil. Occurs at elevations from 45 – 1,555 m amsl. Flowering period March – June (CNPS 2020).	**Will not occur.** Suitable habitat is not present in the project site. Chaparral and woodland are absent from the site. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Calochortus pulchellus Mt. Diablo fairy-lantern	--/--/CRPR 1B.2	Perennial bulbiferous herb. Occurs in chaparral, cismontane woodland, riparian woodland, valley and foothill grassland. Occurs at elevations from 30 – 840 m amsl. Flowering period April – June (CNPS 2020).	**Will not occur.** Suitable habitat is not present in the project site. Chaparral and woodland habitats are absent. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Centromadia parryi ssp. *condonii* Congdon's tarplant	--/--/CRPR 1B.2	Annual herb. Occurs in valley and foothill grassland in alkaline conditions. Occurs at elevations from 0 – 230 m amsl. Flowering period May – October (November) (CNPS 2020).	**Will not occur.** Suitable habitat is not present on the site. This site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. In addition, this species was not observed during a focused rare plant survey conducted during the appropriate blooming period for this species.
Chloropyron palmatum palmated-bracted bird's-beak	FE/SE/CRPR 1B.1	Annual herb (hemiparisitic). Occurs in wetlands in chenopod scrub and valley and foothill grassland. Prefers alkaline conditions. Occurs at elevations from 5 – 155 m amsl. Flowering period May – October (CNPS 2020).	**Will not occur.** Habitat is not present in the project site, and wetland habitat that could support this species is not present. This species was not observed in a focused rare plant survey conducted during the blooming season.
Extriplex joaquinana San Joaquin spearscale	--/--/CRPR 1B.2	Annual herb. Occurs in chenopod scrub, meadows and seeps, playas, valley and foothill grassland in alkaline conditions. Occurs at elevations from 1 – 835 m amsl. Flowering period April – October (CNPS 2020).	**Will not occur.** Suitable habitat is not present in the project site. Chenopod scrub, meadows and seeps, and playas are absent. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in a focused rare plant survey conducted during the blooming season.
Helianthella castanea Diablo helianthella	--/--/CRPR 1B.2	Perennial herb. Occurs in broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Typically, in partial shade in rocky/axonal soil. Occurs at elevations from 60 – 1,300 m amsl. Flowering period March – June (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. Chaparral, forest, scrub and woodland habitats are absent and shaded, rocky soils are not present. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Hesperolinon breweri Brewer's western flax	--/--/CRPR 1B.2	Annual herb. Occurs in chaparral, cismontane woodland, valley and foothill grassland. Usually occurs in serpentinite soil. Occurs at elevations from 30 – 945 m amsl. Flowering period May – June (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. Chaparral and woodland habitats are absent, as are serpentinite soils. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Monardella antonina ssp. *antonina* San Antonio Hills monardella	--/--/CRPR 3	Perennial rhizomatous herb. Occurs in chaparral and cismontane woodland. Occurs at elevations from 320 – 1,000 m amsl. Flowering period June – August (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. Chaparral and woodland habitats are absent and the site is below the lower elevation limit for this species. This species was not observed in a focused rare plant survey conducted during the appropriate blooming period for this species.
Navarretia prostrata prostrate vernal pool navarretia	--/--/CRPR 1B.1	Annual herb. Occurs in coastal scrub, meadows and seeps, vernal pools and valley and foothill grassland (alkaline). Prefers mesic conditions. Occurs at elevations from 3 – 1,210 m amsl. Flowering period April – July (CNPS 2020).	**Will not occur.** Mesic habitat is not present in the project site. Scrub, meadows and seeps, and vernal pools are absent. The grassland in the site does not provide mesic conditions generally. This species was not observed in a focused rare plant survey conducted during the appropriate blooming period for this species.
Plagiobothrys glaber hairless popcornflower	--/--/CRPR 1A	Annual herb. Occurs in coastal salt marshes and swamps, meadows and seeps (alkaline). Occurs at elevations from 15 – 180 m amsl. Flowering period March – May (CNPS 2020).	**Will not occur.** Marsh, swamps and seep habitat is not present in the project site. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Puccinellia simplex California alkali grass	--/--/CRPR 1B.2	Annual herb. Occurs in chenopod scrub, meadows and seeps, vernal pools and valley and foothill grassland. Occurs at elevations from 2 – 930 m amsl. Flowering period March – May (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. Chenopod scrub, meadows and seeps, and vernal pools are absent. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			This species was not observed in the project site during botanical surveys conducted during the blooming season.
Spergularia macrotheca var. *longistyla* long-styled sand-spurrey	--/--/CRPR 1B.2	Annual herb. Occurs in marshes and swamps, meadows and seeps and hot springs. Occurs in alkaline conditions. Occurs at elevations from 0 – 255 m amsl. Flowering period February – May (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Trifolium hydrophilum saline clover	--/--/CRPR 1B.2	Annual herb. Occurs in marshes and swamps, vernal pools and valley and foothill grassland (mesic and alkaline). Occurs at elevations from 0 – 300 m amsl. Flowering period April – June (CNPS 2020).	**Will not occur.** Suitable mesic habitat is not present in the project site. Additionally, this site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Tropidocarpum capparideum caper-fruited tropidocarpum	--/--/CRPR 1B.1	Annual herb. Occurs in valley and foothill grassland. Occurs in alkaline hills. Occurs at elevations from 1 – 455 m amsl. Flowering period March – April (CNPS 2020).	**Will not occur.** Suitable habitat is not present in the project site. This site has been converted to agricultural use for nearly a century and native plant assemblages are no longer present. Grassland habitat on the site is comprised almost entirely of non-native and invasive plant species. This species was not observed in the project site during botanical surveys conducted during the blooming season.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Viburnum ellipticum oval-leaved viburnum	--/--/CRPR 2B.3	Perennial deciduous shrub. Occurs in chaparral, cismontane woodland, and lower montane coniferous forest. Occurs at elevations from 215 – 1,400 m amsl. Flowering period May – June (CNPS 2020).	**Will not occur.** Habitat is not present in the project site. This species was not observed in the project site during botanical surveys conducted during the blooming season.
Wildlife			
Invertebrates			
Bombus crotchii Crotch's bumblebee	--/SCE/--	Crotch's bumble bee occurs in grassland and scrub habitats (California Department of Fish and Wildlife [CDFW] 2019a). New colonies are initiated by solitary queens, generally in the early spring, which typically occupy abandoned rodent burrows (CDFW 2019). This species is a generalist forager and have been reported visiting a wide variety of flowering plants. A short-tongued bumble bee; food plants include *Asclepias* spp., *Antirrhinum* spp., *Clarkia* spp., *Eschscholzia* spp., *Eriogonum* spp., *Chaenactis* spp., *Lupinus* spp., *Medicago* spp., *Phacelia* spp., and *Salvia* spp. (Koch et al. 2012). The flight period for queens in California is from February to October. New queens hibernate over the winter and initiate a new colony the following spring (CDFW 2019). Rare throughout its range and in decline in the Central Valley and southern California (CDFW 2019).	**Will not occur.** Grassland habitat is present on the site and some select food plants are present on site. However, Crotch's bumble bee was not observed in the project site during surveys in 2018 or 2020. Other bumble bee species observed during the survey in February 2020 included yellow-faced bumble bee (*Bombus vosnesenskii*) which is common and uses habitat found in the project site. Crotch's bumble bee is currently rare across its range in California (CDFW 2019) is presumed to be extirpated in Alameda County (NatureServe 2020). The nearest CNDDB occurrence for this species is located approximately 6.4 miles southwest of the project site near Pleasanton (CDFW 2020). However, this record is from 1932 and there are no other nearby current records that document this species near the project site. The closest confirmed account of this species is approximately 12 miles northeast near Discovery Bay documented in 2017 (iNaturalist 2020).

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Bombus occidentalis Western bumble bee	--/SCE/--	Bumble bees are primitively eusocial insects that live in underground colonies made up of one queen, female workers, and reproductive members of the colony. New colonies are initiated by solitary queens, generally in the early spring, which typically occupy abandoned rodent burrows (Thorp et al. 1983). This species is a generalist forager and have been reported visiting a wide variety of flowering plants. A short-tongued bumble bee; select food plants include *Melilotus* spp., *Cirsium* spp., *Trifolium* spp., *Centaurea* spp., *Eriogonum* spp., and *Chrysothamnus* spp. (Koch et al. 2012). This species has a short tongue and typically prefers open flowers with short corollas but is known to chew through the base of flowers with long corollas. The flight period for queens in California is from early February to late November, peaking in late June and late September. New queens hibernate over the winter and initiate a new colony the following spring (Thorp et al. 1983). Rare throughout its range and in decline west of the Sierra Nevada crest.	**Will not occur.** Habitat is present for western bumble bee and some select food plants are present on site. However, this species is currently rare across its range and in California it is currently limited to high elevation meadows in the Sierra Nevada and small coastal populations (CDFW 2019). The nearest CNDDB occurrence for this species is located approximately 6.4 miles southwest of the project site near Pleasanton (CDFW 2020). However, this record is from 1932 and there are no other nearby current records that document this species near the project site. Western bumble bee was not observed in the project site during surveys.
Branchinecta conservatio conservancy fairy shrimp	FE/--/--	Occupies large clay bottomed vernal pools to vernal lakes with turbid water in grasslands. The historical distribution of this species is unknown, and it is currently distributed throughout the Central Valley and southern coastal regions of California (USFWS 2005).	**Will not occur.** There are no large vernal pools, lakes or other large suitable wetland habitats in the project site.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Branchinecta lynchi vernal pool fairy shrimp	FT/--/--	Vernal pools ranging from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. It is most frequently found in pools measuring less than 0.05 acre; although has been collected from vernal pools exceeding 25 acres. The known range within California includes the Central Valley and southern California. (USFWS 2005).	**Will not occur.** There are no vernal pools or other suitable wetland habitats in the project site.
Callophrys mossii bayensis San Bruno elfin butterfly	FE/--/--	Inhabits north-facing slopes on San Bruno Mountain and nearby summits on the Peninsula south of San Francisco. Larvae are restricted to stonecrop (*Sedum spathulifolium*), which grows on steep slopes in chaparral from 50 – 2,500 m amsl (USFWS 1984).	**Will not occur.** Will not occur since the host plant and habitat for the host plant is not present. The project site is outside of this species known range.
Desmocerus californicus californicus valley elderberry longhorn beetle	FT/--/--	Endemic to elderberry shrubs (*Sambucus* spp.) occurring in riparian habitat in the Sacramento and San Joaquin Valleys, riparian habitats in the Sacramento and San Joaquin Valleys, and less common throughout riparian forests of the Central Valley from Redding to Bakersfield typically below 152 m amsl (USFWS 2017).	**Will not occur.** There are no elderberry shrubs in the project site. The project site is outside of this species presumed and historical range (USFWS 2014).
Speyeria callippe callippe Callippe silverspot butterfly	FE/--/--	This species has one flight of adults per year. It historically inhabited hilly grasslands of seven counties bordering the San Francisco Bay. Since 1998 records have documented at San Bruno Mountain, Signal Hill (San Mateo County), hills near Pleasanton (Alameda County), Sears Point (Sonoma County) and the hills between Vallejo and Cordelia, CA (USFWS 2009). Larvae are restricted to Johnny jump-up (*Viola pedunculata*), which grows on grassy slopes, hillsides, chaparral, and oak woodland in full sun below 1,540 m amsl (Black and Vaughan 2005). Hilltops and ridges are important for mating. Adults lay eggs on the larval host plant or on	**Will not occur.** Will not occur since the host plant and its habitat are not present. Hilltop and ridge habitat, which are important for mating, are also not present. In addition, the project site is outside of this species current range.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
		surrounding debris. Adults feed on the nectar of Johnny jump-up in addition to several other flowers (USFWS 2009).	
Fish			
Hypomesus transpacificus Delta smelt	FT/SE/--	Delta smelt are tolerant of a wide salinity range. They have been collected from estuarine waters up to 14 ppt (parts per thousand) salinity. For a large part of their one-year life span, delta smelt live along the freshwater edge of the mixing zone (saltwater-freshwater interface), where the salinity is approximately 2 ppt. Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse into river channels and tidally-influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edge-waters. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, bulrush, tree roots and submerged branches. Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties (USFWS 1995).	**Will not occur.** There is no suitable habitat for this species in the project site.
Amphibians			
Ambystoma californiense California tiger salamander	FT/ST/--	California tiger salamanders are generally restricted to vernal pools and seasonal ponds, including many constructed stockponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet in central California. This species spends the majority of its life in upland areas in the vicinity of suitable breeding ponds, where it inhabits rodent	**May occur.** There is no suitable breeding habitat in the project site and upland refugia is very limited. Cayetano Creek does not provide suitable breeding habitat for this species. Suitable ponds near the project site provide habitat and known records of breeding CTS.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
		burrows. In order to provide suitable habitat for this species, suitable breeding habitat must be present in combination with suitable upland habitat. In the Coastal region, populations are scattered from Sonoma County in the northern San Francisco Bay Area to Santa Barbara County, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern counties (USFWS 2017).	CTS could occur moving through the project site and use Cayetano Creek as aquatic non-breeding habitat during periods of dispersal. California ground squirrel burrows that could provide upland habitat or any other fossorial mammal were virtually absent from the project site. The only upland refugia present for this species were soil cracks in the clay soil.
Rana boylii Foothill yellow-legged frog	--/SCE/SSC	The foothill yellow-legged frog occurs along the coast ranges from Oregon to Los Angeles and along the western side of the Sierra Nevada. This species uses perennial rocky streams in a wide variety of habitats up to 6,400 feet amsl. This species rarely ventures far from water, is usually found basking in the water, or under surface debris or underground within 165 feet of water. Eggs are laid in clusters attached to gravel or rocks along stream margins in flowing water. Tadpoles typically require up to four months to complete aquatic development. Breeding typically follows winter rainfall and snowmelt, which varies based upon location (Jennings and Hayes 1994).	**Will not occur.** Cayetano Creek does not provide habitat for foothill yellow-legged frog and this species was not observed in the project site during two seasons of protocol surveys for CRLF. Cayetano Creek has a brief hydroperiod and dries up in the spring and does not provide perennial water for this species or rocky substrate for egg laying. There is one historical record of this species collected and deposited in the Museum of Vertebrate Zoology from 1973. The specimen was collected from a nonspecific area near Livermore (CDFW 2020) south of the project site.
Rana draytonii California red-legged frog	FT/--/SSC	The California red-legged frog occupies a distinct habitat, combining both specific aquatic and riparian components. The adults require dense, shrubby or emergent riparian vegetation closely associated with deep (greater than 2 1/3-foot deep) still or slow-moving water. The largest densities of California red-legged frogs are associated with deep-water pools with dense	**May occur.** There is no suitable breeding habitat in the project site and this species was not observed in the project site during protocol surveys. Cayetano Creek and other tributaries in the project site do not provide suitable breeding habitat for this species since the water is shallow

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
		stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*). Well-vegetated terrestrial areas within the riparian corridor may provide important sheltering habitat during winter. California red-legged frogs aestivate (enter a dormant state during summer or dry weather) in small mammal burrows and moist leaf litter. They have been found up to 100 feet from water in adjacent dense riparian vegetation. Studies have indicated that this species cannot inhabit water bodies that exceed 70° F, especially if there are no cool, deep portions (USFWS 2002).	and does not persist for long enough duration to support larval development. Suitable ponds near the project site provide habitat and known records of breeding CRLF. CRLF could occur moving through the project site and use Cayetano Creek as aquatic non-breeding habitat during periods of dispersal.
Reptiles			
Actinemys (=Emys) marmorata western pond turtle	--/--/SSC	Turtle that inhabits slow-moving water with dense submerged vegetation, abundant basking sites, gently sloping banks, and dry clay or silt soils in nearby uplands. Turtles will lay eggs up to 0.25-mile from water, but typically go no more than 600 feet (Jennings and Hayes 1994).	**Will not occur.** The segment of Cayetano Creek adjacent to the project site does not provide suitable aquatic habitat for western pond turtle since it has a flashy hydroperiod, flows are very shallow, and it typically dries up in the spring. Sufficient water to support western pond turtle was not present in the project site and this species was not observed during two season of protocol surveys for CRLF or during any other biological surveys conducted for the project.
Masticophis lateralis euryxanthus Alameda whipsnake	FT/ST/--	Inhabits chaparral and scrub communities and utilizes adjacent grasslands, oak savannah, and oak-bay woodlands. Favors sunny slopes with rock outcrops. Currently known from 5 populations, the nearest of which is in the Hayward-Pleasanton Ridge area (USFWS 2006). Nearest records are from Niles, Hayward, and La	**Will not occur.** The project site does not provide suitable habitat for this species. Chaparral and scrub communities inhabited by this species are absent in and adjacent to the project site. In addition, this species is

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
		Costa Valley quads, >3 miles east and north of the project site (CDFW 2020).	not known to occur in the project vicinity.
Birds			
Agelaius tricolor tricolored blackbird	--/SC/--	Common locally throughout central California. Nests and seeks cover in emergent wetland vegetation and thorny vegetation such as Himalayan blackberry (*Rubus armeniacus*) as well as cattails and tules. Nesting area must be large enough to support a minimum colony of 50 pairs as they are a highly colonial species. Forages on ground in croplands, grassy fields, flooded land, and edges of ponds for insects (Shuford and Gardali 2008). Preferred foraging habitat is typically in vegetation that is less than 15 centimeters tall (Shuford and Gardali 2008).	**Not Expected.** There is no suitable marsh habitat or nesting substrate in the project site. This species was not observed on the project site during any of the numerous biological surveys that were conducted. The possibility this species foraging on the site cannot be ruled out with 100% certainty, however, this species was not observed on the site and is not expected to use the site extensively (see text for discussion).
Ammodramus savannarum Grasshopper sparrow	--/--/SSC	A summer resident of foothills and lowlands west of the Cascade-Sierra Nevada crest. Occurs in grasslands with scattered shrubs or other tall structures which it utilizes as singing perches. Nests on the ground in dense grass with overhanging taller grasses and forbs (Zeiner et al. 1988-1990).	**High.** The project site consists of open habitat with non-native annual grasses and forbs that could provide nesting habitat for this species. The nearest CNDDB record is located approximately 1.6 miles east of the project site.
Aquila chrysaetos Golden eagle	--/--/FP	Typically occurs in rolling foothills, mountain areas, deserts and other open habitats up to 3,822 m amsl. Typically nests on cliff ledges or large trees in open areas in canyons. Will occasionally use other tall structures for nesting, such as electrical transmission towers. Prey consists mostly of rodents, carrion, birds, reptiles and occasionally small livestock (Zeiner et al. 1988-1990).	**Present (Foraging).** During surveys in the summer of 2018 and winter of 2020 golden eagles were observed flying over the project site. The project site consists of open habitat with an abundant source of rodent and lagomorph prey and provides foraging habitat for golden eagle. This species would not be expected to nest in the project site and no potential eagle nests have been observed in the site. There are several CNDDB records of golden eagle within

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			a 5-mile radius of the project site, with most situated around Vaqueros Reservoir approximately 2 miles north of the project site and another along Tassajara Road approximately 4 miles west of the project site (CDFW 2020).
Asio otus Long-eared owl	--/--/SSC	Nests and roosts in conifer, oak and riparian habitat. Typically nests in open forests, or in dense forests on the edge of grasslands or another open habitat. Will nest in old hawk or corvid nests, squirrel nests, woodrat nests or mistletoe brooms (Shuford and Gardali 2008). Usually forages in open habitat and rarely in wooded areas. Forages low over the ground and feeds almost exclusively on small mammals but will opportunistically take birds and rabbits (Shuford and Gardali 2008).	**Present.** The project site consists of open habitat consisting mainly of annual grasslands with some oak trees located along Cayetano Creek. On March 17, 2020 one long-eared owl was observed perched atop a bank of Cayetano Creek likely hunting for small mammal prey. Pellets consistent with this species and white-wash have been observed at other locations along the creek likely indicate this owl routinely forages along the steep banks of Cayetano Creek. Long-eared owl could also nest in the large trees on the project site. There are no CNDDB records for long-eared owl in or near the project site.
Athene cunicularia burrowing owl	--/--/SSC	Forages in grasslands, agricultural fields, and disturbed places where burrowing mammals are abundant. Nests in burrows, especially those of California ground squirrel (*Otospermophilus beecheyi*; Shuford and Gardali 2008).	**Present (assumed foraging).** The project site consists of open habitat in cattle grazed land with rodent burrows and manmade structures, such as culverts which could support nesting or overwintering burrowing owls. Most burrows that provide habitat for this species are in the dryland grain crop north of Manning Road. Fences surrounding the perimeter of the project site and other structures provide perches for

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			hunting. No burrowing owl were observed on the project site during protocol surveys conducted in 2020; however, burrowing owl were observed adjacent to the northeast corner of the site north of Manning Road and burrowing owl could forage in the project site. There are several CNDDB records for burrowing owl documenting wintering and breeding sites near the project site, with the nearest record located one mile west of the project site.
Buteo swainsoni Swainson's hawk	--/ST/--	Forages in grasslands, suitable grain or alfalfa fields, or livestock pastures adjacent to nesting habitat. Nests on large trees in open areas (CDFW 1994).	**Not Expected (Nesting).** On two occasions during biological surveys in 2020 a single adult was observed soaring over the site along Cayetano Creek. However, the project site is well outside of this species known breeding range and there are no raptors nests in the project site. There are no confirmed successful CNDDB records for this species nesting within a 5-mile radius. In California, Swainson's hawk nests in the Sacramento and Central Valley. The closest reported nesting centers are in the delta and the Sacramento valley approximately 10 miles from the site. Although this species is expected to occasionally forage over the site, because the site is at the extreme western edge of this species range, the site is not expected to contribute significantly to potential

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
			foraging habitat for this species (see text for discussion).
Circus cyaneus northern harrier	--/--/SSC	Inhabits a variety of treeless habitats including freshwater marsh, brackish- and saltwater marsh, wet meadows, lake margins, grasslands, croplands, desert sinks, and sagebrush flats. Builds nests on large mounds of vegetation between March and August. Forages in most open habitats (Shuford and Gardali 2008).	**Present (foraging).** Grassland habitat in the project site is highly disturbed and this species was not observed nesting in the project site during surveys conducted during its nesting season, although it was observed foraging. There is only one CNDDB record for this species in a 5-mile radius from the project site located 4 miles to the west. The record documents suspected nesting activity in annual grassland (CDFW 2020).
Elanus leucurus white-tailed kite	--/--/FP	Raptor that inhabits rolling foothills and valley margins with scattered oaks, as well as river bottomlands or marshes next to deciduous woodland. Nests in isolated, dense-topped trees in open areas. Forages in a variety of habitats including grassland, marshes, and agricultural fields (Zeiner et al. 1988-1990).	**Present (foraging).** Habitat is present for this species in the project site. Trees that could support nesting habitat for this species are scattered throughout the project site and adjacent to the project boundary. Annual grasslands and agricultural lands also provide foraging habitat for this species. However, this species was not observed nesting in the project site during multiple surveys conducted during the nesting season, although it was observed foraging. The nearest CNDDB record for this species is approximately 4.5 miles west of the project site and documents a nest.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Falco peregrinus anatum American peregrine falcon	FD/SD/FP	Raptor that breeds on steep cliff faces near wetlands. Nests are minimal and may consist of a scrape and are located high on protected ledges or cliffs, including manmade structures. Forages on the wing by swooping on flying prey (Zeiner et al. 1988-1990).	**Will not occur.** There is no suitable breeding or foraging habitat in the project site.
Haliaeetus leucocephalus Bald eagle	FD/SE/FP	Requires large bodies of water with an abundant fish population. Feeds on fish, carrion, small mammals, and water-fowl. Nests are usually located within a 1-mile radius of water. Nests are most often situated in large trees with a commanding view of the area (Zeiner et al. 1988-1990).	**Will not occur.** There is no suitable breeding or foraging habitat in the project site.
Lanius ludovicianus Loggerhead shrike	--/--/SSC	This species prefers open habitats with scattered shrubs, trees, posts, or other perches. It can be found in shrublands or open woodlands with bare ground, or sparse herbaceous cover. The loggerhead shrike is often found in open cropland (Zeiner et al. 1988-1990).	**Present (foraging).** This species was observed foraging in the project site during the surveys. Nesting habitat for this species is present in trees scattered throughout the project site. Foraging habitat is present along fence lines, where this species could perch, catch and cache its prey. There are no CNDDB records documenting this species near the project site.
Melospiza melodia song sparrow (Modesto Population)	--/--/SSC	Breeds in riparian thickets in shrubs or vines near fresh or saline emergent wetland. Nests are typically situated low to the ground or on the ground under dense riparian vegetation (Zeiner et al. 1988-1990).	**Will not occur.** There is no suitable nesting habitat in the project site. This species could occur foraging in the project site.
Sterna antillarum browni California least tern	FE/SE/FP	This species nests in breeding colonies along marine and estuarine shore habitat from San Francisco Bay. Will also use abandoned salt ponds. Feeds in shallow waters on small fish. Suspected of wintering in South American along the western coast. Nesting is easily disrupted by human activities (Zeiner et al. 1988-1990).	**Will not occur.** There is no suitable nesting or foraging habitat in the project site.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
Mammals			
Bassariscus astutus ringtail	--/--/FP	Widely distributed throughout California in riparian forests, woodlands and shrub dominated habitats with rocky outcrops or tree snags with cavities. This species is omnivorous relying on variety of vertebrate and invertebrate prey in addition to berry producing plants such mistletoe (*Phoradendron* spp.). Avoids open ground and prefers moving from tree to tree through the canopy or jumping from trunk to trunk. This species is poorly known and is currently not tracked by the California Department of Fish and Game.	**Will not occur.** There is no suitable woodland habitat in the project site.
Corynorhinus townsendii Townsend's big-eared bat	--/--/SSC	Widely distributed throughout California except alpine and subalpine habitats. This species eats moths, beetle and other insects which it catches on the wing or by gleaning from vegetation. Typically found near water since it is poor at concentrating its urine. This species uses caves, mines, tunnels, buildings and human made structures for roosting. Maternity roosts are typically in warm sites. Hibernation sites are typically cold, but not freezing. This species is very sensitive to disturbance and may abandon its roost after one visit (Zeiner et al. 1988-1990).	**Will not occur.** There is no suitable roosting habitat in the project site.
Neotomas fuscipes annectens San Francisco dusky-footed woodrat	--/--/SSC	This species is widespread and inhabits a wide range of habitats in California with canopy closure and a dense understory such as oak woodlands or riparian forests. Builds nests that may be as large as 8 feet wide and 8 feet tall. Nests are typically built at the base of trees, stumps, shrubs or other structures. Woodrats will defend their nests from competitors. Diet consists mainly of vegetation, such as leaves,	**Will not occur.** There is no suitable woodland habitat in the project site. Potential woodrat nests were not detected in the project site.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Species Name/ Common Name[1]	Status[2]	Habit, Ecology and Life History	Potential to Occur[3]
		grasses, flowers, and acorns. May also eat fungi (Zeiner et al. 1988-1990).	
Taxidea taxus American badger	--/--/SSC	Inhabits drier open stages of most shrub, forest, and herbaceous habitats with loose, friable soils. Preys on a wide variety of mammals, reptiles, birds, and carrion, and hunts mostly by digging out fossorial prey. Occasionally takes prey on the surface. Not tolerant of cultivation. No longer occur in the Central Valley except in the extreme western edge (Williams 1986).	**May Occur.** Suitable habitat is present in the project site since fossorial prey is present, primarily in the project site north of Manning Road. The nearest CNDDB record is located approximately 4.5 miles west from the project site, which documents a mother badger with young (CDFW 2020). However, badger or potential dens suitable for this species were not observed in the project site.
Vulpes macrotis mutica San Joaquin kit fox	FE/ST/--	Inhabits grasslands, agricultural areas, playas, and scrublands. Formerly widespread in the Central Valley; now primarily found in foothills at the margins of the Central Valley and in the interior Coast Ranges. Uses natural and artificial burrows with entrances between 8 and 10 inches in diameter and occupies many different burrows in a single season (USFWS 1998).	**May Occur.** Marginal denning habitat is present for this species since friable soils are absent and fossorial prey is present in dryland grain crop vegetation community. However, potential kit fox burrows or excavations were not observed during numerous biological surveys. The project site is at the northwestern extent of this species' known range. There are several CNDDB records for this species within a 5-mile radius of the project site, with the nearest located approximately 2.7 miles north of the project site. The record documents a natal den from 1989. Subsequent surveys have not identified kit fox in Alameda County.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Note: **Bold font indicates a species that is evaluated in detail in the body of the report.**

[1] Sensitive species reported in CNDDB, USFWS or CNPS lists for the 'Livermore and Byron Tassajara' USGS quad. Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties are not included in this table due to the high volume of plants reported in the database.

[2] Status is as follows: Federal (ESA) listing/State (CESA) listing/other CDFW status or CRPR. F = Federal; S = State of California; E = Endangered; T = Threatened; FP=Fully Protected; R = Rare; C = Candidate to be listed; SSC=Species of Special Concern.

[3] Status in the Project site is assessed as follows. **Will Not Occur**: Species is either sessile (i.e., plants) or so limited to a particular habitat that it cannot disperse on its own and/or habitat suitable for its establishment and survival does not occur on the project site; **Not Expected**: Species moves freely and might disperse through or across the project site, but suitable habitat for residence or breeding does not occur on the project site, potential for an individual of the species to disperse through or forage in the site cannot be excluded with 100% certainty; **Presumed Absent:** Habitat suitable for residence and breeding occurs on the project site; however, focused surveys conducted for the current project were negative; **May Occur**: Species was not observed on the site and breeding habitat is not present but the species has the potential to utilize the site for dispersal, **High**: Habitat suitable for residence and breeding occurs on the project site and the species has been recorded recently on or near the project site, but was not observed during surveys for the current project; **Present**: The species was observed during biological surveys for the current project and is assumed to occupy the project site or utilize the project site during some portion of its life cycle.

CRPR = California Rare Plant Rank: 1A – presumed extinct; 1B – rare, threatened, or endangered in California and elsewhere; 2A – presumed extirpated in California but more common elsewhere; 2B – rare, threatened, or endangered in California but more common elsewhere; 3 – more information needed. Extension codes: .1 – seriously endangered; .2 – moderately endangered; .3 – not very endangered.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

Table C-2: East Bay CNPS Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties Having the Potential to occur in the Project Site*

Species	Rank	Blooming Period	Habitat	Present (Yes or No)**
Calochortus splendens	A2	May-July	chaparral, grassland, open dry slope	No
Cryptantha decipiens	A2	Mar-May	Grassland, sand, sandstone, scrub	No
Cryptantha rattanii	A2	April-July	Grassland, sand, sandstone, scrub	No
Epilobium torreyi	A2	May-August	Riparian	No
Gilia tricolor subsp. tricolor	A2	Not listed	grassland	No
Juglans hindsii	A2	April-May	riparian	No
Lasthenia microglossa	A2	March-May	Chaparral, grassland, wetlands, woodland	No
Muilla maritima	A2	March-June	Alkali areas, grassland, wetlands, open dry slope, woodland, scrub, serpentine soils	No
Osmorhiza brachypoda	A2	March-May	Forest, riparian, woodland	No
Pectocarya pusilla	A2	March-June	Grassland, woodland, miscellaneous	No
Pentachaeta alsinoides	A2	March-June	grassland	No
Ranunculus occidentalis var. occidentalis	A2	March-July	Grassland, woodland	No
Thysanocarpus radians	A2	March-April	miscellaneous	No
Trifolium dichotomum	A2	April-June	Coastal bluff, grassland, open dry slope, woodland, miscellaneous	No
Trifolium olivaceum	A2	April-May	miscellaneous	No
Tropidocarpum gracile	A2	March-May	Alkali areas, grassland	No
Vicia hassei	A2	March-May	Grassland, scrub	No

* Plants from the database with a rank of "A" identified as having the potential to occur in the Morgan Territory area (Dmg) and habitats present on the project site (grassland, riparian or miscellaneous) with an elevational range below 250 meters.

** Based on the negative results of botanical surveys conducted during the blooming season, as well as the overall disturbed condition of the site and the general lack of suitable habitat on the site for special-status plants.

Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

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Appendix C (cont.)
Potential for Special-Status Species and Critical Habitats in the Region to Occur in the Project Site

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Appendix D

Plant and Wildlife Species Observed in the Project Site

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Appendix D
Plant and Wildlife Species Observed in the Project Site

D-1. Plant Species Observed

Family	Species Name	Common Name	Status
Native			
Anacardiaceae	*Schinus molle*	Peruvian pepper tree	Limited
Apocynaceae	*Asclepias fascicularis*	narrow-leaf milkweed	--
Asteraceae	*Artemisia douglasiana*	mugwort	--
	Grindelia camporum	common gumplant	--
	Hemizonia congesta ssp. *luzulifolia*	hayfield tarweed	--
	Holocarpha virgata ssp. *virgata*	narrow tarplant	--
	Pseudognaphalium canescens	everlasting	--
	Xanthium strumarium	cocklebur	--
Boraginaceae	*Amsinckia intermedia*	rancher's fiddleneck	--
	Heliotropium curassavicum var. oculatum	Alkali heliotrope	
Brassicaceae	*Lepidium nitidum*	shining peppergrass	--
Convolvulaceae	*Cressa truxillensis*	alkali weed	--
Crassulaceae	*Crassula connata*	pygmy-weed	--
Cyperaceae	*Cyperus eragrostis*	tall flatsedge	--
	Carex spp.	sedge	--
	Schoenoplectus californicus	California bulrush	--
	Eleocharis macrostachya	common spikerush	--
Euphorbiaceae	*Croton setigerus*	dove weed	--
Fabaceae	*Acmispon americanus*	Spanish clover	--
	Lotus corniculatus	birdfoot trefoil	--
	Lupinus bicolor	dwarf lupine	--
	Lupinus succulentus	arroyo lupine	--
	Melilotus indicus	sourclover	
Fagaceae	*Quercus lobata*	valley oak	--
Juglandaceae	*Juglans hindsii*	northern black walnut	1B.1
Juncaceae	*Juncus balticus* ssp. *ater*	Baltic rush	--
	Juncus bufonius	toad rush	--
	Juncus xiphioides	iris-leaved rush	--
Malvaceae	*Malvella leprosa*	alkali mallow	--
Onagraceae	*Epilobium brachycarpum*	annual fireweed	--
Orobanchaceae	*Castilleja exserta*	purple owl's clover	--
Poaceae	*Distichlis spicata*	saltgrass	--
	Elymus triticoides	beardless wild rye	--
Phrymaceae	*Erythranthe guttata*	seep monkeyflower	
Rosaceae	*Rosa californica*	California rose	--
Salicaceae	*Populus fremontii*	Fremont cottonwood	--
	Salix laevigata	red willow	--
Typhaceae	*Typha latifolia*	broad-leaved cattail	--
Verbenaceae	*Phyla nodiflora*	common lippia	--
Non-native			
Anacardiaceae	*Schinus molle*	Peruvian pepper tree	Limited
Apiaceae	*Foeniculum vulgare*	fennel	High
Asteraceae	*Carduus pycnocephalus*	Italian thistle	Moderate

Appendix D (cont.)
Plant and Wildlife Species Observed in the Project Site

Family	Species Name	Common Name	Status
	Centaurea solstitialis	yellow star thistle	High
	Cirsium vulgare	bull thistle	Moderate/C
	Conium maculatum	poison hemlock	Moderate
	Helminthotheca echioides	bristly ox-tongue	Limited
	Lactuca serriola	wild lettuce	--
	Matricaria discoidea	pineapple weed	--
	Senecio vulgaris	common groundsel	--
	Silybum marianum	milk thistle	Limited
	Sonchus asper	prickly sow thistle	--
Brassicaceae	*Brassica nigra*	black mustard	Moderate
	Lepidium latifolium	perennial pepperweed	High
	Sisymbrium altissimum	tumble mustard	--
Caryophyllaceae	*Spergularia marina*	salt sand spurrey	--
Chenopodiaceae	*Atriplex prostrata*	triangle orache	--
	Atriplex semibaccata	Australian saltbush	Moderate
	Salsola tragus	Russian thistle	Limited/C
Convolvulaceae	*Convolvulus arvensis*	Field bindweed	--/C
Fabaceae	*Medicago polymorpha*	burclover	Limited
	Robinia pseudoacacia	black locust	Limited
	Trifolium hirtum	rose clover	Limited
	Vicia villosa	winter vetch	--
Geraniaceae	*Erodium botrys*	long-beak filaree	--
	Erodium cicutarium	redstem filaree	Limited
	Geranium molle	crane's bill geranium	--
Lamiaceae	*Prunella vulgaris* var. *vulgaris*	selfheal	--
Lythraceae	*Lythrum hyssopifolia*	grass poly	Limited
Malvaceae	*Malva parviflora*	cheeseweed	--
Myrsinaceae	*Lysimachia arvensis*	scarlet pimpernel	--
Poaceae	*Avena fatua*	wild oats	Moderate
	Bromus diandrus	ripgut brome	Moderate
	Bromus hordeaceus	soft brome	Limited
	Bromus madritensis	foxtail chess	--
	Cynodon dactylon	Bermuda grass	Moderate
	Elymus caput-medusae	Medusa head	High
	Festuca perennis	Italian ryegrass	--
	Hordeum marinum	seaside barley	--
	Hordeum murinum	hare barley	Moderate
	Phalaris paradoxa	hood canarygrass	--
	Polypogon monspeliensis	annual beardgrass	Limited
Polygonaceae	*Polygonum aviculare* ssp. *depressa*	common knotweed	--
	Rumex crispus	curly dock	Limited
	Rumex pulcher	fiddle dock	--
Solanaceae	*Nicotiana glauca*	tree tobacco	Moderate

CRPR = California Rare Plant Rank: 1B – rare, threatened, or endangered in California and elsewhere; Extension codes: .1 – seriously endangered.

Appendix D (cont.)
Plant and Wildlife Species Observed in the Project Site

D-2. Wildlife Species Observed

Order/Family	Species Name	Common Name	Status*
Amphibians			
Anura			
Bufonidae	*Anaxyrus boreas halophilus*	California toad	--
Hylidae	*Psuedacris sierra*	Sierran treefrog	--
Reptiles			
Squamata			
Phrynosomatidae	*Sceloporus occidentalis*	western fence lizard	--
Birds			
Accipitriformes			
Accipitridae	*Accipiter cooperii*	Cooper's hawk	WL
	Aquila chrysaetos	golden eagle	FP
	Buteo jamaicensis	red-tailed hawk	--
	Buteo lineatus	red-shouldered hawk	--
	Buteo regalis	Ferruginous hawk	WL
	Buteo swainsoni	Swainson's hawk	ST
	Circus hudsonianus	northern harrier	SSC
	Elanus leucurus	white-tailed kite	FP
Apodiformes			
Trochilidae	*Calypte anna*	Anna's hummingbird	--
Charadriformes			
Charadriidae	*Charadrius vociferus*	killdeer	--
Ciconiformes			
Cathartidae	*Cathartes aura*	turkey vulture	--
Columbiformes			
Columbidae	*Zenaida macroura*	mourning dove	--
Falconiformes			
Falconidae	*Falco sparverius*	American kestrel	--
Galliformes			
Odontophoridae	*Callipepla californica*	California quail	--
Passeriformes			
Aegithalidae	*Psaltriparus minimus*	Bushtit	--
Corvidae	*Aphelocoma californica*	California scrub jay	--
	Corvus brachyrhynchos	American crow	--
	Corvus corax	common raven	--
Emberizidae	*Aimophila ruficeps*	rufous-crowned sparrow	--
	Passerculus sandwichensis	savanna sparrow	--
	Zonotrichia leucophrys	white-crowned sparrow	--
Fringillidae	*Carduelis psaltria*	lesser goldfinch	--
	Haemorhous mexicanus	house finch	--
Hinundiridae	*Tachycineta bicolor*	tree swallow	--
Icteridae	*Agelaius phoeniceus*	red-winged blackbird	--
	Euphagus cyanocephalus	Brewer's blackbird	--
	Icterus bullockii	Bullock's oriole	--
	Sturnella neglecta	western meadowlark	--
Laniidae	*Lanius ludovicianus*	loggerhead shrike	SSC
Mimidae	*Mimus polyglottos*	northern mockingbird	--
Paridae	*Baeolophus inornatus*	oak titmouse	--

Appendix D (cont.)
Plant and Wildlife Species Observed in the Project Site

Order/Family	Species Name	Common Name	Status*
Parulidae	*Setophaga coronata*	Yellow-rumped warbler	--
Passeridae	*Passer domesticus*	house sparrow	--
Sittidae	*Sitta carolinensis*	white-breasted nuthatch	--
Sturridae	*Sturnus vulgaris*	European starling	--
Turdidae	*Sialia mexicana*	western bluebird	--
	Turdus migratorius	American robin	--
Tyrannidae	*Sayornis nigricans*	black phoebe	--
	Sayornis saya	Say's phoebe	
	Tyrannus verticalis	western kingbird	--
Piciformes			
Picidae	*Melanerpes formicivorus*	acorn woodpecker	--
	Dryobates nuttallii	Nuttall's woodpecker	--
Strigiformes			
Strigidae	*Asio otus*	long-eared owl	SSC
	Bubo virginianus	Great horned owl	--
Tytonidae	*Tyto alba*	barn owl	--
Mammals			
Artiodactyla			
Cervidae	*Odocoileus hemionus*	mule deer	
Carnivora			
Canidae	*Canis latrans*	coyote	--
Lagomorpha			
Leporidae	*Lepus californicus*	black-tailed jackrabbit	--
	Sylvilagus audubonii	Audobon's cottontail	--
Rodentia			
Cricetidae	*Microtus californicus*	California vole	--
Geomyidae	*Thomomys bottae*	Botta's pocket gopher	--
Sciuridae	*Otospermophilus beecheyi*	California ground squirrel	--
Insects			
Hymenoptera			
Apidae	*Bombus vosnesenskii*	Yellow-faced bumblebee	--

* Status for animal species: ST = California Threatened; FP = Listed as California Department of Fish and Wildlife (CDFW) Fully Protected; SSC = CDFW Species of Special Concern, WL = CDFW watchlist species.

Appendix E

Representative Site Photos

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Photo 1. View of dryland grain crop in the project site looking south from the northern portion of the northern parcel north of Manning Road. Photo date 8/1/2018.

Photo 2. View of dryland grain crop in the project site looking north from the southern portion of the northern parcel north of Manning Road. Photo date 8/1/2018.

Photo 3. View of westernmost ephemeral stream south of data point 1 looking south from the northern boundary of the central parcel. The project was designed to avoid this stream and it is not within the project site. Photo date 7/31/2018.

Photo 4. View of the banks of Cayetano Creek adjacent to the central portion of the central parcel. Photo date 7/31/2018.

Photo 5. View of Cayetano Creek adjacent to the project site looking west from the northwestern portion of the central parcel near Manning Ave. Photo date 7/31/2018.

Photo 6. Representative view of Cayetano Creek adjacent to the central portion of the central parcel. Photo was taken looking south. Photo date 7/31/2018.

Photo 7. View of Cayetano Creek adjacent to the central parcel with drift deposits (blue arrow) and exposed roots (red arrow) from a valley oak indicating flowing water. Photo date 7/31/2018.

Photo 8. View of a pool along Cayetano Creek adjacent to the southern boundary of the project site. Photo date 6/21/2018.

Photo 9. View of annual grassland looking north from the southern boundary of the project site. Photo date 7/31/2018.

Photo 10. View of a developed area looking east from the southern boundary of the project site. Photo date 8/1/2018.

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Appendix F

California Red-Legged Frog Site Assessment and Protocol Survey Report

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Aramis Solar Energy Generation and Storage Project

California Red-Legged Frog Site Assessment and Protocol Survey Report

July 2020 | IPO-01.03

Prepared for:

Alameda County Planning Department
244 West Winton Avenue
Hayward, CA 94544

Prepared by:

HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 150
Folsom, CA 95630

Aramis Solar Energy Generation and Storage Project

California Red-Legged Frog Site Assessment and Protocol Survey Report

Prepared for:

Alameda County Planning Department
244 West Winton Avenue
Hayward, CA 94544

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July 2020 | IPO-01.03

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1.0 INTRODUCTION

Under contract with IP Aramis LLC (a subsidiary of Intersect Power, LLC), HELIX Environmental Planning, Inc. (HELIX) conducted a site assessment and protocol surveys for the federally listed as threatened California red-legged frog (CRLF; *Rana draytonii*) for the proposed Aramis Solar Energy Generation and Storage Project (project). The purpose of the site assessment and protocol surveys were to assess the site's suitability to support CRLF as well as determine whether this species is currently using the site for breeding and/or dispersal.

1.1 PROJECT LOCATION AND DESCRIPTION

The 410-acre project site is located in unincorporated Alameda County, approximately 2.5 miles north of Livermore (Attachment A: Figure 1). The project site is located on portions of four privately-owned parcels – Assessor's Parcel Numbers 903-0006-001-02 (eastern 269 acres of a 523-acre parcel), 903-0007-002-01 (52 acres), 903-0006-003-07 (38 acres), and 902-0001-005-00 (51 acres) (Attachment A: Figure 2). The project site is within Sections 16 and 17 of Township 02 South, Range 02 East and un-surveyed land of the Las Positas Land Grant, Mount Diablo Base and Meridian. The project site is located within the "Tassajara, CA" and "Livermore, CA" USGS 7.5-minute quadrangles (Attachment A: Figure 3). The project site lies at an elevation of roughly 550 to 700 feet above mean sea level (amsl).

IP Aramis, LLC is the project applicant and is seeking a Conditional Use Permit (CUP) from Alameda County to construct, operate, and maintain a solar photovoltaic (PV) facility for at least 50 years. The project would generate 100 megawatts (MW) of PV power on the 410-acre site. The project would provide solar power to utility customers by connecting to the nearby electricity grid at Pacific Gas and Electric Company's (PG&E) existing Cayetano 230 kilovolt (kV) substation located adjacent and interior to the project site. The project would serve East Bay Clean Energy (EBCE), Clean Power San Francisco (CPSF), and/or PG&E customers by providing local generation capacity under a long-term contract.

1.2 CALIFORNIA RED-LEGGED FROG BACKGROUND

The federally-listed as threatened CRLF is one of two subspecies of red-legged frog. The historic range of CRLF extends from Baja California, Mexico, north to the vicinity of Redding inland, and at least to Point Reyes, California coastally (Jennings and Hayes 1994). The other subspecies is northern red-legged frog (*Rana aurora aurora*), which is a California species of special concern. Its range is located north of the CRLF range in northern California and is largely geographically isolated from CRLF. Today the species is known to occur in about 238 streams or drainages in 23 counties and is found primarily in wetlands and streams in the coastal drainages of Central California. Records of the species are known from Riverside County to Mendocino County along the Coast Range, from Calaveras County to Butte County in the Sierra Nevada, and in Baja California, Mexico. CRLF are still locally abundant within portions of the San Francisco Bay area (including Marin County) and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse ranges (USFWS 2010). In the Sierra Nevada, CRLF historically occupied portions of the lower elevations west of the crest from Shasta County south to Tulare County. Almost all known CRLF populations have been documented at elevations below 3,500 feet amsl with some historical sightings documented at elevations up to 5,200 feet amsl.

Within its range, CRLF occupies a distinct habitat of both aquatic and terrestrial components that consist of aquatic breeding and non-breeding areas embedded within a matrix of habitats used for dispersal, or refugia. Breeding and non-breeding aquatic habitat consists of low-gradient freshwater bodies, including ponds, marshes, sag ponds, dune ponds, stock ponds, lagoons, seeps, springs, and backwaters within streams and creeks. This species does not inhabit water bodies that exceed 70 degrees Fahrenheit if there are no cool, deep portions (USFWS 2002). Important characteristics of aquatic breeding habitat include still or slow moving fresh water (with salinities of less than 7.0 parts per thousand) deeper than 2.3 feet (0.7 meter) with dense, shrubby emergent or overhanging vegetation that provides egg deposition sites and cover for adult frogs (Jennings and Hayes 1994; USFWS 2002) and that persists for a minimum of 20 weeks following the breeding season to allow tadpoles to mature (USFWS 2010).

CRLF typically breed along the margins and shallow parts of sunlit pools, which can be natural or manmade ponds, wide slow sections of streams, or even small, spring-fed puddles, typically without centrarchid fish (Hayes and Jennings 1988 in Berry and Fellers 2013). The breeding season typically occurs from November through April (USFWS 2002) and is likely influenced by local precipitation and ambient temperature. Females typically lay eggs between December and early April. Tadpoles typically metamorphose in 11 to 20 weeks, from July to September, but may overwinter in some sites. The largest populations of CRLF are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) intermixed with cattails (*Typha* spp.). Adults feed primarily on aquatic and terrestrial invertebrates, but may feed on tadpoles, smaller frogs, small mammals, and fish. Juvenile frogs are active diurnally and nocturnally, and adult frogs are largely nocturnal (USFWS 2002).

CRLF are generally found in or near water but may disperse into uplands during the wet season to migrate to breeding habitat or for foraging, or in response to receding water during the driest time of the year. Well-vegetated terrestrial areas within a riparian corridor may provide important sheltering habitat when temperatures are cold in the winter or when water is unavailable during dry periods. CRLF spend considerable time resting and foraging in riparian vegetation when it is present (USFWS 2002). The use of the adjacent riparian corridor during summer is most often associated with drying of creeks in mid- to late-summer (Rathbun in litt., 1994 in USFWS 1996). During dry periods, CRLF remain close to water and often disperse upstream or downstream from their breeding habitat to forage or seek aestivation sites if water is not available (USFWS 2002). This habitat may include shelter under boulders, rocks, logs, industrial debris, agricultural drains, water troughs, small mammal burrows, incised stream channels, or areas with moist leaf litter (Jennings and Hayes 1994; USFWS 2002). Most CRLF do not disperse farther than the nearest suitable cold-shelter or aestivation habitat. CRLF have been found up to 200 feet from water in adjacent dense riparian vegetation (USFWS 2010).

During periods of wet weather, individuals may disperse through uplands to migrate between aquatic breeding sites and have been observed making straight-line point to point migrations rather than using stream corridors (USFWS 2002). Movements of up to two miles have been reported (Fellers 2005), but one mile represents a more typical dispersal distance for breeding migration. Most overland movements occur at night (USFWS 2002).

The decline of the red-legged frog is attributable to a variety of factors. Large-scale commercial harvesting of red-legged frogs led to severe depletions of populations at the turn of the century (Jennings and Hayes 1985). Subsequently, exotic aquatic predators such as bullfrogs (*Rana catesbeiana*), crayfish (*Procambarus clarki*), and various species of fish became established and contributed to the continued decline of the species (Hayes and Jennings 1986). Habitat alterations such as conversion of land to agricultural and commercial uses, reservoir construction, off-road vehicle use, and land-use

practices (i.e., livestock grazing) threaten the remaining populations (Bohn and Buckhouse 1986; Jennings and Hayes 1994; Kauffman et al. 1983; Kauffman and Krueger 1984).

The primary constituent elements of habitat for CRLF are aquatic and upland areas where suitable breeding and non-breeding habitat is interspersed throughout the landscape and is interconnected by unfragmented dispersal habitat. Specifically, to be considered to have the primary constituent elements, an area must include two (or more) suitable breeding locations, a permanent water source, associated uplands surrounding these water bodies up to 300 feet from the water's edge, all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet in width (USFWS 2002).

1.3 REGULATORY SETTING

The CRLF was listed as a threatened species under the federal Endangered Species Act by the USFWS on May 23, 1996 (61 Federal Register [FR] 25813-25833). Critical habitat, which is defined as "a specific area needed by an endangered or threatened animal or plant for it to survive, not go extinct, and recover to a healthy population" was originally designated for CRLF on April 13, 2006 (USFWS 2006; 71 FR 19244-19346). An increase in critical habitat for the CRLF was proposed by the USFWS in a news release on September 16, 2008 and an update to critical habitat for the CRLF was designated on March 17, 2010. Approximately 1,636,609 acres of Critical Habitat in 27 California counties was established for the species in a final revised designation effective April 16, 2010 (75 FR 12816-12959).

2.0 ENVIRONMENTAL SETTING

The project site lies in a rural area of northeastern Alameda County and is surrounded primarily by undeveloped land supporting grazing and agricultural uses. Los Vaqueros Reservoir lies 3 miles north and the City of Livermore lies approximately 2.5 miles south of the project site. Other communities in the area include the community of Tassajara located west of the project site and the City of Dublin, located southwest of the project site.

Alameda County is in central California and spans the Coastal Mountain Range. The County's boundaries are the San Francisco Bay on the west and Contra Costa County on the north, Santa Clara County to the south and San Joaquin County to the east. The eastern part of Alameda County in Livermore Valley is characterized by rolling foothills and annual grasslands. The project site is in a valley and is surrounded by peaks of the Coast Range reaching a height of roughly 2,200 feet.

The climate of Alameda County is Mediterranean, characterized by wet, cool winters and dry, hot summers. The nearest weather station is the Livermore Municipal Airport, located approximately 3.8 miles southwest of the project site in Alameda County. Mean daily maximum and minimum temperatures are 88 degrees in July and 57 degrees Fahrenheit in July, and 58 and 38 degrees Fahrenheit in January (NRCS 2020). The mean annual precipitation is 14.0 inches, with nearly 100 percent occurring as rain from September through May. The weather station at the Livermore Municipal Airport received 11.3 inches of rainfall in the 2019/2020 rain season (from October to September) or about 81% of normal. During the 2018/2019 rain year, the weather station received 13.7 inches of precipitation, which is nearly average. In the 2017/2018 rain year, the nearby weather station received 25.6 inches of precipitation, which is 183% of normal.

3.0 METHODS

3.1 SITE ASSESSMENT

The methods used for this CRLF site assessment are derived from the USFWS *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005). The site assessment included a review of available resources to provide an overview of the upland and aquatic habitats present within the project site and surrounding vicinity. The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2020) and the *Recovery Plan for the California Red-legged Frog* (*Rana aurora draytonii*; USFWS 2002) were reviewed for information regarding known existing and historic populations of CRLF in the project region. A listing of other information sources reviewed to assess suitability of the site and vicinity for CRLF is provided below:

- USGS "*Livermore, California"* and "*Tassajara*, California" 7.5-minute topographic quadrangle maps;
- Aerial photography of the property and vicinity from 1939 to 2018 (Google Earth 2020);
- National Wetland Inventory (NWI) map for the project site and vicinity from the Wetlands Online Mapper (USFWS 2020a); and
- USFWS online species information for CRLF (USFWS 2020b).

Three criteria were used to assess the likelihood of CRLF presence in or within the vicinity of the project site: (1) the location of the project site with respect to the current and historic range of CRLF, (2) the presence/absence of known records of CRLF within a one-mile radius of the project site, and (3) the habitat types occurring within the project site and within a one-mile radius.

A biological reconnaissance survey and CRLF habitat assessment of the site was conducted on December 6, 2017 by HELIX Principal Biologist Stephen Stringer, M.S. All aquatic habitats on the project site were identified and assessed for the potential to support CRLF. Habitats were determined to meet the criteria for suitable CRLF breeding habitat if they met the criteria for aquatic habitat in the literature (USFWS 2002 and USFWS 2005). Such habitats include low-gradient freshwater bodies, including ponds, marshes, sag ponds, dune ponds, stock ponds, lagoons, seeps, springs, and backwaters within streams and creeks with still or slow moving fresh water deeper than 2.3 feet (0.7 meter) with dense, shrubby emergent or overhanging vegetation that provides egg deposition sites and cover for adult frogs and that persists for a minimum of 20 weeks following the breeding season (November through April).

All land surrounding the project site is private property and was inaccessible on foot during the site assessment. Therefore, the review of potential aquatic habitat for CRLF within a one-mile radius of the site was conducted from the project site, public roads, and using desktop analysis of the sources listed above.

3.2 PROTOCOL SURVEYS

Based on the results of the site assessment, protocol surveys were deemed necessary and conducted in 2018. Due to delays in the project schedule, another full set of protocol surveys was conducted in 2020.

Therefore, two full seasons of protocol surveys for CRLF were conducted in all suitable aquatic habitats on and adjacent to the site. Protocol surveys in 2018 were conducted from January 30 to July 31, 2018 and protocol surveys in 2020 were conducted from February 6, 2020 to July 14, 2020. A total of eight surveys were conducted for CRLF at the project site during winter, spring and summer of 2018 and again in 2020.

The CRLF protocol breeding season surveys in 2018 were conducted by CRLF permitted biologists Gretchen Padgett-Flohr, Ph.D. and Jennifer Gonterman (TE-006112-7) from Surf to Snow (previously Californian Environmental Services) and HELIX Principal Biologist Stephen Stringer, M.S. with assistance from HELIX Senior Wildlife Biologist Patrick Martin (CRLF permitted biologist TE-778195-14) and HELIX Senior Botanist/Biologist George Aldridge, Ph.D. for non-breeding season surveys. The CRLF protocol surveys in 2020 were conducted by Mr. Martin with assistance from HELIX Biologist Stephanie McLaughlin, M.S. and HELIX Biologist Halie Goeman. Survey dates and personnel are summarized in Table 1. All suitable aquatic habitat identified during the site assessment as having the potential to support CRLF was surveyed during each survey event. Data sheets are included in Attachment C. Qualifications of surveyors are included following the table.

Table 1
SUMMARY OF SURVEY EFFORT

Survey Date	Time (Day or Night)	Breeding/ Non-breeding	Personnel
January 30, 2018	Day (1)	Breeding	Stephen Stringer, Gretchen Padgett-Flohr, Ph.D, and Jennifer Gonterman
January 31, 2018	Night (2)	Breeding	Stephen Stringer and Jennifer Gonterman
March 15, 2018	Night (3)	Breeding	Stephen Stringer and Jennifer Gonterman
March 29, 2018	Night (4)	Breeding	Stephen Stringer and Jennifer Gonterman
April 23, 2018	Night (5)	Breeding	Stephen Stringer and Jennifer Gonterman
May 3, 2018	Day (6)	Breeding	Stephen Stringer and Jennifer Gonterman
July 31, 2018	Day (7)	Non-breeding	George Aldridge and Patrick Martin
July 31, 2018	Night (8)	Non-breeding	George Aldridge and Patrick Martin
February 6, 2020	Day (1)	Breeding	Patrick Martin and Haile Goeman
March 9, 2020	Day (2)	Breeding	Patrick Martin and Stephanie McLaughlin
March 9, 2020	Night (3)	Breeding	Patrick Martin and Stephanie McLaughlin
March 17, 2020	Night (4)	Breeding	Patrick Martin and Halie Goeman
April 6, 2020	Night (5)	Breeding	Patrick Martin and Haile Goeman
April 28, 2020	Night (6)	Breeding	Patrick Martin
July 14, 2020	Day (7)	Non-breeding	Patrick Martin
July 14, 2020	Night (8)	Non-breeding	Patrick Martin

Mr. Stringer holds a B.S. in Biological Conservation and an M.S. in Biological Sciences (emphasis in Conservation Biology) from California State University, Sacramento (CSUS). He has approximately 17 years of experience in the public and private sector conducting biological, botanical, and wetland studies. Mr. Stringer holds a USFWS Section 10(a)(1)(A) Recovery Permit (TE-141359-3) for federally-listed vernal pool branchiopods throughout the range of the species in California and Oregon and for the Central Valley Distinct Population Segment of California tiger salamander (*Ambystoma californiense*) (CTS). Mr. Stringer has conducted biological surveys for hundreds of projects throughout California and is familiar with amphibians and reptiles found throughout the state. He has also conducted dozens of CRLF site assessments and protocol surveys. His formal training in amphibian identification includes

coursework in identification and natural history of native reptiles and amphibians at CSUS and completion of the Rare Pond Species Workshop conducted by the Laguna de Santa Rosa Foundation in 2008. The workshop included classroom and field studies of CRLF involving ecology, identification of all life stages, and surveying techniques. Mr. Stringer encountered numerous CRLF during the workshop both in the classroom and field portions.

Dr. Aldridge holds a B.S. in Botany from Humboldt State University and a Ph.D. in Biology from the University of California, Irvine. He has over 13 years of experience in field and laboratory studies and teaching in the field of biology and botany. His biological field studies have been performed throughout California. He has also conducted biological field studies and has taught classes within California, in Humboldt and Orange Counties, as well as Colorado. Dr. Aldridge's biological field study experience includes vegetation mapping, general biological surveys, rare plant surveys, and focused surveys for special-status animal species including CRLF and arroyo toad (*Anaxyrus californicus*). Dr. Aldridge is familiar with amphibians throughout the state. His formal training in amphibian identification includes completion of the Rare Pond Species Workshop conducted by the Laguna de Santa Rosa Foundation in 2017.

Mr. Martin (CRLF and CTS permitted biologist TE-778195-14) holds a B.S. in Ecology and Evolution with a minor in Earth Sciences from the University of California at Santa Cruz (UCSC). He has approximately 13 years of experience in the private sector conducting wildlife surveys, including wetland and botanical studies. Mr. Martin has conducted biological surveys for projects throughout California and is familiar with amphibians and reptiles found throughout the state. He has conducted several CRLF site assessments, in addition to habitat assessments for other amphibians such as CTS, Sierra Nevada yellow-legged frog (*Rana sierrae*) and Yosemite toad (*Anaxyrus canorus*). Mr. Martin conducted protocol surveys for CRLF and arroyo toad in the Los Padres National Forest with forest service biologists through a partnership with the Santa Barbara Zoological Gardens. His formal training in amphibian identification includes coursework in identification and natural history of native reptiles and amphibians at UCSC (Herpetology class and lab) and completion of the California Red-legged Frog Workshop conducted by the Alameda County Conservation Partnership in 2010. The workshop included classroom and field studies of CRLF involving ecology, identification of all life stages, and surveying techniques. Mr. Martin encountered numerous CRLF during the workshop both in the classroom and field portions. Mr. Martin also encountered several CRLF tadpoles during the CTS Workshop conducted by the Elkhorn Slough Coastal Training Program in 2011.

Dr. Gretchen Padgett-Flohr has over 30 years of experience in research and biological consulting and has worked extensively with CRLF, including mitigation and recovery planning and numerous surveys. Dr. Padgett-Flohr holds 10(a)(1)(A) federal recovery permits for CRLF, CTS, and salt marsh harvest mouse. Jennifer Gonterman is an experienced field biologist with over 17 years of experience conducting protocol surveys and construction monitoring for salt marsh harvest mouse (*Reithrodontomys raviventris*), Foothill yellow-legged frog (*Rana boylii*), CRLF, CTS, western pond turtle (*Actinemys marmorata*), and nesting birds. Listed as an independent investigator on Dr. Gretchen Padgett-Flohr's 10(a)(1)(A) federal recovery permits for CRLF, CTS, and salt marsh harvest mouse, she has extensive experience with rescue and relocation of special-status amphibians and reptiles, including draining of ponds to eradicate non-native predators. For the Carmel River Re-route project she was involved in capturing and relocating over 10,000 CRLF.

Ms. McLaughlin is a biologist and International Society of Arboriculture (ISA)-certified Arborist (WE-12922A). She performs biological and arborist field surveys, habitat and vegetation mapping, and

biological and construction monitoring. She has experience surveying for sensitive wildlife species, including special-status birds and other wildlife. She possesses a U.S. Fish and Wildlife Service 10(a)1(A) permit for western snowy plover and California least tern. Ms. McLaughlin has seven years of experience as a biologist for transportation, renewable energy, private development, and restoration projects and has been approved by CDFW to monitor for CRLF and other special-status amphibians and reptiles.

Ms. Goeman is a biologist that has performed biological field work throughout Nevada and Northern California including Sacramento, Lassen, Alameda, Shasta, San Joaquin, and El Dorado Counties. She has an academic background in wildlife ecology and conservation from the University of Nevada, Reno. She has gained extensive experience with volunteer opportunities within her time at the university. She has performed focused surveys for burrowing owls, bald eagles, and greater sage grouse. In addition, Ms. Goeman has performed raptor nest surveys. Ms. Goeman has also conducted protocol-level surveys for the federally endangered Carson wandering skipper. Ms. Goeman is particularly skilled in terrestrial and aquatic habitat assessments, special-status animal surveys, public outreach, and science education. Additionally, Ms. Goeman has gained experience with environmental consulting as well as serving in a public agency with her time at the Bureau of Land Management.

4.0 RESULTS

4.1 SITE ASSESSMENT RESULTS

4.1.1 Current and Historic Range of CRLF in Relation to the Project

The project site is located within the current and historic range of CRLF and there are documented populations of breeding CRLF within one mile of the project site, as discussed in further detail below.

The project site is located within the current and historic range of CRLF per the *Recovery Plan for the California Red-legged Frog* (*Rana aurora draytonii*; USFWS 2002). The Recovery Plan designated eight Recovery Units within California. Within these Recovery Units, specific Core Units are identified for focused recovery efforts. The project site is located within Recovery Unit 4: South and East San Francisco Bay. The project site is located within the East San Francisco Bay Core Unit 16. Core Unit 16 includes Alameda Creek, East Bay Cities, and North Diablo Range hydrologic sub-areas. Conservation needs for Core Unit 16 include protection of existing populations; control of non-native predators; studying the effects of grazing in riparian corridors, ponds, and uplands (e.g., on EBRPD lands); reduce impacts associated with livestock grazing; protect habitat connectivity; minimize effects of recreation and off-road vehicle use; avoid and reduce impacts of urbanization; and protect habitat buffers from nearby urbanization.

The project site is located adjacent to Critical Habitat Unit CCS-2B, Mount Diablo, which is in Alameda County and Contra Costa County, north of Interstate 580. This Critical Habitat was considered occupied at the time of the April 16, 2010 ruling, and is in the San Francisco Bay watershed. The western portion of APN 903-0006-001-02, which is being split off as a separate parcel and is not part of the project site, is within designated Critical Habitat Unit CSS-2B. The project site was chosen in part because it is not located within the designated Critical Habitat and does not support breeding habitat surrounded by high quality upland habitat.

The CNDDB was also consulted to determine if there are any known occurrences of CRLF in the project site or vicinity. There are five documented occurrences of CRLF within a 1-mile radius of the project site (discussed in Section 4.1.2), although there are no records of occurrences within the project site.

4.1.2 Assessment of CRLF Records Within a One-Mile Radius of the Project Site

There are 5 documented locations where CRLF have been reported in the CNDDB within a one-mile radius of the project site (Attachment A: Figure 4). There are 9 additional reported occurrences on the Byron Hot Springs quad that show up within a one-mile radius search, but these records are non-specific records that cover the entire quad. The actual location of these reported occurrences appears to be outside of the one-mile radius and these records are not reported here.

The closest reported occurrence (Occurrence no. 297) of CRLF to the project site is a polygon that extends to within 100 feet southeast of the project site where juveniles were observed dispersing from Altamont Creek in non-native annual grassland in January of 1997. The next closest record (Occurrence no. 1382) is approximately 0.6 miles west of the western project boundary south of Manning Road and along a branch of Cayetano Creek (CDFW 2020). That record is of two adult CRLF and approximately 50 tadpoles that were observed in May 2013 in a riparian area dominated by willow. The creek was not flowing, but a remnant pool with a depth of between 2-3 feet provided habitat for California red-legged frog (CDFW 2020). The branch of Cayetano Creek where the CRLF have been reported has stretches of dense riparian vegetation and holds water into at least late August in at least some years based on aerial imagery (Google Earth 2020; imagery date 8/31/2017), whereas the segment of Cayetano Creek adjacent to the project site has very sparse riparian vegetation consisting primarily of single trees and rarely holds any water past spring based on survey results and a review of aerial imagery (Google Earth 2020). CRLF records within one mile of the site have been compiled and are listed below in Table 2.

Table 2
CNDDB RESULTS FOR CRLF RECORDS WITHIN A ONE-MILE RADIUS OF THE PROJECT SITE

Occurrence Number	USGS Quadrangle	Presence	UTM Zone-10	Date	Information
117	Tassajara	Presumed Extant	N4180829, E607290	19811112	Farm pond near Cayetano Creek in grazed annual grasslands. One adult observed.
297	Livermore	Presumed Extant	N4175380, E609080	19970123	Juveniles dispersing from Altamont Creek in non-native annual grassland.
456	Byron Hot Springs	Presumed Extant	Not available	20070703	Juveniles dispersing from Altamont Creek in non-native annual grassland.
864	Tassajara	Presumed Extant	N4179158, E605668	20121002	Riparian corridor surrounded by grazed annual grassland with remnant pool. Several adults, juveniles and tadpoles observed.
1382	Livermore	Presumed Extant	Not available	20130531	Habitat consists of riparian vegetation in a pool within a branch of Cayetano Creek. Creek is not flowing and is approximately 2-3 feet deep. Two adults and 50 tadpoles observed.

4.1.3 Habitat Types Occurring in the Project Site and Within a One-Mile Radius

4.1.3.1 Upland Habitat

The predominant upland habitat types within a one-mile radius of the project site are annual grassland and agricultural land, particularly dryland grain crops. Annual grassland, much of which is used for grazing, is the primary upland land cover to the north and west of the site, which consists primarily of undeveloped areas. Dryland grain crop is the primary upland land cover to the east and south where rural residential farmsteads predominate. Dryland grain crop is regularly cultivated and harvested for hay or cattle grazed lands. There are also smaller patches of developed land consisting of residences and small commercial/industrial developments.

The project site itself is predominantly comprised of annual grassland and dryland grain crops. Annual grassland occurs in the central parcel south of Manning Road, which is grazed by cattle with small areas of developed land consisting of a residence and a graveled staging area. Dryland grain crop occurs in the northern parcel north of Manning road and in the two southern parcels. The site exhibits evidence of prior agricultural use (e.g., disking/furrowing), likely production of feed for cattle such as hay crops. Several large valley oak trees (*Quercus lobata*) and a mix of willows, walnut (*Juglans* spp.) and Fremont cottonwood (*Populus fremontii*) are also scattered individually along the banks of Cayetano Creek adjacent to the western boundary of the central parcel.

Potentially suitable upland refugia in the form of mammal burrows and deadfall from large trees is mostly limited to areas adjacent to the project site along Cayetano Creek. On the project site, mammal burrows are mostly located in the northern parcel north of Manning Road. North Livermore Avenue and Manning Road, adjacent to the northern and central parcels, are moderately well travelled rural roadways and may present a hazard to dispersing CRLF.

4.1.3.2 Aquatic Habitat

Aquatic habitats can be used by CRLF for breeding, refugia, or dispersal corridors between other suitable habitats. Aquatic habitats within a one-mile radius of the project site deemed potentially suitable for CRLF breeding were identified on Figure 5 in Attachment A. A total of 11 aquatic habitats were identified outside of the project boundaries but within a one-mile radius that could provide breeding habitat for CRLF as determined based on a review of aerial imagery. Aquatic habitats that could be suitable for CRLF breeding occur primarily to the north and west where the land is undeveloped and consist primarily of annual grassland used for grazing. Lands to the east and south are more developed and less suitable.

Potential aquatic habitat for CRLF within a one-mile radius of the project site consists primarily of stock ponds within annual grassland and seasonal drainages with riparian habitat or deeper pools, as determined using aerial photography (Google Earth 2020). A brief discussion of the site assessment locations is included below.

Site Assessment Locations 1-6: Site assessment locations 1-6 are small to mid-sized ponds (likely stock ponds or agricultural tailwater) located north of Manning Ave. Locations 1, 2, and 4 are located within designated Critical Habitat and reported occurrences of CRLF correspond with the general proximity of Locations 2 and 4. These ponds are generally scattered through annual grasslands and grazing lands and lack aquatic connectivity but generally have fair to good quality upland connectivity. Location 1 is a

mid-sized stock pond that holds water at least into August (Google Earth 2020) and is therefore assumed to be potentially suitable breeding habitat for CRLF. Location 2 appears to be a small depression within grazing land that is potentially drinking water for cattle. Based on a review of aerial imagery (Google Earth 2020), Location 2 does not appear to hold water long enough to meet the breeding habitat requirements for CRLF. This small pond is dry by April in most years. Location 3 is also a small pond likely for cattle. This pond holds water into late summer at least in some years and is likely potential breeding habitat for CRLF. Location 4 is a mid-sized pond that holds water at least into August (Google Earth 2020) and is therefore assumed to be potentially suitable breeding habitat for CRLF. Location 5 is a constructed pond fed by an inlet pipe that appears to dry up in most years by June and likely is not suitable breeding habitat for CRLF. Location 6 is directly across Manning Ave from the northern boundary of the central project site parcel. Location 6 appears to be a basin constructed to collect water for agricultural purposes. Based on a review of aerial imagery (Google Earth 2020), Location 6 does not appear to hold water long enough to meet the breeding habitat requirements for CRLF. This small pond is dry by April in most years.

Site Assessment Locations 7-9, and 11: Site assessment locations 7-9 and 11 are located west of the project site's central and southern parcels within an annual grassland matrix. These ponds are all located within designated Critical Habitat and are all constructed ponds along branches of Cayetano Creek that hold water into late summer at least and are potentially suitable breeding habitat for CRLF. These ponds are connected by intermittent or ephemeral drainages with riparian vegetation and are high quality habitat for CRLF. A reported occurrence of CRLF in the CNDDB corresponds to the general proximity of Location 7.

Site Assessment Location 10: Site assessment location 10 is located adjacent to the southern boundary of the southwest parcel within cultivated dryland grain crop (hay) and appears to be a basin constructed to collect water for agricultural purposes. Based on a review of aerial imagery (Google Earth 2020), Location 10 does not appear to hold water long enough to meet the breeding habitat requirements for CRLF. This small pond is dry by June in most years.

There are no aquatic habitats on the project site that are suitable for CRLF breeding. The segment of Cayetano Creek and its tributaries adjacent to the project site was deemed potentially suitable habitat for CRLF and was included in protocol surveys (Attachment A-Figure 5: Survey Location 1). This segment of Cayetano Creek and portions of its banks are located in the critical habitat unit CCS-2B, Mount Diablo. Only one ephemeral drainage was identified on the project site that appears to support flowing water at least periodically (Attachment A-Figure 5: Survey Location 2). Surveyed habitats and their corresponding acreages are included in Table 3 and discussed briefly following the table. Photos of surveyed habitats are included in Attachment B.

Table 3
CRLF SITE ASSESSMENT LOCATIONS

Site Assessment Location	Habitat Type	Approximate Surface Area Acres/Linear Feet
Survey Location 1	Intermittent Stream	4.37/9,605
Survey Location 2	Ephemeral Stream	0.09/577

Survey Location 1: The segment of Cayetano Creek adjacent to the project site is a natural stream that supports seasonal flow during and shortly after periods of precipitation. Cayetano Creek is also fed by some groundwater which allows the stream to persist for longer periods than its ephemeral tributaries.

The main stem of Cayetano Creek flows north to south just outside the western boundary of the central parcel and bisects the southern parcels. This segment of the creek collects runoff from the adjacent fields, surrounding hillslopes and small ephemeral tributary streams and is a tributary to Alameda Creek, which drains to the San Francisco Bay.

The segment of Cayetano Creek adjacent to the project site has a maximum potential depth of approximately 3-4 feet when flowing as evidenced by scour and drift deposits (Photo 1), although it likely never holds water more than 12 inches deep in this segment based on field observations. The ephemeral tributaries to Cayetano Creek adjacent to the project site have a brief hydroperiod which is not supported by groundwater, and flow in the streams stops after precipitation events have ceased or shortly thereafter. These ephemeral streams do not support wetlands due to their brief hydroperiods, although they have incised banks.

The segment of Cayetano Creek and its tributaries adjacent to the project site are largely unvegetated or dominated by vegetation consistent with annual grassland habitat which consist primarily of wild oats (*Avena fatua*), soft brome (*Bromus hordeaceus*), yellow star-thistle (*Centaurea solstitialis*) and ripgut brome (*Bromus diandrus*) (Photo 2). Small portions of Cayetano Creek adjacent to the northern and southern limits of the central parcel in the project site support a dominance of hydrophytes (Photo 3) that consist of broad-leaved cattail (*Typha latifolia*), California bulrush (*Schoenoplectus californicus*), tall flatsedge (*Cyperus eragrostis*), saltgrass (*Distichlis spicata*), and common spikerush (*Eleocharis macrostachya*). Hydrophytes are limited to small portions of the stream and represent seasonally inundated herbaceous riparian wetlands in the stream channel. The entire stream channel was mostly dry following the May 2018 protocol survey. During the 2020 protocol surveys, Cayetano Creek was intermittently flowing with shallow water of 12 inches or less in some small short-lived pools. Sierran tree frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*) adults and tadpoles were observed in the stream (Photo 4) in pools along Cayetano Creek (Photo 5 and 6) during 2018 and 2020.

The segment of Cayetano Creek adjacent to the project site does not meet the breeding habitat requirements for CRLF due to the shallow depth and the short duration of water, which does not persist for long enough to support larval development of CRLF. However, this segment of Cayetano Creek fulfills aquatic non-breeding habitat primary constituent elements where it is located adjacent to the project site and primary constituent upland habitat in areas where there are surface soil cracks in the soil. Surface soil cracks provide refuge during periods of dispersal for juvenile and adult CRLF.

In contrast to the segment of Cayetano Creek adjacent to the project site, the branch of Cayetano Creek where CRLF have been reported within one mile of the site has stretches of dense riparian vegetation and holds water into at least late August in at least some years based on aerial imagery (Google Earth 2020; imagery date 8/31/2017). The segment of Cayetano Creek adjacent to the project site has very sparse riparian vegetation consisting primarily of single trees and rarely holds any water past spring based on survey results and a review of aerial imagery (Google Earth 2020).

Survey Location 2: This ephemeral stream is a natural drainage (Photo 7). The stream likely only carries water during and shortly after precipitation events and does not seem to flow frequently as evidenced by the lack of scour and drift deposits; it would be best characterized as a gully. The stream supports one hydrophyte, Italian ryegrass (*Festuca perennis*) although other upland vegetation consistent with annual grassland is abundant in the ephemeral stream. Survey Location 2 collects runoff from the adjacent hillslopes and water impoundments upstream and carries it downslope where it terminates into uplands and dissipates into dryland grain crop as an upland swale (Photo 8). Survey Location 2 has a

maximum potential depth of less than 3-4 feet at the top of the bank, but this stream rarely holds more than a few inches of water when it does carry water infrequently. During 2018 and 2020 surveys, no water was observed in this feature. No aquatic species were detected in this feature and California ground squirrel (*Otospermophilus beecheyi*) burrows were observed in the bed of this stream. Survey Location 2 does not meet the breeding habitat requirements for CRLF due to the shallow depth and it does not hold water for long enough duration to provide breeding habitat for CRLF. This feature may provide limited dispersal habitat for CRLF.

4.2 PROTOCOL SURVEY RESULTS

Protocol surveys for CRLF were conducted in the segment of Cayetano Creek and its tributaries adjacent to the project site and in one ephemeral drainage on the project site in the northern parcel (see Attachment A: Figure 5). These aquatic features were included in the protocol surveys because they were determined to provide potential habitat for CRLF. A total of eight surveys were conducted between January 30th and July 31st of 2018 and an additional eight surveys were conducted from February 6th to July 14th of 2020. The segment of Cayetano Creek surveyed adjacent to the project site supported small and isolated pools of water in the main channel but was mostly dry during almost all of the survey events including surveys conducted in January through May of 2018. No aquatic features on the site contained water and the segment of Cayetano Creek was nearly dry by May 3, 2018 and by April 28, 2020. Observed hydrology in the stream was a result of a leaking water well that drained into Cayetano Creek. Water was of sufficient depth to support Sierran treefrog and western toad larval development although it did not persist for long enough duration to support breeding CRLF. The maximum water depth observed during any of the CRLF surveys was only a few inches in 2018 and approximately 12 inches in 2020 in a few small short-lived pools. Pools along the stream are small and shallow and are mostly located at the southern and northern reaches of the stream (see photos in Attachment B). Potential aquatic predators of CRLF were not observed during protocol surveys. Data sheets are included as Attachment C.

No CRLF were observed within Cayetano Creek, its tributaries, or the ephemeral drainage during any of the protocol surveys. None of the aquatic habitats surveyed meet the habitat requirements for CRLF breeding because they are too shallow and do not provide water for a sufficient period of time to support larval development through late spring or early summer. CRLF could potentially use the streams adjacent to the project site and/or uplands in the project site for dispersal between other more suitable habitats offsite. Upland refuge sites for CRLF are sparse in the project site since deadfall or other surface debris and mammal burrows are not abundant. Large surface cracks in the clay soil could provide temporary refuge for dispersing juvenile CRLF.

5.0 DISCUSSION

Based on the results of the site assessment for CRLF, the project site lacks suitable breeding habitat for CRLF but provides potential upland dispersal habitat for CRLF since the project site is within the current range of CRLF, federally designated Critical Habitat occurs adjacent to the project site to the north, east, and west, this species is documented breeding within one mile of the project site in the CNDDB, and there are other pools within one mile of the project site that provide potential breeding habitat for CRLF. Potential dispersal by CRLF could occur through the uplands on the site as well as through segments of Cayetano Creek and its tributaries adjacent to the site. However, no CRLF were observed in

or adjacent to the site during two seasons of CRLF protocol surveys or any other biological surveys. The project site does not provide suitable breeding habitat and is not being used by CRLF for breeding.

The project site is located within a larger geographic area that provides high quality habitat for CRLF and supports populations of CRLF breeding in constructed and natural ponds within a grassland matrix with dispersal habitat consisting of uplands as well as intermittent and ephemeral drainages. The project site itself does not provide breeding habitat for CRLF and is not a high quality dispersal corridor. Although the project site supports annual grassland and provides potential for upland dispersal, it is peripheral to designated Critical Habitat and these higher quality habitats for CRLF and is on the edge of developed areas that are less suitable. The central and southern parcels in the project site are bordered by North Livermore Ave. on the east and the central parcel is also bordered by Manning Road on the north; these roadways pose hazards to dispersing CRLF and may be a partial dispersal barrier as does the chicken farm that separates the central and southern parcels. Although the potential for CRLF to disperse through the uplands or use the site for upland refugia (particularly in portions of the site adjacent to Cayetano Creek and its tributaries) cannot be ruled out, the site otherwise lacks suitable habitat for CRLF and would not be expected to be highly utilized by this species as evidenced by the lack of sightings.

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Attachment A

Figures

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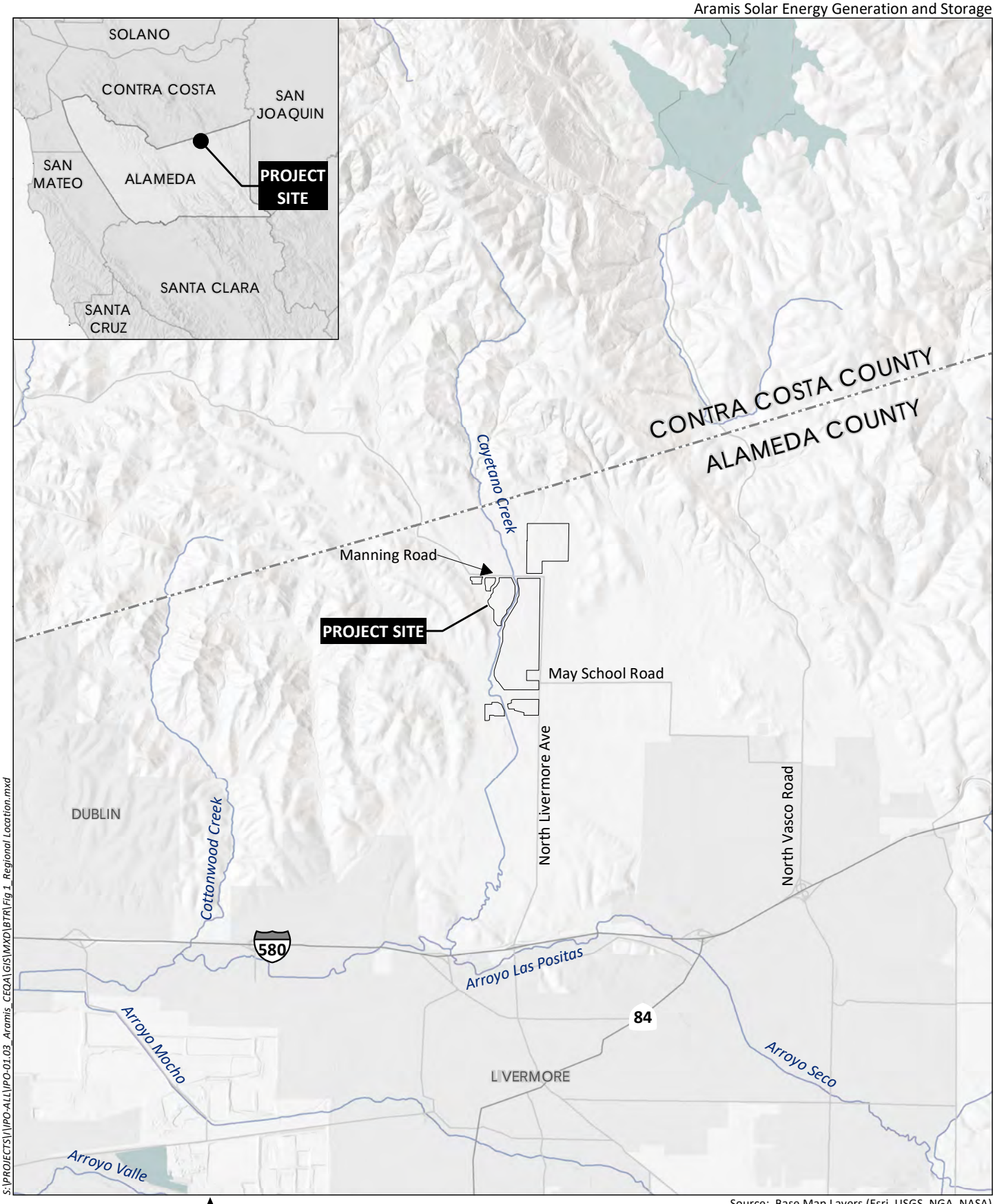


S:\PROJECTS\\IPO-ALL\IPO-01.03_Aramis_CEQA\GIS\MXD\BTR\Fig 1_Regional Location.mxd

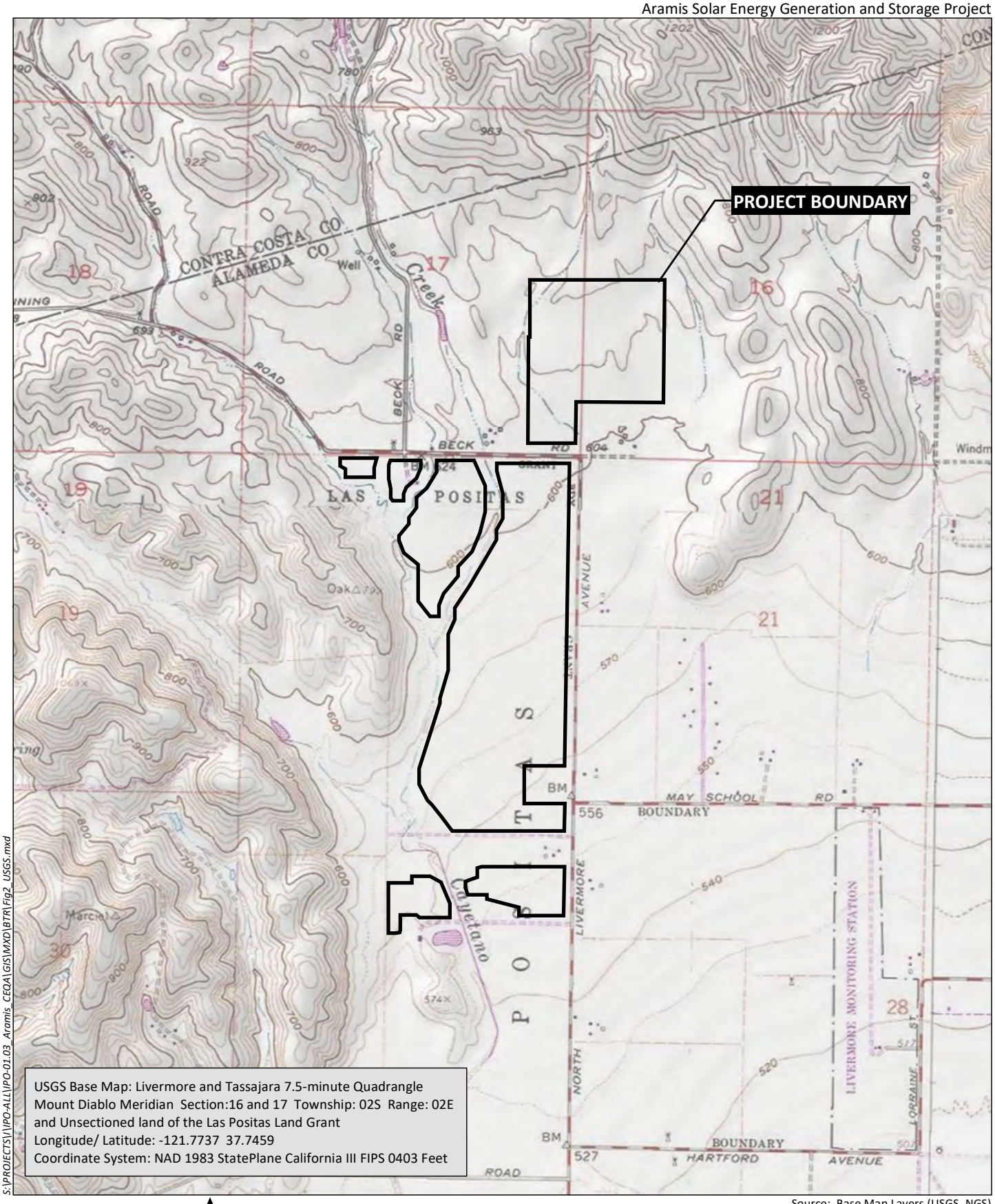
0 1.25 Miles

Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Regional Location

Figure 1



USGS Base Map: Livermore and Tassajara 7.5-minute Quadrangle
Mount Diablo Meridian Section:16 and 17 Township: 02S Range: 02E
and Unsectioned land of the Las Positas Land Grant
Longitude/ Latitude: -121.7737 37.7459
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

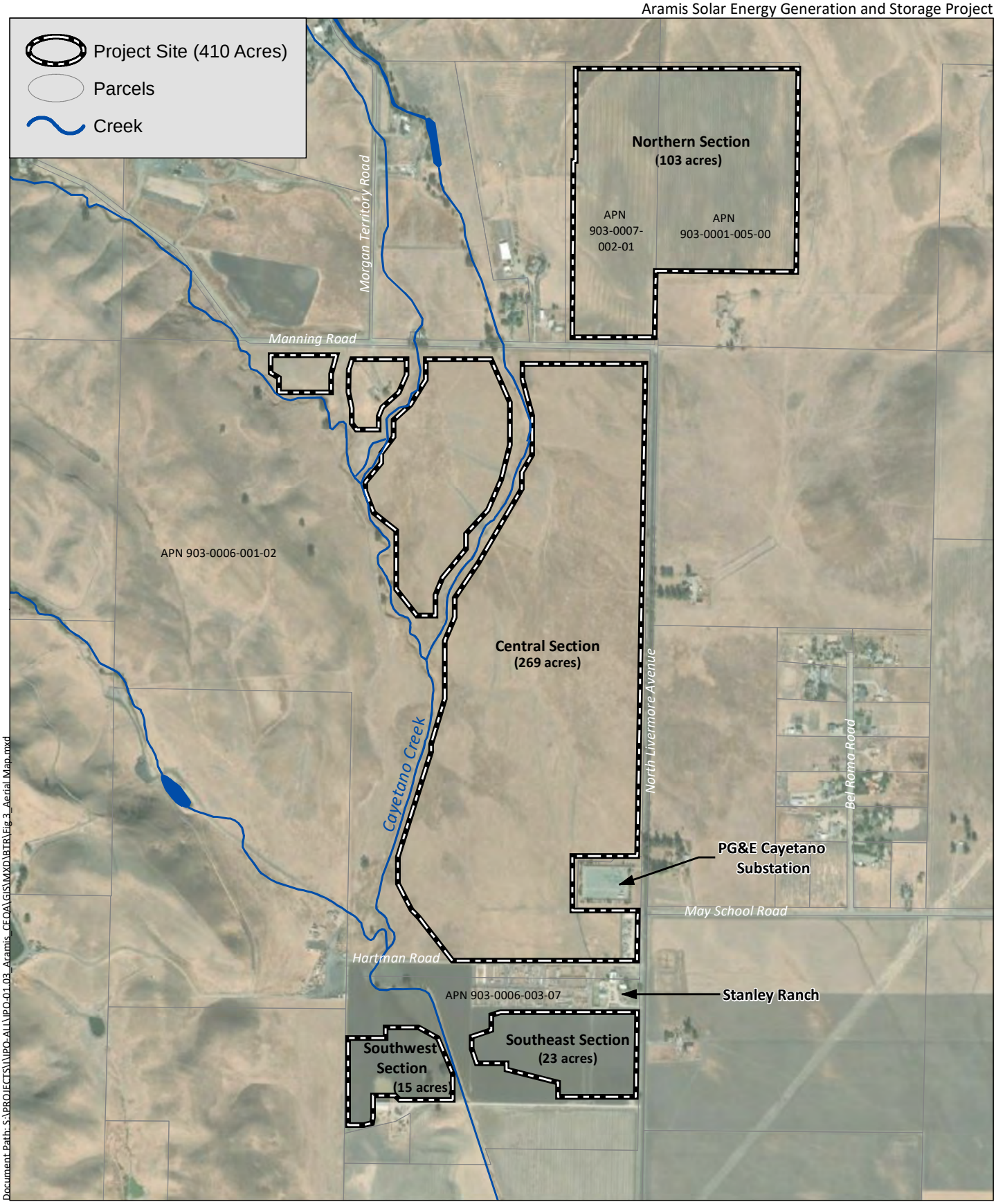
S:\PROJECTS\\IPO-ALL\IPO-01.03_Aramis_CEQA\GIS\MXD\BTR\Fig2_USGS.mxd

0 2,000 Feet

Source: Base Map Layers (USGS, NGS)

USGS 7.5-minute Quadrangle Map

Figure 2

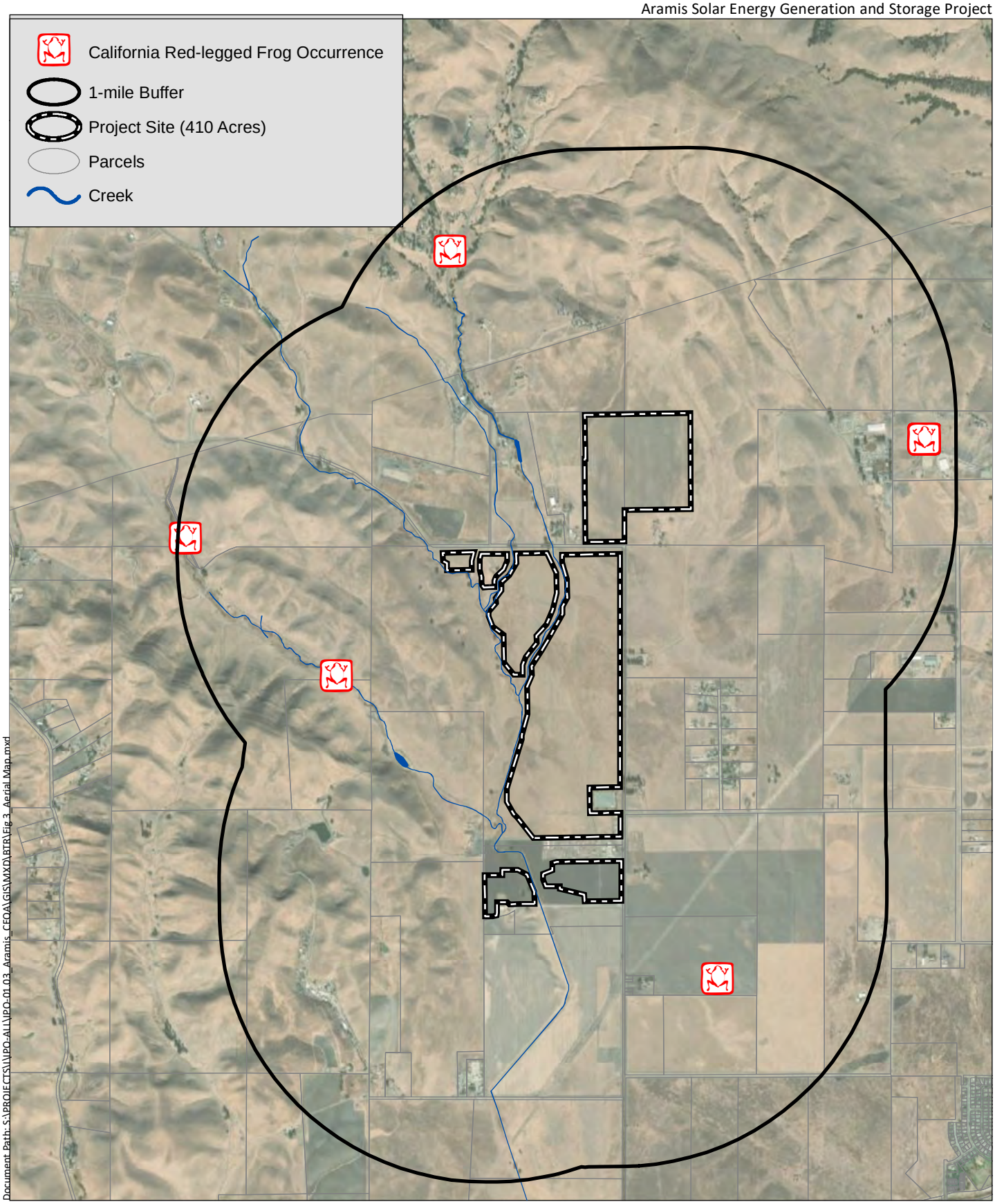


Source: Base Map Layers (DigitalGlobe 2018); Data (Alameda County 2017)

HELIX Environmental Planning

Aerial Map

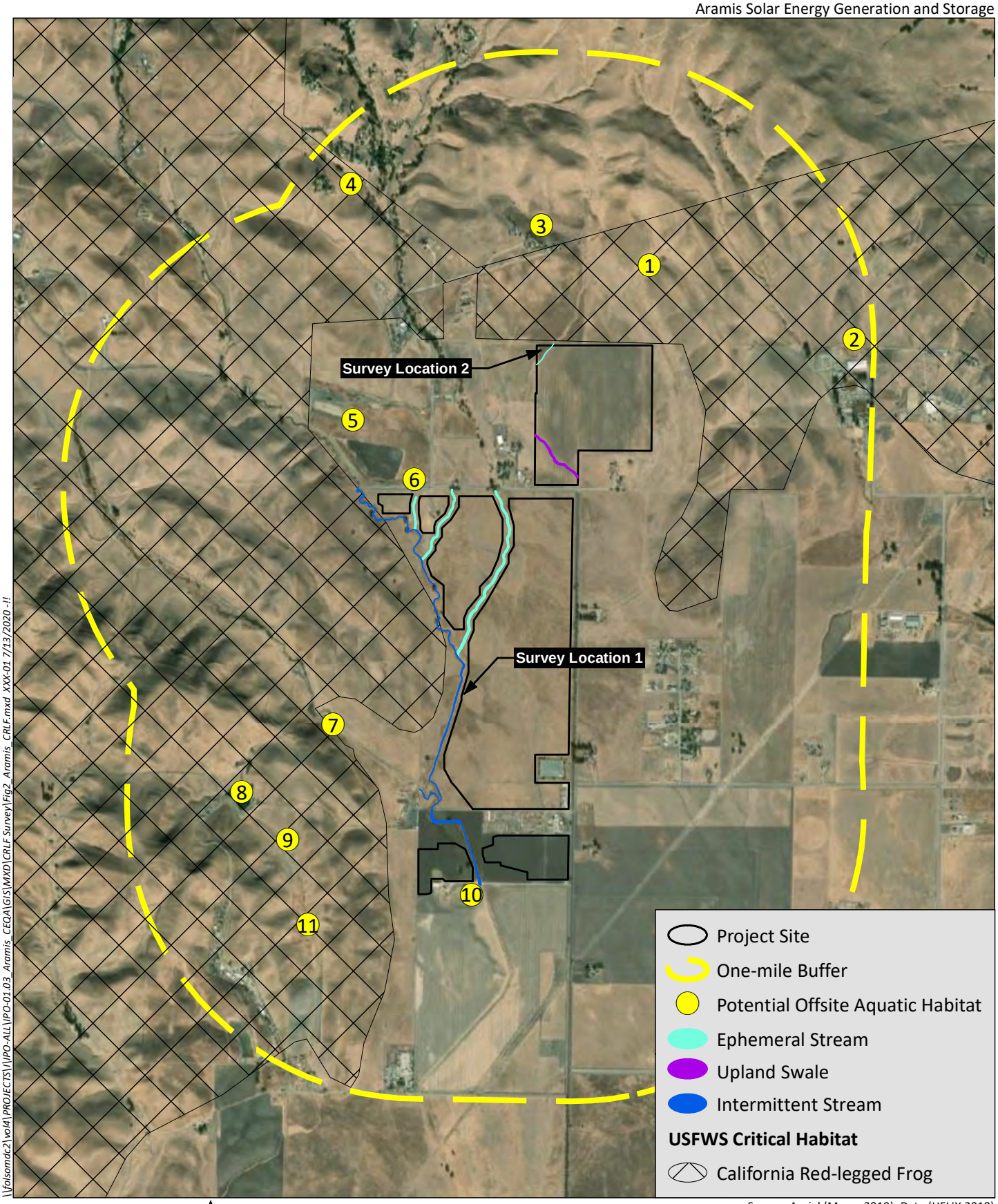
Figure 3



HELIX Environmental Planning

CRLF Occurrences within One-mile of Project Site

Figure 4



\\folsomdc2\vol4\PROJECTS\VPO-ALL\PO-01.03_Aramis_CEQA\GIS\MXD\CRLF Survey\Fig2_Aramis_CRLF.mxd XXX-01 7/13/2020 -JI

Source: Aerial (Maxar 2019); Data (HELIX 2018)

HELIX Environmental Planning

California Red-legged Frog Survey Locations & Potential Habitat

Figure 5

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Attachment B

Site Photos

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Photo 1. View of Cayetano Creek adjacent to the site looking downstream from south of Manning Road. Photo date 7/31/2018.

Photo 2. Representative view of Cayetano Creek adjacent to the site from the central portion of the survey segment adjacent to the site looking south. Photo date 7/31/2018.

Photo 3. View of Cayetano Creek adjacent to the site with drift deposits (blue arrow) and exposed roots (red arrow) from a valley oak indicating flowing water had been present over the winter. Photo date 7/31/2018.

Photo 4. View of Sierran treefrog (red circle) detected during protocol survey along the southern end of Cayetano Creek adjacent to the site. Photo date 7/31/2018.

Photo 5. View of a pool along Cayetano Creek looking north from the southern limits of the survey segment adjacent to the project site. Photo date 6/21/2018.

Photo 6. View of a small pool below a culvert outfall along a tributary to Cayetano Creek looking west from just west of the southwest corner of the central parcel. Photo date 6/21/2018.

Photo 7. View of dry ephemeral stream in the northern parcel looking northeast from the southwestern end of the feature. Photo date 8/1/2018.

Photo 8. View of upland swale in the northern parcel looking southeast. Photo date 8/1/2018.

Photo 9. View of the small pool (same feature as Photo 6) below a culvert outfall along Cayetano Creek looking west from west of the southern boundary of the central parcel. Photo date 2/6/2020.

Photo 10. View of a pool along Cayetano Creek looking north from the southern limit of the survey segment adjacent to the project site. Photo date 2/6/2020.

Photo 11. View of a pool (wet) along Cayetano Creek looking north from the southern boundary of the survey segment adjacent to the project site. Photo date 2/25/2020.

Photo 12. View of a small pool (same as Photos 6 and 9) below a culvert outfall along Cayetano Creek looking west from west of the southern boundary of the central parcel. Photo date 2/25/2020.

Photo 13. View of a small pool (same as Photos 6, 9, and 12) below a culvert outfall along Cayetano Creek looking north from the southern boundary of the survey segment adjacent to the project site. Photo date 3/9/2020.

Photo 14. View of a small shallow pool along Cayetano Creek adjacent to the site looking south from the south side of Manning Road. Photo date 3/9/2020.

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Attachment C

Protocol Survey Data Sheets

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Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 01/30/2018 (mm/dd/yyyy)

Survey Biologist: Flohr (Last name) Gretchen/Jennifer (first name)

Survey Biologist: Stringer (Last name) Stephen (first name)

Site Location: Alameda County, Crosby Property
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:

proposed large scale solar facility

Type of Survey (circle one): (DAY) NIGHT (BREEDING) NON-BREEDING

Survey number (circle one): (1) 2 3 4 5 6 7 8

Begin Time: 9:00 am **End Time:** 12:00 noon

Cloud cover: none **Precipitation:** none

Air Temperature: 60°F **Water Temperature:** 55°F

Wind Speed: 0-1 mph **Visibility Conditions:** good

Moon phase: Full moon **Humidity:** very low

Description of weather conditions: sunny, warm, clear, calm

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? YES (NO)
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pacific chorus frog	3	H			100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, *etc.*

Cayetano Creek is mostly dry except for far northern segment on site and far southern segment. Minimal breeding habitat for CRLF currently.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 01/31/2018 (mm/dd/yyyy) **Survey Biologist:** Stringer (Last name) Stephen (first name)

Survey Biologist: _____ (Last name) _____ (first name)

Site Location: Alameda County, Broadman Property
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:
proposed large scale solar facility

Type of Survey (circle one): (DAY) NIGHT (BREEDING) NON-BREEDING

Survey number (circle one): (1) 2 3 4 5 6 7 8

Begin Time: 3:30 pm **End Time:** 5:00 pm

Cloud cover: none **Precipitation:** none

Air Temperature: 56 **Water Temperature:** N/A

Wind Speed: 0-2 mph **Visibility Conditions:** good

Moon phase: Full moon **Humidity:** very low

Description of weather conditions: sunny, mild, calm

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? YES (NO)
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
none					

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, *etc.*

ephemeral drainage on site is dry, no aquatic habitat at time of survey

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 01/31/18 (mm/dd/yyyy)

Survey Biologist: Fahr (Last name) Jennifer (first name)

Survey Biologist: Stringer (Last name) Stephen (first name)

Site Location: Crosby Property, Alameda County
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)****

Proposed project name: Aramis Solar
Brief description of proposed action:
proposed large scale solar facility

Type of Survey (circle one): **DAY** **(NIGHT)** 1st nighttime 2nd overall **(BREEDING)** **NON-BREEDING**

Survey number (circle one): **(1)** **(2)** 3 4 5 6 7 8

Begin Time: 6:00 pm **End Time:** 9:30 pm

Cloud cover: none **Precipitation:** none

Air Temperature: 50°F **Water Temperature:** 52°F

Wind Speed: 0-1 mph **Visibility Conditions:** good

Moon phase: Full moon **Humidity:** very low

Description of weather conditions: cool, clear, calm

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? **YES** **(NO)**
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pacific chorus frog	~12	O/H	adult	large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed. No bullfrogs, fish, or raccoons obs.

Other notes, observations, comments, *etc.*

Cayetano Creek is mostly dry except for far northern and southern extents. Limited breeding habitat currently, dry conditions.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 03/15/2018 (mm/dd/yyyy) **Survey Biologist:** Jennifer Flohr (Last name) (first name)
Survey Biologist: Stephen Stringer (Last name) (first name)

Site Location: Alameda, North Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar, Crosby Property
Brief description of proposed action:
proposed utility scale solar development

Type of Survey (circle one): **DAY** (**NIGHT**) (**BREEDING**) **NON-BREEDING**

Survey number (circle one): **1** **2** (**3**) **4** **5** **6** **7** **8**

Begin Time: 19:30 **End Time:** 21:30

Cloud cover: 100% **Precipitation:** light rain

Air Temperature: 52°F **Water Temperature:** 50°F

Wind Speed: 0-1 **Visibility Conditions:** good

Moon phase: new **Humidity:** high/100%

Description of weather conditions: overcast, light rain, calm

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? **YES** (**NO**)
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pacific chorus frog	10s	O/H	adult	large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none

Other notes, observations, comments, *etc.*

Chorus frogs were breeding. Broadman property was visited immediately prior to Crosby property and no water or CRLF aquatic habitat is present.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 03/29/18 (mm/dd/yyyy) **Survey Biologist:** Jennifer Conterman (Last name) (first name)
Survey Biologist: Stephen Stringer (Last name) (first name)

Site Location: Alameda North Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:
utility scale solar

Type of Survey (circle one): **DAY** (**NIGHT**) (**BREEDING**) **NON-BREEDING**

Survey number (circle one): **1** **2** **3** (**4**) **5** **6** **7** **8**

Begin Time: 7:30 **End Time:** 9:30

Cloud cover: clear **Precipitation:** none

Air Temperature: 69°F **Water Temperature:** 71°F

Wind Speed: 0-1 **Visibility Conditions:** good

Moon phase: Full **Humidity:** low

Description of weather conditions: clear, calm, warm

Brand name and model of light used to conduct surveys: Headsup Lite 2640 w/ 4-D-cell beltpack

Were binoculars used for the surveys (circle one)? **YES** (**NO**)
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Western toad	6	O	adult/juvenile		100%
Chorus frog	10s	O/H	adult/juvenile		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, *etc.*

No water on Broadman Property. Little water in drainage on Crosby property. No suitable CRLF breeding habitat - potential dispersal only.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 04/23/2018 (mm/dd/yyyy) **Survey Biologist:** Conterman Jennifer (Last name) (first name)
Survey Biologist: Stringer Stephen (Last name) (first name)

Site Location: Alameda County, Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:
proposed large-scale solar development

Type of Survey (circle one): **DAY** (**NIGHT**) **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** (**5**) **6** **7** **8**

Begin Time: 20:00 **End Time:** 21:30

Cloud cover: 20% **Precipitation:** none

Air Temperature: 71°F **Water Temperature:** 74°F

Wind Speed: 1-2 mph **Visibility Conditions:** good

Moon phase: 3/4 **Humidity:** low

Description of weather conditions: clear (mostly), warm, light breeze

Brand name and model of light used to conduct surveys: Headsup lite 2640 w/ 4 D-cell beltpack

Were binoculars used for the surveys (circle one)? **YES** (**NO**)
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Chorus Frog	100s	O/H	adult/ tadpole		100%
western toad	1	O	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, *etc.*

Water quality in creek appears to be very low quality due to heavy cattle use and warm conditions.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 5/3/2018 (mm/dd/yyyy) **Survey Biologist:** Conterman (Last name) Jennifer (first name)
Survey Biologist: Stringer (Last name) Stephen (first name)

Site Location: Aramis, Alameda, North Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:

proposed utility-scale solar

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **(6)** **7** **8**

Begin Time: 15:00 **End Time:** 16:30

Cloud cover: 10% **Precipitation:** none

Air Temperature: 69° **Water Temperature:** 70°

Wind Speed: 3-4 mph **Visibility Conditions:** good

Moon phase: new **Humidity:** Low

Description of weather conditions: mild, sunny, light breeze

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? **YES** **(NO)**
Brand, model, and power of binoculars: _____

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Chorus Frog	100s	O	1 adult many tadpoles		100%
Western toad	100s	O	tadpole		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: none observed

Other notes, observations, comments, *etc.*

nearly dry

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 7/31/2018 (mm/dd/yyyy)

Survey Biologist: Aldridge (Last name) George (first name)

Survey Biologist: Martin (Last name) Patrick (first name)

Site Location: Alameda County, Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:
Proposed large scale solar development.

Type of Survey (circle one): **DAY** NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 (7) 8

Begin Time: 1100 **End Time:** 1245

Cloud cover: 0% **Precipitation:** None

Air Temperature: 81°F **Water Temperature:** N/A

Wind Speed: 3-5 mph **Visibility Conditions:** Excellent

Moon phase: 3rd Quarter **Humidity:** 25%

Description of weather conditions: Clear and hot.

Brand name and model of light used to conduct surveys: Heads Up 2640 w/ 4-D battery pack Fenix PD35 flashlight @ 200 lumen

Were binoculars used for the surveys (circle one)? **YES** NO
Brand, model, and power of binoculars: Vortex Talon 10x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
None					

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Coyote scat observed along stream channel. Foraging raptors such as American kestrel and red-tailed hawk are present.

Other notes, observations, comments, *etc.* Stream is completely dry.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 7/31/2018 (mm/dd/yyyy)

Survey Biologist: Aldridge (Last name) George (first name)

Survey Biologist: Martin (Last name) Patrick (first name)

Site Location: Alameda County, Livermore
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Aramis Solar
Brief description of proposed action:
Proposed large scale solar development.

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 2055 **End Time:** 2145

Cloud cover: 0% **Precipitation:** None

Air Temperature: 73°F **Water Temperature:** N/A

Wind Speed: 4-5 mph **Visibility Conditions:** Excellent

Moon phase: 3rd Quarter **Humidity:** 35%

Description of weather conditions: Clear and warm.

Brand name and model of light used to conduct surveys: Fenix PD35 flashlight @ 200 lumen; HeadsUp 2640 w/ 4-D battery pack

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Vortex Talon 10 x 42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	1	O	Adult	small	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Coyote scat detected along drainage in addition to unidentified Mesocarnivore scat. Barn owl nest detected near project site (detected by sound).

Other notes, observations, comments, *etc.* No water in stream.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 02/06/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: Goeman (Last name) Hailee (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **NIGHT** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 0938 **End Time:** 1230

Cloud cover: 0 **Precipitation:** 0

Air Temperature: 56-59 degrees F **Water Temperature:** N/A

Wind Speed: 0-5 mph **Visibility Conditions:** 8 miles

Moon phase: Waxing gibbous **Humidity:** 72%

Description of weather conditions: Cool conditions with calm wind in the streambed which is protected from gustier wind to 5 mph above the banks.

Brand name and model of light used to conduct surveys: The sun

Were binoculars used for the surveys (circle one)? **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Wingspan 10x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	20	H	Adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Cayetano Creek was dry during the survey with the upper 20% of the drainage supported hydrophytes with saturated soil. Potential predator tracks included coyote and raccoon in the creek.

Other notes, observations, comments, *etc.*

Sierran treefrogs were detected by sound in the surrounding annual grassland. No treefrogs or any other amphibians were observed.

No breeding habitat for CRLF is present on site. All waterways were dry.

Abnormally dry season with very little rain.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 03/09/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: McLaughlin (Last name) Stephanie (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **NIGHT** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 1715 **End Time:** 1930

Cloud cover: 70 **Precipitation:** 10 %

Air Temperature: 64 degrees F **Water Temperature:** 60 degrees F

Wind Speed: 6-9 mph **Visibility Conditions:** 10 miles

Moon phase: Waning gibbous **Humidity:** 41%

Description of weather conditions: Cool to warm conditions with calm wind (0-2 mph) in the streambed which is protected from gustier wind to 9 mph above the banks.

Brand name and model of light used to conduct surveys: The sun

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Nikon Monarch 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	5	H/O	Adult	Large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Cayetano Creek was mostly dry during the survey with the upper 20% of the drainage supporting hydrophytes with saturated soil. One small pool (6 inches deep and 60 F) was observed in the northern reach of Cayetano Creek. One Sierran treefrog was observed in this pool. Birds that could prey on CRLF include common raven, white-tailed kite, red-tailed hawk and barn owl which were observed in the loitering and/or nesting near the creek. Potential predator tracks included coyote and raccoon in the creek.

Other notes, observations, comments, *etc.*

Upper 20% of Cayetano Creek was intermittently damp with one small shallow pool with Eleocharis sp. Typha sp. One Sierran treefrog was observed in this pool. No other amphibians were observed along the stream.

No breeding habitat for CRLF is present on site.

Abnormally dry season with very little rain, however some precipitation occurred over the weekend that preceded the survey.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 03/09/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: McLaughlin (Last name) Stephanie (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** **N** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 2012 **End Time:** 2130

Cloud cover: 50 **Precipitation:** 10 %

Air Temperature: 54 degrees F **Water Temperature:** 60 degrees F

Wind Speed: 0-6 mph **Visibility Conditions:** 10 miles

Moon phase: Waning gibbous **Humidity:** 53%

Description of weather conditions: Cool to warm conditions with calm wind (0-2 mph) in the streambed which is protected from gustier wind to 9 mph above the banks.

Brand name and model of light used to conduct surveys: Fenix PD35 @ 200 lumens and Black Diamond Cosmo @ 160-225 lumens

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Nikon Monarch 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	3	H/O	Adult	Large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Cayetano Creek was mostly dry during the survey with the upper 20% of the drainage supporting hydrophytes with saturated soil. One small pool (6 inches deep and 60 F) was observed in the northern reach of Cayetano Creek. No amphibians were observed in this pool in the evening. Birds observed that could prey on CRLF at night include barn owl. Coyotes were heard howling on site but were never directly visible. Potential predator tracks included coyote and raccoon in the creek.

Other notes, observations, comments, *etc.*

Upper 20% of Cayetano Creek was intermittently damp with one small shallow pool with Eleocharis sp. Typha sp. One Sierran treefrog was observed in this pool. No other amphibians were observed along the stream.

No breeding habitat for CRLF is present on site.

Abnormally dry season with very little rain, however some precipitation occurred over the weekend that preceded the survey.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 03/17/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: Goeman (Last name) Haile (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** **N** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2020 **End Time:** 2200

Cloud cover: 100 **Precipitation:** 60 %

Air Temperature: 44 degrees F **Water Temperature:** 58 degrees F

Wind Speed: 0-2 mph **Visibility Conditions:** 3 miles

Moon phase: Waxing crescent **Humidity:** 90%

Description of weather conditions: Cold conditions with few intermittent showers, but mostly dry after storm event earlier.
Most vegetation is wet and Cayteno Creek is intermittently flowing in the northern stretch and has puddles in the southern stretch.

Brand name and model of light used to conduct surveys: Fenix PD35 @ 200 lumens and Black Diamond spot @ 160-325 lumens

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Nikon Monarch 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	300+	H/O	Adult	Large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Coyotes were heard howling on site but were never directly visible. Potential predator tracks included coyote and raccoon in the creek. Long-eared owl was observed foraging in the creek.

Other notes, observations, comments, *etc.*

Cayetano Creek was mostly dry during the survey with the upper with 30% of the drainage with flowing water and pools following several days of precipitation. Pools were approximately 58 degrees F. Several Pseudacris sierra were observed throughout the site calling or amplexing in the water. No other amphibians were observed along the stream.

No breeding habitat for CRLF is present on site.

Abnormally dry season with very little rain, however precipitation occurred over the weekend that preceded the survey the created several pools that encouraged treefrogs to breed. Pools in Cayetano creek were up to approximately 12 inches deep.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 04/6/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: Goeman (Last name) Haile (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** **N** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2036 **End Time:** 2135

Cloud cover: 40-60 **Precipitation:** 60 %

Air Temperature: 51 degrees F **Water Temperature:** 60 degrees F

Wind Speed: 0-3 mph **Visibility Conditions:** 6 miles

Moon phase: Full moon **Humidity:** 90%

Description of weather conditions: Intermittent and isolated thunderstorms with light precipitation but mostly dry after storm event earlier.
Most vegetation is wet and Cayteno Creek is intermittently flowing in the northern stretch and has puddles in the southern stretch. The deepest puddles are up to 12 inches.

Brand name and model of light used to conduct surveys: Fenix PD35 @ 200 lumens and Black Diamond spot @ 160-325 lumens

Were binoculars used for the surveys (circle one)? **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Nikon Monarch 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	300+	H/O	Adult	Large	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Coyotes were heard howling on site but were never directly visible. Potential predator tracks included coyote and raccoon in the creek. Barn owl was observed foraging in the grasslands above the bank of Cayetano Creek.

Other notes, observations, comments, *etc.*

Cayetano Creek was mostly dry during the survey with the upper with 40% of the drainage with flowing water and pools to 12 inches deep following multiple days of precipitation. Pools were approximately 60 degrees F. Several Pseudacris sierra were observed throughout the site calling or amplexing in the water, however less than the previous site visit. No other amphibians were observed along the stream.

No breeding habitat for CRLF is present on site.

Abnormally dry season with little rain, however precipitation occurred over the weekend that preceded the survey that created several pools that encouraged treefrogs to breed. Pools in Cayetano creek were up to approximately 12 inches deep.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 04/28/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: _____ (Last name) _____ (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** **N** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **7** **8**

Begin Time: 2045 **End Time:** 1000

Cloud cover: 10 **Precipitation:** 10%

Air Temperature: 64 degrees F **Water Temperature:** --

Wind Speed: 0-6 mph **Visibility Conditions:** 8 miles

Moon phase: Waxing crescent **Humidity:** 67%

Description of weather conditions: Clear and warm. Light wind is diminished in streambed.
Only two puddles remain on site, one in the upper reach of Cayetano Creek and the other at the southwestern boundary along a separate Cayetano Creek branch.

Brand name and model of light used to conduct surveys: Fenix PD35 @ 200 lumens

Were binoculars used for the surveys (circle one)? **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris sierra	12	H	Adult	unknown	100%
Anaxyrus boreas	2	O	Juvenile	small	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Potential predator tracks included coyote and raccoon in the creek. Barn owl was observed foraging in the grasslands above the bank of Cayetano Creek. Barn owl is also likely nesting in large valley oak trees along Cayetano Creek.

Other notes, observations, comments, *etc.*

Cayetano Creek was mostly dry during the survey with only two small and shallow puddles supporting water. Pseudacris sierra tadpoles were observed in one shallow pool and appeared to be struggling to survive with beetles eating them. Adults treefrogs were heard calling in uplands. Two juvenile Anaxyrus boreas were detected while walking the creek. One individual was actively foraging while the other was hiding in a crevice in a damp section of the creek. No other amphibians were observed along the stream.

No breeding habitat for CRLF is present on site and this creek is dry by May.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 7/14/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: Goeman (Last name) Hailee (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 0630 **End Time:** 0800

Cloud cover: 0 **Precipitation:** 0

Air Temperature: 81 degrees F **Water Temperature:** N/A

Wind Speed: 0-5 mph gusts to 10 **Visibility Conditions:** 10 miles

Moon phase: Waning Crescent **Humidity:** 38%

Description of weather conditions: Warm and calm conditions.
Some intermittent wind, but overall calm in Cayetano Creek.

Brand name and model of light used to conduct surveys: The sun

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Vortex Talon 10x42 and Wingspan 10x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
None	--	--	--	--	--

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Cayetano Creek was dry during the survey with the upper 20% of the drainage supported hydrophytes with saturated soil. Potential predator tracks included coyote and raccoon in the creek.

Other notes, observations, comments, *etc.*

No amphibians detected today.

No breeding habitat for CRLF is present on site and this creek is dry. The northern portion of Cayetano Creek supports hydrophytes with damp soil.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 7/14/2020 (mm/dd/yyyy)

Survey Biologist: Martin (Last name) Patrick (first name)

Survey Biologist: Goeman (Last name) Hailee (first name)

Site Location: Alameda County, S17 of T02 South, R02 East
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: _____
Brief description of proposed action:
Construct, operate, and maintain a solar photovoltaic facility for at least 50 years.

Type of Survey (circle one): **DAY** (T) **BREEDING** **N** (G)

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** (circled)

Begin Time: 930 **End Time:** 1030

Cloud cover: 0 **Precipitation:** 0

Air Temperature: 66 degrees F **Water Temperature:** N/A

Wind Speed: 0-5 mph gusts to 10 **Visibility Conditions:** 10 miles

Moon phase: Waning Crescent **Humidity:** 64%

Description of weather conditions: Cool and calm conditions.
Some intermittent wind, but overall calm in Cayetano Creek.

Brand name and model of light used to conduct surveys: Fenix PD35 @ 200 lumens

Were binoculars used for the surveys (circle one)? (NO)
Brand, model, and power of binoculars: Vortex Talon 10x42 and Wingspan 10x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
None	--	--	--	--	--

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Cayetano Creek was dry during the survey with the upper 20% of the drainage supported hydrophytes with saturated soil. Potential predator tracks included coyote and raccoon in the creek.

Other notes, observations, comments, *etc.*

No amphibians detected tonight.

No breeding habitat for CRLF is present on site and this creek is dry. The northern portion of Cayetano Creek supports hydrophytes with damp soil.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix G

Burrowing Owl Habitat Assessment and Protocol Survey Report

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HELIX Environmental Planning, Inc.
11 Natoma Street, Suite 150
Folsom, CA 95630
916.365.8700 tel
619.462.0552 fax
www.**helixepi**.com

July 27, 2020 Project #IPO-01.03

Mr. Andrew Young
Senior Planner
Alameda County Planning Department
244 West Winton Avenue
Hayward, CA 94544

Subject: Burrowing Owl Survey Report
Aramis Solar Energy Generation and Storage Project, Alameda County, California

Dear Mr. Young:

Under contract with IP Aramis LLC, HELIX Environmental Planning, Inc. (HELIX) conducted a habitat assessment and protocol surveys for burrowing owl (*Athene cunicularia*), a California species of special concern, for the proposed Aramis Solar Energy Generation and Storage Project (Project). The purpose of the habitat assessment and protocol surveys was to assess the site's suitability to support burrowing owl (BUOW), as well as determine whether this species is currently present on or adjacent to the site. This report describes the methods used to conduct the burrowing owl surveys and summarizes the findings.

PROJECT LOCATION AND DESCRIPTION

The 410-acre project site is located in unincorporated Alameda County, approximately 2.5 miles north of Livermore (Attachment A: Figure 1). The proposed project would be located on portions of four privately-owned parcels – Assessor's Parcel Numbers 903-0006-001-02 (eastern 269 acres of a 523-acre parcel), 903-0007-002-01 (52 acres), 903-0006-003-07 (38 acres), and 902-0001-005-00 (51 acres) (Attachment A: Figure 2). The project site is located within Sections 16 and 17 of Township 02 South, Range 02 East and un-surveyed land of the Las Positas Land Grant, Mount Diablo Base and Meridian. The project site is located within the "Tassajara, CA" and "Livermore, CA" USGS 7.5-minute quadrangles (Attachment A: Figure 3). The project site lies at an elevation of roughly 550 – 700 feet above mean sea level.

IP Aramis, LLC is the project applicant and is seeking a Conditional Use Permit (CUP) from Alameda County to construct, operate, and maintain a solar photovoltaic (PV) facility for at least 50 years. The project would generate 100 megawatts (MW) of PV power on the 410-acre site. The project would provide solar power to utility customers by connecting to the nearby electricity grid at Pacific Gas and Electric Company's (PG&E) existing Cayetano 230 kilovolt (kV) substation located adjacent and interior

to the project site. The project would serve East Bay Clean Energy (EBCE), Clean Power San Francisco (CPSF), and/or PG&E customers by providing local generation capacity under a long-term contract.

PROJECT SETTING AND EXISTING CONDITIONS

The project site lies in a rural area of northern Alameda County and is surrounded primarily by undeveloped land supporting grazing and agricultural uses. Los Vaqueros Reservoir lies 3 miles north and the City of Livermore lies approximately 2.5 miles south of the project site. Other communities in the area include the community of Tassajara located west of the project site and the City of Dublin located southwest of the project site.

Alameda County is in central California and spans the Coast Range. The County's boundaries are the San Francisco Bay on the west and Contra Costa County on the north, Santa Clara County to the south and San Joaquin County to the east. The eastern part of Alameda County in Livermore Valley is characterized by rolling foothills and annual grasslands. The project site is in a valley and is surrounded by peaks of the Coast Range reaching a height of approximately 2,200 feet.

Five vegetation communities/land cover types are present in the project site: developed (2.82), annual grassland (267.77 acres), dryland grain crop (138.76 acres), upland swale (0.39), and ephemeral stream (0.08) (Attachment A: Figure 4). The northern parcel north of Manning Road and the two southern parcels are comprised almost entirely of dryland grain crop. This habitat is dominated by oats and other annual grasses and is harvested for hay production. The central parcel is comprised primarily of annual grassland. This annual grassland community is being used for cattle grazing and appears to have been functioning for agricultural use for nearly a century based on historical aerial imagery (Google Earth 2020). The majority of the annual grassland is dominated by wild oats (*Avena fatua*), soft brome (*Bromus hordeaceus*), yellow star-thistle (*Centaurea solstitialis*) and ripgut brome (*Bromus diandrus*). Other portions of the annual grassland community are dominated by a mix of Italian rye grass (*Festuca perennis*), black mustard (*Brassica nigra*), medusahead (*Elymus caput-medusae*) and soft brome.

METHODS

Burrowing Owl Background

BUOW are often found in open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. BUOW occur at elevations ranging from 200 feet below mean sea level to over 9,000 feet above mean sea level (Shuford and Gardali 2008). In California, the highest elevation where BUOW are known to occur is 5,300 feet above mean sea level in Lassen County. In addition to natural habitats, BUOW can be found in urban habitats such as at the margins of airports and golf courses and in vacant urban lots. BUOW nest in burrows in the ground and commonly perch on fence posts or mounds near the burrow. The owls often use ground squirrel burrows or badger dens or artificial burrows such as abandoned pipes or culverts. BUOW forage in adjacent grasslands and other suitable habitats primarily for insects and small mammals, and less often for reptiles, amphibians, and other small birds (Shuford and Gardali 2008).

Desktop Review

The site assessment included a review of available resources to provide an overview of the habitats present within the project site and surrounding vicinity. Information sources reviewed to assess suitability of the site and vicinity for BUOW is provided below:

- USGS "Livermore, California" and "Tassajara, California" 7.5-minute topographic quadrangle maps; and

- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW 2020) reported occurrences of BUOW within a 2-mile radius of the project area.

There are eight CNDDB reported occurrences of BUOW within a 2-mile radius of the project site with the nearest reported occurrence (Occurrence no. 257) located approximately 0.55 mi southeast where burrowing owls were documented nesting in grazed grassland with ground squirrel burrows in spring/summer of 1997. The next closest record (Occurrence no. 46) is located approximately 1.2 miles southeast of the project site. This observation documents two BUOWs during the winter along the road. Another CNDDB record (Occurrence no. 642) documents a pair of BUOW nesting in a preserve approximately 1.25 miles east of the project site in 2016 (CDFW 2020).

Habitat Assessment and Surveys

A habitat assessment and protocol surveys for BUOW were conducted in 2020. A habitat assessment of the site was conducted on February 6, 2020 and the site was determined to provide suitable breeding and foraging habitat for BUOW. Breeding season BUOW surveys were then conducted according to the guidelines prepared by CDFW in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The project site and adjacent areas were surveyed a total of four times during the BUOW breeding season (Table 1) by HELIX biologists with extensive experience at burrowing owl surveys.

During each survey, the entire site was surveyed by walking and stopping every 100 meters or less to scan the surrounding area for BUOW presence with binoculars. Pedestrian transects were performed in areas of suitable nesting habitat such as the margins of agricultural fields, ruderal areas, and along Cayetano Creek and its tributaries adjacent to the project site due to the presence of ground squirrel burrows in these locations. All observed mammal burrows, as well as standpipes and other structures providing perches, were searched for sign of recent use by burrowing owls such as excrement, feathers, and owl pellets.

Surveys were timed to allow for comprehensive surveys of this site and a high detection probability. The morning surveys started after morning civil twilight to allow ambient temperatures to increase to a level more suitable for BUOW detection and extended beyond 1000 hours due to the amount of time required to comprehensively examine all of the mammal burrows on the site. During the first two morning surveys, a comprehensive survey of all the mammal burrows on the site was conducted to search for owl sign around the openings of the mammal burrows. The two subsequent evening surveys could then focus on searching the site for the presence of BUOW. The evening surveys were conducted roughly between one hour before sunset and evening civil twilight. In addition, surveys were conducted for several other species by the same surveyors familiar with the site and burrowing owls, including a total of 16 California red-legged frog (*Rana draytonii*) surveys (6 daytime and 10 nighttime surveys).

Table 1
SURVEY DATES AND TIMES (ALL SURVEYS CONDUCTED IN 2020)

Date	Start/End Time	Start/End Temp (° F)	Wind Speed (mph)	Weather	Personnel
Site Assessment					
February 6	0700-1400	43/65	0-5	Clear	G. Aldridge, S. McLaughlin
Survey #1					
February 25	1600-1830	71/73	0-5	Clear	P. Martin, S. McLaughlin
February 26	0615-1100	37/70	0-3	Clear	P. Martin, S. McLaughlin
Survey #2					
April 22	1800-2030	78/68	0-2	Clear	Halie Goeman, S. McLaughlin
April 23	0600-1100	53/78	0-2	Clear	Halie Goeman, S. McLaughlin
Survey #3					
May 21	1500-1900	55/80	0-2	Clear	P. Martin, S. McLaughlin
May 22	530-1100	84/77	0-2	Clear	P. Martin, S. McLaughlin
Survey #4					
June 17	0530-1000	83/88	6-10	Clear	P. Martin
June 18	550-1145	55/90	0-2	Clear	P. Martin

RESULTS

No BUOW were observed on the project site during any of the protocol surveys or any other biological surveys conducted for this project (including a total of 10 nighttime surveys for CRLF) and the site is not currently occupied by BUOW. However, BUOW were observed adjacent to the project site (discussed below) and BUOW sign (pellets and feathers) was observed on multiple occasions along the northern boundary of the northern parcel north of Manning Road and throughout Cayetano Creek adjacent to the site during protocol surveys. The BUOW pellets and feathers were not observed in association with any burrows or owls and were likely a result of transient owls passing through the site or the creek, which represents an area used by BUOWs to forage. BUOWs and sign were not observed at any of the California ground squirrel burrows or at any of the culverts or abandoned pipes located in the project site. Additionally, very little burrow habitat was observed in the project site south of Manning Road. A few burrows located south of Manning Road were limited to areas adjacent to the site along Cayetano Creek and its banks. Most burrow habitat for this species was detected on the northern parcel north of Manning Road with several California ground squirrel burrows located throughout the northern parcel. Representative photos taken during the BUOW surveys are included as Attachment B.

On June 17 and 18, 2020, two juvenile BUOWs were observed at a burrow approximately 200 feet east of the northeast boundary of the northern parcel (Attachment A: Figure 4). Both owls were observed making short flights during daylight hours and returning to the burrow over two days. A follow up survey conducted on July 14, 2020 documented four juvenile BUOWs at this burrow. Mature BUOWs were not observed at this burrow during any of the surveys. These juvenile owls likely originated from a nest nearby and are dispersing away from the nest.

SUMMARY/CONCLUSION

HELIX biologists conducted protocol surveys for BUOW in the project site and within adjacent areas and no BUOW were observed in the project site. The project site is currently unoccupied by resident BUOW,

although based on the presence of sign (feathers and pellets), BUOW are using adjacent areas and potentially the site as well for dispersal and foraging. BUOW were observed using burrows east of the northern parcel outside of the project site within high quality habitat consisting of grazed annual grassland. The grasses are much shorter in the area where the juvenile BUOW were observed than on the majority of the project site and mammal burrows are numerous along hillsides in these areas, which provide ideal perching sites where owls have a good view of the surrounding pastures.

The project site provides potential foraging habitat for BUOW primarily in the dryland grain crop in the northern and southern parcels; much of the central parcel is comprised of tall grass, which is typically avoided by BUOW. Mammal burrows are present adjacent to the project site along Cayetano Creek, along the fence line of the northern parcel north of Manning Road, and in the dryland grain crop north of Manning Road providing potential nesting habitat for BUOW. Annual grassland habitat in the central parcel south of Manning Road is nearly devoid of burrowing mammals and the grassland consists of tall grass which is typically avoided by BUOW.

Due to the presence of suitable nesting and foraging habitat in portions of the project site and the presence of BUOW in the vicinity, the site or other adjacent areas could become occupied by BUOW in the future. Surveys for BUOW should be conducted prior to any construction activities on the site involving vegetation clearing or ground disturbance to determine whether BUOW are present on the site. This would avoid potential impacts to nesting owls.

Sincerely,

Stephen Stringer, M.S.
Principal Biologist

Attachments:

Attachment A: Figures
Attachment B: Site Photos

REFERENCES

California Department of Fish and Wildlife (CDFW). 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency Department of Fish and Game. March 2012.

2020. California Department of Fish and Wildlife, Natural Diversity Database Biogeographic Data Branch. Sacramento, California. Accessed online July 13, 2020.

Google Earth. 2020. Aerial Imagery 1939-2020. Accessed July 2020.

Shuford, W.D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Attachment A

Figures

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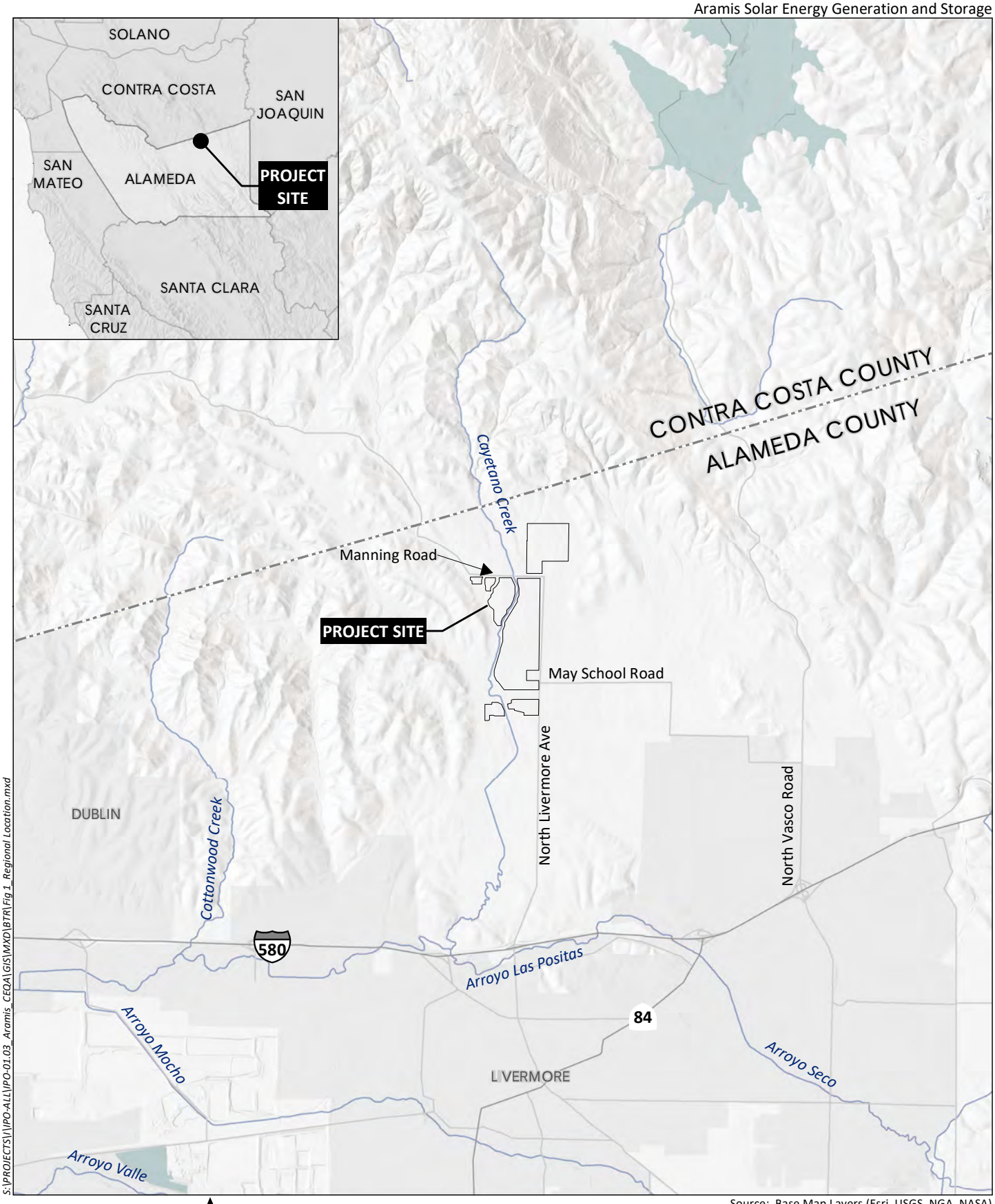


S:\PROJECTS\\IPO-ALL\IPO-01.03_Aramis_CEQA\GIS\MXD\BTR\Fig 1_Regional Location.mxd

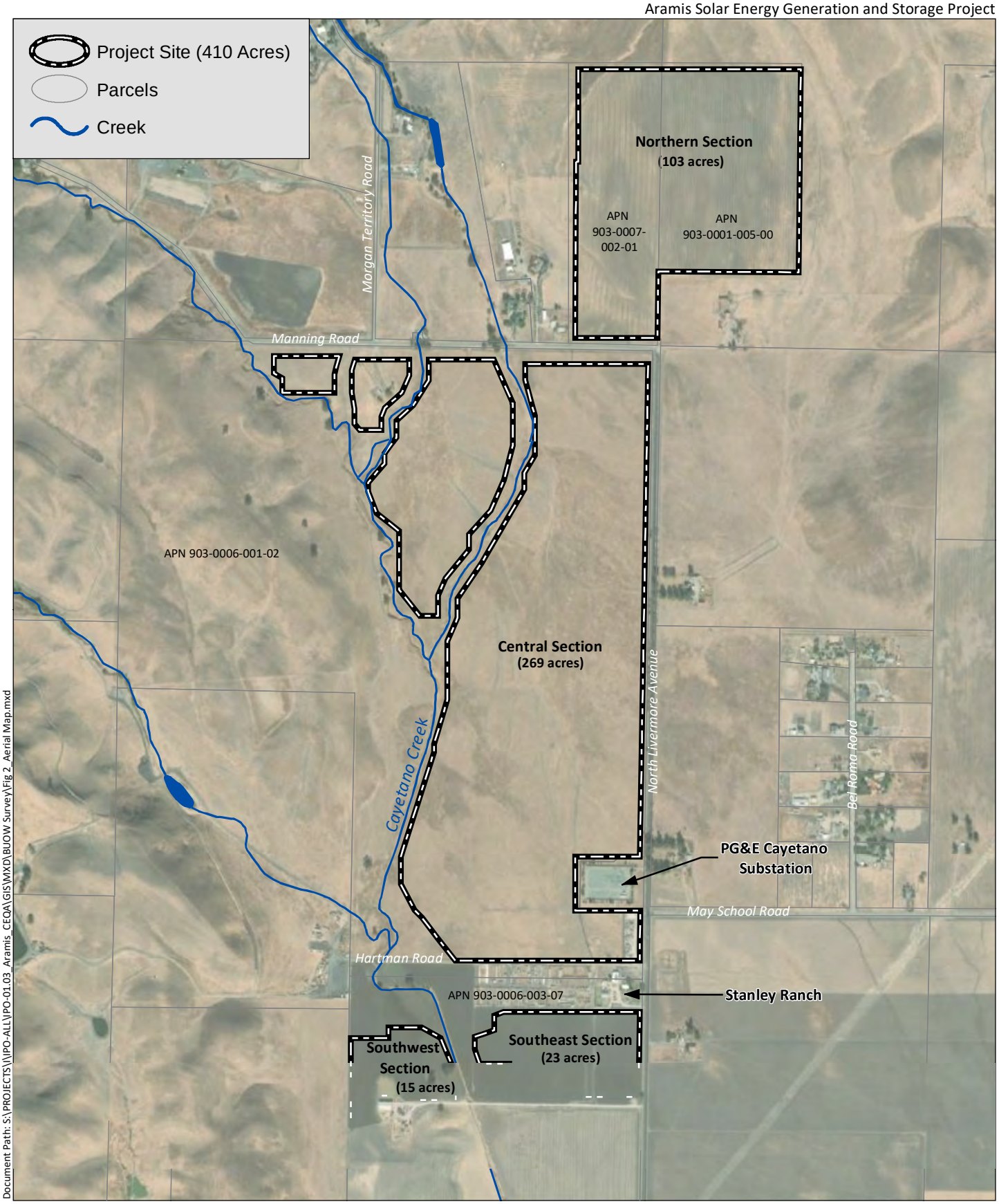
0 1.25 Miles

Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Regional Location

Figure 1

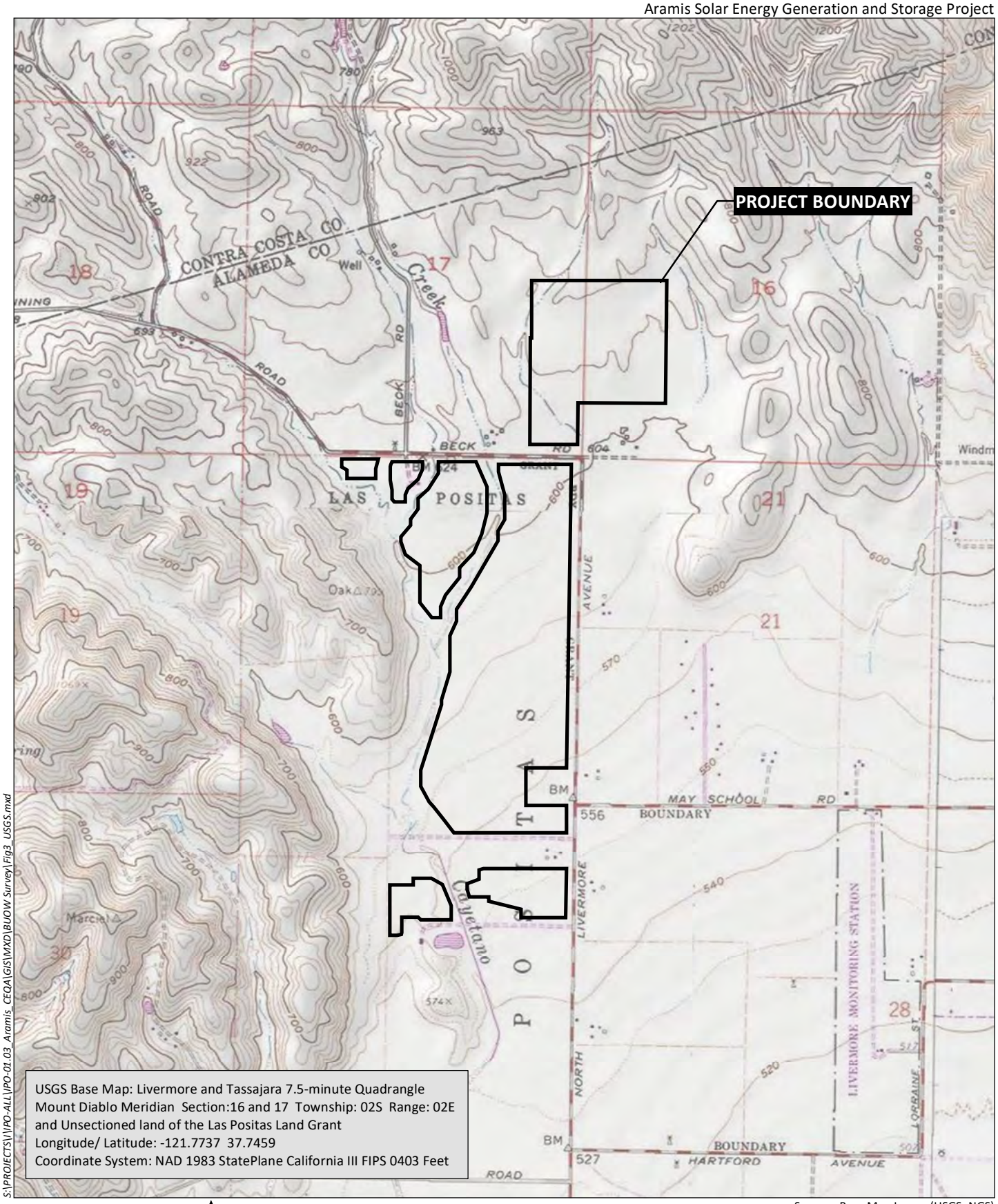


Source: Base Map Layers (DigitalGlobe 2018); Data (Alameda County 2017)

HELIX Environmental Planning

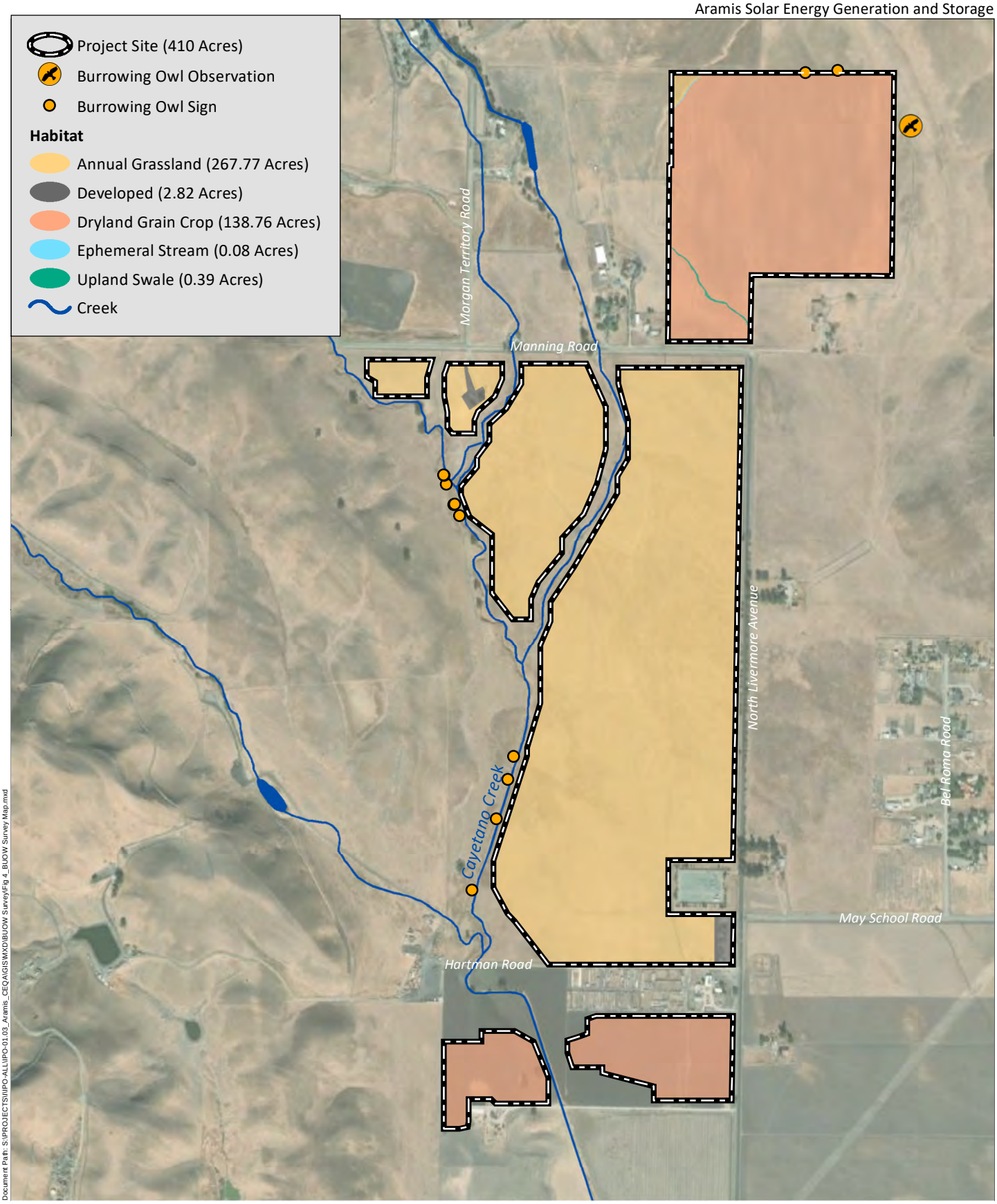
Aerial Map

Figure 2



USGS 7.5-minute Quadrangle Map

Figure 3



Habitat Map and Burrowing Owl Survey Results

Figure 4

Attachment B

Site Photos

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Photo 1. View of California ground squirrel burrows in the northern parcel north of Manning Road, looking north. Photo date 2/25/2020.

Photo 2. Representative view of Cayetano Creek adjacent to the western site boundary from the central portion of the survey area looking south. Photo date 7/31/2018.

Photo 3. View of burrowing owl pellet along Cayetano Creek adjacent to the site. Photo date 2/25/2020.

Photo 4. View of burrowing owl pellet along Cayetano Creek adjacent to the site. Photo date 2/6/2020.

Photo 5. View of dryland grain cropland in the northern parcel north of Manning Road, looking north. Photo date 5/21/2020.

Photo 6. View of burrowing owls at burrow (red circle) from the northeastern project boundary looking east. Photo date 6/17/2020.

Photo 7. Burrowing owl feather observed along the fence line on the northern boundary of the northern parcel, north of Manning Road. Photo date 6/17/2020.

Photo 8. View of long-eared owl detected during nighttime survey along Cayetano Creek adjacent to the project site. Photo date 3/17/2020.

Appendix H

Wetland Determination Data Sheets

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 7/31/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 1

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): C Lat: 37.75214 Long: -121.77989 Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

In a swale 100 feet downslope from the outfall of a ditch relief culvert under Manning Road

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Festuca perennis	25	Y	FAC
2. Juncus bufonius	15	Y	FACW
3. Hirschfeldia incana	15	Y	UPL
4. Lythrum hyssopifolium	5	N	OBL
5. Centaurea solstitialis	10	N	UPL
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 7/31/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 2

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: Unsectioned, T2S, R2E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 37.75112 Long: -121.78091 Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Depression in a swale draining Manning Road, 50 feet north of unnamed creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Festuca perennis	30	Y	FAC
2. Rumex pulcher	20	Y	FAC
3. Malvella leprosa	20	Y	FACU
4. Convlvulus arvensis	5	N	UPL
5. Centaurea solstitialis	5	N	UPL
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ✓ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Obvious depression

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 7/31/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 3

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: Unsectioned, T2S, R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 37.75119 Long: -121.77611 Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Swale draining Manning Road

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Festuca perennis	15	Y	FAC
2. Avena fatua	15	Y	UPL
3. Juncus bufonius	10	Y	FACW
4. Leontodon saxatilis	10	Y	FACU
5.			
6.			
7.			
8.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	10	x 4 =	40
UPL species	15	x 5 =	75
Column Totals:	50 (A)		180 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 7/31/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 4

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C Lat: 37.75216 Long: -121.77264 Datum: NAD-83

Soil Map Unit Name: Diablo clay, very deep, 3-15 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Swale fed by a culvert under Manning Road

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Helminthotheca echioides	15	Y	FAC
2. Festuca perennis	10	Y	FAC
3. Centaurea solstitialis	2	N	UPL
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 75 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Vegetation has been grazed by cattle

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 8/01/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 5

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 37.75371 Long: -121.77074 Datum: NAD-83

Soil Map Unit Name: Diablo clay, very deep, 3-15 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Swale in an active oat hay field, recently harvested

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Avena fatua	75	Y	UPL
2. Medicago polymorpha	15	N	FACU
3. Centaurea solstitialis	5	N	UPL
4. Matricaria discoidea	5	N	FACU
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Recently mowed

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 8/01/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 6

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C Lat: 37.75371 Long: -121.77074 Datum: NAD-83

Soil Map Unit Name: Diablo clay, very deep, 3-15 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Small depression in a swale in an active oat hay field, recently harvested

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Festuca perennis	100	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Recently mowed

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Sa Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 8/01/2018

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 7

Investigator(s): P. Martin, G. Aldridge Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): C Lat: 37.75879 Long: -121.77233 Datum: NAD-83

Soil Map Unit Name: Diablo clay, very deep, 3-15 percent slopes NWI classification: 2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Large gully with no bed/bank

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Festuca perennis	40	Y	FAC
2. Bromus diandrus	35	Y	UPL
3. Brassica nigra	10	N	UPL
4. Silybum marianum	5	N	UPL
5. Centaurea solstitialis	5	N	UPL
6. Rumex crispus	2	N	FAC
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	42	x 3 =	126
FACU species	0	x 4 =	0
UPL species	55	x 5 =	275
Column Totals:	97 (A)		401 (B)

Prevalence Index = B/A = 4.1

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Sa Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Chroma =1 but value <4 and no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 2/6/2020

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 8

Investigator(s): P. Martin, H. Goeman Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): _____ Slope (%): 1

Subregion (LRR): C Lat: _____ Long: _____ Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Low area mapped by US National Wetland Inventory. Site consists entirely of upland vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Avena fatua	10	N	--
2. Centaurea solstitialis	3	N	--
3. Medicago polymorpha	20	Y	FACU
4. Taraxacum officinale	10	N	FACU
5. Sonchus asper	2	N	FAC
6. Erodium bothys	5	N	FACU
7. Brassica nigra	20	Y	--
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation is dominated by upland vegetation.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Upland swale topographically low area is mapped by NWI as a seasonal emergent wetland.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 2/6/2020

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 9

Investigator(s): P. Martin, H. Goeman Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): _____ Slope (%): 1

Subregion (LRR): C Lat: _____ Long: _____ Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

NWI mapped seasonal wetland is upland. Low area on hillslopes.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Avena fatua	30	Y	--
2. Brassica nigra	20	Y	--
3. Medicago polymorpha	20	N	FACU
4.			
5.			
6.			
7.			
8.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species 10	x 4 = 40
UPL species 50	x 5 = 250
Column Totals: 60 (A)	290 (B)

Prevalence Index = B/A = 4.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Dominated by upland vegetation.

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: IP Aramis Solar City/County: Alameda Sampling Date: 2/6/2020

Applicant/Owner: IP Aramis LLC State: CA Sampling Point: 10

Investigator(s): P. Martin, H. Goeman Section, Township, Range: S17, T2S, R2E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): _____ Slope (%): 1

Subregion (LRR): C Lat: _____ Long: _____ Datum: NAD-83

Soil Map Unit Name: Clear Lake clay, drained, 0-2 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland point in floodplain. Location of data point does not appear to flood frequently.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Bromus hordeaceus	25	Y	FACU
2. Hordium marinum	10	N	FAC
3. Festuca perennis	20	Y	FAC
4. Brassica nigra	30	Y	--
5.			
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Dominated by upland vegetation.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

No hydric soil indicators detected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators detected.