ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

November 29, 2017

Aaron Ross-Swain
Richland Communities
3000 Lava Ridge Court, Suite 115
Roseville, CA 95661

RE: Response to Live Oak Associates, Inc. Peer Review Comments for The Ranch Biological Resources Assessment

Dear Mr. Ross-Swain,

Richland Communities requested that ECORP Consulting, Inc. respond to peer review comments provided by Live Oak Associates, Inc. (LOA) on the Biological Resources Assessment that ECORP prepared for The Ranch in Antioch (Project). This letter includes a table (Attachment A) with a response to LOA's comments, as well as the revised Biological Resources Assessment (Attachment B).

If you have any questions or require additional information, please contact Kathleen Ports at kports@ecorpconsulting.com.

Sincerely,

Kathleen Ports

Staff Biologist/Project Manager
ECORP Consulting, Inc.

Attachments

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LIST OF ATTACHMENTS

Attachment A – Response to Comments Table

Attachment B – Revised Biological Resources Assessment

ATTACHMENT A

Response to Comments Table

Comment Number	Live Oak Associates, Inc. Comment	Response[1]
1	That ECORP review the Sand Creek Specific Plan (2002) and modify their 2017 report to address/include these previous these findings. This document was presented to the City Council in 2002 and the proposed development was rejected. Significant background information was collected for this document, including previous surveys onsite and in the vicinity of the site, as the Sand Creek Specific Plan covered a large area including the Cowan Ranch, and large amounts of properties to the east, west, and south of Cowan Ranch.	Noted. The Sand Creek Specific Plan findings were not incorporated as it is a 15-year-old document and more recent site investigations, as well as current database searches (Attachment B), were conducted.
2	That ECORP add a discussion on consistency with the Antioch General Plan, including conformance to Appendix A of the General Plan: Framework for Resource Management Plan for Sand Creek Focus Area (Live Oak Associates, Inc. 2003) and the Draft General Plan Update Environmental Impact Report (LSA 2003).	Under Section 5.0 of the BRA, a subsection was added with a statement describing consistency with the Antioch General Plan.
3	Include an analysis of whether the project will have a substantial adverse effect to each biotic resource, and provide avoidance, minimization, and compensation measures should the potential impact be significant.	See revisions in Section 5.0 (Recommendations).
4	Revise Figures to remove “DRAFT”.	Figures revised.
5	Include a figure with the biotic habitats map.	Vegetation communities and land cover types figures for the Project Area and Offsite Infrastructure Areas are included in the report as Figures 2 and 3, respectively.
6	Include a figure for with locations for special status species observed onsite or in the vicinity of the site.	We only observed bird species flying overhead – we are not able to map these. Monk & Associates’ rare plant survey results figure was added to the BRA as Attachment F. Regarding CNDDB data, CDFW requires that users who share the mapping information only summarize the species records and not show exact locations of occurrences. Therefore, we no longer include species occurrence maps.
7	Include a figure with the site plans.	A site plan figure is included in the report as Attachment A.
8	That ECORP modify their 2017 report to discuss the potential impacts to wildlife movement corridors. Add a discussion on whether potential impacts are considered to be significant.	Section 4.8 was revised and Section 5.5 was added to discuss potential impacts to wildlife movement corridors.
9	Revise the report to evaluate the significance of loss of habitat for native wildlife.	A section was added in the recommendations to discuss impacts to native wildlife (Section 5.3).
10	That ECORP modify their 2017 report to discuss potential impacts to riparian habitat including potential light and noise impacts and the potential downstream effects of the project. Potential impacts of stormwater should be discussed as well.	Measures to mitigate light and noise impacts as well as downstream stormwater impacts are discussed under Section 5.4.1 and 5.4.2.

Comment Number	Live Oak Associates, Inc. Comment	Response[1]
11	Discuss proposed setbacks from Sand Creek and other sensitive habitats.	Section 1.2 was revised to describe the proposed setbacks from Sand Creek.
12	That ECORP revise the tree section to include how many trees are protected as a "mature tree" or "landscaped tree". Include expected replacement ratios or fees the City may require for each tree removed.	The Project is not currently proposing to remove trees. Section 5.2 was revised to include the requested discussion.
13	Include in the special status plants section, the existence of big tarplant onsite along the Sand Creek Corridor, as noted in the Sand Creek Specific Plan (2002). Ensure recent surveys were conducted within this species' blooming period, and include this species the discussion of special status plants existing on the project site. Include in the discussion additional species have previously been observed within FUA-1 of which the Cowan Ranch is a part: 1) there was a historical occurrence (1938-1941) of showy madia on the adjacent (to the east) Kaiser property; 2) brittlescale and San Joaquin saltbrush were previously observed on the Albers property; and 3) Mt. Diablo Manzanita, Brewers dwarf flax, Contra Costa manzanita, and crownscale were previously observed on the Zeka/Higgins property adjacent to the west of Cowan Ranch. As FUA-1 has had previous surveys, the results of these surveys should be included and discussed in the BRA.	Big tarplant was not identified during the 2015 Monk & Associates' rare plant surveys. Additional, current, rare plant surveys will be conducted for the Offsite Infrastructure Areas prior to construction. Results of surveys from 15+ years ago were not added to the report. A section (Section 3.3) was added to the report detailing the methods of the rare plant surveys conducted by Monk & Associates.
14	Revise the report to include a rare plant location map from the rare plant surveys to provide better information the amount of area impacted and its relative location to the proposed development.	A figure was attached (Attachment F) showing the current locations of rare plants on-site, as determined by Monk & Associates surveys.
15	Include a figure of historical and current locations for rare plants onsite and in the vicinity of the site.	A figure was attached (Attachment F) showing the current locations of rare plants on-site, as determined by Monk & Associates surveys. Historical occurrences were not included due to the reasons discussed in the response to comments 6 and 13.
16	Include a measure for surveys and for take of the Valley elderberry longhorn beetle. The survey protocol should follow CDFW's Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (2017).	The survey protocol is a USFWS protocol, not CDFW. CDFW does not regulate valley elderberry longhorn beetle. The survey/site assessments that were conducted are sufficient. No additional surveys are needed. The elderberry shrub will be avoided by 100 feet. If impacts occur within 100 feet of the shrub, they will be mitigated as necessary. The text of the document (Section 5.5.2) already explains this. No further measures are necessary.
17	Include in the fairy shrimp section a discussion of previous records and onsite records, including a figure to show where these observations are onsite and in the vicinity of the site.	See response to comment 6.

Comment Number	Live Oak Associates, Inc. Comment	Response[1]
18	Revise the measures for Foothill yellow-legged frog to either include acquiring a take permit or including measures to avoid take.	The potential for this species is very low. We do not believe a take permit will be required; however, if foothill yellow-legged frog are observed, consultation with CDFW will be required. The measures that are proposed are sufficient.
19	Revise the measures for Alameda whipsnake to establish appropriate measures should this species be observed onsite, so consultation with CDFW would not be necessary.	If Alamenda whipsnake is observed onsite, consultation with USFWS and CDFW will be required because this species is both state and federally listed. The biological resources assessment recommends consultation with USFWS and CDFW since there are several nearby occurrences of the species and they have potential to disperse through the Study Area. During consultation regarding other species, Alameda whipsnake should also be discussed. At that time, appropriate mitigation/minimization/avoidance will be determined.
20	Revise the measures for Blainville's horned lizard, northwestern pond turtle, and silvery legless lizard to establish appropriate measures should this species be observed onsite, so consultation with CDFW would not be necessary.	Section 5.5.5 was revised to recommend relocation of these species if they are seen onsite.
21	Revise the report to specifically call out Swainson's hawk and include protocol-level surveys for this species.	The buffer for Swainson's hawk is 0.5 mile and is sufficient for this species. The surveys for this species do not need to be discussed separately. Protocol-level surveys are not required unless CDFW specifically requests them.
22	Revise the report to specifically call out tricolored blackbird and include appropriate measures for this species.	A survey buffer for tricolored blackbird (500') was added to Section 5.5.6.
23	Revise the measures for burrowing owl to reference the CDFW's Staff Report on Burrowing Owl Mitigation (CDFG 2012) guidelines as the protocol to use for preconstruction (take avoidance) surveys.	The CDFW protocol is a recommended protocol and is not required. The proposed measures are adequate.
24	Revise the measures for American badger to establish appropriate measures should this species be observed onsite, so consultation with CDFW would not be necessary.	If American badger is observed onsite and the species is unable to leave on its own (i.e., if it is denning onsite), consultation with CDFW will be required. CDFW will need to approve burrow excavation and/or relocation methods prior to any action. Text was added to Section 5.5.7 to clarify why consultation would be needed.

Comment Number	Live Oak Associates, Inc. Comment	Response[1]
25	Revise the measures for San Joaquin kit fox to establish appropriate measures should this species be observed onsite, including preconstruction surveys following the U.S. Fish and Wildlife Service San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS 1999), and construction-free buffer distances so consultation with CDFW would not be necessary.	If San Joaquin kit fox is observed onsite, consultation with USFWS and CDFW will be required because this species is both state and federally listed. The biological resources assessment recommends consultation with USFWS and CDFW since there are nearby occurrences of the species and they have potential to occur within the Study Area. During consultation regarding other species, San Joaquin kit fox should also be discussed. At that time, appropriate mitigation/minimization/avoidance will be determined.
26	Revise the report to include a discussion on potential impacts to mastiff bats and include appropriate avoidance and mitigation measures.	Greater mastiff bat was added to Table 3 and to the proceeding mammal sections.
27	Revise the report to include a discussion on potential impacts to ringtails and include appropriate avoidance and mitigation measures.	Ringtail was added to Table 3 and to the proceeding mammal sections.
Wildlife Comment, Page 3	We suggest the full list of observed wildlife be incorporated into the body of the BRA.	The full list is provided as Attachment D and does not need to be in the body of the report.
Soils Comment, Page 3	We suggest the BRA include whether or not the soils have other characteristics such as being alkaline or characteristics which would indicate a particular type of plant species may or may not occur.	During ECORP's analysis of the site, ECORP botanists reviewed soils information and made plant determinations with those factors in mind. This does not need to be described in the biological resources report.

[1]Section numbers, figure numbers, and attachment letters are represented in this table as the revised numbers and letters. When referring to the sections, figures, and attachments described above, use the revised document.

ATTACHMENT B

Revised Biological Resources Assessment

Biological Resources Assessment

The Ranch in Antioch

Contra Costa County, California

Prepared For:

Richland Planned Communities, Inc.

November 2017

FINAL

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

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LIST OF ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
BA	Biological Assessment
BO	Biological Opinion
BCC	Birds of Conservation Concern
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society
CNDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
CRLF	California red-legged frog
CTS	California tiger salamander
General Plan	City of Antioch General Plan

LIST OF ACRONYMS AND ABBREVIATIONS

CWA	Clean Water Act
DPS	Distinct Population Segment
ESA	Endangered Species Act
EFH	Essential Fish Habitat
ESU	Evolutionarily Significant Unit
FYLF	foothill yellow-legged frog
HCP	Habitat Conservation Plan
M&A	Monk & Associates, Inc.
MSL	mean sea level
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
SAA	Streambed Alteration Agreement
Project	The Ranch in Antioch
TRBL	tricolored blackbird
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	valley elderberry longhorn beetle

1.0 INTRODUCTION

At the request of Richland Planned Communities, Inc., ECORP Consulting, Inc. conducted a biological resources assessment for The Ranch in Antioch (Project) located in Contra Costa County. The Project Area as well as the Project's potential offsite infrastructure areas (Offsite Infrastructure Areas) are collectively referred to as the Study Area.

1.1 Study Area Location

The ±632.9-acre Study Area is generally located south of Lone Tree Way and west of California State Route (SR) 4 in the southern limits of the City of Antioch, Contra Costa County California. The Study Area corresponds to a portion of Sections 1, 5, 6, 7, 8, 9, and 12, Township 1 North, and Ranges 1 and 2 East (Mount Diablo Base and Meridian) of the "Antioch South, California" 7.5-minute quadrangle (U.S. Geological Survey [USGS] 1978) (Figure 1. *Study Area Location and Vicinity*). The approximate center of the Study Area is located at latitude 37.949989 and longitude -121.792847 within the San Joaquin Delta Watershed (Hydrologic Unit Code #18040003, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016).

1.2 Project Description

The Project Area consists of ±550.8 acres where Richland Planned Communities, Inc. plans to process entitlements that will allow up to 1,338 residential units divided into various neighborhoods that will be arranged into two villages separated by Sand Creek, accompanied by parks, a system of improved and natural pedestrian trails, a trail staging area, a private recreation facility, a fire station, a series of roads throughout the development, a vehicular bridge, a pedestrian bridge, two storm drain basins with outfalls into the creek, and a village center located across from Kaiser Hospital. The Project proponent is proposing a minimum 50 foot no-disturbance setback from Sand Creek. A conceptual site plan is included as Attachment A.

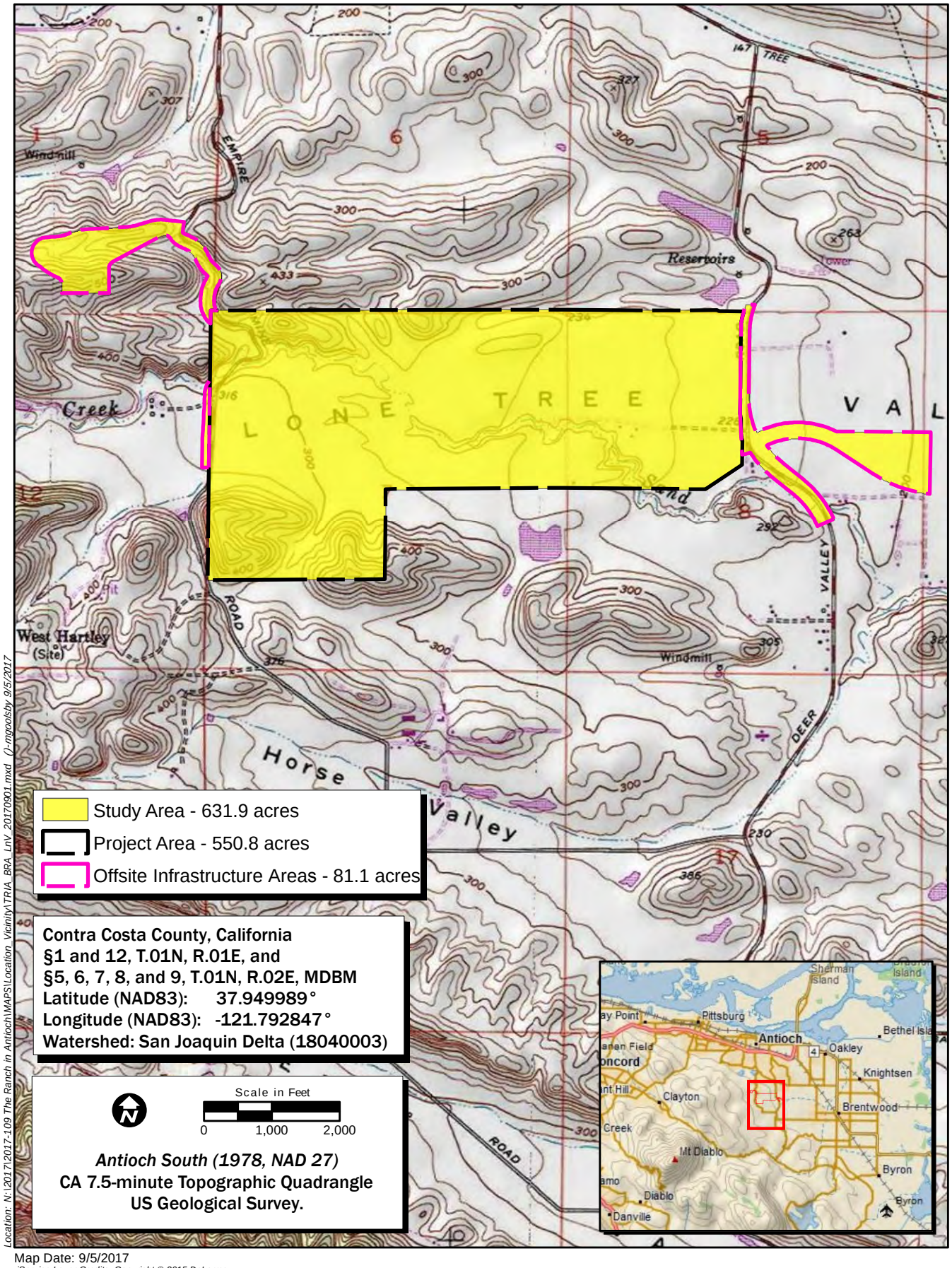
The Offsite Infrastructure Areas consist of ±81.1 acres and represent an area that may be used for the installation of water pump stations, water tanks, sewer lines, or other necessary infrastructure improvements that may be required to support the residential community.

1.3 Purpose of this Biological Resources Assessment

The purpose of this Biological Resources Assessment is to assess the potential for occurrence of special-status plant and animal species or their habitat, and sensitive habitats such as wetlands within the Study Area. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols, and the conclusions and recommendations presented in this report are based upon a literature review, database queries, and limited site reconnaissance.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California ESA;



Location: N:\2017\2017-109 The Ranch in Antioch\MAPS\Location_Vicinity\TRIA_BRA_LnV_20170901.mxd (J-mgoolsby 9/5/2017

Map Date: 9/5/2017

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Figure 1. Study Area Location and Vicinity

2017-109 The Ranch in Antioch

- meet the definitions of endangered or rare under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- are fully protected in California in accordance with the California Fish and Game Code, §§ 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" [California Rare Plant Rank (CRPR) 1 and 2];
- are plants listed by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4); or
- are plants listed as rare under the California Native Plant Protection Act (NPPA, California Fish and Game Code, § 1900 et seq.).

Only species that fall into one of the above-listed groups were considered for this assessment. Birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS), without other special status, were not included in this analysis. Other species without special status that are sometimes found in database or literature searches were not included within this analysis.

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by USFWS and the National Marine Fisheries Service (NMFS). Section 9 of the federal ESA prohibits the taking of listed wildlife, where take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on nonfederal land in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of federal ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a Biological Opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of federal ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a Habitat Conservation Plan (HCP) is developed.

Section 7

Section 7 of the federal ESA mandates that all federal agencies consult with USFWS and/or NMFS to ensure that federal agencies' actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. If direct and/or indirect effects will occur to Critical

Habitat that appreciably diminish the value of critical habitat for both the survival and recovery of a species, the adverse modifications will require formal consultation with USFWS or NMFS. If adverse effects are likely, the applicant must conduct a Biological Assessment (BA) for the purpose of analyzing the potential effects of the project on listed species and critical habitat to establish and justify an "effect determination." The federal agency reviews the BA; if it concludes that the project may adversely affect a listed species or its habitat, it prepares a BO. The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat.

Section 10

When no discretionary action is being taken by a federal agency but a project may result in the take of listed species, an incidental take permit under Section 10 of the federal ESA is necessary. The purpose of the incidental take permit is to authorize the take of federally listed species that may result from an otherwise lawful activity, not to authorize the activities themselves. In order to obtain an incidental take permit under section 10, an application must be submitted that includes an HCP. In some instances, applicants, USFWS, and/or NMFS may determine that an HCP is necessary or prudent, even if a discretionary federal action will occur. The purpose of the HCP planning process associated with the permit application is to ensure that adequate minimization and mitigation for impacts to listed species and/or their habitat will occur.

Critical Habitat and Essential Habitat

Critical Habitat is defined in Section 3 of the federal ESA as

1. The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the federal ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and
2. Specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

For inclusion in a Critical Habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features that are essential to the conservation of the species. Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the primary constituent elements). Primary constituent elements are the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These include, but are not limited to, the following elements:

- Space for individual and population growth and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, or rearing (or development) of offspring; or
- Habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species.

Excluded essential habitat is defined as areas that were found to be essential habitat for the survival of a species and assumed to contain at least one of the primary constituent elements for the species but were excluded from the Critical Habitat designation. The USFWS has stated that any action within the excluded essential habitat that triggers a federal nexus will be required to undergo the Section 7(a)(1) process, and the species covered under the specific Critical Habitat designation would be afforded protection under Section 7(a)(2) of the federal ESA.

Essential Fish Habitat

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), federal agencies are required to consult with NMFS for activities that may affect Essential Fish Habitat (EFH). EFH are the waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity, and include several important components: adequate substrate; water quality and quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity (Pacific Fishery Management Council 2000).

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22]. The USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

2.1.4 Federal Clean Water Act

The federal Clean Water Act's (CWA's) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into Waters of the United States (U.S.) without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that

under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The USEPA also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

2.2 State or Local Regulations

2.2.1 California Fish and Game Code

California Endangered Species Act

The California ESA (California Fish and Game Code §§ 2050-2116) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State-led agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened or candidate species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the federal and/or California ESAs. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code, § 4700 for mammals, § 3511 for birds, § 5050 for reptiles and amphibians, and § 5515 for fish) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing incidental take permits for fully protected species. CDFW will issue licenses or permits for take of these species for necessary scientific research or live capture and relocation pursuant to the permit.

Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code §§ 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code §§ 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA.

Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Additionally, Subsection 3503.5 prohibits the take, possession, or destruction of any birds and their nests in the orders Strigiformes (owls) or Falconiformes (hawks and eagles). These provisions, along with the federal MBTA, serve to protect nesting native birds.

California Streambed Alteration Notification/Agreement

Section 1602 of the California Fish and Game Code requires that a Streambed Alteration Agreement (SAA) be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." CDFW reviews the proposed actions and, if necessary, submits proposed for measures to protect affected fish and wildlife resources to the applicant. The final proposal that is mutually agreed upon by CDFW and the Applicant is the SAA. Often, projects that require an SAA also require a permit from USACE under Section 404 of the CWA. In these instances, the conditions of the Section 404 permit and the SAA overlap.

2.2.2 Species of Special Concern

The SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under the federal or California ESAs or the California Fish and Game Code, but currently satisfies one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role.
- The species is listed as federally (but not state) threatened or endangered, or meets the state definition of threatened or endangered but has not formally been listed.
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status.
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for state threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, state-threatened or endangered species are considered "significant" under CEQA.

2.2.3 California Plant Ranks

The CNPS maintains the *Inventory of Rare and Endangered Plants of California* (CNPS 2017), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, nongovernmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The California Rare Plant Ranks are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed
- Rare Plant Rank 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of one through three, with one being the most threatened and three being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

- Threat Rank 0.1 – Seriously threatened in California (more than 80 percent of occurrences threatened/high degree and immediacy of threat)
- Threat Rank 0.2 – Moderately threatened in California (20 - 80 percent occurrences threatened/ moderate degree and immediacy of threat)
- Threat Rank 0.3 – Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Factors such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank, and differences in Threat Ranks do not constitute additional or different protection (CNPS 2017). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines § 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

2.2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development

and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code § 13050 (e)). Where dredging, filling, or discharging materials into the Waters of the State will occur pursuant to a federal permit (i.e., a 404 permit), the RWQCB must issue a water quality certification (i.e., a 401 permit). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

2.2.5 California Environmental Quality Act

In accordance with the California Environmental Quality Act (CEQA) Guidelines section 15380 (d), a species not protected on a federal or state list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in federal and California ESAs and sections 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either USFWS or CDFW.

CEQA Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant, and are particularly relevant to species with special status. Generally, impacts to listed (rare, threatened, or endangered) species are considered significant and require lead agencies to prepare an Environmental Impact Report to thoroughly analyze and evaluate the impacts. Assessment of "impact significance" to populations of nonlisted species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Specifically, Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project 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 CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- Have a substantial adverse effect on federally protected Waters of the U.S. including wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) 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; and
- Conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional or state HCPs.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.2.6 City of Antioch General Plan

The City of Antioch General Plan (General Plan) contains several objectives and policies related to biological resources under the Resource Management section. Specifically, the biological resources objectives and policies pertain to CDFW sensitive natural communities such as: native grasslands, vernal pools, stabilized interior dunes, seasonal wetlands, freshwater seeps, freshwater marshes, coastal brackish marshes, alkaline floodplains, alkali seeps, valley oak woodlands, and riparian woodland. The biological resources objectives and policies also pertain to special-status species (City of Antioch 2003).

The General Plan biological resources policies emphasize compliance with federal policies regarding no net loss of wetlands through avoidance and creation; preserving and/or restoring existing wetlands and riparian resources along natural streams; requiring development setbacks adjacent to natural streams; requiring development projects to protect and/or mitigate for impacts to sensitive habitats through environmental review process; limiting uses within preserves (e.g., implementing passive recreation and public trails); permitting removal of healthy oaks only when necessary; preserving heritage trees; limiting introduction of invasive species and incorporating native vegetation in the planting plans; avoiding creation of perennial flows within urban streams; and, when presence/absence determinations are being made for threatened, endangered, or special of special concern, requiring protocol-level surveys prior to a final determination of absence for the species (City of Antioch 2003).

2.2.7 City of Antioch Tree Ordinance

Title 9: Planning and Zoning, Chapter 5 Zoning, Article 12: Tree Preservation and Regulation establishes the requirement for a permit or development application required prior to the removal of protected trees (City of Antioch 2017). Article 12 defines protected trees as:

"(a) any tree required to be preserved as a condition of an approval from a "regular development application" as defined by this section, and/or any tree that is shown to be preserved on an approved development plan as submitted by the applicant and subsequently approved by the city.
(b) All established indigenous trees as defined by this section.
(c) all street trees as defined by this section.
(d) all mature and landmark trees as defined by this section."

Indigenous trees are defined as: blue oak (*Quercus douglasii),* valley oak (*Q. lobata*), coast live oak (*Q. agrifolia*), canyon live oak (*Q. chrysolepis*), interior live oak (*Q. wislizeni*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*).

Street trees are defined as "*any tree planted within either the public right-of-way and/or planting easement, where applicable*."

Landmark trees are defined as "*any tree which is at least 48 inches in diameter and/or in excess of 40 feet in height*."

Mature trees are defined as "*any tree which is at least 26 inches in diameter, as measured four and one half feet above natural grade*."

3.0 METHODS

3.1 Literature Review

Prior to conducting the field portion of the assessment, the following species lists were queried to determine the special-status species that had been documented within or in the vicinity of the Study Area. Results of the database searches are included as Attachment B:

- CDFW CNDDB for the "Antioch South, California" and surrounding eight 7.5-minute USGS quadrangles (CDFW 2017);
- USFWS IPaC Resource Report List for the Study Area (USFWS 2017a); and
- CNPS electronic *Inventory of Rare and Endangered Plants of California* was queried for the "Antioch South, California" 7.5-minute USGS quadrangle, and the eight surrounding USGS topographic quadrangles (CNPS 2017).

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the Study Area from the following sources:

- The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004 (CDFG 2005);
- California Bird Species of Special Concern (Shuford and Gardali 2008);
- Amphibian and Reptile Species of Special Concern in California (Thompson, Wright, and Shaffer 2016);
- Mammalian Species of Special Concern in California (Williams 1986);

- California's Wildlife, Volumes I-III (Zeiner, et al. 1988, 1990a, 1990b); and
- A Guide to Wildlife Habitats of California (Mayer and Laudenslayer Jr., eds. 1988).

Other reports and verifications previously prepared for the Project Area that were reviewed for this assessment include the following:

- Tree Preservation Report for The Ranch Project, Antioch California (Brennan 2015);
- Investigation of Waters of the United States, Cowan Property, Contra Costa County, California (Live Oak Associates, Inc. 2014).
- U.S. Army Corps of Engineers Approved Jurisdictional Determination for the Ranch Residential Development Site (USACE 2016).
- DRAFT Biological Assessment for The Ranch, City of Antioch, Contra Costa County (Monk & Associates, Inc. [M&A] 2015). This draft report also documents the methods and results of protocol-level special-status plant surveys conducted in 2015 by M&A.

3.2 Site Reconnaissance

ECORP biologists Ariel Miller, Dustin Brown, Clay DeLong, and Emily Mecke conducted the site assessments on April 12, 2017 and August 22, 2017. The Study Area was systematically surveyed on foot using a Trimble GPS unit with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the site with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring within the Study Area were characterized and the following biological resource information was collected:

- Potential Waters of the U.S. (Offsite Infrastructure Areas only);
- Plant and animal species directly observed;
- Animal evidence (e.g., scat, tracks);
- Elderberry (*Sambucus nigra* ssp. *caerulea*) shrub locations;
- Burrows and any other special habitat features; and
- Representative site photographs (Attachment C).

In addition, soil types were identified using the NRCS Web Soil Survey (NRCS 2017a).

3.3 Rare Plant Surveys Conducted By Monk & Associates

M&A biologists conducted rare plant surveys within the Project Area on March 23 and 25, April 28 and 29, and July 14 and 15, 2015 (M&A 2015). M&A biologists Sarah Lynch, Christy Owens, Bridgett Downs and Sadie McGarvey completed focused surveys that followed CDFW (CDFG 2009), USFWS Guidelines (USFWS 2000), and CNPS (2001) published survey guidelines. The plant species found in the Project Area were identified to species. A list of all vascular plant taxa encountered within the Project Area was recorded in the field. Plants that needed further evaluation were collected and keyed at the M&A

lab. Final determinations for collected plants were made by keying specimens using standard references such as The Jepson Manual Second Edition (Baldwin et al. 2012) (M&A 2015).

3.4 Special-Status Species Considered for the Project

Based on species occurrence information from the CNDDB, the literature review, and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Project Area and/or Offsite Infrastructure Areas was generated (Table 4 in Section 4.7). Only special-status species as defined in Section 1.3 were included in this analysis. Each of these species' potential to occur within the Project Area and/or Offsite Infrastructure Areas was assessed based on the following criteria:

- **Present** - Species was observed during the site visits or is known to occur within the Project Area and/or Offsite Infrastructure Areas based on documented occurrences within the CNDDB or other literature.
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the Project Area and/or Offsite Infrastructure Areas.
- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur in the vicinity based on CNDDB records and other available documentation.
- **Absent** - No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur in the vicinity based on CNDDB records and other documentation.

4.0 RESULTS

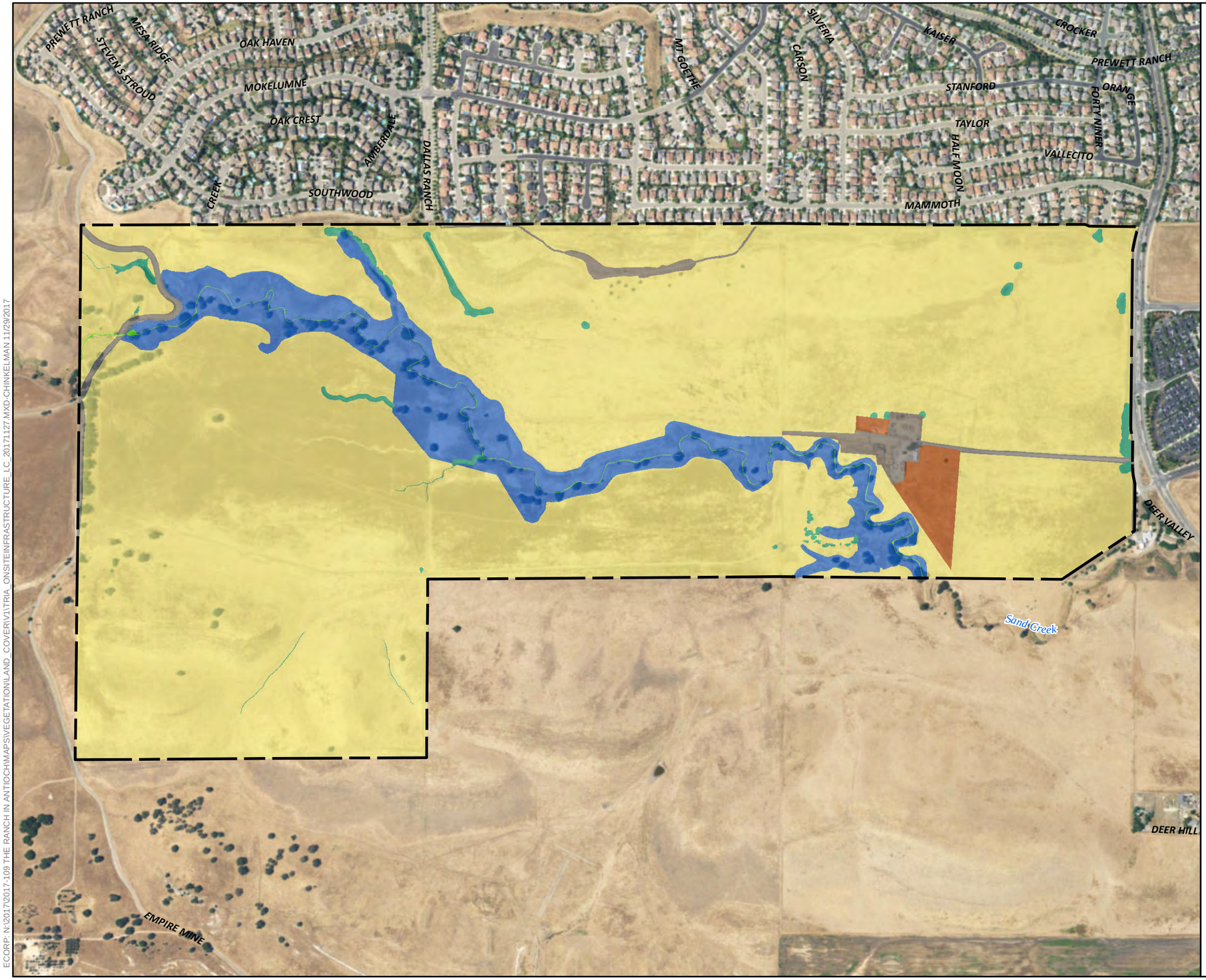
4.1 Site Characteristics and Land Use

The Study Area is bounded by suburban residential development to the north, undeveloped land, a hospital, and a high school on the east, and undeveloped land to the south and west. Topography within the Study Area ranges from rolling hills to flat terrain, with elevations ranging from approximately 200 feet to 500 feet above mean sea level. The majority of the Study Area is undeveloped and is used primarily for livestock grazing. A rural residence and several outbuildings occur in the central-eastern portion of the Project Area. A water tank and paved road occur within the northwestern Offsite Infrastructure Area. Portions of Deer Valley Road and Sand Creek Road occur within the eastern Offsite Infrastructure Area.

4.2 Vegetation Communities and Land Cover Types

Three vegetation communities and land cover types were documented within the Study Area. These include annual grassland, ruderal community, and developed. These vegetation communities and land cover types are described below. Figures 2 and 3 show the vegetation communities, land cover types, and aquatic resources within the Study Area. Table 1 below provides the approximate percent cover of each of these features within the Project Area and Offsite Infrastructure Areas. Waters of the U.S. are discussed in detail under Section 4.6. Separate waters of the U.S. figures and acreages are also provided in Section 4.6.

Figure 2. Project Area Vegetation Communities and Land Cover Types



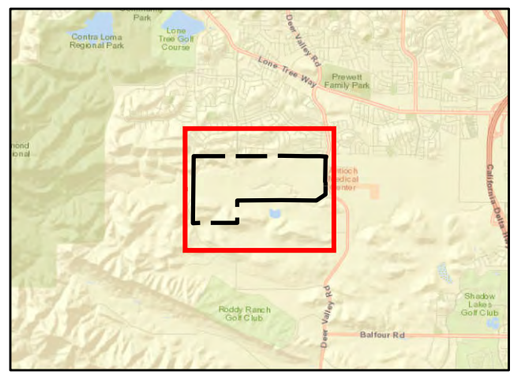
Map Features

- Project Boundary (550.8 acres)

Land Cover Type

- Annual Grassland (478.8 acres)
- Developed (9.6 acres)
- Ruderal (6.4 acres)
- Sand Creek (1.9 acres)
- Sand Creek Corridor (51.7 acres)
- Aquatic/Wetlands Complex (2.3 acres)

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



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2017-109 The Ranch in Antioch

Scale in Feet
0 750

Photo Source: NAIP, 2016
Boundary Source: Monk and Associates

Map Date: 11/29/2017

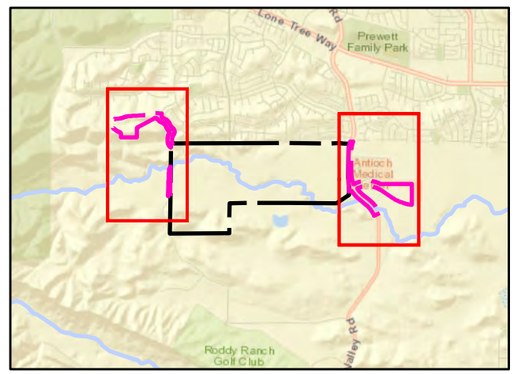
Figure 3. Offsite Infrastructure Areas Vegetation Communities and Land Cover Types

Map Features

- Offsite Infrastructure Areas (81.1 acres)

Land Cover Type

- Annual Grassland (56.5 acres)
- Developed (21.2 acres)
- Ruderal (2.7 acres)
- Sand Creek (0.2 acre)
- Aquatic/Wetlands Complex (0.6 acre)



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2017-109 The Ranch in Antioch

Scale in Feet
0 600

Photo Source: ESRI, 2017
Boundary Source: Carlson, Barbee, & Gibson

Map Date: 11/29/2017

Table 1. Vegetation Communities and Land Cover Types		
Type	Acres[1]	Approximate Percent Cover[1]
Project Area	550.8	N/A
Annual Grassland	478.8	86.9%
Developed	9.6	1.7%
Ruderal	6.4	1.2%
Sand Creek	1.9	0.3%
Sand Creek Corridor[2]	51.7	9.4%
Aquatic/Wetlands Complex	2.3	0.4%
Offsite Infrastructure Areas	81.1	N/A
Annual Grassland	56.5	69.7%
Developed	21.2	26.1%
Ruderal Community	2.7	3.3%
Sand Creek[3]	0.2	0.2%
Aquatic/Wetlands Complex	0.6	0.7%

[1]The individual acre and/or percentage amounts may not add up to the total acres/100% due to rounding.
[2]For the Project Area, the Sand Creek Corridor boundary is mapped as the approved CDFW jurisdictional limit.
[3]For the Offsite Infrastructure Areas, the Sand Creek boundary is mapped as the OHWM (consultation with CDFW regarding their jurisdictional along Sand Creek has not yet occurred for the Offsite Infrastructure Areas).

4.2.1 Annual Grassland

The majority of the Study Area is composed of annual grassland. Annual grasslands within the Study Area are dominated primarily by nonnative annual grass species, including ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceous*), wild oat (*Avena fatua*), foxtail barley (*Hordeum murinum*), and Italian ryegrass (*Festuca perennis*). Common forb species within the annual grasslands include common gumplant (*Grindelia camporum*), bur clover (*Medicago polymorpha*), and red-stemmed filaree (*Erodium cicutarium*). Annual grasslands within the Study Area also include scattered native trees, which occur at low density in the southwestern portion of the Project Area, and along Sand Creek. Native trees species within annual grasslands in the Study Area include California buckeye, blue oak, valley oak, and interior live oak.

4.2.2 Ruderal

Ruderal vegetation occurs adjacent to Deer Valley Road and Sand Creek Road within the eastern Offsite Infrastructure Area, and surrounding the rural residence within the Project Area. This vegetation community is composed primarily of nonnative forbs and grasses characteristic of recently disturbed sites. Dominant plant species within the ruderal vegetation communities in the Study Area include yellow star-thistle (*Centaurea solstitialis*), stinkwort (*Dittrichia graveolens*), Russian thistle (*Salsola tragus*), Italian ryegrass, and wild oat. A grove of planted blue gum (*Eucalyptus globulus*) also occurs along the western boundary of the Project Area.

4.2.3 Developed

Developed portions of the Study Area include roads, landscaped areas, the rural residence in the Project Area, the water tank in the northwestern Offsite Infrastructure Area, and other paved or recently disturbed areas. These areas do not contain appreciable native or naturalized vegetation.

4.2.4 Sand Creek and Sand Creek Corridor

Sand Creek is located within portions of the Offsite Infrastructure Areas and also runs east/west through the Project Area. Within the Project Area, Sand Creek and the associated approved CDFW 1602 jurisdictional area are referred to as the Sand Creek Corridor. The Sand Creek boundary within the Offsite Infrastructure Areas only includes the mapped OHWM since these areas have not been subject to agency review. See Section 4.6 for a detailed description of Sand Creek.

4.2.5 Aquatic/Wetlands Complex

Aquatic/wetlands complex within the Study Area includes all the mapped Waters of the U.S. and State with the exception of Sand Creek and the Sand Creek Corridor (described above). See Section 4.6 for a detailed description of the Waters of the U.S. and State within the Study Area.

4.3 Trees

A tree survey was conducted for the Project Area in July 2015 (Brennan 2015). During this survey, 16 tree species and 255 individual trees were mapped, identified, and evaluated for indicators of health within the Project Area. A large majority of the trees identified within the Project Area belonged to five species, including 73 blue oaks, 60 valley oaks, 54 blue gums, 29 California buckeyes, and 13 interior live oaks (Brennan 2015). Tree surveys have not been conducted for the Offsite Infrastructure Area.

4.4 Wildlife

Wildlife species observed within the Study Area during the 2017 site visits include American crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), killdeer (*Charadrius vociferus*), barn swallow (*Hirundo rustica*), western meadowlark (*Sturnella neglecta*), Bullock's oriole (*Icterus bullockii*), house finch (*Haemorhous mexicanus*), black phoebe (*Sayornis nigricans),* turkey vulture (*Cathartes aura*), and California ground squirrel (*Otospermophilus beecheyi*). A complete list of wildlife species observed within the Study Area during the 2017 site visits is provided as Attachment D.

4.5 Soils

According to the Web Soil Survey (NRCS 2017a), six soil units, or types, have been mapped within the Study Area (Figure 4. *Natural Resource Conservation Service Soil Types*):

- AbD – Altamont clay, 9 to 15 percent slopes
- AbE – Altamont clay, 15 to 30 percent slopes
- AcF – Altamont-Fontana complex, 30 to 50 percent slopes
- BdE – Briones loamy sand, 5 to 30 percent slopes
- CaA – Capay clay, 0 to 2 percent slopes
- RbA – Rincon clay loam, 0 to 2 percent slopes, MLRA 14

Figure 4. Natural Resources Conservation Service Soil Types

Map Features

Survey Boundary

Series Number - Series Name

- AbD - Altamont clay, 9 to 15 percent slopes
- AbE - Altamont clay, 15 to 30 percent slopes
- AcF - Altamont-Fontana complex, 30 to 50 percent slopes
- BdE - Briones loamy sand, 5 to 30 percent slopes
- CaA - Capay clay, 0 to 2 percent slopes
- RbA - Rincon clay loam, 0 to 2 percent slopes, MLRA 14

Natural Resources Conservation Service (NRCS)
Soil Survey Geographic (SSURGO) Database for
Contra Costa County, CA

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Location: N:\2017\2017-109 The Ranch in Antioch\MAPS\Soils_and_Geology\Soils\TRIA_BRA_Soils_20170901.mxd ()-mgoolsby 9/1/2017

2017-109 The Ranch in Antioch

Scale in Feet
0 1,200

Photo Source: NAIL, 2016

Map Date: 9/1/2017

Altamont clay, 15 to 30 percent slopes (AbE) is partially composed of the Clear Lake and Pescadero components, which are considered hydric when occurring in depressions and drainageways (NRCS 2017b). Altamont-Fontana complex, 30 to 50 percent slopes (AcF) is partially composed of the Pescadero component, which is considered hydric when occurring in depressions (NRCS 2017b). Capay clay, 0 to 2 percent slopes (CaA) is partially composed of the Marcuse component, which is considered hydric when occurring in depressions. None of the remaining soil types contain hydric components.

4.6 Potential Waters of the U.S.

4.6.1 Project Area

A jurisdictional delineation of Waters of the U.S. was conducted for the Project Area (Live Oak Associates, Inc. 2014; Attachment E), and an Approved Jurisdictional Determination was issued on 23 February 2016 (USACE 2016; Attachment F). Waters of the U.S. mapped within the Project Area include wetlands and other waters (See Table 2 and Figure 5. *Project Area Aquatic Resources*). A total of 3.948 acres of Waters of the U.S. were mapped within the Project Area. Jurisdictional wetlands consist of seasonal wetland pools and wetland seeps. Other jurisdictional waters include an intermittent tributary (Sand Creek), ephemeral tributaries, and impoundments. A total of 1.111 acres of non-jurisdictional, isolated waters and wetlands were also mapped within the Project Area. Non-jurisdictional wetlands within the Project Area include seasonal wetland pools and a wetland drainage. Other non-jurisdictional waters include ephemeral drainages. For further details regarding wetlands and other waters within the Project Area, see Attachments E and F.

Table 2. Project Area Aquatic Resources

Type	Acres[1]
Jurisdictional Waters	3.948
Wetlands	
Seasonal Wetland Pool	0.303
Wetland Seep	0.030
Other Waters	
Ephemeral Tributary (to Sand Creek)	0.340
Intermittent Tributary (Sand Creek)	1.901
Impoundment	1.372
Non-Jurisdictional Waters	1.111
Isolated Wetlands	
Wetland Drainage	0.286
Seasonal Wetland Pool	0.588
Non-Tributary Waters	
Ephemeral Drainage	0.132
Other Waters	
Non-Wetland Seasonal Pool	0.105
Total:	5.059

[1]The individual acre amounts may not add up to the total acres due to rounding.

Figure 5. Project Area Aquatic Resources

Map Features

Project Boundary - 550.8 acres

Jurisdictional Waters (3.948 acres) [1] *

Wetlands (0.333 acres)

Seasonal Wetland Pool, Jurisdictional (0.303 acres)

Wetland Seep (0.030 acres)

Other Waters (3.613 acres)

Ephemeral Tributary (to Sand Creek) (0.340 acres)

Intermittent Tributary (Sand Creek) (1.901 acres)

Impoundment (1.372 acres)

Non-Jurisdictional Waters (1.111 acres) [1] *

Non-Tributary Waters (0.132 acres)

Ephemeral Drainage (0.132 acres)

Isolated Wetlands (0.874 acres)

Wetland Drainage (0.286 acres)

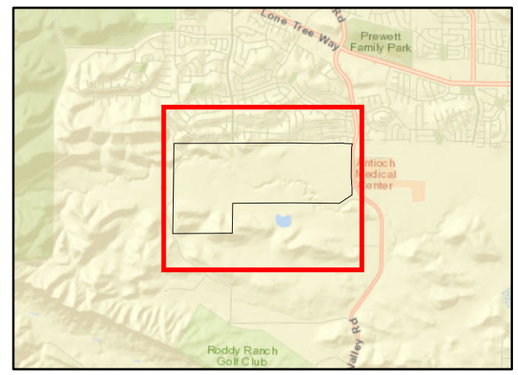
Seasonal Wetland Pool, Non-Jurisdictional (0.588 acres)

Other Waters (0.105 acres)

Non-wetland Seasonal Pool (0.105 acres)

[1] *The information depicted on this graphic represents a preliminary wetland assessment. The assessment was not conducted in accordance with the Corps of Engineers Wetland Delineation Manual and Sacramento District Minimum Standards. The project boundaries, wetland boundaries, and acreage values are approximate.*

* *The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*



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2017-109 The Ranch in Antioch

Scale in Feet
0 740

Photo Source: NAIP, 2016
Boundary Source: Carlson, Barbee, & Gibson
Delineator(s): Live Oak Associates, Inc., March 2015
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/7/2017

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4.6.2 Offsite Infrastructure Areas

A jurisdictional delineation of Waters of the U.S. has not been conducted for the Offsite Infrastructure Areas. However, a preliminary wetland assessment was conducted for the Offsite Infrastructure Areas on August 22, 2017. Potential Waters of the U.S. mapped within the Offsite Infrastructure Areas include wetlands and other waters (See Table 3 and Figure 6a-c. *Offsite Infrastructure Areas Wetland Assessment*). A total of 0.692 acre of potential wetlands and other waters were mapped within the Offsite Infrastructure Areas. Wetlands and other waters include seasonal wetland, seasonal wetland swale, intermittent drainage, ephemeral drainage, ditch, and pond. These features are described below.

Table 3. Offsite Infrastructure Areas Potential Waters of the U.S.

Type	Acres[1]
Wetlands	
Seasonal Wetland	0.141
Seasonal Wetland Swale	0.099
Other Waters	
Intermittent Drainage (Sand Creek)	0.135
Ephemeral Drainage	0.043
Ditch	0.041
Pond	0.233
Total	0.692

[1]Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

Seasonal Wetland

Seasonal wetlands are ephemerally wet due to accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short and they are commonly dominated by nonnative annual and sometimes perennial hydrophytic species. Four seasonal wetlands occur within the eastern Offsite Infrastructure Area. These seasonal wetlands are shallow features dominated by Italian ryegrass and Mediterranean barley (*Hordeum marinum*).

Seasonal Wetland Swale

Seasonal wetland swales are generally linear wetland features that convey precipitation runoff and support a predominance of hydrophytic vegetation, but do not exhibit an ordinary high water mark (OHWM). These are typically inundated for short periods during and immediately after rain events, but usually maintain soil saturation for longer periods during the wet season. Three seasonal wetland swales occur in the northwestern Offsite Infrastructure Area. The two westernmost seasonal wetland swales occur in a steep drainage adjacent to the water tank, and are dominated by Italian ryegrass and soft brome. The easternmost seasonal wetland swale is a broad, low-gradient feature dominated by inland saltgrass (*Distichlis spicata*).

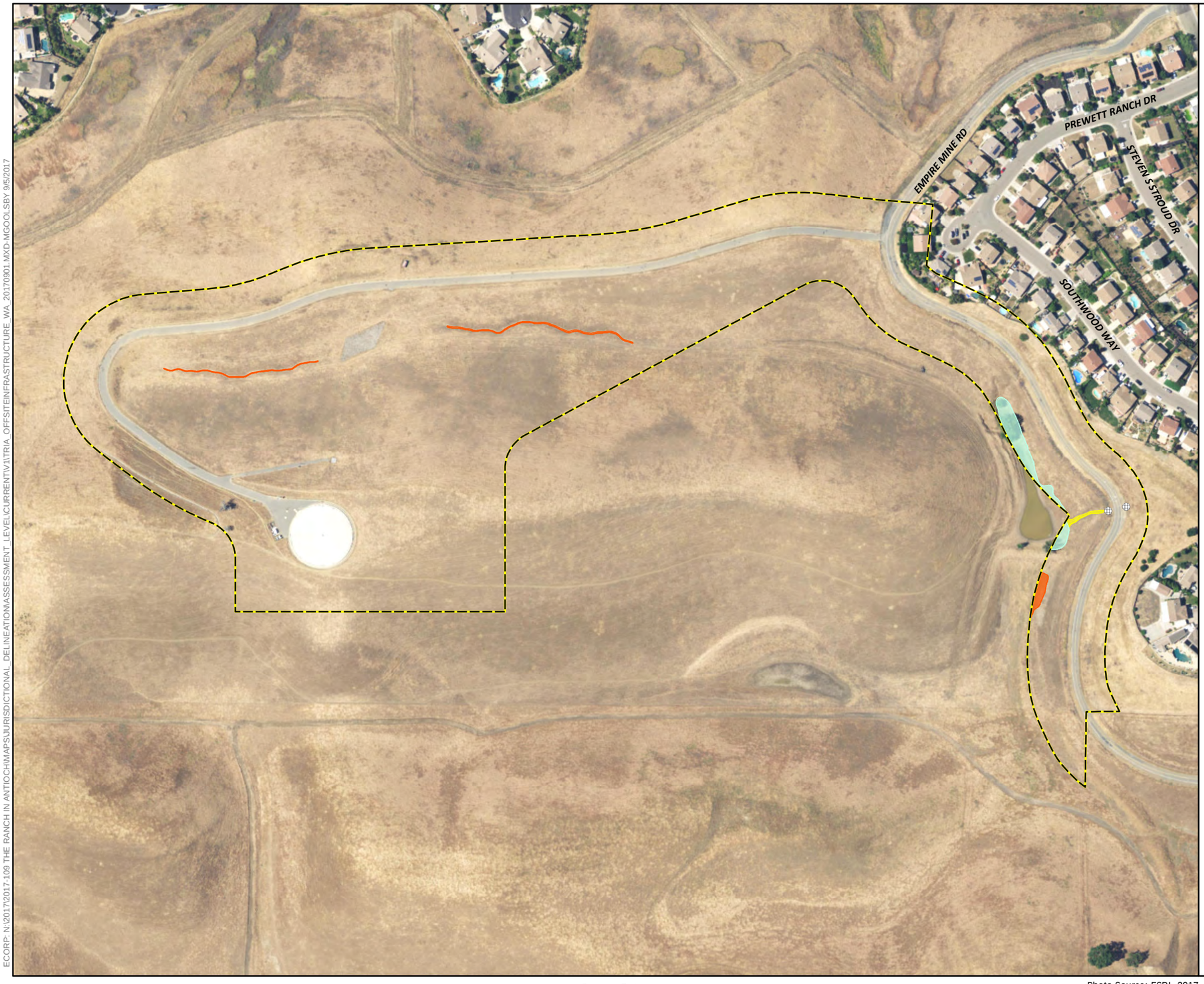


Figure 6a. Offsite Infrastructure Areas Wetland Assessment

Map Features

- Offsite Infrastructure Survey Areas - 81.1 acres
- Culvert

Potential Waters of the U.S. (0.692 acres) [1] *

Wetland (0.240 acres)

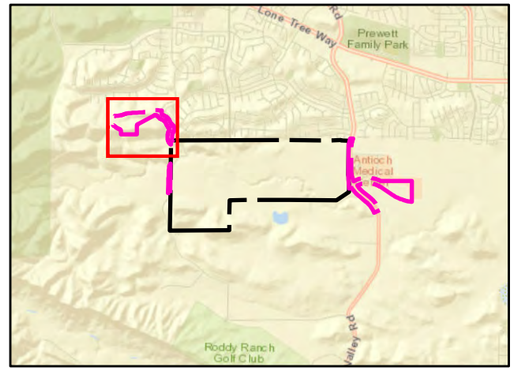
- Seasonal Wetland (0.141 acres)
- Seasonal Wetland Swale (0.099 acres)

Other Waters (0.452 acres)

- Intermittent Drainage (0.135 acres)
- Ephemeral Drainage (0.043 acres)
- Ditch (0.041 acres)
- Pond (0.233 acres)

[1] *The information depicted on this graphic represents a preliminary wetland assessment. The assessment was not conducted in accordance with the Corps of Engineers Wetland Delineation Manual and Sacramento District Minimum Standards. The project boundaries, wetland boundaries, and acreage values are approximate.*

* *The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*



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2017-109 The Ranch in Antioch

Scale in Feet
0 260

Photo Source: ESRI, 2017
Boundary Source: Carlson, Barbee, & Gibson
Delineator(s): C. DeLong
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/5/2017

Figure 6b. Offsite Infrastructure Areas Wetland Assessment

Map Features

- Offsite Infrastructure Survey Areas - 81.1 acres
- Culvert

Potential Waters of the U.S. (0.692 acres) [1] *

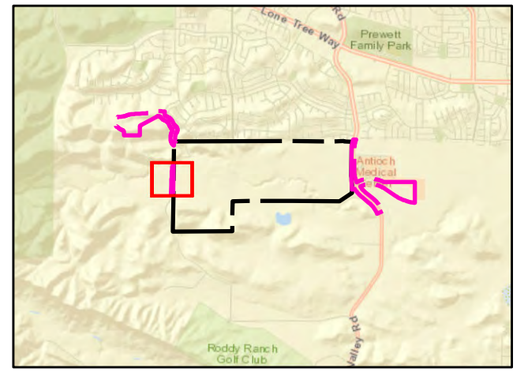
Wetland (0.240 acres)

- Seasonal Wetland (0.141 acres)
- Seasonal Wetland Swale (0.099 acres)

Other Waters (0.452 acres)

- Intermittent Drainage (0.135 acres)
- Ephemeral Drainage (0.043 acres)
- Ditch (0.041 acres)
- Pond (0.233 acres)

[1] The information depicted on this graphic represents a preliminary wetland assessment. The assessment was not conducted in accordance with the Corps of Engineers Wetland Delineation Manual and Sacramento District Minimum Standards. The project boundaries, wetland boundaries, and acreage values are approximate.
** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*



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ENVIRONMENTAL CONSULTANTS

2017-109 The Ranch in Antioch

Scale in Feet
0 150

Photo Source: ESRI, 2017
Boundary Source: Carlson, Barbee, & Gibson
Delineator(s): C. DeLong
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/5/2017

Figure 6c. Offsite Infrastructure Areas Wetland Assessment

Map Features

- Offsite Infrastructure Survey Areas - 81.1 acres
- Culvert

Potential Waters of the U.S. (0.692 acres) [1] *

Wetland (0.240 acres)

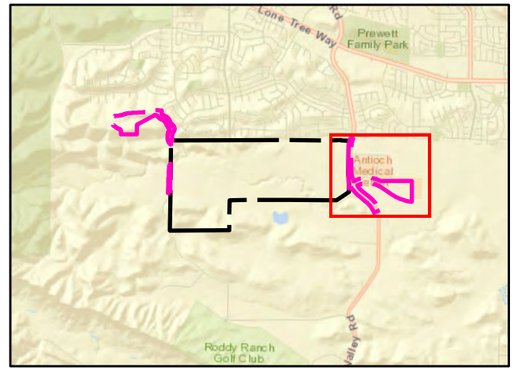
- Seasonal Wetland (0.141 acres)
- Seasonal Wetland Swale (0.099 acres)

Other Waters (0.452 acres)

- Intermittent Drainage (0.135 acres)
- Ephemeral Drainage (0.043 acres)
- Ditch (0.041 acres)
- Pond (0.233 acres)

[1] *The information depicted on this graphic represents a preliminary wetland assessment. The assessment was not conducted in accordance with the Corps of Engineers Wetland Delineation Manual and Sacramento District Minimum Standards. The project boundaries, wetland boundaries, and acreage values are approximate.*

* *The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*



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ENVIRONMENTAL CONSULTANTS

ECORP: N:\2017\2017-109 THE RANCH IN ANTIOCH\MAPS\JURISDICTIONAL DELINEATION\ASSESSMENT LEVEL\CURRENT\VALTRIA_OFFSITEINFRASTRUCTURE_WA_20170901.MXD-MGOOLSBY 9/5/2017

2017-109 The Ranch in Antioch

Scale in Feet
0 370

Photo Source: ESRI, 2017
Boundary Source: Carlson, Barbee, & Gibson
Delineator(s): C. DeLong
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/5/2017

Intermittent Drainage (Sand Creek)

Intermittent drainages are linear features that exhibit a bed and bank and an OHWM. Intermittent drainages differ from ephemeral drainages in that they flow for longer duration, typically weeks or months following rainfall events, and are often influenced by groundwater. This usually results in greater quantities and duration of flow relative to ephemeral drainages. One intermittent drainage, Sand Creek, occurs in the southeastern Offsite Infrastructure Area. Sand Creek is a highly incised intermittent drainage with steep banks and an unvegetated bed.

Ephemeral Drainage

Ephemeral drainages are linear features that exhibit a bed and bank and an OHWM. These features typically convey runoff for short periods of time, during and immediately following rain events, and are not influenced by groundwater sources at any time during the year. Ephemeral drainages occur in the two westernmost Offsite Infrastructure Areas. These features are sparsely vegetated. Vegetated portions of ephemeral drainages within the Offsite Infrastructure Area are dominated by alkali mallow (*Malvella leprosa*).

Ditch

Ditches are linear features constructed to convey storm water and/or irrigation water. One ditch occurs within the southwestern Offsite Infrastructure Area adjacent to Empire Mine Road. This feature is a maintained roadside drainage ditch with an unvegetated bed.

4.7 Evaluation of Potentially Occurring Special-Status Species

A list of all of the plant and wildlife species identified in the literature search as potentially occurring within the Project Area and/or Offsite Infrastructure Areas is provided in Table 4. Included in this table are the listing status for each species, a brief habitat description, and a determination on the potential to occur in the Project Area and Offsite Infrastructure Areas. Following the table is a brief description of each species.

Several species and sensitive habitat types came up in the database and literature searches (Attachment B) but are not included in Table 4. These species and habitat types were not included in Table 4 because the species have been formally delisted or are only tracked by the CNDDB and possess no special-status, or because the identified sensitive habitats are not located within the Project Area and Offsite Infrastructure Areas. They are not discussed further in this report.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Plants						
Large-flowered fiddleneck *(Amsinckia grandiflora)*	FE	CE	1B.1	Cismontane woodland and valley and foothill grasslands (886' - 1,804').	March – May	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
California androsace *(Androsace elongata* ssp. *acuta)*	-	-	4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland (492' – 4,281).	March – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Slender silver moss *(Anomobryum julaceum)*	-	-	4.2	Damp rock and soil on outcrops, usually on road cuts in broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest (328' – 3,281').	Any Season	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Coast rockcress *(Arabis blepharophylla)*	-	-	4.3	Rocky soils in broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub (10' – 3,609').	February – May	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mt. Diablo manzanita (*Arctostaphylos auriculata*)	-	-	1B.3	Sandstone chaparral and cismontane woodland (443' – 2,133').	January – March	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Contra Costa manzanita *(Arctostaphylos manzanita* ssp. *laevigata)*	-	-	1B.2	Rocky soils in chaparral (1,410' – 3,609').	January – April	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Alkali Milk-Vetch *(Astragalus tener* var. *tener)*	-	-	1B.2	Playas, mesic areas within valley and foothill grasslands, and alkaline vernal pools (3' – 197').	March – June	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Heartscale *(Atriplex cordulata* var. *cordulata)*	-	-	1B.2	Alkaline or saline valley and foothill grasslands, meadows and seeps, and chenopod scrub communities (0' – 1,837').	April – October	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Crownscale *(Atriplex coronata* var. *coronata)*	-	-	4.2	Alkaline, often clay, substrates in chenopod scrub, valley and foothill grassland, and vernal pools (3' – 1,936').	March – October	Present/Potential to Occur. This species was identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Brittlescale *(Atriplex depressa)*	-	-	1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools, and is typically found on alkaline clay soils (3' – 1,050').	April – October	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Big tarplant *(Blepharizonia plumosa)*	-	-	1B.1	Valley and foothill grassland (98' – 1,657').	July – October	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (2015); this species has potential to occur within the Offsite Infrastructure Areas.
Brewer's calandrinia *(Calandrinia breweri)*	-	-	4.2	Sandy or loamy soils disturbed sites and burns within chaparral and coastal scrub (33' – 4,003').	January – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Round-Leaved filaree *(California macrophylla)*	-	-	1B.2	Clay soils in cismontane woodland and valley and foothill grassland communities. (49' – 3,937').	March – May	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mt. Diablo fairy-lantern *(Calochortus pulchellus)*	-	-	1B.2	Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland (98' – 2,756').	April – June	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Oakland star-tulip *(Calochortus umbellatus)*	-	-	4.2	Often serpentinite substrates in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (328' – 2,297').	March – May	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Chaparral harebell *(Campanula exigua)*	-	-	1B.2	Chaparral on rocky, usually serpentinite substrates (902' – 4,101').	May – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Congdon's Tarplant *(Centromadia parryi* ssp. *congdonii)*	-	-	1B.1	Valley and foothill grassland with alkaline soils (0' – 755').	May – November	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Soft bird's-beak *(Chloropyron molle* ssp. *molle)*	FE	CR	1B.2	Coastal salt marshes and swamps (0' – 10').	June – November	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Bolander's water-hemlock *(Cicuta maculata* var. *bolanderi)*	-	-	2B.1	Coastal, fresh, or brackish marshes and swamps (0' – 656').	July – September	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Serpentine collomia *(Collomia diversifolia)*	-	-	4.3	Serpentinite, rocky, or gravelly substrates in chaparral and cismontane woodland (656' – 1,969').	May – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Small-flowering morning-glory *(Convolvulus simulans)*	-	-	4.2	Clay, serpentinite seeps within chaparral, coastal scrub, and valley and foothill grassland (98' – 2,428').	March – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mt. Diablo bird's-beak *(Cordylanthus nidularius)*	-	CR	1B.1	Serpentinite substrates in chaparral (1,969' – 2,625').	June – August	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Hoover's cryptantha *(Cryptantha hooveri)*	-	-	1A	Inland dunes, sandy substrates in valley and foothill grassland (30' – 492').	April – May	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Hospital Canyon larkspur *(Delphinium californicum* ssp. *interius)*	-	-	1B.2	Openings in chaparral, mesic areas in cismontane woodland, and coastal scrub (640' – 3,593').	April – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Recurved larkspur *(Delphinium recurvatum)*	-	-	1B.2	Alkaline soils within chenopod scrub, cismontane woodland, and valley and foothill grasslands (10' – 2,592').	March – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Western leatherwood *(Dirca occidentalis)*	-	-	1B.2	Mesic areas in broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland (82' – 1,394').	January – March (April)	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Dwarf downingia *(Downingia pusilla)*	-	-	2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species appears to have an affinity for slight disturbance (i.e., scraped depressions, ditches, etc.) (Baldwin et al. 2012) (3' – 1,460').	March – May	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Lime Ridge eriastrum *(Eriastrum ertterae)*	-	-	1B.1	Alkaline or semi-alkaline, sandy substrates in openings or along the edges of chaparral (656' – 951').	June – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Antioch Dunes buckwheat *(Eriogonum nudum* var. *psychicola)*	-	-	1B.1	Inland dunes (0' – 66').	July – October	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mt. Diablo buckwheat *(Eriogonum truncatum)*	-	-	1B.1	Sandy soils in chaparral, coastal scrub, valley and foothill grassland (10' – 1,148').	April – September	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Jepson's woolly sunflower *(Eriophyllum jepsonii)*	-	-	4.3	Chaparral, cismontane woodland, and coastal scrub, sometimes on serpentinite (656' – 3,363').	April – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Jepson's coyote thistle (*Eryngium jepsonii*)	-	-	1B.2	Clay soils of valley and foothill grassland, and vernal pools (10' – 9,842').	April – August	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Spiny-sepaled button-celery *(Eryngium spinosepalum)*	-	-	1B.2	Vernal pools and valley and foothill grassland (262' – 3,199').	April – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Contra Costa wallflower *(Erysimum capitatum* var. *angustatum)*	FE	CE	1B.1	Inland dunes (10' – 66').	March – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Diamond-petaled California poppy *(Eschscholzia rhombipetala)*	-	-	1B.1	Valley and foothill grassland in alkaline and clay soils (0' – 3,199').	March – April	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
San Joaquin spearscale (*Extriplex joaquinana*)	-	-	1B.2	Alkaline soils in chenopod scrub, meadows seeps, playas, and valley and foothill grassland (3' – 2,740').	April – October	Present/Potential to Occur. This species was identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Stinkbells *(Fritillaria agrestis)*	-	-	4.2	Clay and sometimes serpentinite soils in chaparral, cismontane woodland, Pinyon and juniper woodland, and valley and foothill grassland (33' – 5,102').	March – June	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Fragrant fritillary (*Fritillaria liliaceae*)	-	-	1B.2	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, often on serpentinite substrates (10' – 1,345').	February – April	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Phlox-leaf serpentine bedstraw *(Galium andrewsii* ssp. *gatense)*	-	-	4.2	Serpentinite, rocky soils in chaparral, cismontane woodland, lower montane coniferous forest (492'- 4,757').	April – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Toren's grimmia (*Grimmia torenii*)	-	-	1B.3	Openings, rocky substrates, boulder and rock walls, carbonate substrates, and volcanic substrates in chaparral, cismontane woodland, and lower montane coniferous forest (1,066' – 3,806').	Any Season	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Diablo helianthella *(Helianthella castanea)*	-	-	1B.2	Usually rocky, axonal soils in broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland, often in partial shade (197' – 4,265').	March – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Hogwallow starfish *(Hesperevax caulescens)*	-	-	4.2	Mesic areas with clay and sometimes alkaline soils within valley and foothill grassland and shallow vernal pools (0'-1,657').	March – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Brewer's western flax (*Hesperolinon breweri*)	-	-	1B.2	Usually in serpentinite soils of chaparral, cismontane woodland, and valley and foothill grassland (98' – 3,100').	May – July	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Woolly rose-mallow *(Hibiscus lasiocarpos* var. *occidentalis)*	-	-	1B.2	Marshes and freshwater swamps (0' – 394').	June – September	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Carquinez goldenbush *(Isocoma arguta)*	-	-	1B.1	Alkaline soils in valley and foothill grasslands (3' – 66').	August – December	Low Potential to Occur/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); however, this species' bloom period falls outside of M&A's survey dates; therefore, this species has low potential to occur within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Contra Costa Goldfields *(Lasthenia conjugens)*	FE	-	1B.1	Mesic sites within cismontane woodland, playas with alkaline soils, valley and foothill grassland and vernal pools (0' – 1,542').	March – June	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii)*	-	-	1B.2	Freshwater and brackish marshes and swamps (0' – 17').	May – September	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Mason's lilaeopsis *(Lilaeopsis masonii)*	-	CR	1B.1	Brackish or freshwater marshes or swamps and riparian scrub (0' – 33').	April – November	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Delta mudwort (*Limosella australis*)	-	-	2B.1	Usually mud banks in freshwater or brackish marshes and swamps and riparian scrub (0' – 10').	May – August	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Showy golden madia (*Madia radiata*)	-	-	1B.1	Cismontane woodland and valley and foothill grassland (82' – 3,986').	March – May	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Hall's bush-mallow *(Malacothamnus hallii)*	-	-	1B.2	Chaparral, coastal scrub (32' – 2,493').	May – October	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
San Antonio Hills monardella *(Monardella antonina* ssp. *antonina)*	-	-	3	Chaparral, cismontane woodland (1,050' – 3,281').	June – August	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Woodland woolythreads (*Monolopia gracilens*)	-	-	1B.2	Serpentinite substrates in openings in broadleafed upland forest and chaparral, cismontane woodland, openings in North Coast coniferous forest, and valley and foothill grassland (328' – 3,937').	(February) March – July	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Lime Ridge navarretia (*Navarretia gowenii*)	-	-	1B.1	Chaparral (591' – 1,001').	May – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Tehama navarretia (*Navarretia heterandra*)	-	-	4.3	Mesic areas in valley and foothill grassland and vernal pools (98' – 3,314').	April – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Adobe navarretia *(Navarretia nigelliformis* ssp. *nigelliformis)*	-	-	4.2	Clay and sometimes serpentinite soils in vernally mesic valley and foothill grasslands and sometimes in vernal pools (328' – 3,281).	April – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Shining navarretia *(Navarretia nigelliformis* ssp. *radians)*	-	-	1B.2	Vernal pools, cismontane woodland, and valley and foothill grassland (249' – 3,281').	April – July	Present/Potential to Occur. This species was identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.

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Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Colusa Grass *(Neostapfia colusana)*	FT	CE	1B.1	Large vernal pools with adobe soils (16' – 656').	May – August	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Antioch Dunes evening-primrose *(Oenothera deltoides* ssp. *howellii)*	FE	CE	1B.1	Inland dunes (0' – 98').	March – September	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Mt. Diablo phacelia *(Phacelia phacelioides)*	-	-	1B.2	Rocky substrates in chaparral and cismontane woodland (1,640' – 4,495').	April – May	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Bearded popcornflower *(Plagiobothrys hystriculus)*	-	-	1B.1	Often in vernal swales, and in mesic areas of valley and foothill grassland and vernal pool margins (0' – 899').	April – May	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Eel-grass pondweed *(Potamogeton zosteriformis)*	-	-	2B.2	Assorted freshwater marshes and swamps (0' – 6,102').	June – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
California alkali grass (*Puccinellia simplex*)	-	-	1B.2	Alkaline, vernally mesic areas in sinks, flats and lake margins in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools (7' – 3,051').	March – May	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Lobb's aquatic buttercup (*Ranunculus lobbii*)	-	-	4.2	Mesic areas of cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools (49' – 1,542').	February – May	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Rock sanicle (*Sanicula saxatilis*)	-	CR	1B.2	Rocky, scree, and talus substrates in broadleafed upland forest, chaparral, and valley and foothill grassland (2,034' – 3,855').	April – May	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Chaparral ragwort *(Senecio aphanactis)*	-	-	2B.2	Sometimes alkaline soils in chaparral, cismontane woodland, coastal scrub (49' – 2,625').	January – April	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Sweet marsh ragwort (*Senecio hydrophiloides*)	-	-	4.2	Mesic areas in lower montane coniferous forest and meadows and seeps (0' – 9,186').	May – August	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Keck's checkerbloom *(Sidalcea keckii)*	FE	-	1B.1	Serpentinite clay soils within cismontane woodland and valley and foothill grasslands (246' – 2,133').	April – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Most beautiful jewelflower *(Streptanthus albidus* ssp. *peramoenus)*	-	-	1B.2	Serpentinite soils in chaparral, cismontane woodland, and valley and foothill grassland (312' – 3,281').	April – September	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.

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Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mt. Diablo jewelflower *(Streptanthus hispidus)*	-	-	1B.3	Rocky soils in chaparral and valley and foothill grassland (1,198' – 3,937').	March – June	Absent/Low Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has low potential to occur within the Offsite Infrastructure Areas.
Slender-leaved pondweed *(Stuckenia filiformis* ssp. *alpina)*	-	-	2B.2	Assorted shallow freshwater marshes and swamps (984' – 7,054').	May – July	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Suisun marsh aster (*Symphyotrichum lentum*)	-	-	1B.2	Brackish and freshwater marshes and swamps (0' – 10').	April – November	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Coastal triquetrella (*Triquetrella californica*)	-	-	1B.2	Soil in coastal bluff scrub and coastal scrub (33' – 328').	Any Season	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Caper-fruited tropidocarpum *(Tropidocarpum capparideum)*	-	-	1B.1	Alkaline hills in valley and foothill grassland (3' – 1,493').	March – April	Absent/Potential to Occur. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); this species has potential to occur within the Offsite Infrastructure Areas.
Oval-leaved viburnum *(Viburnum ellipticum)*	-	-	2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest communities (705' – 4,593).	May – June	Absent/Absent. This species was not identified within the Project Area during protocol-level rare plant surveys conducted by M&A (M&A 2015); suitable habitat for this species does not occur within the Project Area or Offsite Infrastructure Areas.
Invertebrates						
Conservancy fairy shrimp (*Branchinecta conservatio)*	FE	-	-	Vernal pools/wetlands	November – April	Absent/Absent. This species has a highly restricted range and is not known from within 10 miles of the Study Area.
Lange's metalmark butterfly *(Apodemia mormo langei)*	FE	-	-	Requires specific sand dune habitat that is found only in Antioch Dunes National Wildlife Refuge. It is reliant on a specific subspecies of naked buckwheat for its diet as well as reproduction.	Late summer	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Longhorn fairy shrimp *(Branchinecta longiantenna)*	FE	-	-	Vernal pools/wetlands.	November – April	Absent/Absent. This species has a highly restricted range and is not known from within 10 miles of the Study Area.
San Bruno elfin butterfly *(Callophrys mossii bayensis)*	FE	-	-	Inhabits rocky outcrops and cliffs in coastal scrub on the San Francisco peninsula.	Late February – mid-April	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT, FPD	-	-	Elderberry shrubs	Any Season	Potential to Occur/Absent. Suitable habitat for this species occurs within the Project Area, as one elderberry shrub was identified along Sand Creek during the site assessments; suitable habitat for this species does not occur within the Offsite Infrastructure Areas, as no elderberry shrubs were identified during the site assessments.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	-	-	Vernal pools/wetlands	November – April	Present/Potential to Occur. There is a CNDDB-documented occurrence of this species within the Project Area (CDFW 2017) suitable habitat for this species occurs within the Offsite Infrastructure Areas.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	-	-	Vernal pools/wetlands	November – April	Present/Potential to Occur. There is a CNDDB-documented occurrence of this species within the Project Area (CDFW 2017); suitable habitat for this species occurs within the Offsite Infrastructure Areas.
Fish						
Chinook salmon (Central Valley fall/late fall-run ESU) (*Oncorhynchus tshawytscha*)	-	-	SSC	Undammed rivers, streams, creeks.	N/A	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Delta smelt (*Hypomesus transpacificus*)	FT	CE	-	Sac-San Joaquin delta	N/A	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Longfin smelt (*Spirinchus thaleichthys*)	FC	CT	SSC	Freshwater and seawater estuaries.	N/A	Absent/Absent. Suitable habitat for this species does not occur within the Study Area; the Study Area is outside of the known range of this species (CDFW 2017).

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Sacramento perch *(Archoplites interruptus)*	-	-	SSC	Ponds, rivers, backwaters, and lakes	N/A	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Steelhead (CA Central Valley ESU) (*Oncorhynchus mykiss*)	FT	-	-	Undammed rivers, streams, creeks.	N/A	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Amphibians						
California red-legged frog (*Rana draytonii*)	FT	-	SSC	Lowlands or foothills at waters with dense shrubby or emergent riparian vegetation. Adults must have aestivation habitat to endure summer dry down.	May 1 – November 1	Present/Present. There is a CNDDB-documented occurrence of this species located partially within the Project Area and partially within the Offsite Infrastructure Areas (CDFW 2017). Suitable habitat for this species occurs within the Study Area.
California tiger salamander (Central California DPS) (*Ambystoma californiense*)	FT	CT	SSC	Vernal pools, wetlands (breeding) and adjacent grassland or oak woodland; needs underground refuge (e.g., ground squirrel and/or gopher burrows). Largely terrestrial as adults.	March – May	Present/Present. There is a CNDDB-documented occurrence of this species located partially within the Project Area and partially within the Offsite Infrastructure Areas (CDFW 2017). Suitable habitat for this species occurs within the Study Area.
Foothill yellow-legged frog (*Rana boylii*)	-	CC	SSC	Foothill yellow-legged frogs can be active all year in warmer locations, but may become inactive or hibernate in colder climates. At lower elevations, foothill yellow-legged frogs likely spend most of the year in or near streams. Adult frogs, primarily males, will gather along main-stem rivers during spring to breed.	May – October	Low Potential to Occur/Low Potential to Occur. Suitable habitat for this species occurs within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Reptiles						
Alameda whipsnake *(Masticophis lateralis euryxanthus)*	FT	CT	-	Occurs in coastal scrub and chaparral communities, but also forages in a variety of other communities in the inner Coast Range, including grasslands and open woodlands. Rock outcrops with deep crevices or abundant rodent burrows are important habitat components.	March – October	Low Potential to Occur/Low Potential to Occur. Suitable dispersal habitat for this species occurs within the Study Area.
Blainville's ("Coast") horned lizard (*Phrynosoma blainvillii*)	-	-	SSC	Formerly a wide-spread horned lizard found in a wide variety of habitats, often in lower elevation areas with sandy washes and scattered low bushes. Also occurs in Sierra Nevada foothills. Requires open areas for basking, but with bushes or grass clumps for cover, patches of loamy soil or sand for burrowing and an abundance of ants (Stebbins and McGinnis 2012). In the northern Sacramento area, this species appears restricted to the foothills between 1000 to 3000 feet from Cameron Park (El Dorado County) north and west to Grass Valley and Nevada City.	April – October	Low Potential to Occur/Low Potential to Occur. Marginally suitable habitat for this species occurs within the Study Area.
California glossy snake *(Arizona elegans occidentalis)*	-	-	SSC	Occurs from the eastern part of the San Francisco Bay Area south to northwestern Baja California. Inhabits arid scrub, rocky washes, grasslands, and chaparral Stebbins and McGinnis 2012)	Any Season	Absent/Absent. The Study Area is outside of the known range of this species.
Giant garter snake (*Thamnophis gigas*)	FT	CT	-	Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range.	April – October	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.

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Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Northwestern pond turtle (*Actinemys marmorata*)	-	-	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	Any Season	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Silvery legless lizard (*Anniella pulchra pulchra*)	-	-	SSC	Occurs in sandy or loose soils under sparse vegetation from Antioch south coastally and inland to Baja California. Bush lupine is often an indicator plant.	Any Season	Low Potential to Occur/Low Potential to Occur. Marginally suitable habitat for this species occurs within the Study Area.
San Joaquin coachwhip *(Masticophis flagellum ruddocki)*	-	-	SSC	Occurs in open, dry, usually flat habitats in valley Grassland and Saltbush Scrub with little to no shrub cover in the San Joaquin Valley. A dietary generalist.	March – October	Absent/Absent. The Study Area is outside of the known range of this species.
Birds						
American peregrine falcon (nesting) *(Falco peregrinus anatum)*	De-listed	De-listed	BCC, CFP	In California, breeds in coastal region, northern California, and Sierra Nevada. Nesting habitat includes cliff ledges and human-made ledges on towers and buildings. Wintering habitat includes areas where there are large concentrations of shorebirds, waterfowl, pigeons or doves.	CA Residents nest in February-June	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Bank swallow (nesting) (*Riparia riparia*)	-	CT	-	Nests colonially along coasts, rivers, streams, lakes, reservoirs, and wetlands in vertical banks, cliffs, and bluffs in alluvial, friable soils. May also nest in sand, gravel quarries and road cuts. In California, breeding range includes northern and central California.	May – July	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.

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Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Burrowing owl (burrow sites) *(Athene cunicularia)*	-	-	BCC, SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds.	February – August	Present/Potential to Occur. This species was observed within the Project Area by M&A biologists during the fall and winter months from 2013 to 2015 (M&A 2015). Suitable habitat for this species occurs within the Offsite Infrastructure Areas.
California black rail (*Laterallus jamaicensis coturniculus*)	-	CT	BCC, CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills (Butte, Yuba, Nevada, Placer counties)	March – September (breeding)	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
California horned lark (*Eremophila alpestris actia*)	-	-	WL	San Joaquin Valley, coast range from Sonoma County south to Baja California; grassland, agricultural	March – July	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
California least tern (nesting colony) *(Sternula antillarum browni)*	FE	CE	CFP	Nests along Pacific Coast from San Francisco Bay south the Mexico; nests colonially, on sand or dried mudflats, sand or shell islands, and gravel and sand pits and rarely in agricultural fields, parking lots, airports, and flat/graveled rooftops.	April – August	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Double-crested cormorant (nesting colony) *(Phalacrocorax auritus)*	-	-	WL	Nests near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines and typically forages in shallow water. Non-nesters are found in many coastal and inland waters.	April – August	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Ferruginous hawk (wintering) (*Buteo regalis*)	-	-	BCC, WL	Rarely breeds in California (Lassen County); winter range includes grassland and shrubsteppe habitats from Northern California (except northeast and northwest corners) south to Mexico and east to Oklahoma, Nebraska, and Texas.	September – March	Potential to Occur/Potential to Occur. Suitable wintering habitat for this species occurs within the Study Area. The Study Area is outside of the nesting range of this species.
Golden eagle (nesting and wintering) (*Aquila chrysaetos*)	-	-	BCC, CFP	Nesting habitat includes mountainous canyon land, rimrock terrain of open desert and grasslands, riparian, oak woodland/savannah, and chaparral. Nesting occurs on cliff ledges, river banks, trees, and human-made structures (e.g. windmills, platforms, and transmission towers). Breeding occurs throughout California, except the immediate coast, Central Valley floor, Salton Sea region, and the Colorado River region, where they can be found during Winter.	Nest (February – August); winter CV (October – February)	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Grasshopper sparrow (*Ammodramus savannarum*)	-	-	SSC	In California, breeding range includes most coastal counties south to Baja California; western Sacramento Valley and western edge of Sierra Nevada region. Nests in moderately open grasslands and prairies with patchy bare ground. Avoids grasslands with extensive shrub cover; more likely to occupy large tracts of habitat than small fragments; removal of grass cover by grazing often detrimental.	May – August	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.

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Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Loggerhead shrike (*Lanius ludovicianus*)	-	-	BCC, SSC	Found throughout California in open county with short vegetation, pastures, old orchards, grasslands, agricultural areas, open woodlands. Not found in heavily forested habitats.	March – July	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Northern harrier (nesting) (*Circus hudsonicus*)	-	-	SSC	Nests on the ground in open wetlands, marshy meadows, wet/lightly grazed pastures, (rarely) freshwater/brackish marshes, tundra, grasslands, prairies, croplands, desert, shrub-steppe, and (rarely) riparian woodland communities.	April – September	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Prairie falcon (nesting) (*Falco mexicanus*)	-	-	BCC, WL	Found in open habitat at all elevations up to 3,350 meters (Steenhof 2013). Nests on cliffs and bluffs in arid plains and steppes; In California, nesting throughout state except northwest corner, along immediate coast, and the Central Valley floor. Winters throughout California, in open habitats, such as grasslands in Central Valley.	March – July (breeding); September – February (wintering in Central Valley)	Present/Present. This species was observed foraging within the Study Area by ECORP biologists in 2017. Suitable wintering habitat for this species occurs within the Study Area. No suitable nesting habitat occurs within the Study Area.
Ridgway's rail (California clapper rail) *(Rallus obsoletus obsoletus)*	FE	CE	CFP	San Francisco and San Pablo Bay tidal marshes, sloughs, with pickleweed *(Salicornia* spp.), cordgrass *(Spartina* spp.), and gum plant *(Grindelia* spp.).	March – August	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	-	-	BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego County.	March – July	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Short-eared owl (nesting) (*Asio flammeus*)	-	-	SSC	Nests in large expanses of prairie, coastal grasslands, heathlands, shrub-steppe, tundra, and agricultural areas.	March – July (breeding); August – March (wintering in Central Valley)	Potential to Occur/Potential to Occur. Suitable wintering habitat for this species occurs within the Study Area. No suitable nesting habitat occurs within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Song sparrow "Modesto" (*Melospiza melodia heermanni*)	-	-	BCC, SSC	Resident in central and southwest California, including Central Valley; nests in marsh, scrub habitat.	April – June	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Suisun song sparrow (*Melospiza melodia maxillaris*)	-	-	BCC, SSC	Resident of brackish marshes of Suisun Bay.	Year round resident; nests March – July	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
Swainson's hawk (nesting) (*Buteo swainsoni*)	-	CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures.	March – August	Present/Present. This species was observed foraging within the Study Area by M&A biologists during site visits conducted from 2013 to 2015; ECORP biologists also observed this species foraging in 2017. Suitable habitat for this species occurs within the Study Area.
Tricolored blackbird (nesting colony) (*Agelaius tricolor*)	-	CC	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta Cos south to San Bernardino, Riverside and San Diego Counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen Counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields.	March – August	Low Potential to Occur/Low Potential to Occur. Marginally suitable foraging habitat for this species occurs within the Study Area. No suitable nesting habitat occurs within the Study Area.
White-tailed kite (nesting) (*Elanus leucurus*)	-	-	CFP	Nesting occurs within trees in low elevation grassland, agricultural, wetland, oak woodland, riparian, savannah, and urban habitats.	March – August	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Mammals						
American badger *(Taxidea taxus)*	-	-	SSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils.	Year round resident (breeds summer-early fall)	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Pallid bat *(Antrozous pallidus)*	-	-	SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g. basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (WBWG 2017).	April – September	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Ringtail (*Bassariscus astutus*)	-	-	FP	Most often found in riparian corridors in forested, shrubby habitats. Dens in rock outcrops, hollow trees and snags at low to middle elevations. Its range includes the North and South Coast Ranges, Sierra Nevada, Cascades, and the mountainous areas of the Mojave Desert.	Any season	Low Potential to Occur/Low Potential to Occur. Marginally suitable habitat for this species occurs within the Study Area.
Salt-marsh harvest mouse *(Reithrodontomys raviventris)*	FE	CE	CFP	Saline emergent marsh.	Any Season	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
San Francisco dusky-footed woodrat *(Neotoma fuscipes annectens)*	-	-	SSC	Dense chaparral, mixed deciduous forest with thick understory, coniferous forest, and coastal sage scrub (Reid 2006). Builds large houses that are made of twigs, leaves, and other debris (Reid 2006).	Any Season	Absent/Absent. Suitable habitat for this species does not occur within the Study Area.
San Joaquin kit fox *(Vulpes macrotis mutica)*	FE	CT	-	Grasslands, sagebrush scrub.	April 15 – July 15, September 1 – December 1	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.

Table 4. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status			Habitat Description[1]	Survey Period	Potential To Occur within the Project Area/Offsite Infrastructure Areas
	ESA	CESA/ NPPA	Other Status			
Townsend's big-eared bat *(Corynorhinus townsendii)*	-	-	SSC	Caves, mines, buildings, rock crevices, trees.	April – September	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.
Greater mastiff bat (*Eumops perotis californicus*)	-	-	SSC	Primarily a cliff-dwelling species, found in similar crevices in large boulders and buildings (WBWG 2017).	April – September	Low Potential to Occur/Absent. Marginally suitable habitat for this species occurs within the Project Area. Suitable habitat for this species does not occur within the Offsite Infrastructure Areas.
Western red bat (*Eumops perotis californicus*)	-	-	SSC	Roosts in foliage of trees or shrubs; Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores) (WBWG 2017).	April – September	Potential to Occur/Potential to Occur. Suitable habitat for this species occurs within the Study Area.

Status Codes:

[1] Unless otherwise noted, all plant habitat descriptions were adapted from information provided by CNPS (CNPS 2017)

1A	CRPR/Presumed extinct
1B	CRPR/Rare or Endangered in California and elsewhere
2B	CRPR /Rare or Endangered in California, more common elsewhere
3	CRPR /Plants About Which More Information is Needed - A Review List
4	CRPR /Plants of Limited Distribution – A Watch List
0.1	Threat Rank/Seriously threatened in California (over 80% of occurrences threatened / high degree and. immediacy of threat)
0.2	Threat Rank/Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3	Threat Rank/Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)
BCC	USFWS Bird of Conservation Concern
CC	Candidate for California ESA listing as Endangered or Threatened
CE	California ESA or NPPA listed, Endangered
CESA	California Endangered Species Act
CFP	California Fully Protected
CR	California NPPA listed, Rare
CT	California ESA or NPPA listed, Threatened
Delisted	Delisted from the ESA
ESA	Endangered Species Act
FC	Candidate for ESA listing as Threatened or Endangered
FE	Federal ESA listed, Endangered.
FPD	Listed under ESA, but formally proposed for delisting
FT	Federal ESA listed, Threatened
NPPA	California Native Plant Protection Act
SSC	CDFW Species of Special Concern
WL	CDFW Watch List

4.7.1 Plants

A total of 75 special-status plant species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, 37 species were considered to be absent from the Study Area due to the lack of suitable habitat. In addition, M&A conducted protocol-level rare plant surveys in 2015 and identified three CNPS-ranked plants in the Project Area: shining navarretia (*Navarretia nigelliformis* ssp. *radians*) rank 1B.2; crownscale (*Atriplex coronata* var. *coronata*) rank 4.2; and San Joaquin spearscale (*Extriplex joaquinana*) rank 1B.2 (M&A 2015). With the exception of Carquinez goldenbush (*Isocoma arguta*), M&A's survey dates correspond with all rare plant survey periods; therefore, all other plants are absent from the Project Area. Brief descriptions of the four species that occur or have potential to occur within the Project Area and the 38 species that have the potential to occur within the Offsite Infrastructure Areas are presented below.

Large-Flowered Fiddleneck

Large-flowered fiddleneck (*Amsinckia grandiflora*) is listed as endangered pursuant to both the federal and California ESAs and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in cismontane woodland and valley and foothill grasslands (CNPS 2017). Large-flowered fiddleneck blooms from March to May and is known to occur at elevations ranging from 886 to 1,804 feet above mean sea level (MSL). Large-flowered fiddleneck is endemic to California; the current range of this species includes Alameda, Contra Costa, and San Joaquin counties (CNPS 2017).

There are four documented occurrences of large-flowered fiddleneck within 10 miles of the Study Area (CDFW 2017). Large-flowered fiddleneck was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Large-flowered fiddleneck has potential to occur within the Offsite Infrastructure Areas.

There is no Critical Habitat for this species within the Study Area.

California Androsace

California androsace (*Androsace elongata ssp. acuta*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland (CNPS 2017). California androsace blooms from March through June and is known to occur at elevations ranging from 492 to 4,281 feet above MSL (CNPS 2017). The current range of this species in California includes Alameda, Contra Costa, Colusa, Fresno, Glenn, Kern, Los Angeles, Merced, Riverside, San Bernardino, San Benito, Santa Clara, San Diego, Siskiyou, San Joaquin, San Luis Obispo, San Mateo, Stanislaus, and Tehama counties (CNPS 2017).

There are no documented occurrences of California androsace within 10 miles of the Study Area (CDFW 2017). California androsace was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. California androsace has low potential to occur within the Offsite Infrastructure Areas.

Alkali Milk-Vetch

Alkali milk-vetch (*Astragalus tener var. tener*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in alkaline areas of playas, adobe clay valley and foothill grasslands, and vernal pools (CNPS 2017). Alkali milk-vetch blooms from March through June and is known to occur at elevations ranging from 3 to 197 feet above MSL (CNPS 2017). Alkali milk-vetch is endemic to California; the current range of this species includes Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, Santa Clara, San Francisco, San Joaquin, Solano, Sonoma, Stanislaus, and Yolo counties and is likely extirpated from Contra Costa, Monterey, San Benito, Santa Clara, San Francisco, San Joaquin, Sonoma, and Stanislaus counties (CNPS 2017).

There are two documented occurrences of alkali milk-vetch within 10 miles of the Study Area (CDFW 2017). Alkali milk-vetch was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Alkali milk-vetch has potential to occur within the Offsite Infrastructure Areas.

Heartscale

Heartscale (*Atriplex cordulata var. cordulata*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual found within alkaline or saline sandy valley and foothill grasslands, meadows and seeps, and chenopod scrub communities. Heartscale flowers between April and October and is known to occur at elevations ranging from sea level to 1,837 feet above MSL (CNPS 2017). Heartscale is endemic to California; the current range of this species in California includes Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, San Joaquin, Solano, Stanislaus, Tulare, and Yolo counties and is considered extirpated from San Joaquin, Stanislaus, and Yolo counties (CNPS 2017).

There are no documented occurrences of heartscale within 10 miles of the Study Area (CDFW 2017). Heartscale was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Heartscale has low potential to occur within the Offsite Infrastructure Areas.

Crownscale

Crownscale is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in alkaline and often clay soils within chenopod scrub, valley and foothill grassland, and vernal pools (CNPS 2017). Crownscale blooms from March through October and is known to occur at elevations ranging from 3 to 1,936 feet above MSL (CNPS 2017). Crownscale is endemic to California; the current range of this species includes Alameda, Contra Costa, Fresno, Glenn, Kings, Kern, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, and Stanislaus counties; its distribution in San Joaquin County is uncertain (CNPS 2017).

There are no documented occurrences of crownscale within 10 miles of the Study Area (CDFW 2017). However, crownscale was identified in the Project Area during rare plant surveys conducted by M&A in 2015 (M&A 2015); this species is present in the Project Area. M&A's rare plant survey results map

is included as Attachment G. The annual grassland and wetlands within the Offsite Infrastructure Areas provide suitable habitat for this species. Crownscale has potential to occur within the Offsite Infrastructure Areas.

Brittlescale

Brittlescale (*Atriplex depressa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in alkaline and clay soils within chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools, and is typically found on alkaline clay soils (CNPS 2017). Brittlescale blooms from April through October and is known to occur at elevations ranging from 3 to 1,050 feet above MSL (CNPS 2017). Brittlescale is endemic to California; the current range of this species includes Alameda, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Solano, Stanislaus, Tulare, and Yolo counties (CNPS 2017).

There are six documented occurrences of brittlescale within 10 miles of the Study Area (CDFW 2017). Brittlescale was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland and wetlands within the Offsite Infrastructure Areas provide suitable habitat for this species. Brittlescale has potential to occur within the Offsite Infrastructure Areas.

Big Tarplant

Big tarplant (*Blepharizonia plumosa*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in valley and foothill grassland, usually in clay soil (CNPS 2017). Big tarplant blooms from July through October and is known to occur from 98 to 1,657 feet above MSL (CNPS 2017). Big tarplant is endemic to California; the current range of the species includes Alameda, Contra Costa, San Joaquin, Solano, and Stanislaus counties and is considered extirpated from Solano County (CNPS 2017).

There are 22 documented occurrences of big tarplant within 10 miles of the Study Area (CDFW 2017). Big tarplant was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Big tarplant has potential to occur within the Offsite Infrastructure Areas.

Round-Leaved Filaree

Round-leaved filaree (*California macrophylla*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs on clay soils in cismontane woodland and valley and foothill grassland communities (CNPS 2017). Round-leaved filaree blooms from March through May and is known to occur at elevations ranging from 49 to 3,937 feet above MSL (CNPS 2017). The current range of this species in California includes Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Los Angeles, Merced, Monterey, Napa, Riverside, Santa Barbara, San Benito, Santa Clara, Santa Catalina Island, Santa Cruz Island, San Diego, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, Stanislaus, Tehama, Ventura, and Yolo counties (CNPS 2017). It is likely extirpated from Butte County and Santa Cruz Island (CNPS 2017).

There are 11 documented occurrences of round-leaved filaree within 10 miles of the Study Area (CDFW 2017). Round-leaved filaree was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Round-leaved filaree has potential to occur within the Offsite Infrastructure Areas.

Mt. Diablo Fairy-Lantern

Mt. Diablo fairy-lantern (*Calochortus pulchellus*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial bulbiferous herb that occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland (CNPS 2017). Mt. Diablo fairy-lantern blooms from April through June and is known to occur from 98 to 2,756 feet above MSL (CNPS 2017). Mt. Diablo fairy-lantern is endemic to California; the current range of the species includes Alameda, Contra Costa, and Solano counties (CNPS 2017).

There are 30 documented occurrences of Mt. Diablo fairy-lantern within 10 miles of the Study Area (CDFW 2017). Mt. Diablo fairy-lantern was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Mt. Diablo fairy-lantern has potential to occur within the Offsite Infrastructure Areas.

Oakland Star-Tulip

Oakland star-tulip (*Calochortus umbellatus*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is a perennial bulbiferous herb that occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland, often on serpentinite soils (CNPS 2017). Oakland star-tulip blooms from March through May and is known to occur from 328 to 2,297 feet above MSL (CNPS 2017). Oakland star-tulip is endemic to California; the current range of the species includes Alameda, Contra Costa, Lake, Marin, Santa Clara, San Mateo, and Stanislaus counties. It is presumed extirpated in Santa Cruz County (CNPS 2017).

There are no documented occurrences of Oakland star-tulip within 10 miles of the Study Area (CDFW 2017). Oakland star-tulip was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Oakland star-tulip has low potential to occur within the Offsite Infrastructure Areas.

Congdon's Tarplant

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in Valley and foothill grassland with alkaline soils (CNPS 2017). Congdon's tarplant blooms from May to October and is known to occur at elevations ranging from 0 to 755 feet above MSL (CNPS 2017). Congdon's tarplant is endemic to California; its current range includes Alameda, Contra Costa, Monterey, Santa Clara, Santa Cruz, San Luis Obispo, San Mateo, and Solano counties (CNPS 2017). However, it is likely extirpated from Santa Cruz and Solano counties (CNPS 2017).

There is one documented occurrence of Congdon's tarplant within 10 miles of the Study Area (CDFW 2017). Congdon's tarplant was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Congdon's tarplant has potential to occur within the Offsite Infrastructure Areas.

Hoover's Cryptantha

Hoover's cryptantha (*Cryptantha hooveri*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 1A species. This species is an herbaceous annual that occurs in inland dunes and sandy valley and foothill grassland (CNPS 2017). Hoover's cryptantha blooms between April and May and is known to occur at elevations ranging from 30 to 492 feet above MSL (CNPS 2017). Hoover's cryptantha is endemic to California; its current range includes Contra Costa, Kern, Madera, and Stanislaus counties; however, it is presumed extirpated in Contra Costa, Madera and Stanislaus counties (CNPS 2017).

There is one documented occurrence of Hoover's cryptantha within 10 miles of the Study Area (CDFW 2017). Hoover's cryptantha was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas lacks sandy soils and therefore provides marginally suitable habitat for this species. Hoover's cryptantha has low potential to occur within the Offsite Infrastructure Areas.

Recurved Larkspur

Recurved larkspur (*Delphinium recurvatum*) is not listed pursuant to either the federal or California ESAs, but is designated a CRPR 1B.2 species. This species is an herbaceous perennial that occurs in alkaline substrates in chenopod scrub, cismontane woodland, and valley and foothill grasslands (CNPS 2017). Recurved larkspur blooms from March through June and is known to occur at elevations ranging from 10 to 2,592 feet above MSL (CNPS 2017). Recurved larkspur is endemic to California; the current range of this species includes Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, Sutter, and Tulare counties and is likely extirpated from Butte and Colusa counties (CNPS 2017).

There are no documented occurrences of recurved larkspur within 10 miles of the Study Area (CDFW 2017). Recurved larkspur was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Recurved larkspur has low potential to occur within the Offsite Infrastructure Areas.

Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the federal or California ESAs, but has been identified by the CNPS as a List 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas in Valley and foothill grasslands (CNPS 2017). Dwarf downingia also appears to have an affinity for slight disturbance since it has been found in manmade features such as tire ruts, scraped depressions, stock ponds, and roadside ditches (Baldwin et al. 2012, CDFW 2017). This species blooms from March through May and is known to occur at elevations ranging from

3 to 1,460 feet above MSL (CNPS 2017). The current range of this species in California includes Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2017).

There are no documented occurrences of dwarf downingia within 10 miles of the Study Area (CDFW 2017). Dwarf downingia was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland within the Offsite Infrastructure Areas provide marginally suitable habitat for this species. Dwarf downingia has low potential to occur within the Offsite Infrastructure Areas.

Mount Diablo Buckwheat

Mount Diablo buckwheat (*Eriogonum truncatum*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in sandy substrates in chaparral, coastal scrub, and Valley and foothill grassland (CNPS 2017). Mount Diablo buckwheat blooms from April through December and is known to occur at elevations ranging from 10 to 1,148 feet above MSL (CNPS 2017). Mount Diablo buckwheat is endemic to California; the current range of this species includes Alameda, Contra Costa, and Solano counties, and is considered to be extirpated in Solano County (CNPS 2017).

There are five documented occurrences of Mount Diablo buckwheat within 10 miles of the Study Area (CDFW 2017). Mount Diablo buckwheat was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas lacks sandy soils and therefore provides marginally suitable habitat for this species. Mount Diablo buckwheat has low potential to occur within the Offsite Infrastructure Areas.

Jepson's Coyote Thistle

Jepson's coyote thistle (*Eryngium jepsonii*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial herb that occurs often in clay soils of valley and foothill grassland, and vernal pools (CNPS 2017). Jepson's coyote thistle blooms from April through August and is known to occur at elevations ranging from 10 to 9,842 feet above MSL (CNPS 2017). Jepson's coyote thistle is endemic to California; the current range of this species includes Alameda, Amador, Calaveras, Contra Costa, Fresno, Napa, San Mateo, Solano, Stanislaus, Tuolumne, and Yolo counties (CNPS 2017).

There is one documented occurrence of Jepson's coyote thistle within 10 miles of the Study Area (CDFW 2017). Jepson's coyote thistle was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland and wetlands within the Offsite Infrastructure Areas provide suitable habitat for this species. Jepson's coyote thistle has potential to occur within the Offsite Infrastructure Areas.

Spiny-Sepaled Button-Celery

Spiny-sepaled button-celery (*Eryngium spinosepalum*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual/perennial that occurs in Valley and foothill grassland and vernal pools (CNPS 2017). Spiny-

sepaled button-celery blooms from April through June and is known to occur at elevations ranging from 262 to 3,199 feet above MSL (CNPS 2017). Spiny-sepaled button-celery is endemic to California; the current range of this species includes Contra Costa, Fresno, Kern, Madera, Merced, San Luis Obispo, Stanislaus, Tulare, and Tuolumne counties (CNPS 2017).

There are no documented occurrences of spiny-sepaled button-celery within 10 miles of the Study Area (CDFW 2017). Spiny-sepaled button-celery was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland and wetlands within the Offsite Infrastructure Areas provide suitable habitat for this species. Spiny-sepaled button-celery has low potential to occur within the Offsite Infrastructure Areas.

Diamond-Petaled California Poppy

Diamond-petaled California poppy (*Eschscholzia rhombipetala*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in alkaline and clay soils within Valley and foothill grassland (CNPS 2017). Diamond-petaled California poppy blooms from March through April and is known to occur at elevations ranging from sea level to 3,199 feet above MSL (CNPS 2017). Diamond-petaled California poppy is endemic to California; the current range of this species includes Alameda, Contra Costa, Colusa, San Joaquin, San Luis Obispo, and Stanislaus counties, and is considered to be extirpated in Contra Costa, Colusa, and Stanislaus counties (CNPS 2017).

There are two documented occurrences of diamond-petaled California poppy within 10 miles of the Study Area (CDFW 2017). Diamond-petaled California poppy was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Diamond-petaled California poppy has potential to occur within the Offsite Infrastructure Areas.

San Joaquin Spearscale

San Joaquin spearscale is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an annual herb that occurs often in alkaline soils in chenopod scrub, meadows seeps, playas, and valley and foothill grassland (CNPS 2017). San Joaquin spearscale blooms from April through October and is known to occur at elevations ranging from 3 to 2,740 feet above MSL (CNPS 2017). San Joaquin spearscale is endemic to California; the current range of this species includes Alameda, Contra Costa, Colusa, Fresno, Glenn, Merced, Monterey, Napa, San Benito, Santa Clara, San Joaquin, San Luis Obispo, Solano, Tulare, and Yolo counties, and is considered to be extirpated from Santa Clara, San Joaquin, and uncertain in San Luis Obispo and Tulare counties (CNPS 2017).

There are 22 documented occurrences of San Joaquin spearscale within 10 miles of the Study Area (CDFW 2017). San Joaquin spearscale was identified in the Project Area during rare plant surveys conducted by M&A in 2015 (M&A 2015, Attachment G); this species is present in the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. San Joaquin spearscale has potential to occur within the Offsite Infrastructure Areas.

Stinkbells

Stinkbells (*Fritillaria agrestis*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is a perennial bulbiferous herb that occurs in clay, sometimes serpentine areas in chaparral, cismontane woodland, pinyon and juniper woodland, and Valley and foothill grassland (CNPS 2017). Stinkbells bloom from March to June and is known to occur at elevations ranging from 33 to 5,102 feet above MSL (CNPS 2017). The current range of this species in California includes Alameda, Contra Costa, Fresno, Kern, Mendocino, Merced, Monterey, Mariposa, Placer, Sacramento, Santa Barbara, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, San Mateo, Stanislaus, Tuolumne, Ventura, and Yuba counties, and is considered to be extirpated from Santa Cruz and San Mateo counties (CNPS 2017).

There are seven documented occurrences of stinkbells within 10 miles of the Study Area (CDFW 2017). Stinkbells was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Stinkbells has potential to occur within the Offsite Infrastructure Areas

Fragrant Fritillary

Fragrant fritillary (*Fritillaria liliacea*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is a perennial bulbiferous herb that occurs often on serpentine soils in cismontane woodland, coastal prairie, coastal scrub, and Valley and foothill grassland (CNPS 2017). Fragrant fritillary blooms from February through April and is known to occur from 10 to 1,345 feet above MSL (CNPS 2017). Fragrant fritillary is endemic to California; the current range of this species includes Alameda, Contra Costa, Monterey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma counties (CNPS 2017).

There are no documented occurrences of fragrant fritillary within 10 miles of the Study Area (CDFW 2017). Fragrant fritillary was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Fragrant fritillary has low potential to occur within the Offsite Infrastructure Areas.

Diablo Helianthella

Diablo helianthella (*Helianthella castanea*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous perennial that occurs usually on rocky, axonal soils, often in partial shade, in broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and Valley and foothill grassland (CNPS 2017). Diablo helianthella blooms from March through June and is known to occur from 197 to 4,265 feet above MSL (CNPS 2017). Diablo helianthella is endemic to California; the current range of this species includes Alameda, Contra Costa, Marin, San Francisco, and San Mateo counties, and it is considered to be extirpated in Marin and San Francisco counties (CNPS 2017).

There are 38 documented occurrences of diablo helianthella within 10 miles of the Study Area (CDFW 2017). Diablo helianthella was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite

Infrastructure Areas provides marginally suitable habitat for this species. Diablo helianthella has low potential to occur within the Offsite Infrastructure Areas.

Hogwallow Starfish

Hogwallow starfish (*Hesperevax caulescens*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in mesic, clay areas within Valley and foothill grassland, and shallow vernal pools, sometimes in alkaline areas (CNPS 2017). Hogwallow starfish blooms from March through June and is known to occur from sea level to 1,657 feet above MSL (CNPS 2017). Hogwallow starfish is endemic to California; the current range of this species includes Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Monterey, Napa, Sacramento, San Diego, San Joaquin, San Luis Obispo, Solano, Stanislaus, Sutter, Tehama, and Yolo counties, and is considered to be extirpated in Napa and San Diego counties (CNPS 2017).

There are no documented occurrences of hogwallow starfish within 10 miles of the Study Area (CDFW 2017). Hogwallow starfish was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Hogwallow starfish has low potential to occur within the Offsite Infrastructure Areas.

Brewer's Western Flax

Brewer's western flax (*Hesperolinon brewerí*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in chaparral, cismontane woodland, and valley and foothill grassland, usually in serpentine substrates (CNPS 2017). Brewer's western flax blooms from May through July and is known to occur from 98 to 3,100 feet above MSL (CNPS 2017). Brewer's western flax is endemic to California; the current range of this species includes Contra Costa, Napa, and Solano counties (CNPS 2017).

There are 17 documented occurrences of Brewer's western flax within 10 miles of the Study Area and one documented occurrence within the Study Area (CDFW 2017). Brewer's western flax was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Brewer's western flax has potential to occur within the Offsite Infrastructure Areas.

Carquinez Goldenbush

Carquinez goldenbush (*Isocoma arguta*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This perennial shrub typically occurs on alkaline soils in valley and foothill grasslands (CNPS 2017). Carquinez goldenbush blooms from August through December and is known to occur at elevations ranging from 3 to 66 feet above MSL (CNPS 2017). Carquinez goldenbush is endemic to California; the current range of this species is Solano County (CNPS 2017).

There are no documented occurrences of Carquinez goldenbush within 10 miles of the Study Area (CDFW 2017). Carquinez goldenbush's survey period occurs outside of the survey dates of the rare

plant surveys conducted in the Project Area by M&A in 2015. The annual grassland within the Study Area provides suitable habitat for this species. Carquinez goldenbush has low potential to occur within the Study Area.

Contra Costa Goldfields

Contra Costa goldfields (*Lasthenia conjugens*) is listed as endangered pursuant to the federal ESA, and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in mesic sites within cismontane woodland, playas with alkaline soils, Valley and foothill grassland and vernal pools (CNPS 2017). Contra Costa goldfields blooms between March and June and is known to occur at elevations ranging from 0 to 1,542 feet above MSL (CNPS 2017). Contra Costa goldfields is endemic to California; its current range includes Alameda, Contra Costa, Mendocino, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Solano, and Sonoma counties (CNPS 2017). It is likely extirpated from Mendocino, Santa Barbara, and Santa Clara counties (CNPS 2017).

There is one documented occurrence of Contra Costa goldfields within 10 miles of the Study Area (CDFW 2017). Contra Costa goldfields was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Contra Costa goldfields has potential to occur within the Offsite Infrastructure Areas.

There is no Critical Habitat for this species within the Study Area.

Showy Golden Madia

Showy golden madia (*Madia radiata*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in cismontane woodland and valley and foothill grassland (CNPS 2017). Showy golden madia blooms between March and May and is known to occur at elevations ranging from 82 to 3,986 feet above MSL (CNPS 2017). Showy golden madia is endemic to California; its current range includes Contra Costa, Fresno, Kings, Kern, Monterey, Santa Barbara, San Benito, Santa Clara, San Joaquin, San Luis Obispo, and Stanislaus counties, and is considered to be extirpated in Contra Costa, Kings, Monterey, Santa Barbara, and San Joaquin counties (CNPS 2017).

There is one documented occurrence of showy golden madia within 10 miles of the Study Area and one documented occurrence within the Study Area (CDFW 2017). Showy golden madia was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Showy golden madia has potential to occur within the Offsite Infrastructure Areas.

Woodland Woolythreads

Woodland woolythreads (*Monolopia gracilens*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in serpentinite substrates in openings in broadleafed upland forest and chaparral, cismontane woodland, openings in North Coast coniferous forest, and valley and foothill grassland (CNPS 2017). Woodland woolythreads blooms between March and July and is known to occur at

elevations ranging from 328 to 3,937 feet above MSL (CNPS 2017). Woodland woolythreads is endemic to California; its current range includes Alameda, Contra Costa, Monterey, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, and San Mateo counties (CNPS 2017).

There are four documented occurrences of woodland woolythreads within 10 miles of the Study Area (CDFW 2017). Woodland woolythreads was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Woodland woolythreads has low potential to occur within the Offsite Infrastructure Areas.

Tehama Navarretia

Tehama navarretia (*Navarretia heterandra*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 4.3 species. This species is an herbaceous annual that occurs in mesic areas in valley and foothill grassland and vernal pools (CNPS 2017). Tehama navarretia blooms between April and June and is known to occur at elevations ranging from 98 to 3,314 feet above MSL (CNPS 2017). The current range of Tehama navarretia in California includes Butte, Colusa, Lake, Napa, Shasta, Tehama, Trinity, and Yuba counties (CNPS 2017).

There are no documented occurrences of Tehama navarretia within 10 miles of the Study Area (CDFW 2017). Tehama navarretia was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Tehama navarretia has low potential to occur within the Offsite Infrastructure Areas.

Adobe Navarretia

Adobe navarretia (*Navarretia nigelliformis ssp. nigelliformis*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in clay and sometimes serpentinite substrates in mesic areas in valley and foothill grassland and sometimes in vernal pools (CNPS 2017). Adobe navarretia blooms between April and June and is known to occur at elevations ranging from 328 to 3,281 feet above MSL (CNPS 2017). Adobe navarretia is endemic to California; its current range includes Alameda, Butte, Contra Costa, Colusa, Fresno, Kern, Merced, Monterey, Placer, Sutter and Tulare counties (CNPS 2017).

There are no documented occurrences of adobe navarretia within 10 miles of the Study Area (CDFW 2017). Adobe navarretia was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Adobe navarretia has low potential to occur within the Offsite Infrastructure Areas.

Shining Navarretia

Shining navarretia is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in vernal pools within cismontane woodland and Valley or foothill grassland (CNPS 2017). Shining navarretia blooms April through July and is known to occur at elevations ranging from 213 to 3,281 feet above MSL (CNPS 2017). Shining navarretia is endemic to California; the current range of this species includes Alameda,

Contra Costa, Colusa, Fresno, Madera, Merced, Monterey, San Benito, San Joaquin, and San Luis Obispo counties (CNPS 2017).

There are three documented occurrences of shining navarretia within 10 miles of the Study Area (CDFW 2017). Shining navarretia was identified in the Project Area during rare plant surveys conducted by M&A in 2015 (M&A 2015, Attachment G); this species is present in the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Shining navarretia has potential to occur within the Offsite Infrastructure Areas.

Bearded Popcornflower

Bearded popcornflower (*Plagiobothrys hystriculus*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in mesic areas in valley and foothill grassland and vernal pool margins, often in vernal swales (CNPS 2017). Bearded popcornflower blooms between April and May and is known to occur at elevations ranging from 0 to 899 feet above MSL (CNPS 2017). Bearded popcornflower is endemic to California; its current range includes Napa, Solano, and Yolo counties (CNPS 2017).

There are no documented occurrences of bearded popcornflower within 10 miles of the Study Area (CDFW 2017). Bearded popcornflower was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Bearded popcornflower has low potential to occur within the Offsite Infrastructure Areas.

California Alkali Grass

California alkali grass (*Puccinellia simplex*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in alkaline, vernally mesic chenopod scrub, meadows and seeps, Valley and foothill grassland, and vernal pools along sinks, flats and lake margins (CNPS 2017). California alkali grass blooms between March and May and is known to occur at elevations ranging from 7 to 3,051 feet above MSL (CNPS 2017). the current range for alkali grass' in California includes Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Los Angeles, Madera, Merced, Napa, San Bernardino, Santa Clara, Santa Cruz, San Luis Obispo, Solano, Stanislaus, Tulare and Yolo counties; however, it is presumed extirpated in Kings counties (CNPS 2017).

There is one documented occurrence of California alkali grass within 10 miles of the Study Area (CDFW 2017). California alkali grass was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. California alkali grass has potential to occur within the Offsite Infrastructure Areas.

Lobb's Aquatic Buttercup

Lobb's aquatic buttercup (*Ranunculus lobbii*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 4.2 species. This species is an aquatic annual herb that occurs in mesic areas of cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and

vernal pools (CNPS 2017). Lobb's aquatic buttercup blooms from February through May and is known to occur at elevations ranging from 49 to 1,542 feet above MSL (CNPS 2017). The current range of this species in California includes Alameda, Contra Costa, Mendocino, Marin, Napa, Santa Cruz, San Mateo, Solano, and Sonoma counties (CNPS 2017).

There are no documented occurrences of Lobb's aquatic buttercup within 10 miles of the Study Area (CDFW 2017). Lobb's aquatic buttercup was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. Mesic areas and wetlands within the annual grassland in the Offsite Infrastructure Areas provide suitable habitat for this species. Lobb's aquatic buttercup has low potential to occur within the Offsite Infrastructure Areas.

Keck's checkerbloom

Keck's checkerbloom (*Sidalcea keckii*) is listed as endangered as pursuant to the ESA, not listed pursuant to the California ESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in serpentinite clay soils in cismontane woodlands and Valley and foothill grasslands (CNPS 2017). Keck's checkerbloom blooms from April through June and is known to occur at elevations ranging from 246 to 2,133 feet above MSL (CNPS 2017). Keck's checkerbloom is endemic to California; the current range of this species includes Colusa, Fresno, Merced, Napa, Solano, Tulare and Yolo counties; distribution or identity is uncertain in Colusa, Napa, Solano and Yolo counties (CNPS 2017).

There are no documented occurrences of Keck's checkerbloom within 10 miles of the Study Area (CDFW 2017). Keck's checkerbloom was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Keck's checkerbloom has low potential to occur within the Offsite Infrastructure Areas.

There is no Critical Habitat for this species within the Study Area.

Most Beautiful Jewelflower

Most beautiful jewelflower (*Streptanthus albidus ssp. peramoenus*) is not listed as endangered pursuant to either the federal and California ESAs and is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in serpentinite substrates in chaparral, cismontane woodland, and valley and foothill grassland (CNPS 2017). Most beautiful jewelflower typically blooms between April and September and occasionally blooms between March and October. It is known to occur at elevations ranging from 312 to 3,281 feet above MSL (CNPS 2017). Most beautiful jewelflower is endemic to California; its current range includes Alameda, Contra Costa, Monterey, Santa Clara, and San Luis Obispo counties (CNPS 2017).

There are three documented occurrences of most beautiful jewelflower within 10 miles of the Study Area (CDFW 2017). Most beautiful jewelflower was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Most beautiful jewelflower has low potential to occur within the Offsite Infrastructure Areas.

Mt. Diablo Jewelflower

Mt. Diablo jewelflower (*Streptanthus hispidus*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.3 species. This species is an herbaceous annual that occurs in rocky soils in chaparral and valley and foothill grassland (CNPS 2017). Mt. Diablo jewelflower blooms March through June and is known to occur at elevations ranging from 1,198 to 3,937 feet above MSL (CNPS 2017). Mt. Diablo jewelflower is endemic to California; the current range of this species includes Contra Costa County (CNPS 2017).

There are seven documented occurrences of Mt. Diablo jewelflower within 10 miles of the Study Area (CDFW 2017). Mt. Diablo jewelflower was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides marginally suitable habitat for this species. Mt. Diablo jewelflower has low potential to occur within the Offsite Infrastructure Areas.

Caper-Fruited Tropidocarpum

Caper-fruited tropidocarpum (*Tropidocarpum capparideum*) is not listed pursuant to either the federal or California ESAs, but is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in alkaline hills in Valley and foothill grassland (CNPS 2017). Caper-fruited tropidocarpum blooms March through April and is known to occur at elevations ranging from 3 to 1,493 feet above MSL (CNPS 2017). Caper-fruited tropidocarpum is endemic to California; the current range of this species includes Alameda, Contra Costa, Fresno, Glenn, Monterey, Santa Clara, San Joaquin, and San Luis Obispo counties, and is considered to be extirpated in Alameda, Contra Costa, Glenn, Santa Clara, and San Joaquin counties (CNPS 2017).

There are three documented occurrences of caper-fruited tropidocarpum within 10 miles of the Study Area (CDFW 2017). Caper-fruited tropidocarpum was not identified in the Project Area during rare plant surveys conducted by M&A in 2015; this species is absent from the Project Area. The annual grassland within the Offsite Infrastructure Areas provides suitable habitat for this species. Caper-fruited tropidocarpum has potential to occur within the Offsite Infrastructure Areas.

4.7.2 Invertebrates

A total of seven special-status invertebrate species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, four species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining three species that are present or have the potential to occur within the Project Area and/or Offsite Infrastructure Areas are presented below.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) (D*esmocerus californicus dimorphus*) is listed as threatened in accordance with the federal ESA (USFWS 1980). The VELB is completely dependent on its host plant, elderberry (*Sambucus* species), which occurs in riparian and other non-riparian vegetation communities (USFWS 2017b). Elderberry shrubs are most common in riparian areas or in areas that were historically riparian or floodplain terraces.

The adult flight season extends from late March through June. During that time, the adults feed on foliage and perhaps flowers; they also mate and females lay eggs on living elderberry plants (Barr 1991). The first instar larvae bore into live elderberry stems, where they develop for one to two years feeding on the pith. The fifth instar larvae create exit holes in the stems and then plug the holes and remain in the stems through pupation (Talley et al. 2007). The beetle's current distribution is patchy throughout California's Central Valley, from Shasta County in the north to Fresno County in the south. The majority of VELB occurrences have been recorded below 500 feet; however, if there is suitable VELB habitat and known VELB occurrences in a riparian corridor that is lower in elevation and connected to the area in question, it may contain VELB (USFWS 2017b).

There are no documented occurrences of VELB within 10 miles of the Study Area (CDFW 2017). One elderberry shrub was observed in the western central portion of the Project Area, along Sand Creek; the elderberry shrub within the Project Area provides suitable habitat for this species. VELB has potential to occur within the Project Area. No elderberry shrubs were observed within the Offsite Infrastructure Areas; therefore, VELB is absent from the Offsite Infrastructure Areas.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*Branchinecta lynchi*) is listed as threatened in accordance with the federal ESA. Vernal pool fairy shrimp may occur in seasonal ponds, vernal pools, and swales during the wet season, which generally occurs from December through May. This species can be found in a variety of pool sizes, ranging from less than 0.001 to over 24.5 acres (Eriksen and Belk 1999). The shrimp hatch from cysts when colder water (10˚C [50˚F] or less) fills the pool and mature in as few as 18 days, under optimal conditions (Eriksen and Belk 1999). At maturity, mating takes place and cysts are dropped. Vernal pool fairy shrimp occur in disjunct patches dispersed across California's Central Valley from Shasta County to Tulare County, the central and southern portions of the Coast Ranges from northern Solano County to Ventura County, and three areas in Riverside County (USFWS 2003a).

There are 14 documented occurrences of vernal pool fairy shrimp within 10 miles of the Study Area and one documented occurrence within the Project Area (CDFW 2017). Wetlands within the Study Area provide suitable habitat for this species. Vernal pool fairy shrimp is present within the Project Area and has potential to occur within the Offsite Infrastructure Areas.

There is no Critical Habitat for this species within the Study Area.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp (*Lepidurus packardi*) is listed as endangered pursuant to the federal ESA. This species inhabits vernal pools containing clear to highly turbid water, ranging in size from 0.001 to 89.0 acres (USFWS 1994). Vernal pool tadpole shrimp are distinguished from other vernal pool branchiopods discussed in this report by a large, shield like carapace that covers the anterior half of their body (USFWS 2003a). Cysts hatch during the wet season and the shrimp reach maturity in a few weeks. This species matures slowly and is long-lived, relative to other species. Vernal pool tadpole shrimp will continue to grow as long as the pools they occur in remain inundated, and in some instances can survive for six months or longer (USFWS 2003a). The geographic range of vernal pool tadpole shrimp extends from Shasta County to northern Tulare County in California's Central Valley, and in the central coast range from Solano County to Alameda County (USFWS 2003a).

There is one documented occurrence of vernal pool tadpole shrimp within 10 miles of the Study Area and one documented occurrence within the Project Area (CDFW 2017). Wetlands within the Study Area provide suitable habitat for this species. Vernal pool tadpole shrimp is present within the Project Area and has potential to occur within the Offsite Infrastructure Areas.

There is no Critical Habitat for this species within the Study Area.

4.7.3 Fish

A total of five special-status fish species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, all were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this report.

4.7.4 Amphibians

A total of three special-status amphibian species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). Brief descriptions of the three species that are present or have the potential to occur within the Project Area and/or Offsite Infrastructure Areas are presented below.

California Red-Legged Frog

The California red-legged frog (CRLF, *Rana draytonii*) was listed as threatened by USFWS on May 23, 1996 (Federal Register Vol. 61, No. 101:25813) and is a CDFW SSC. Critical habitat was designated pursuant to the ESA across ±1,636,609 acres in 27 counties including Alameda, Butte, Calaveras, Contra Costa, El Dorado, Marin, Napa, Nevada, Placer, Solano, and Yuba counties.

CRLF is the largest native frog in the western United States, ranging from 3.8 to 12.7 cm (1.5 to 5 inches) in length. Their historic range extends through Pacific slope drainages and parts of the Central Valley from Shasta County, California, to Baja, Mexico. This area includes the Coast Ranges and the west slope of the Sierra Nevada at elevations below 1,548 m (5,000 feet). The current range is greatly reduced, with most remaining populations occurring along the coast from Marin County to Ventura County and in isolated locations in the foothills of the western slope of the Sierra Nevada (Fellers 2005; Barry and Fellers 2013).

CRLF occur in different habitats depending on life stage, season, and weather conditions. Breeding habitat includes coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, and ponded and backwater portions of streams. California red-legged frogs also breed in artificial impoundments including stock ponds, irrigation ponds, and siltation ponds. Creeks and ponds with dense growths of woody riparian vegetation, especially willows (*Salix* spp.) are used disproportionally (Hayes and Jennings 1988). The absence of vegetation at an aquatic site does not rule out the possibility of occupancy. Adult CRLF are most often found in areas of dense, shrubby or emergent riparian vegetation near deep [≥ 0.6 - 0.9 m (2 - 3 feet)], still or slow-moving water, especially where dense stands of overhanging willow and an intermixed fringe of cattail (*Typha* sp.) occur adjacent to open water. CRLF breed from November through April (Jennings and Hayes 1994), and larvae generally metamorphose by mid to late summer.

Upland and riparian areas provide important habitat during summer when CRLF are known to aestivate in dense vegetation, burrows and leaf litter. CRLF often disperse from breeding habitats to forage and seek upland refugia, and are often found within close proximity to a pond or deep pool in a creek where emergent vegetation, undercut banks, or semi-submerged rootballs afford shelter (USFWS 2005). The diet of CRLF is highly variable. Larvae probably graze on algae, whereas invertebrates are the most common food items of adult frogs. Vertebrates, such as Sierra chorus frogs (*Pseudacris sierra*) and California mice (*Peromyscus californicus*) are frequently eaten by larger frogs. Juvenile frogs are active both during the day and at night, whereas adult frogs are largely nocturnal.

There are 113 documented occurrences of CRLF within 10 miles of the Study Area, including one documented occurrence located partially within the Project Area and partially within the Offsite Infrastructure Areas (CDFW 2017). The occurrence in the Study Area was documented in 1998; adults and larvae were observed along Sand Creek within the northwestern portion of the Study Area.

The ponds/impoundments and large main channel pools within Sand Creek provide potential suitable breeding habitat for California red-legged frog. Sand Creek, other aquatic features, and the annual grassland within the Study Area provide suitable dispersal habitat for this species. CRLF is present within the Study Area.

There is no Critical Habitat for this species within the Study Area.

California Tiger Salamander

The Central Valley Distinct Population Segment (DPS) of California tiger salamander (CTS, *Ambystoma californiense*) was listed as threatened by USFWS on 4 August 2004 (Federal Register Vol. 69, No. 149: 47212). The Santa Barbara County and Sonoma County DPS, both of which are disjunct from the larger range of the salamander, are federally listed as endangered. As of August 19, 2010, the CTS is listed as a threatened species under the California ESA throughout its range. Populations at the north and south edges of the historical distribution are extirpated, many populations within the interior of the range have been lost, and abundance has been reduced in many areas. Large areas of habitat conversion to agriculture and urban infrastructure have caused extirpations throughout Central California. Conversion of ephemeral breeding waters to perennial ponds and streams allows the introduction of predators and competitors including fish, crayfish (*Procambarus clarkii*), American bullfrogs (*Lithobates catesbeianus*), and (in some locations) introduced tiger salamanders (*Ambystoma tigrinum*) (Ryan et al. 2009). Hybridization with introduced tiger salamanders is a major threat, and in some populations hybrid vigor is leading to landscape-scale conservation problems (Fitzpatrick and Shaffer 2007). The distribution of hybrid tiger salamanders has been increasing quickly, such that researchers are very concerned for the genetic integrity of native populations (Ryan et al. 2009). On August 23, 2005, the USFWS published a final rule designating Critical Habitat for the Central Population of CTS (Federal Register Vol. 70, No. 162:49380). Critical Habitat was designated in 19 counties within four geographic regions of the Central population, for a total of ±199,109 acres (80,576 ha). The Study Area is not designated as Critical Habitat for the CTS.

CTS is a member of the family Ambystomatidae, a group of salamanders confined to North America. This species is most commonly associated with intact annual grassland habitats and vernal pool landscapes but may also occur within open woodlands in low hills and valleys. CTS is endemic to

California's Central Valley from Yolo County south to Kern County, and from Santa Barbara County north through the inner Coast Range to Sonoma County (USFWS 2003b, USFWS 2015).

Necessary habitat components for CTS include intact open terrestrial landscapes used by adults for most of their life history, and ponded aquatic features where reproduction occurs. CTS spend most of their adult life within terrestrial subterranean refuges such as California ground squirrel or Botta's pocket gopher (*Thomomys bottae*) burrows (Stebbins 1972, Loredo et al. 1996). Foraging takes place within these subterranean refugia and out in the open at night or during rains. Suitable breeding sites include vernal pools, seasonal wetlands, stock ponds, or, rarely, slow-moving streams. They may use permanent manmade ponds if predatory species (e.g., fish, crayfish) are absent.

Adult California tiger salamanders are generally nocturnal and may migrate over long distances (up to 1.8 miles) from upland habitats to breeding ponds (Trenham and Shaffer 2005, Searcy and Shaffer 2008). Breeding and egg-laying typically occurs between November and February (Shaffer and Fisher 1991) following relatively warm rain events. Eggs are laid singly or in small clumps on both submerged and emergent vegetation and debris in shallow water (Stebbins 1972, Shaffer and Fisher 1991, Barry and Shaffer 1994, Jennings and Hayes 1994). Adult females will usually remain at the pond for only a few days following egg-laying, whereas adult males may stay for several weeks. Larvae feed upon various aquatic invertebrates and occasionally on larvae of other amphibian species. Salamander larvae metamorphose during late spring or early summer, usually by the first week of July. The minimum length of time required for egg-laying through metamorphosis (requiring continuous inundation) is 10 weeks, usually extending into April. However, 12 weeks is more typical.

There are 115 documented occurrences of CTS within 10 miles of the Study Area, including one documented occurrence located partially within the Project Area and partially within the Offsite Infrastructure Areas (CDFW 2017). The occurrence in the Study Area was documented in 1989 in the northwestern portion of the Study Area. No additional information is available regarding this documented occurrence.

The deeper depressional wetlands and ponds/impoundments within the Study Area provide suitable potential breeding habitat for this species. In addition, rodent burrows were observed within the annual grassland in the Study Area; therefore, the annual grasslands within the Study Area provide potential suitable dispersal habitat for CTS. CTS is present within the Study Area.

There is no Critical Habitat for this species within the Study Area.

Foothill Yellow-Legged Frog

The foothill yellow-legged frog (FYLF, Ra*na boylii*) is not listed pursuant to the federal ESA but is a candidate for listing under the California ESA. It is also designated as a CDFW SSC. The species occurs in the Coast Ranges, from the Oregon border south to the Transverse Mountains in Los Angeles County, west of the Cascade crest in most of northern California, and in the Sierra Nevada foothills south to Kern County, from sea level to 6,000 feet (Stebbins, 1985). FYLF occupy rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow plant communities. The FYLF is a small [3.7 – 7.1 cm (1.5 – 2.8 inches)], highly aquatic frog that occurs almost exclusively in shallow, flowing streams with cobble substrates at elevations below 1,830 m (6,000 feet) (Stebbins 1985,

Jennings and Hayes 1994). They are rarely found far from water and will often dive into water to take refuge under rocks or sediment when disturbed (Zeiner et al., 1988).

There is one documented occurrence of FYLF within 10 miles of the Study Area (CDFW 2017). Sand Creek within the Study Area provides marginally suitable habitat for this species. Thus, FYLF has low potential to occur within the Study Area.

4.7.5 Reptiles

A total of seven special-status reptile species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, three species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining four species that have the potential to occur within the Study Area are presented below.

Alameda Whipsnake

The Alameda whipsnake (*Masticophis lateralis euryxanthus*), also known as the Alameda striped racer, (*Coluber lateralis euryxanthus*) is a narrow, medium-sized (to 1.5 m), snake of the widespread family Columbidae (Ernst and Ernst 2003). Known from Alameda and Contra Costa counties, and tentatively in Santa Clara and San Joaquin counties (USFWS 2002), this snake is an isolated subspecies of the much more widespread California striped racer (*C. l. lateralis*), which is found throughout chaparral and foothill transition zones in California and northern Baja (Stebbins and McGinnis 2012). Because of its limited distribution and the extensive loss of habitat to residential development in Alameda and Contra Costa counties, in 1997 the Alameda whipsnake was listed as threatened under the federal ESA (1973 as amended). Preceding the federal listing, in 1971 California listed the Alameda whipsnake as threatened under the California ESA. Critical Habitat was designated in 2006 (71 FR No. 190, October 2). In total, approximately 154,800 acres (62,700 ha) of Critical Habitat was designated in Alameda, Contra Costa, Santa Clara, and San Joaquin counties.

The Alameda whipsnake is active and diurnal (Ernst and Ernst 2003). Like all Coluber, the Alameda whipsnake is an active forager and uses visual cues to a larger extent than many other snakes, and often forages with its head held high (Stebbins 2003). Although to some degree they are dietary generalists, eating frogs, snakes, birds, and mammals, the majority of their diet consists of lizards, particularly western fence lizard (*Sceloporus occidentalis*), whose activity cycles correspond with those of the whipsnake. Prey are tracked and may be actively run down, grabbed in the jaws, and swallowed alive (Stebbins 2003). No constriction is used, although loops of the body may be used to subdue prey while manipulating for swallowing.

This is a snake of foothills, chaparral, and scrub habitats in the eastern San Francisco Bay Area. Common microhabitat associations include rocky outcrops and talus slopes in an open or broken canopy, usually with a south-, southeastern-, southwestern- or northeast-facing aspect (Stebbins and McGinnis 2012). Alameda whipsnakes also use grasslands and oak woodlands, but the degree to which they use them, as well as the timing and duration of excursions into these habitats, is unknown. Even in grasslands and woodlands, rock outcrops are considered an essential feature of Alameda whipsnake habitat, as they provide retreats and positively favor lizard populations. They can often go into trees,

and may flee there when pursued (USFWS 2002). There is some evidence that their use of grasslands is higher in the spring (Swaim 1994).

There are 47 documented occurrences Alameda whipsnake within 10 miles of the Study Area (CDFW 2017). The annual grassland within the Study Area provides suitable dispersal habitat for this species. The Study Area and immediate vicinity lack coastal scrub and chaparral communities, which have been found to serve as the center of home ranges for the species (Swaim 1994). Although Alameda whipsnake have been found to utilize and disperse through annual grasslands, they are frequently found within 500 feet of coastal scrub and chaparral (Swaim 1994; Alvarez, Shea, and Murphy 2005). Alameda whipsnake have been found to use grasslands further from coastal scrub and chaparral, although this is less common. Since there is no coastal scrub or chaparral in the immediate vicinity of the Study Area, Alameda whipsnake has low potential to occur within the Study Area.

There is no Critical Habitat for this species within the Study Area.

Blainville's (Coast) Horned Lizard

Blainville's horned lizard (*Phrynosoma blainvillii*) is considered an SSC by CDFW. This species is a relatively large (to 105 mm in snout-vent length, dorsoventrally flattened, rounded lizard found historically from Redding, California, to Baja, Mexico (Jennings and Hayes 1994). Formally considered the coast horned lizard (*P. coronatum*), the species has gone through a long period of taxonomic instability (Jennings and Hayes 1994; Montanucci 2004, Leaché et al. 2009). This diurnal species can occur within a variety of habitats including scrubland, annual grassland, valley-foothill woodlands and coniferous forests, though it is most common along lowland desert sandy washes and chaparral (Stebbins 2003). In the Coast Ranges it occurs from Sonoma County south into Baja California (CDFG 1988). It occurs from sea level to 8,000 feet above MSL and an isolated population occurs in Siskiyou County (Stebbins 2003).

Like all horned lizards, Blainville's horned lizard is adorned with pointed and keeled scales, head spines, and parallel lateral fringes of scales, all of which serve to dissuade predators and aid in crypsis (Sherbrooke 2003). This is a ground-dwelling lizard, which does not use vertical structures except where they shade the ground (Stebbins and McGinnis 2012).

Blainville's horned lizard is found in open microhabitats such as sandy washes with scattered shrubs or firebreaks in chaparral, where they forage for ants, small beetles and other insects (Jennings and Hayes 1994). Horned lizards (*Phrynosoma*) are native ant specialists and daily activities are centered on above-ground activity patterns of ants, with lizards active generally in mornings and later in the afternoon in the summer. They generally emerge from hibernation in March or April, and are active until September or later. Mating takes place in April through early May (Jennings and Hayes 1994), and an average of 12 (but up to 21) eggs are laid from April to June (Stebbins and McGinnis 2012). Hatchlings 25–27 mm in length emerge from July through September (Stebbins and McGinnis 2012). Periods of daily or seasonal inactivity are spent within rodent burrows or underneath the soil or surface objects (CDFG 1988).

There are three documented occurrences of Blainville's horned lizard within 10 miles of the Study Area (CDFW 2017). However, the annual grassland within the Study Area provides only marginally suitable

habitat for this species. Thus, Blainville's horned lizard has low potential to occur within the Study Area.

Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata*) is not listed pursuant to either the California or federal ESAs; however, it is designated as a CDFW SSC. Northwestern pond turtles occur in a variety of fresh and brackish water habitats including marshes, lakes, ponds, and slow moving streams (Jennings and Hayes 1994). This species is primarily aquatic; however, they typically leave aquatic habitats in the fall to reproduce and to overwinter (Jennings and Hayes 1994). Deep, still water with abundant emergent woody debris, overhanging vegetation, and rock outcrops are optimal for basking and thermoregulation. Although adults are habitat generalists, hatchlings and juveniles require shallow edgewater with relatively dense submergent or short emergent vegetation in which to forage. Northwestern pond turtles are typically active between March and November. Mating generally occurs during late April and early May and eggs are deposited between late April and early August (Jennings and Hayes 1994). Eggs are deposited within excavated nests in upland areas, with substrates that typically have high clay or silt fractions (Jennings and Hayes 1994). The majority of nesting sites are located within 650 feet (200 m) of the aquatic sites; however, nests have been documented as far as 1,310 feet (400 m) from the aquatic habitat.

There are 31 documented occurrences of northwestern pond turtle within 10 miles of the Study Area (CDFW 2017). Sand Creek and the ponds/impoundments within the Study Area provide suitable habitat for this species. Thus, northwestern pond turtle has potential to occur within the Study Area.

Silvery Legless Lizard

The silvery legless lizard (*Anniella pulchra pulchra*) is one of five species of legless lizard in California (Papenfuss and Parham 2013). This species is not listed pursuant to the California or Federal ESAs, but is designated as a CDFW SSC. Although lacking legs, the legless lizards (Anniella) are decidedly lizards as shown by their eyelids, which are lacking in all snakes. Like snakes, however, these species lack external ear openings. The species ranges from sites in and around Antioch, in the East Bay, south to northern San Luis Obispo County.

There are six documented occurrences of silvery legless lizard within 10 miles of the Study Area (CDFW 2017). However, the annual grasslands within the Study Area provide only marginally suitable habitat for this species. Thus, the silvery legless lizard has low potential to occur within the Study Area.

4.7.6 Birds

A total of 21 special-status bird species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, nine species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis.

ECORP biologists observed two special-status bird species, prairie falcon (*Falco mexicanus*) and Swainson's hawk (*Buteo swainsoni*), foraging in the vicinity of the Study Area during the 2017 site visits. M&A observed Swainson's hawk foraging during their Project Area site visits from 2013 to 2015 (M&A 2015). They also observed one lone burrowing owl along the banks of Sand Creek during the

fall and winter months; burrowing owls were not observed within the Project Area in the spring or summer months (M&A 2015). Brief descriptions of the 12 species that are present or have the potential to occur within the Project Area and/or Offsite Infrastructure Areas are presented below.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is not listed pursuant to either the federal or California ESAs; however, it is designated as a BCC by USFWS and an SSC by CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, road sides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Poulin et al. 2011). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel, but may also use manmade structures such as cement culverts or pipes; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (CDFG 2012). The breeding season typically occurs between February 1 and August 31 (CDFG 2012).

There are 75 documented occurrences of burrowing owl within 10 miles of the Study Area (CDFW 2017). M&A observed one lone burrowing owl along the banks of Sand Creek during the fall and winter months from 2013 to 2015; burrowing owls were not observed nesting within the Project Area in the spring or summer months (M&A 2015). Burrowing owl is present wintering within the Project Area and has potential to winter within the Offsite Infrastructure Areas. Burrows within the annual grassland and ruderal areas in the Study Area provide suitable nesting habitat for this species. Burrowing owl has potential to nest within the Study Area.

California Horned Lark

The horned lark (*Eremophila alpestris*) is widely distributed throughout North America with 21 recognized subspecies (American Ornithologists' Union 1957). The California horned lark (*E. a. actia*) is one of approximately nine subspecies that breeds and/or winters in California, and is found in the Coast Range and southern San Joaquin Valley south into northern Baja California (Beason 1995). The California horned lark is resident and non-migratory. They are found in grasslands and other open habitats with sparse vegetation. Nests are grass-lined and built on the ground. Breeding season includes March through July, with a peak of activity in May.

There are no documented occurrences of California horned lark within 10 miles of the Study Area (CDFW 2017). However, because the annual grassland in the Study Area provides suitable nesting habitat for this species, California horned lark has potential to occur within the Study Area.

Ferruginous Hawk

Ferruginous hawks (*Buteo regalis*) are not listed pursuant to either the California or federal ESAs. However, they are a CDFW watch list species and USFWS BCC. This species typically occurs in open environments and nests from Oregon to Canada, though nesting has recently been documented in Lassen County, California (Small 1994). For the remainder of the state, including the Central Valley, ferruginous hawk occurrences are restricted to the nonbreeding season (approximately September through March) (Small 1994). Winter foraging habitat includes a variety of open communities including annual grasslands, agricultural areas, deserts, and savannahs. Ferruginous hawks do not nest in the

region but may occasionally forage within grassland and other open vegetation communities within the Study Area during winter or migration.

There is one documented occurrence of ferruginous hawk within 10 miles of the Study Area (CDFW 2017). The annual grassland in the Study Area provides suitable winter foraging habitat for this species, although the Study Area is outside of the nesting range of this species. Ferruginous hawk has potential to migrate through or winter within the Study Area.

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is not listed pursuant to either the California or federal ESAs. However, it is fully protected according to § 3511 of the California Fish and Game Code and the federal Bald and Golden Eagle Protection Act. Golden eagles generally nest on cliff ledges and/or large lone trees in rolling to mountainous terrain. Golden eagles nest throughout California except the Central Valley, the immediate coast, and portions of southeastern California (Kochert et al 2002). Occurrences within the Central Valley are usually dispersing post-breeding birds, non-breeding sub-adults, or migrants. Foraging habitat includes open grassland and savannah. Nesting occurs during February through August.

There are 11 documented occurrences of golden eagle within 10 miles of the Study Area (CDFW 2017). Trees within the annual grassland in the Study Area provide suitable nesting habitat for this species. Thus, the golden eagle has potential to occur within the Study Area.

Grasshopper Sparrow

The grasshopper sparrow (*Ammodramus savannarum*) is not listed pursuant to either the California or federal ESAs, but it is designated as an SSC by CDFW. The grasshopper sparrow is an uncommon and local summer resident and breeder along the western edge of the Sierra Nevada and most coastal counties south to Baja California (Small 1994, Vickery 1996). This species generally inhabits moderately open grasslands and prairies with patchy bare ground and scattered shrubs (Vickery 1996). Grasshopper sparrows are more likely to occupy large tracts of habitat than small fragments (Samson 1980, Herkert 1994, Vickery et al. 1994 as cited in Vickery 1996). Breeding generally occurs from early May through August.

There are no documented occurrences of grasshopper sparrow within 10 miles of the Study Area (CDFW 2017). However, because the annual grassland within the Study Area provides suitable nesting habitat for this species the grasshopper sparrow has potential to occur within the Study Area.

Loggerhead shrike

The loggerhead shrike (*Lanius ludovicianus*) is not listed pursuant to either the federal or California ESAs, but is considered a BCC by USFWS and an SSC by CDFW. Loggerhead shrikes nest throughout California except the northwestern corner, montane forests, and high deserts (Small 1994). Loggerhead shrikes nest in small trees and shrubs in open country with short vegetation such as pastures, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1996). The nesting season extends from March through June.

There is one documented occurrence of loggerhead shrike within 10 miles of the Study Area (CDFW 2017). Shrubs and trees within the annual grassland in the Study Area provide suitable nesting habitat for this species; thus, the loggerhead shrike has potential to occur within the Study Area.

Northern Harrier

The northern harrier (*Circus cyaneus)* is not listed pursuant to either the California or federal ESAs; however, it is considered to be an SSC by CDFW. This species is known to nest within the Central Valley, along the Pacific Coast, and in northeastern California. The northern harrier is a ground-nesting species and typically nests in emergent wetland/marsh, open grasslands, or savannah communities usually in areas with dense vegetation (Smith et al. 2011). Foraging occurs within a variety of open environments such as marshes, agricultural fields, and grasslands. Nesting occurs during April through September.

There are no documented occurrences of northern harrier within 10 miles of the Study Area (CDFW 2017). Wetlands and annual grassland within the Study Area provide suitable nesting habitat for this species. Northern harrier has potential to occur within the Study Area.

Prairie Falcon

Prairie falcons are not listed pursuant to either the California or federal ESAs; however, they are considered to be a CDFW watch list species and a USFWS BCC. The breeding distribution of prairie falcons includes the entire state except the extreme northwestern part of the state and coastal areas (Steenhof 2013). Nesting occurs during March through July. However, prairie falcons have not been documented to nest in the Central Valley but may occur as migrants and wintering birds. They nest primarily on shelves, ledges, or potholes in cliffs, but may also use trees, power line structures, buildings, mine highwalls, caves, or stone quarries (Steenhof 2013). Breeding habitat includes open habitat at all elevation up to 3,350m in arid plains and stepped, wherever cliffs or bluffs are present (Steenhof 2013). Nesting occurs during March through July.

There are seven documented occurrences of prairie falcon within 10 miles of the Study Area (CDFW 2017). A prairie falcon was observed flying overhead by ECORP biologists during the 2017 Study Area site visits. The annual grassland in the Study Area provides suitable migration or winter foraging habitat for this species, although the Study Area does not provide suitable nesting habitat. Prairie falcon is present migrating through or wintering within the Study Area; however, this species does not nest in this region.

Short-Eared Owl

Short-eared owls (*Asio flammeus*) are not listed pursuant to either the California or federal ESAs, but is designated as an SSC by CDFW. The breeding range of this species extends from Alaska south to central California, including the San Francisco Bay region and irregularly in the Sacramento Valley (Holt and Leasure 2006). In the Central Valley, short-eared owls are a wintering species. Wintering habitat includes large open areas within woodlots, weedy areas, stubble fields, and marsh and shrub thickets. Nesting occurs during March through July.

There are no documented occurrences of short-eared owl within 10 miles of the Study Area (CDFW 2017). The annual grassland in the Study Area provides suitable winter foraging habitat for this

species, although the Study Area does not provide suitable nesting habitat. Short-eared owl has potential to migrate through or winter within the Study Area.

Swainson's Hawk

Swainson's hawk is listed as a threatened species and is protected pursuant to the California ESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel, ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus* species). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, discing, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There are 28 documented occurrences of Swainson's hawk within 10 miles of the Study Area (CDFW 2017). M&A observed Swainson's hawk foraging during their Project Area site visits from 2013 to 2015 (M&A 2015). A Swainson's hawk was also observed flying overhead by ECORP biologists during the 2017 Study Area site visits. The annual grassland and large trees within the Study Area provide suitable foraging and nesting habitat for this species. Swainson's hawk is present foraging within the Study Area and has potential to nest within the Study Area.

Tricolored Blackbird

The tricolored blackbird (TRBL, Ag*elaius tricolor*) was granted emergency listing for protection under the California ESA in December 2014 but the listing status was not renewed in June 2015. It is currently considered a candidate for listing under the California ESA and undergoing a status review by the CDFW. It is currently considered a USFWS BCC and is designated as an SSC by CDFW. This colonial nesting species is distributed widely throughout the Central Valley, Coast Range, and into Oregon, Washington, Nevada, and Baja California (Meese et al. 2014). TRBL nest in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or level of human disturbance. TRBL nesting habitat includes emergent marsh, riparian woodland/scrub, blackberry thickets, densely vegetated agricultural and idle fields (e.g., wheat, triticale, safflower, fava bean fields, thistle, mustard, cane, and fiddleneck), usually with some nearby standing water or ground saturation (Meese et al. 2014). They feed mainly on grasshoppers during the breeding season, but may also forage upon a variety of other insects, grains, and seeds in open grasslands, wetlands, feedlots, dairies, and agricultural fields (Meese et al. 2014). The nesting season is generally from March through August.

There are five documented occurrences of TRBL within 10 miles of the Study Area (CDFW 2017). The annual grassland within the Study Area provides marginally suitable foraging habitat, although the

Study Area does not provide suitable nesting habitat. TRBL has low potential to occur within the Study Area.

White-Tailed Kite

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either the federal or California ESAs; however, the species is fully protected pursuant to § 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast, and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 1995). In northern California, white-tailed kite nesting occurs from March through early August, with nesting activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (Dunk 1995).

There are four documented occurrences of white-tailed kite within 10 miles of the Study Area (CDFW 2017). The annual grassland and large trees within the Study Area provide suitable nesting habitat for this species. White-tailed kite has potential to occur within the Study Area.

4.7.7 Mammals

A total of nine special-status mammal species were identified as having the potential to occur within the Study Area based on the literature review (Table 4). However, upon further analysis and after the site visits, two species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining seven species that have the potential to occur within the Study Area are presented below.

American Badger

The American badger (*Taxidea taxus*) is designated as an SSC by CDFW. The species historically ranged throughout much of the state except in humid coastal forests. Badgers were once numerous in the Central Valley; however, populations now occur in low numbers in the surrounding peripheral parts of the valley and in the adjacent lowlands of eastern Monterey, San Benito, and San Luis Obispo counties (Williams 1986). Badgers occupy a variety of habitats, including grasslands and savannas. The principal requirements seem to be significant food supply friable soils, and relatively open uncultivated ground (Williams, 1986).

There are five documented occurrences of American badger within 10 miles of the Study Area (CDFW 2017). The annual grassland within the Study Area provides suitable habitat for this species. American badger has potential to occur within the Study Area.

Pallid Bat

The pallid bat (*Antrozous pallidus*) is not listed pursuant to either the federal or California ESAs; however, this species is considered an SSC by CDFW. The pallid bat is a large, light-colored bat with long, prominent ears and pink, brown, or grey wing and tail membranes. This species ranges throughout North America from the interior of British Columbia, south to Mexico, and east to Texas. The pallid bat inhabits low elevation (below 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forest (above 7,000 feet). This

species roosts alone or in groups in the crevices of rocky outcrops and cliffs, caves, mines, trees, and in various human structures such as bridges, and barns. Pallid bats are feeding generalists that glean a variety of arthropod prey from surfaces as well as capturing insects on the wing. Foraging occurs over grasslands, oak savannahs, ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. Although this species utilizes echolocation to locate prey, often they use only passive acoustic cues. This species is not thought to migrate long distances between summer and winter sites (WBWG 2017).

There are three documented occurrences of pallid bat within 10 miles of the Study Area (CDFW 2017). Trees and structures within the Study Area provide suitable roosting habitat for this species. Pallid bat has potential to occur within the Study Area.

Ringtail

Ringtail is not listed pursuant to the federal or California ESAs, but is designated as Fully Protected in California by CDFW. This is a smallish procyonid, related to the widespread raccoon (*Procyon lotor*) and neotropical white-nosed coati (*Nasua narica*). Ringtails are mesocarnivores of riparian areas, especially with abundant rocky outcrops, in low- to middle elevation drainages in blue oak woodlands, foothill pine/oak forests, chaparral, ponderosa pine woodlands, black oak woodlands, riparian deciduous forests, and mixed coniferous forest (Verner and Boss 1980). Highly nocturnal, ringtails consume small rodents, snakes, birds and their eggs, invertebrates, and some fruits, nuts, and carrion (Zeiner et al. 1990b).

There are no documented occurrences of ringtail within 10 miles of the Study Area because ringtail is not tracked by the CNDDB (CDFW 2017). Trees along Sand Creek within the Study Area provide marginally suitable habitat for this species. Ringtail has potential to occur within the Study Area.

San Joaquin Kit Fox

The San Joaquin kit fox is listed as threatened under the California ESA and as endangered under the federal ESA. Although the precise historical range of the San Joaquin kit fox is unknown, Grinnell et al. (1937) believed that prior to 1930, San Joaquin kit fox occupied most of the San Joaquin Valley from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side. Since then the San Joaquin kit fox population has declined primarily as a result of habitat loss to agricultural, urban, industrial and mineral development in the San Joaquin Valley. San Joaquin kit fox has been listed as endangered for over 30 years; yet despite the loss of habitat and apparent decline in numbers since the early 1970s, there has never been a comprehensive survey of its entire range or habitat that was once thought to be occupied (USFWS 1983; Morrell 1975). Despite the lack of a comprehensive data set, local surveys, research projects and incidental sightings indicate that kit foxes currently inhabit some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains, from southern Kern County north to Contra Costa, Alameda, and San Joaquin Counties on the west, and near La Grange, Stanislaus County on the east side of the Valley (Williams in litt. 1990), and some of the larger scattered islands of natural land on the Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced Counties (USFWS 1998).

In the southern portion of the range, the kit fox is commonly associated with Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. Kit foxes also inhabit grazed grasslands, petroleum fields (Morrell 1971, O'Farrell 1980), and survive adjacent to tilled or fallow fields (Jensen 1972, Ralls and White 1991). In the central portion of the range, which includes Madera County, the kit fox is associated with Valley Sink Scrub, Interior Coast Range Saltbush Scrub, Upper Sonoran Subshrub Scrub, Annual Grassland and the remaining native grasslands. Agriculture dominates this region where kit foxes mostly inhabit grazed, non-irrigated grasslands, but also live next to and forage in tilled or fallow fields, irrigated row crops, orchards, and vineyards (USFWS 1998). In the northern portion of their range, kit foxes commonly are associated with annual grassland (Hall 1983) and Valley Oak Woodland (Bell 1994). Kit foxes inhabit grazed grasslands, grasslands with wind turbines, and also live adjacent to and forage in tilled and fallow fields, and irrigated row crops (Bell 1994). They usually inhabit areas with loose-textured (friable) soils, suitable for den excavation (USFW 1983). Where soils make digging difficult, the foxes frequently use and modify burrows built by other animals (Orloff et al. 1986). Structures such as culverts, abandoned pipelines, and well casings also may be used as den sites (USFWS 1983).

Kit foxes are primarily nocturnal and carnivorous, but are commonly seen during the day in the late spring and early summer (Orloff et al. 1986). Major prey includes kangaroo rats, black-tailed hares, desert cottontails, deer mice, California ground squirrels, ground nesting birds, and insects (Scrivener et al. 1987).

There are 17 documented occurrences of San Joaquin kit fox within 10 miles of the Study Area (CDFW 2017). Annual grassland and ruderal areas within the Study Area provide suitable habitat for this species. San Joaquin kit fox has potential to occur within the Study Area.

Townsend's Big-Eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) is not listed pursuant to either the federal or California ESAs; however, this species is considered an SSC by CDFW. Townsend's big-eared bat is a fairly large bat with prominent bilateral nose lumps and large rabbit-like ears. This species occurs throughout the west and ranges from the southern portion of British Columbia south along the Pacific coast to central Mexico and east into the Great Plains. This species has been reported from a wide variety of habitat types and elevations from sea level to 10,827 feet. Habitats used include coniferous forests, mixed mesophytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Its distribution is strongly associated with the availability of caves and cave-like roosting habitat including abandoned mines, buildings, bridges, rock crevices, and hollow trees. This species is readily detectable when roosting due to their habit of roosting pendant-like on open surfaces. Townsend's big-eared bat is a moth specialist with over 90 percent of its diet composed of Lepidopterans. Foraging habitat is generally edge habitats along streams adjacent to and within a variety of wooded habitats. This species often travels long distances when foraging and large home ranges have been documented in California (WBWG 2017).

There are two documented occurrences of Townsend's big-eared bat within 10 miles of the Study Area (CDFW 2017). Trees and structures within the Study Area provide suitable roosting habitat for this species. Townsend's big-eared bat has potential to occur within the Study Area.

Greater Mastiff Bat

The greater mastiff bat (*Eumops perotis californicus*) is not listed pursuant to either the California or federal Endangered Species Acts; however, this species is considered a species of special concern by CDFW (CDFW 2017). The greater mastiff bat is the largest North American molossid (free-tailed bat) with a forearm length of 73-83 mm. This species has a disjunct distribution and ranges from central Mexico across the southwestern United States, and throughout California to within a few miles of the Oregon border. The greater mastiff bat can be found in a variety of habitats, including desert scrub, chaparral, oak woodland, the ponderosa pine belt, and at high elevation meadows and mixed conifer forests. This species is primarily a cliff-dwelling species and roosting colonies are generally found on under exfoliating rock slabs. Roosts have also been identified in similar crevices in large boulders and buildings. Foraging has been documented as high as 2000 feet above the ground, although 100 to 200 feet is more typical. This species is most commonly encountered in open broad open areas including dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas. The diet of the greater mastiff bat consists primarily of moths, but also includes beetles, crickets, and katydids (WBWG 2017).

There are no documented occurrences of greater mastiff bat within 10 miles of the Study Area (CDFW 2017). Structures within the Project Area provide marginally suitable roosting habitat for this species, however the Offsite Infrastructure Areas do not provide suitable roosting habitat. Greater mastiff bat has low potential to occur within the Project Area.

Western Red Bat

The western red bat (*Lasiurus blossevillii*) is not listed pursuant to either the California or federal ESAs; however, this species is considered an SSC by CDFW. The western red bat is easily distinguished from other western bat species by its distinctive red coloration. This species is broadly distributed, its range extending from southern British Columbia in Canada through Argentina and Chile in South America, and including much of the western United States. This solitary species day roosts primarily in the foliage of trees or shrubs in edge habitats bordering streams or open fields, in orchards, and occasionally urban areas. They may be associated with intact riparian habitat, especially with willows, cottonwoods, and sycamores. This species may occasionally utilize caves for roosting as well. They feed on a variety of insects, and generally begin to forage one to two hours after sunset. This species is considered highly migratory; however, the timing of migration and the summer ranges of males and females may be different. Winter behavior of this species is poorly understood (WBWG 2017).

There is one documented occurrence of western red bat within 10 miles of the Study Area (CDFW 2017). Trees within the Study Area provide suitable roosting habitat for this species. Western red bat has potential to occur within the Study Area.

4.8 Wildlife Movement/Corridors

The annual grassland within the Project Area provides a large area of open space along a creek (Sand Creek). The annual grassland and Sand Creek may be used by both aquatic and terrestrial species as a wildlife movement corridor. A large portion of the annual grassland within the Project Area will be converted to development; however, wildlife that use the annual grassland as a movement corridor will be able to use the Sand Creek corridor or the annual grassland surrounding the Project Area for

dispersal. The Sand Creek corridor will not be developed for the Project. Two bridges (a vehicular bridge and a pedestrian bridge) over Sand Creek are planned, but the bridges will not impede wildlife movement. The Offsite Infrastructure Areas are small, disjunct areas along existing roads and infrastructure and are not likely used as major wildlife movement corridors.

5.0 PROJECT IMPACTS AND RECOMMENDATIONS

5.1 City of Antioch General Plan

The Project proponent will collaborate with the City of Antioch to ensure the Project is compliant with the General Plan's biological resources policies.

5.2 City of Antioch Tree Ordinance

Approximately 181 of the 255 trees identified within the Project Area are indigenous trees as identified in the City of Antioch Tree Ordinance (City of Antioch 2017; Brennan 2015). The indigenous trees in the Project Area consist of native oaks (coast live oak, blue oak, valley oak, and interior live oak) and California buckeye (Brennan 2015). There are also various planted and ornamental trees such blue gum eucalyptus, manna gum (*Eucalyptus viminalis*), black locust (*Robinia pseudoacacia*), and others (Brennan 2015). Some of these planted and ornamental trees are protected under the City of Antioch Tree Ordinance as "mature trees" or "landmark trees" because they are over 26 inches dbh or 48 inches dbh, respectively (City of Antioch 2017; Brennan 2015).

Although a tree survey was not conducted for the Offsite Infrastructure Areas, trees that would be protected under the City of Antioch Tree Ordinance were observed during the site visit. In particular, several large eucalyptus trees and several indigenous oak trees were observed.

The Project is not currently proposing to remove protected trees. However, if any protected trees within the Study Area (i.e., indigenous trees, street trees, mature trees, and/or landmark trees) require removal due to Project-related activities, a tree permit/authorization must be acquired from the City of Antioch. It is recommended that grade cuts and fills, hardscapes, structures, and utility lines be located outside of the drip line of any trees being preserved within the Study Area.

5.2.1 Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to protected trees to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.3 Wildlife

Native wildlife species were observed within the Study Area and likely use the Study Area for foraging, dispersal, nesting, permanent residence, etc. Although the Project will result in permanent disturbance of annual grassland, the Project proponent is proposing to preserve two mitigation properties of comparable habitat value. These mitigation properties will serve to offset impacts to native wildlife species. In addition, within the Project Area, Sand Creek Corridor will be almost entirely preserved as open space. Two bridges (a vehicular bridge and a pedestrian bridge) over Sand Creek are planned,

but the bridges will not impede wildlife movement and will provide suitable dispersal habitat through the Project Area.

5.3.1 Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to native wildlife species to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.4 Waters of the U.S. and State

5.4.1 Project Area

A total of 3.948 acres of Waters of the U.S. have been mapped and verified by USACE within the Project Area (USACE 2016). This includes 1.901 acres of intermittent tributary (Sand Creek), 0.340 acre of ephemeral tributary (tributaries to Sand Creek), 1.372 acres of impoundment, 0.303 acre of seasonal wetland pool, and 0.030 acre of wetland seep (Figure 5; USACE 2016).

The following measures are recommended to minimize potential impacts to Waters of the U.S.:

- A permit authorization to fill wetlands under the Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Mitigation measures will be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. An application for a Section 404 Permit for the Project will be prepared and submitted to USACE, and will include an assessment of directly impacted, avoided, and preserved acreages to Waters of the U.S. Mitigation for direct impacts to Waters of the U.S. within the Project Area would occur at a minimum of 1:1 ratio for direct impacts; however, final mitigation requirements will be developed in consultation with USACE.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions.

An additional 1.111 acres of Waters of the U.S. were verified by USACE as non-jurisdictional wetlands/Waters within the Project Area (USACE 2016). This includes 0.132 acre of non-tributary ephemeral drainage, 0.286 acre of isolated wetland drainage, 0.588 acre of isolated seasonal wetland pool, and 0.105 acre of non-wetland seasonal pool (Figure 5; USACE 2016).

The following measures are recommended to minimize potential impacts to Waters of the State (i.e., wetlands/Waters of the U.S. that were considered as non-jurisdictional by USACE):

- Pursuant to the Porter-Cologne Water Quality Act, a permit authorization from the RWQCB is required prior to the discharge of material in an area that could affect Waters of the State. Mitigation requirements for discharge to Waters of the State within the Project Area will be developed in consultation with the RWQCB.
- Features that may be subject to CDFW Section 1602 jurisdiction were identified in the Project Area (e.g., intermittent tributary [Sand Creek], ephemeral tributaries, and non-tributary ephemeral drainages) (USACE 2016). The following measure is recommended to minimize potential impacts to the bed, bank, or channel of rivers, streams, or lakes within the Project Area:

- An SAA pursuant to Section 1602 of the California Fish and Game Code must be obtained for any activity that will impact the bed, bank, or channel of any river, stream or lake. Mitigation measures will be developed during consultation with CDFW as part of the SAA permit process to ensure protections for affected fish and wildlife resources.
- The Project will be designed to maintain pre-Project flows and prevent sedimentation downstream of the Project.
- Potential light and noise impacts to Sand Creek will be minimized through the use of setback buffers (minimum of 50 feet) as well as native plantings and landscaping. Lights will be directed and/or shaded away from Sand Creek. The vehicular bridge crossing over Sand Creek will have native plantings to reduce light pollution.

5.4.2 Offsite Infrastructure Areas

A total of 0.692 acre of potential Waters of the U.S. has been mapped within the Offsite Infrastructure Areas. This includes ±0.141 acre of seasonal wetland, 0.099 acre of seasonal wetland swale, 0.135 acre of intermittent drainage, 0.043 acre of ephemeral drainage, 0.041 acre of ditch, and 0.233 acre of pond (Figure 6a-c). Prior to any impacts to these features, a request for a jurisdictional determination for the Offsite Infrastructure Areas will need to be prepared and submitted to USACE for verification. If any potential Waters of the U.S. and State would be impacted by the infrastructure improvements, the following measures would be recommended to minimize potential impacts to Waters of the U.S.:

- A permit authorization to fill wetlands under the Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Mitigation measures will be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. If impacts to verified Waters of the U.S. will occur, an application for a Section 404 Permit for the Offsite Infrastructure Areas will be prepared and submitted to USACE and will include an assessment of directly impacted, avoided, and preserved acreages to Waters of the U.S. within the Offsite Infrastructure Areas. Mitigation for direct impacts to Waters of the U.S. within the Offsite Infrastructure Area is proposed at a minimum 1:1 ratio, however final mitigation requirements will be developed in consultation with USACE.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions from the Regional Water Quality Control Board. If Waters of the State are present, (i.e., wetlands/Waters of the U.S. that were considered non-jurisdictional by USACE), Waste Discharge Requirements or a waiver from RWQCB under the Porter-Cologne Water Quality Act will be required prior to the discharge of material in an area that could affect Waters of the State. Mitigation requirements for discharge to Waters of the State within the Offsite Infrastructure Areas will be developed in consultation with the RWQCB.
- An SAA pursuant to Section 1602 of the California Fish and Game Code must be obtained for any activity that will impact the bed, bank, or channel of any river, stream or lake. If the offsite infrastructure improvements will impact features pursuant to Section 1602, mitigation measures will be developed during consultation with CDFW as part of the SAA permit process to ensure protections for affected fish and wildlife resources.

- The Project will be designed to maintain pre-Project flows and prevent sedimentation downstream of the Project.
- Potential light and noise impacts to Sand Creek within the Offsite Infrastructure Areas will be minimized through the use of setback buffers as well as native plantings and landscaping. Lights will be directed and/or shaded away from Sand Creek.

5.4.3 Impact Determination

Implementation of the mitigation measures described above in sections 5.4.1 and 5.4.2 would reduce potentially adverse impacts to waters of the U.S. and State to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5 Special-Status Species

5.5.1 Plants

Thirty-eight special-status plant species (large-flowered fiddleneck, California androsace, alkali milk-vetch, heartscale, crownscale, brittlescale, big tarplant, round-leaved filaree, Mt. Diablo fairy-lantern, Oakland start-tulip, Congdon's tarplant, serpentine collomia, Hoover's cryptantha, recurved larkspur, dwarf downingia, Mount Diablo buckwheat, Jepson's coyote thistle, spiny-sepaled button-celery, diamond-petaled California poppy, San Joaquin spearscale, stinkbells, fragrant fritillary, Diablo helianthella, hogwallow starfish, Brewer's western flax, Carquinez goldenbush, Contra Costa goldfields, showy golden madia, woodland woolythreads, Tehama navarretia, adobe navarretia, shining navarretia, bearded popcornflower, California alkali grass, Lobb's aquatic buttercup, Keck's checkerbloom, most beautiful jewelflower, Mt. Diablo jewelflower, and caper-fruited tropidocarpum) have potential to occur within the Offsite Infrastructure Areas. No special-status plant surveys have been conducted in the Offsite Infrastructure Areas.

Three special-status plant species (shining navarretia, crownscale, and San Joaquin spearscale) were identified in the Project Area during the 2015 protocol-level rare plant surveys (M&A 2015). One special-status plant species (Carquinez goldenbush) has a bloom period outside of M&A's survey dates and has low potential to occur within the Project Area.

The following measures are recommended to minimize potential impacts to special-status plants:

- Special-status plant species were identified within the Project Area; therefore, if feasible, it is recommended that avoidance zones around plant populations be established to clearly demarcate areas for avoidance. If the populations cannot be avoided, seed collection, transplantation, and/or other mitigation measures may be developed in consultation with the CEQA Lead Agency to reduce impacts to the identified special-status plant populations.
- Prior to construction a qualified botanist will conduct protocol-level floristic surveys for Carquinez goldenbush within the Project Area. The surveys shall be conducted during the appropriate bloom period. If Carquinez goldenbush is found during the surveys within the Project Area and avoidance of the species is not possible, seed collection, transplantation, and/or other mitigation measures may be developed in consultation with appropriate resource agencies to reduce impacts to special-status plant populations.

- Special-status plant surveys have not been conducted for the Offsite Infrastructure Areas. Therefore, focused special-status plant surveys of the Offsite Infrastructure Areas are recommended. Focused surveys should be performed according to USFWS, CDFW, and CNPS protocols. Surveys should be timed according to the blooming period for target species and known reference populations, if available, and/or local herbaria should be visited prior to surveys to confirm the appropriate phenological state of the target species.
- If special-status plant species are found during future surveys in the Offsite Infrastructure Areas, avoidance zones may be established around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may vary between species and the specific avoidance zone distance will be determined in coordination with appropriate resource agencies (i.e., CDFW, USFWS, and/or the CEQA Lead Agency).
- If special-status plant species are found during future surveys within the Offsite Infrastructure Areas and avoidance of the species is not possible, seed collection, transplantation, and/or other mitigation measures may be developed in consultation with appropriate resource agencies to reduce impacts to special-status plant populations.
- If no special-status plants are found within the Offsite Infrastructure Areas, no further measures pertaining to special-status plants in the Offsite Infrastructure Areas are necessary.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to special-status plants to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5.2 Invertebrates

One special-status invertebrate (VELB) has potential to occur within the Project Area but is absent from the Offsite Infrastructure Areas. Two special-status invertebrates (vernal pool fairy shrimp, and vernal pool tadpole shrimp) are present within the Project Area and have potential to occur within the Offsite Infrastructure Areas.

The following measures are recommended to minimize potential impacts to special-status invertebrates:

Valley Elderberry Longhorn Beetle

- One elderberry shrub was identified within the Project Area. To ensure no direct or indirect effects to VELB, it is recommended that a minimum 100-foot no-disturbance buffer be maintained from the elderberry shrub.
- High-visibility Environmental Sensitive Area fencing and signage should be placed at least 100 feet from the dripline of each elderberry shrub. If the elderberry shrub cannot be avoided by 100 feet, consultation with USFWS is recommended.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

- These species are known to occur within the Project Area and have potential to occur within the Offsite Infrastructure Areas. Take coverage from USFWS (under Sections 7 or 10 of the federal

ESA) would be required for any impacts to these species and/or their habitat. Any required mitigation would be determined during consultation with USFWS.

- If the Project assumes presence for vernal pool fairy shrimp and vernal pool tadpole shrimp in all Waters of the U.S. within the Study Area that provide habitat for these species, take coverage from USFWS (under Sections 7 or 10 of the federal ESA) may be required for any impacts to these species and/or their habitat.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to special-status invertebrates to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5.3 Fish

No special-status fish species have potential to occur within the Study Area; therefore, no recommendations or measures are proposed.

5.5.4 Amphibians

Two special-status amphibian species (CRLF and CTS) are present within the Study Area. One special-status amphibian species (FYLF) has low potential to occur within the Study Area.

The following measures are recommended to minimize potential impacts to special-status amphibians:

California Red-Legged Frog and California Tiger Salamander

- Prior to construction activities, take coverage from USFWS under Sections 7 or 10 of the federal ESA may be required for any impacts to CRLF and CTS and/or their habitat. In addition, take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required for any impacts to CTS and/or its habitat. Any required compensatory mitigation would be determined during consultation with USFWS and CDFW.
- To the maximum extent possible, avoid impacts to aquatic habitat, which includes Sand Creek and seasonal impoundments within the Study Area.

Foothill Yellow-Legged Frog

- To the maximum extent possible, avoid impacts to aquatic habitat, which includes Sand Creek within the Study Area.
- Conduct a preconstruction FYLF clearance survey within 48 hours prior to construction activities within the vicinity of Sand Creek. If FYLF are found within the Project Area or Offsite Infrastructure Areas during the preconstruction surveys or during Project implementation, consultation with CDFW will occur and a 2081 Incidental Take Permit will be required. If no FYLF are found, no further measures pertaining to this species are necessary.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to special-status amphibians to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5.5 Reptiles

Four special-status reptile species (Alameda whipsnake, Blainville's horned lizard, northwestern pond turtle, and silvery legless lizard) have potential to occur within the Study Area.

The following measures are recommended to minimize potential impacts to special-status reptiles:

Alameda Whipsnake

- Prior to construction activities, consultation with USFWS and CDFW is recommended to determine appropriate avoidance and minimization measures and/or mitigation for potential impacts to Alameda whipsnake and/or its habitat.

Blainville's Horned Lizard, Northwestern Pond Turtle, and Silvery Legless Lizard

- Conduct preconstruction surveys for Blainville's horned lizard, northwestern pond turtle, and silvery legless lizard within 14 days prior to construction activities. If Blainville's horned lizard, northwestern pond turtle, or silvery legless lizard are found, a qualified biologist will relocate them outside of the Study Area and will be available during construction to relocate these species if necessary.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to special-status reptiles to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5.6 Special-Status Birds and MBTA Protected Birds

Three special-status bird species (burrowing owl, prairie falcon, and Swainson's hawk) are present within the Project Area and nine special-status bird species (California horned lark, ferruginous hawk, golden eagle, grasshopper sparrow, loggerhead shrike, northern harrier, short-eared owl, TRBL, and white-tailed kite) have potential to occur within the Project Area. Two special-status bird species are present within the Offsite Infrastructure Areas (prairie falcon and Swainson's hawk) and ten special-status bird species (burrowing owl, California horned lark, ferruginous hawk, golden eagle, grasshopper sparrow, loggerhead shrike, northern harrier, short-eared owl, TRBL, and white-tailed kite) have potential to occur within the Offsite Infrastructure Areas.

In addition to the above listed special-status birds, all native birds, including raptors, are protected under the California Fish and Game Code and migratory birds are protected pursuant to the Federal MBTA.

Burrowing Owl

If burrowing owl or evidence of burrowing owl is observed in the Study Area or within 300 feet of the Study Area during pre-construction surveys, then the following will occur:

- During Breeding Season: If the approved biologist finds evidence of burrowing owls within the Study Area during the breeding season (February 1 through August 31), all Project-related activities will avoid nest sites during the remainder of the breeding season or while the nest remains occupied by adults or young (nest occupation includes individuals or family groups foraging on or near the site following fledging). Avoidance is establishment of a minimum 300-foot buffer zone around nests. Construction and other Project-related activities may occur outside of the 300-foot buffer zone. Construction and other Project-related activities may be allowed inside of the 300-foot non-disturbance buffer during the breeding season if the nest is not disturbed, and the Project activities are monitored by a qualified biologist.

  - If monitoring by the approved biologist indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use, the non-disturbance buffer zone may be removed if approved by CDFW. The approved biologist will excavate the burrow in accordance with the latest CDFW guidelines for burrowing owl to prevent reoccupation after receiving approval from CDFW.

- During Non-Breeding Season: During the non-breeding season (September 1 through January 31), the approved biologist will establish a minimum 300-foot non-disturbance buffer around occupied burrows. Construction activities outside of this 300-foot buffer will be allowed. Construction activities within the non-disturbance buffer will be allowed if the following criteria are met to prevent owls from abandoning over-wintering sites:

  - A burrowing owl exclusion plan shall be developed for the Project and approved by CDFW. This plan will include the results of the preconstruction surveys and proposed methods for the installation and monitoring of one-way doors and the exclusion of burrowing owls;

  - Upon approval by CDFW a qualified biologist will install one-way door at the entrance of each occupied burrow. The Project will then be monitored twice daily for 48 hours to ensure that the owls have vacated the burrow. After the burrows have been vacated at the end of the 48-hour monitoring period the one way doors shall be removed and the burrow will be hand-excavated to its terminus and completely backfilled. The site will then be monitored daily for one week to ensure that the site is not reoccupied by burrowing owls.

Special-Status Birds and MBTA Protected Birds

The following measures are recommended to minimize potential impacts to all special-status birds (with the exception of burrowing owl which is discussed above) and birds protected by the MBTA:

- Conduct a preconstruction nesting bird survey of all suitable habitat within the Study Area within 14 days of the commencement of construction during the nesting season (February 1 – August 31). Surveys should be conducted within 0.5 mile of the Study Area for Swainson's hawk, 300 feet of the Study Area for nesting raptors, 500 feet for TRBL, and 100 feet of the Study Area for nesting songbirds.

- If active nests are found, a no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with CDFW, but is recommended to be 300 feet for raptors and 50 feet for nonraptor songbirds. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest. Once the young are independent of the nest, no further measures are necessary.
- Preconstruction nesting bird surveys are not required for construction activity outside the nesting season.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to protected bird species to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.5.7 Mammals

Seven special-status mammal species (American badger, San Joaquin kit fox, ringtail, pallid bat, Townsend's big-eared bat, and western red bat) have potential to occur within the Study Area. One special-status mammal species (greater mastiff bat) has potential to occur within the Project Area but is absent from the Offsite Infrastructure Areas.

The following measures are recommended to minimize potential impacts to special-status mammals:

American Badger

- Conduct a pre-construction American badger survey 48 hours prior to construction activities. It is anticipated that these surveys could be completed concurrently with the above nesting surveys. If American badgers or burrows with American badger sign are found, consultation with CDFW is recommended prior to initiation of construction activities to determine an appropriate burrow excavation and/or relocation method.

San Joaquin Kit Fox

- Prior to construction activities, consultation with USFWS and CDFW is recommended to determine appropriate avoidance and minimization measures and/or mitigation for potential impacts to San Joaquin kit fox and/or its habitat. Any required mitigation would be determined during consultation with USFWS and CDFW.

Ringtail

- Prior to ground disturbance and removal of suitable habitat (e.g. trees and large snags), the Study Area will be surveyed for the presence of ringtail by a qualified biologist. Occupied dens will be marked and mapped and a 200-foot avoidance buffer will be mapped around the site. To passively relocate this species from impact areas, occupied dens will be monitored on a regular basis by a qualified biologist and destroyed after they are confirmed to be abandoned by ringtails.

Pallid Bat, Townsend's Big-Eared Bat, Greater Mastiff Bat, and Western Red Bat

- If suitable roosting habitat for special-status bats (i.e., trees and manmade structures) will be impacted during construction activities, conduct pre-construction roosting bat surveys for all suitable roosting habitat prior to construction activities. If suitable roosting habitat is identified, a qualified biologist will conduct an evening bat emergence survey that may include acoustic monitoring to determine whether bats are present. If pallid bat, Townsend's big eared bat, greater mastiff bat, and/or western red bat are found, consultation with CDFW may be required prior to initiation of construction activities. If special-status bats are not found during the preconstruction surveys, no further measures are recommended.

Impact Determination

Implementation of the mitigation measures described above would reduce potentially adverse impacts to special-status mammals to a less-than-significant level. Therefore, these impacts are less than significant with mitigation incorporated.

5.6 Wildlife Movement/Corridors

A large portion of the annual grassland within the Project Area will be converted to development; however, wildlife that use the annual grassland as a movement corridor will be able to use the Sand Creek corridor or the annual grassland surrounding the Project Area for dispersal. The Sand Creek Corridor will not be developed for the Project. Two bridges (a vehicular bridge and a pedestrian bridge) over Sand Creek are planned, but the bridges will not impede wildlife movement. The Offsite Infrastructure Areas are small, disjunct areas along existing roads and infrastructure and are not likely used as major wildlife movement corridors.

5.6.1 Impact Determination

No mitigation measures are recommended because the proposed development will have a less than significant impact on wildlife movement/corridors.

6.0 REFERENCES

Alvarez, J. A., M. A. Shea, and A. C. Murphy. 2005. A compilation of observations of Alameda whipsnakes outside of typical habitat. Transactions of the Western Section of the Wildlife Society 41:21-25.

American Ornithologists' Union. 1957. Check-list of North American birds. 5th ed. American Ornithol. Union, Washington, D.C.

Baldwin, B. G., D.H Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual; Vascular Plants of California*, Second Edition. University of California Press, Berkeley, California. 1,519 pp. + app.

Barr, C.B. 1991. The distribution, habitat and status of the valley elderberry longhorn beetle *Desmocerus californicus dimorphus* Fisher (Coleoptera: Cerambycidae). U.S. Fish and Wildlife Service, Sacramento, California.

Barry, S. J. and G. M. Fellers. 2013. History and status of the California red-legged frog (*Rana draytonii*) in the Sierra Nevada, California, USA. Herpetological Conservation and Biology 8: 456-502.

Barry, S. J., and H. B. Shaffer. 1994. The status of the California tiger salamander (*Ambystoma californiense*) at Lagunita: a 50-year update. Journal of Herpetology 28:159-164.

Beason, R.C. 1995. Horned Lark (*Eremophila alpestris*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/195.

Bechard, Marc J., C. Stuart Houston, Jose H. Sarasola and A. Sidney England. 2010. Swainson's Hawk (*Buteo swainsoni*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/265

Bell, H.M., J.A. Alvarez, L.L. Eberhardt, and K. Ralls. 1994. Distribution and abundance of San Joaquin kit fox. California Dept. Fish and Game, Sacramento, Nongame Bird and Mammal Sec., Unpublished. Rep.

Brennan, E. 2015. Tree Preservation Report for The Ranch, Antioch, California. Prepared for Richland Communities, Inc. Dated 29 July 2015.

California Department of Fish and Game (CDFG). 1988. California's Wildlife. Volume I, Amphibians and Reptiles. D. C. Zeiner, W. F. Laudenslayer, Jr., K. E. Mayer, and M. White, eds. California Department of Fish and Game. Sacramento, California.

California Department of Fish and Game (CDFG). 2005. The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004. Sacramento, California.

California Department of Fish and Game (CDFG). 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. California Natural Resources Agency, Sacramento, CA. November 24, 2009.

California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. Dated March 7, 2012.

California Department of Fish and Wildlife (CDFW). 2017. Rarefind Natural Diversity Data Base Program. Version 5, commercial version. California Natural Diversity Database. The Resources Agency, Sacramento. Accessed August 2017.

CNPS (California Native Plant Society). 2001. Inventory of rare and endangered plants of California (sixth edition). Rare plant scientific advisory committee, David P. Tibor, convening editor. California Native Plant Society. Sacramento, CA. 338 pps.

California Native Plant Society (CNPS). 2017. Inventory of Rare and Endangered Plants in California (online edition, v7-14). California Native Plant Society. Sacramento, CA. Available online: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed August 2017.

City of Antioch. 2003. City of Antioch General Plan. Updated 24 November 2003. Available at: http://www.ci.antioch.ca.us/CityGov/CommDev/PlanningDivision/docs/Antioch_Adopted_General_Plan.pdf. Accessed 31 August 2017.

City of Antioch. 2017. City of Antioch Code of Ordinances; Title 9, Chapter 5, Article 12 Tree Preservation and Regulations. Available at: http://library.amlegal.com/nxt/gateway.dll/California/antioch/cityofantiochcaliforniacodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:antioch_ca. Accessed 31 August 2017.

Dunk, J. R. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Eriksen, C. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Inc. Eureka, CA.

Ernst, C. H and E. M. Ernst. 2003. Snakes of the United States and Canada. Smithsonian Institution Press, Washington. 668 pp.

Estep, J.A. 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987. California Department of Fish and Game, Nongame Bird and Mammal Section Report.

Fellers, G. M. 2005. *Rana draytonii*. Pages 552 – 554 in Amphibian Declines: the Conservation Status of United States Species, M. Lannoo, ed. University of California Press, Berkeley.

Fitzpatrick, B. M. and H. B. Shaffer. 2007. Hybrid vigor between native and introduced salamanders raises new challenges for conservation. Proceedings of the National Academy of Sciences of the United States of America 104: 15793 – 15798.

Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. Fur-bearing mammals of California. Vol. 2. Univ. California Press, Berkeley.

Hall, F.A. 1983. Status of the San Joaquin kit fox, *Vulpes macrotis mutica*, at the Bethany wind turbine generating site, Alameda County, California. Unpublished. Rep., California Dept. Fish and Game, Sacramento, 34 pp.

Hayes, M.P. and M.R. Jennings. 1988 Habitat correlates of distributions of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylii*): Implications for management. Pages 144-158 In: R.C. Szaro, K.E. Severson, and D.R. Patton (technical coordinators), Proceedings of the symposium on the management of amphibians, reptiles,

and small mammals in North America. U.S. Department of Agriculture, Forest Service, General Technical Report (RM-166):1-458.

Herkert, J.R. 1994. The effects of habitat fragmentation on midwestern grassland bird communities. J. Ecol. Appl. 4:461-471.

Holt, D.W., and S.M. Leasure. 2006. Short-eared Owl (*Asio flammeus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/062

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. A Report to the California Department of Fish and Game, Rancho Cordova, California.

Jensen, C.C. 1972. San Joaquin kit fox distribution. U.S. Fish and Wildlife Service, Sacramento, CA, Unpublished. Rep., 18 pp.

Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/684

Leaché, A. D., M. S. Koo, C. L. Spencer, T. J. Papenfuss, R. N. Fisher and J. A. McGuire. 2009. Quantifying ecological, morphological, and genetic variation to delimit species in the coast horned lizard species complex (Phrynosoma). Proceedings of the National Academy of Sciences 106: 12418-12423.

Live Oak Associates, Inc. 2014. Investigation of Waters of the United States, Cowan Property, Contra Costa County, California. Prepared for Richland Communities, Inc. Dated 3 June 2014.

Loredo, I., D. Van Buren, and M. L. Morrison. 1996. Habitat use and migration behavior of the California tiger salamander. Journal of Herpetology 30: 282 – 285.

Mayer, K. E. and W. F. Laudenslayer Jr (eds). 1988. A Guide to Wildlife Habitats of California. California Department of Fish and Game.

Meese, R.J., E.C. Beedy and W.J. Hamilton, III. 2014. Tricolored Blackbird (*Agelaius tricolor*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/423.

Monk & Associates, Inc. (M&A). 2015. DRAFT Biological Assessment for The Ranch, City of Antioch, Contra Costa County.

Montanucci, R. R. 2004. Geographic variation in Phrynosoma coronatum (Lacertilia, Phrynosomatidae): Further evidence for a Peninsular Archipelago. Herpetologica 60: 117-139.

Morrell, S.H. 1971. Life history of the San Joaquin kit fox. California Dept. Fish and Game, Sacramento, Spec. Wildl. Invest., Unpublished. Rep., 25 pp.

Morrell, S.H. 1975. San Joaquin kit fox distribution and abundance in 1975. California Dept. Fish and Game, Sacramento, Wildlife Management Branch, Admin. Rep. No. 75-3, 28 pp.

Moyle, P.B. 2002. Inland fishes of California. University of California Press, Berkeley and Los Angeles, CA.

Natural Heritage Institute and Delta Science Center. 2003. The Past and Present Condition of the Marsh Creek Watershed, Third Edition. November.

Natural Resources Conservation Service (NRCS). 2017a. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed 1 September 2017.

Natural Resources Conservation Service (NRCS). 2017b. Soil Data Access Hydric Soils List. Available at https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed 5 September 2017.

Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), and Environmental Protection Agency (EPA). 2016. Watershed Boundary Dataset for California. Available online: http://datageteway.nrcs.usda.gov [Accessed 09/21/2016].

O'Farrell, T.P. 1980. Elk Hills endangered and threatened species program, phase 1 progress summary. U.S. Dept. Energy Topical Rep. No. EGG 1183-2403, Santa Barbara Operations, EG&G Energy Measurements, Goleta, CA, 19 pp.

Orloff, S.G., F. Hall, and L. Spiegel. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of their range. Trans. West. Sect. Wildl. Soc. 22:60-70.

Pacific Fishery Management Council. 2000. Review of 1999 Ocean Salmon Fisheries. Portland Oregon. February 2000.

Papenfuss, T. J and J. F. Parham. 2013. Four new species of California legless lizards (Anniella). Breviora 536: 1 – 17.

Poulin, Ray G., L. Danielle Todd, E. A. Haug, B. A. Millsap and Mark S. Martell. 2011. Burrowing Owl (*Athene cunicularia*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/burowl

Ralls, K., and P.J. White. 1991. Kit fox-coyote relationships in the Carrizo Plain Natural Area. U.S. Fish and Wildlife Service, Sacramento, CA, Ann. Rep., 6 pp.

Reid, F. 2006. A Field Guide to Mammals of North America. Fourth Edition. Houghton Mifflin Company: Boston, New York.

Ryan, M. E., J. R. Johnson, and B. M. Fitzpatrick. 2009. Invasive hybrid tiger salamander genotypes impact native amphibians. Proceedings of the National Academy of Sciences 106: 27.

Samson, F. B. 1980. Island biogeography and the conservation of prairie birds. Proc. North Am. Prairie Conf. 7:293-305.

Scrivener, J.H., T.P. O'Farrell, T.T. Kato, and M.K. Johnson. 1987. Diet of the San Joaquin kit fox, *Vulpes macrotis mutica*, on Naval Petroleum Reserve #1, Kern County, California, 1980-1984. Rep. No. EGG 10282-2168, EG&G Energy Measurements, Goleta, CA, 26 pp.

Searcy, C. A. and H. B. Shaffer. 2008. Calculating biologically accurate mitigation credits: insights from the California tiger salamander. Conservation Biology 22: 997-1005.

Shaffer, H. B. and R. Fisher. 1991. Final report to the California Department of Fish and Game: California tiger salamander surveys, 1990-(Contract FG9422). California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.

Sherbrooke, W. C. 2003. Introduction to Horned Lizards of North America. University of California Press, Berkeley. 191 pp.

Shuford, W.D. and T. Gardali, eds. 2008. California Bird Species of Special Concern. Studies of Western Birds No. 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Game, Sacramento, California.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. Vista, California. 342 pp.

Smith, Kimberly G., Sara Ress Wittenberg, R. Bruce Macwhirter and Keith L. Bildstein. 2011. Northern Harrier (*Circus cyaneus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/norhar

Stebbins, R. C. 1972. California amphibians and reptiles. University of California Press. Berkeley, California. 152 pp.

Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians (second edition). Houghton Mifflin Company, Boston, MA.

Stebbins, R. C. 2003. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts.

Stebbins, R. C. and S. M. McGinnis. 2012. Field Guide to Amphibians and Reptiles of California (revised edition). University of California Press, Berkeley.

Steenhof, K. 2013. Prairie Falcon (*Falco mexicanus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/prafal

Swaim, K. E. 1994. Aspects of the ecology of the Alameda whipsnake *Masticophis lateralis euryxanthus*. Thesis, California State University, Hayward, USA.

Talley, T.S., E. Fleishman, M. Holyoak, D.D. Murphy, and A. Ballard. 2007. Rethinking a rare-species conservation strategy in an urban landscape: The case of the valley elderberry longhorn beetle. Biological Conservation 135(2007): 21-32.

Thompson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. University of California Press, Oakland, California.

Trenham, P. C. and H. B. Shaffer. 2005. Amphibian upland habitat use and its consequences for population viability. Ecological Applications 15: 1158 – 1168.

U.S. Army Corps of Engineers (USACE). 2016. Approved Jurisdictional Determination for the Ranch Residential Development Site. Dated 23 February 2016.

U.S. Fish and Wildlife Service (USFWS). 1980. Listing the Valley Elderberry Longhorn Beetle as a Threatened Species with Critical Habitat; Final Rule. Federal Register Volume 45, Number 155 (August 8, 1980).

U.S. Fish and Wildlife Service (USFWS). 1983. San Joaquin kit fox recovery plan. U.S. Fish and Wildlife Service, Portland, OR, 84 pp.

U.S. Fish and Wildlife Service (USFWS). 1994. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and the Vernal Pool Tadpole Shrimp; and Threatened Status for the Vernal Pool Fairy Shrimp. Portland, Oregon.

U.S. Fish and Wildlife Service (USFWS). 1998. Endangered Species Recovery Program, Recovery Plan for Upland Species of the San Joaquin Valley, California. California State University, Stanislaus.

U.S. Fish and Wildlife Service (USFWS). 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. January 2000.U.S. Fish and Wildlife Service (USFWS). 1998. Endangered Species Recovery Program, Recovery Plan for Upland Species of the San Joaquin Valley, California. California State University, Stanislaus.

U.S. Fish and Wildlife Service (USFWS). 2002. Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California. March 20. Prepared by Endangered Species Division, Sacramento Fishfile:///C:/Users/estitt/Downloads/Whipsnakepln.pdf and Wildlife Office.

U.S. Fish and Wildlife Service (USFWS). 2003a. Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Final Rule. Federal Register 68(151):46684-46867.

U.S. Fish and Wildlife Service (USFWS). 2003b. Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander. October 2003.

U.S. Fish and Wildlife Service (USFWS). 2005. Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog. Dated August 2005.

U.S. Fish and Wildlife Service (USFWS). 2015. Draft recovery plan for the Central California distinct population segment of the California tiger salamander (*Ambystoma californiense*). U. S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 53 pp.

U.S. Fish and Wildlife Service (USFWS). 2017a. USFWS Resource Report List. Information for Planning and Conservation. Internet website: http://ecos.fws.gov/ipac/. Accessed August 2017.

U.S. Fish and Wildlife Service (USFWS). 2017b. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service; Sacramento, Ca. 28 pp. Dated May 2017.

U.S. Geological Survey (USGS). 1978. "Antioch South, California" 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

Vickery, P.D. 1996. Grasshopper Sparrow (*Ammodramus savannarum*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/239

Western Bat Working Group (WBWG). 2017. Western Bat Species Accounts. http://wbwg.org/western-bat-species/. Accessed September 2017.

Williams, D. F. 1986. Mammalian Species of Special Concern in California. State of California Department of Fish and Game, Wildlife Management Division. Sacramento, California. 112pp.

Williams, D.F. 1990. Assessment of potential habitat for the blunt-nosed leopard lizard and San Joaquin kit fox in western Madera County, California. U.S. Fish and Wildlife Service, Endangered Species Office, Sacramento, CA, 31 pp.

Yosef, R. 1996. Loggerhead Shrike (*Lanius ludovicianus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/231

Zeiner, D. C., W. F. Laudenslayer, Jr., and K. E. Mayer (eds). 1988. California's Wildlife, Volume I, Amphibian and Reptiles. California Statewide Habitat Relationships System, California Department of Fish and Game, Sacramento, California.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (eds). 1990a. California's Wildlife, Volume II, Birds. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (eds). 1990b. California's Wildlife, Volume III, Mammals. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

LIST OF ATTACHMENTS

ATTACHMENT A

Conceptual Site Plan

The Ranch Concept Plan: Multi-Generational Community

Land Use: Multi-Generational Community

Development Summary	Acreage	% Overall	% Res Ac	Density (du/ac)	Av. Lot Size (sqft)	#Units	% Res Units
Low Density - All-Ages	105.9	19.2%	37%	4.0	7,000	424	33%
Medium Low Density - All-Ages	39.9	7.2%	14%	5.5	4,500	219	17%
Low Density - Executive Housing (Hillside)	34.1	6.2%	12%	3.5	8,000	119	9%
Low Density - Executive Housing (Lake view)	17.3	3.1%	6%	4.0	7,000	69	5%
Low Density - 55+	91.7	16.6%	32%	5.0	5,000	459	36%
RESIDENTIAL TOTAL	**288.9**	**52.4%**	**100%**			**1,290**	**100%**
Mixed Use	5.7	1.0%					
Fire Station	2.2	0.4%					
Staging Area	1.3	0.2%					
Parks	19.8	3.6%					
Open Space	207.2	37.6%					
Major Roadways	26.4	4.8%					
TOTAL	**551.5**	**100.0%**					

*Note: LD within the 55+ community may include lot sizes ranging from 4,500 sqft. to 6,000 sqft. with an overall average lot size of 5,000 sqft.

ATTACHMENT B

CNDDB, USFWS IPAC, and CNPS Database Searches

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Antioch South (3712187) OR Honker Bay (3812118) OR Clayton (3712188) OR Diablo (3712178) OR Antioch North (3812117) OR Tassajara (3712177) OR Jersey Island (3812116) OR Brentwood (3712186) OR Byron Hot Springs (3712176))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Alkali Meadow Alkali Meadow	CTT45310CA	None	None	G3	S2.1	
Alkali Seep Alkali Seep	CTT45320CA	None	None	G3	S2.1	
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S3	SSC
Amsinckia grandiflora large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1	1B.1
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Anniella pulchra pulchra silvery legless lizard	ARACC01012	None	None	G3G4T3T4Q	S3	SSC
Anomobryum julaceum slender silver moss	NBMUS80010	None	None	G5?	S2	4.2
Anthicus antiochensis Antioch Dunes anthicid beetle	IICOL49020	None	None	G1	S1	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Apodemia mormo langei Lange's metalmark butterfly	IILEPH7012	Endangered	None	G5T1	S1	
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G2G3	S1	SSC
Arctostaphylos auriculata Mt. Diablo manzanita	PDERI04040	None	None	G2	S2	1B.3
Arctostaphylos manzanita ssp. laevigata Contra Costa manzanita	PDERI04273	None	None	G5T2	S2	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2	S2	1B.2
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G2	S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G2	S2	
Branchinecta longiantenna longhorn fairy shrimp	ICBRA03020	Endangered	None	G1	S1S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
California macrophylla round-leaved filaree	PDGER01070	None	None	G3?	S3?	1B.2
Callophrys mossii bayensis San Bruno elfin butterfly	IILEPE2202	Endangered	None	G4T1	S1	
Calochortus pulchellus Mt. Diablo fairy-lantern	PMLIL0D160	None	None	G2	S2	1B.2
Campanula exigua chaparral harebell	PDCAM020A0	None	None	G2	S2	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
Chloropyron molle ssp. molle soft salty bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAPI0M051	None	None	G5T4	S2	2B.1
Circus cyaneus northern harrier	ABNKC11010	None	None	G5	S3	SSC
Cismontane Alkali Marsh Cismontane Alkali Marsh	CTT52310CA	None	None	G1	S1.1	
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus gracilis San Joaquin dune beetle	IICOL4A020	None	None	G1	S1	
Cordylanthus nidularius Mt. Diablo bird's-beak	PDSCR0J0F0	None	Rare	G1	S1	1B.1
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Cryptantha hooveri Hoover's cryptantha	PDBOR0A190	None	None	GH	SH	1A
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Dipodomys heermanni berkeleyensis Berkeley kangaroo rat	AMAFD03061	None	None	G3G4T1	S1	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Efferia antiochi Antioch efferian robberfly	IIDIP07010	None	None	G1G2	S1S2	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eriastrum ertterae Lime Ridge eriastrum	PDPLM030F0	None	None	G1	S1	1B.1
Eriogonum nudum var. psychicola Antioch Dunes buckwheat	PDPGN0849Q	None	None	G5T1	S1	1B.1
Eriogonum truncatum Mt. Diablo buckwheat	PDPGN085Z0	None	None	G2	S2	1B.1
Eryngium jepsonii Jepson's coyote-thistle	PDAPI0Z130	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Erysimum capitatum var. angustatum Contra Costa wallflower	PDBRA16052	Endangered	Endangered	G5T1	S1	1B.1
Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0	None	None	G1	S1	1B.1
Eucerceris ruficeps redheaded sphecid wasp	IIHYM18010	None	None	G1G3	S1S2	
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3	4.2
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Grimmia torenii Toren's grimmia	NBMUS32330	None	None	G2	S2	1B.3
Helianthella castanea Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
Helminthoglypta nickliniana bridgesi Bridges' coast range shoulderband	IMGASC2362	None	None	G3T1	S1S2	
Hesperolinon breweri Brewer's western flax	PDLIN01030	None	None	G2?	S2?	1B.2
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Hygrotus curvipes curved-foot hygrotus diving beetle	IICOL38030	None	None	G1	S1	
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Idiostatus middlekauffi Middlekauff's shieldback katydid	IIORT31010	None	None	G1G2	S1	
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Limosella australis Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Madia radiata showy golden madia	PDAST650E0	None	None	G2	S2	1B.1
Malacothamnus hallii Hall's bush-mallow	PDMAL0Q0F0	None	None	G2	S2	1B.2
Masticophis flagellum ruddocki San Joaquin coachwhip	ARADB21021	None	None	G5T2T3	S2?	SSC
Masticophis lateralis euryxanthus Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Melospiza melodia maxillaris Suisun song sparrow	ABPBXA301K	None	None	G5T3	S3	SSC
Metapogon hurdi Hurd's metapogon robberfly	IIDIP08010	None	None	G1G3	S1S3	
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Navarretia gowenii Lime Ridge navarretia	PDPLM0C120	None	None	G1	S1	1B.1
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	AMAFF08082	None	None	G5T2T3	S2S3	SSC
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Oenothera deltoides ssp. howellii Antioch Dunes evening-primrose	PDONA0C0B4	Endangered	Endangered	G5T1	S1	1B.1
Oncorhynchus mykiss irideus steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Perdita scitula antiochensis Antioch andrenid bee	IIHYM01031	None	None	G1T1	S1	
Perognathus inornatus San Joaquin Pocket Mouse	AMAFD01060	None	None	G2G3	S2S3	
Phacelia phacelioides Mt. Diablo phacelia	PDHYD0C3Q0	None	None	G2	S2	1B.2
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Philanthus nasalis Antioch specid wasp	IIHYM20010	None	None	G1	S1	
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Plagiobothrys hystriculus bearded popcornflower	PDBOR0V0H0	None	None	G2	S2	1B.1
Potamogeton zosteriformis eel-grass pondweed	PMPOT03160	None	None	G5	S3	2B.2
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sanicula saxatilis rock sanicle	PDAPI1Z0H0	None	Rare	G2	S2	1B.2
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Serpentine Bunchgrass Serpentine Bunchgrass	CTT42130CA	None	None	G2	S2.2	
Sidalcea keckii Keck's checkerbloom	PDMAL110D0	Endangered	None	G2	S2	1B.1
Sphecodogastra antiochensis Antioch Dunes halcitid bee	IIHYM78010	None	None	G1	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Stabilized Interior Dunes Stabilized Interior Dunes	CTT23100CA	None	None	G1	S1.1	
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Streptanthus albidus ssp. peramoenus most beautiful jewelflower	PDBRA2G012	None	None	G2T2	S2	1B.2
Streptanthus hispidus Mt. Diablo jewelflower	PDBRA2G0M0	None	None	G2	S2	1B.3
Stuckenia filiformis ssp. alpina slender-leaved pondweed	PMPOT03091	None	None	G5T5	S3	2B.2
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Sink Scrub Valley Sink Scrub	CTT36210CA	None	None	G1	S1.1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 138

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: June 30, 2017
Consultation Code: 08ESMF00-2017-SLI-2515
Event Code: 08ESMF00-2017-E-06856
Project Name: The Ranch in Antioch

Subject: 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: 08ESMF00-2017-SLI-2515

Event Code: 08ESMF00-2017-E-06856

Project Name: The Ranch in Antioch

Project Type: DEVELOPMENT

Project Description: Project just south of the City of Antioch

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.948744865006795N121.79182431543035W

Counties: Contra Costa, CA

Endangered Species Act Species

There is a total of 17 threatened, endangered, or candidate species on your 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. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
San Joaquin Kit Fox *(Vulpes macrotis mutica)*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2873

Birds

NAME	STATUS
California Clapper Rail *(Rallus longirostris obsoletus)*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4240

NAME	STATUS
California Least Tern *(Sterna antillarum browni)*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/8104

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) *(Masticophis lateralis euryxanthus)*	Threatened

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/5524

NAME	STATUS
Giant Garter Snake *(Thamnophis gigas)*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4482

Amphibians

NAME	STATUS
California Red-legged Frog *(Rana draytonii)*	Threatened

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2891

NAME	STATUS
California Tiger Salamander *(Ambystoma californiense)*	Threatened

Population: U.S.A. (Central CA DPS)
There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2076

Fishes

NAME	STATUS
Delta Smelt *(Hypomesus transpacificus)*	Threatened

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Steelhead *(Oncorhynchus (=Salmo) mykiss)*	Threatened

Population: Northern California DPS
There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/1007

Insects

NAME	STATUS
San Bruno Elfin Butterfly *(Callophrys mossii bayensis)*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/3394

Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*	Threatened

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7850

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *(Branchinecta conservatio)*	Endangered

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp *(Branchinecta lynchi)*	Threatened

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	Endangered

There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2246

Flowering Plants

NAME	STATUS
Antioch Dunes Evening-primrose *(Oenothera deltoides ssp. howellii)*	Endangered
There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5970	
Contra Costa Goldfields *(Lasthenia conjugens)*	Endangered
There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7058	
Large-flowered Fiddleneck *(Amsinckia grandiflora)*	Endangered
There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5558	

Critical habitats

There are no critical habitats within your project area.

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

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

Search Criteria

Found in Quads 3812118, 3812117, 3812116, 3712188, 3712187, 3712186, 3712178 3712177 and 3712176;

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
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	4.2	S3S4	G5?T3T4
Anomobryum julaceum	slender silver moss	Bryaceae	moss		4.2	S2	G5?
Arabis blepharophylla	coast rockcress	Brassicaceae	perennial herb	Feb-May	4.3	S4	G4
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
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
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
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S2	G2
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	(Jan)Mar-Jun	4.2	S4	G4
California macrophylla	round-leaved filaree	Geraniaceae	annual herb	Mar-May	1B.2	S3?	G3?
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	1B.2	S2	G2
Calochortus umbellatus	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	Mar-May	4.2	S4	G4
Campanula exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	1B.2	S2	G2
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S2	G3T2
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jul-Nov	1B.2	S1	G2T1
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	2B.1	S2	G5T4

Collomia diversifolia	serpentine collomia	Polemoniaceae	annual herb	May-Jun	4.3	S4	G4
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	4.2	S4	G4
Cordylanthus nidularius	Mt. Diablo bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Aug	1B.1	S1	G1
Cryptantha hooveri	Hoover's cryptantha	Boraginaceae	annual herb	Apr-May	1A	SH	GH
Delphinium californicum ssp. interius	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	1B.2	S3	G3T3
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Dirca occidentalis	western leatherwood	Thymelaeaceae	perennial deciduous shrub	Jan-Mar(Apr)	1B.2	S2	G2
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eriastrum ertterae	Lime Ridge eriastrum	Polemoniaceae	annual herb	Jun-Jul	1B.1	S1	G1
Eriogonum nudum var. psychicola	Antioch Dunes buckwheat	Polygonaceae	perennial herb	Jul-Oct	1B.1	S1	G5T1
Eriogonum truncatum	Mt. Diablo buckwheat	Polygonaceae	annual herb	Apr-Sep(Nov-Dec)	1B.1	S2	G2
Eriophyllum jepsonii	Jepson's woolly sunflower	Asteraceae	perennial herb	Apr-Jun	4.3	S3	G3
Eryngium jepsonii	Jepson's coyote thistle	Apiaceae	perennial herb	Apr-Aug	1B.2	S2?	G2?
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2
Erysimum capitatum var. angustatum	Contra Costa wallflower	Brassicaceae	perennial herb	Mar-Jul	1B.1	S1	G5T1
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	S3	G3
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
Galium andrewsii ssp. gatense	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	Apr-Jul	4.2	S3	G5T3
Grimmia torenii	Toren's grimmia	Grimmiaceae	moss		1B.3	S2	G2
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
Hesperolinon breweri	Brewer's western flax	Linaceae	annual herb	May-Jul	1B.2	S2?	G2?
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Isocoma arguta	Carquinez goldenbush	Asteraceae	perennial shrub	Aug-Dec	1B.1	S1	G1
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	1B.1	S1	G1
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-	1B.2	S2	G5T2

				Sep)			
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	1B.1	S2	G2
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	2B.1	S2	G4G5
Madia radiata	showy golden madia	Asteraceae	annual herb	Mar-May	1B.1	S2	G2
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	(Apr)May-Sep(Oct)	1B.2	S2	G2
Monardella antonina ssp. antonina	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	Jun-Aug	3	S1S3	G4T1T3Q
Monolopia gracilens	woodland woolythreads	Asteraceae	annual herb	(Feb)Mar-Jul	1B.2	S3	G3
Navarretia gowenii	Lime Ridge navarretia	Polemoniaceae	annual herb	May-Jun	1B.1	S1	G1
Navarretia heterandra	Tehama navarretia	Polemoniaceae	annual herb	Apr-Jun	4.3	S4	G4
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	Onagraceae	perennial herb	Mar-Sep	1B.1	S1	G5T1
Phacelia phacelioides	Mt. Diablo phacelia	Hydrophyllaceae	annual herb	Apr-May	1B.2	S2	G2
Plagiobothrys hystriculus	bearded popcornflower	Boraginaceae	annual herb	Apr-May	1B.1	S2	G2
Potamogeton zosteriformis	eel-grass pondweed	Potamogetonaceae	annual herb (aquatic)	Jun-Jul	2B.2	S3	G5
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	4.2	S3	G4
Sanicula saxatilis	rock sanicle	Apiaceae	perennial herb	Apr-May	1B.2	S2	G2
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	2B.2	S2	G3
Senecio hydrophiloides	sweet marsh ragwort	Asteraceae	perennial herb	May-Aug	4.2	S3	G5
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	Brassicaceae	annual herb	(Mar)Apr-Sep(Oct)	1B.2	S2	G2T2
Streptanthus hispidus	Mt. Diablo jewelflower	Brassicaceae	annual herb	Mar-Jun	1B.3	S2	G2
Stuckenia filiformis ssp. alpina	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	2B.2	S3	G5T5
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Triquetrella californica	coastal triquetrella	Pottiaceae	moss		1B.2	S2	G2
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	1B.1	S1	G1
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	2B.3	S3?	G4G5

Suggested Citation

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ATTACHMENT C

Representative Site Photographs

Photo 1: Photo of annual grassland in the southwest portion of the Project Area, view north, 04/12/17.

Photo 2: Photo of the impoundment in the north-central portion of the Project Area, view north, 04/12/17.

Photo 3: Photo of an intermittent tributary (Sand Creek) in the western portion of the Project Area, view northwest, 04/12/17.

Photo 4: Photo of the cemented drainage channel in the northern portion of the Project Area, view east, 04/12/17.

Photo 5: Photo of a seasonal wetland pool, in the southcentral portion of the Project Area, view southwest, 04/12/17.

Photo 6: Photo of the bank along an intermittent tributary (Sand Creek) in the central portion of the Project Area, view west, 04/12/17.

Photo 7: Photo of a pond on the edge of the northwestern portion of the Offsite Infrastructure Areas, view south 08/22/17.

Photo 8: Photo of a drainage located in the southwestern portion of the Offsite Infrastructure Areas, view south, 08/22/17.

Photo 9: Photo the southwestern portion of the Offsite Infrastructure Areas, view west, 08/22/17.

Photo 10: Photo along the eastern edge of the southwestern portion of the Offsite Infrastructure Areas, view north, 08/22/17.

Photo 11: Photo of a seasonal wetland in the northwestern portion of the Offsite Infrastructure Areas, view south, 08/22/17.

Photo 12: Photo of a seasonal wetland swale in the northwestern portion of the Offsite Infrastructure Areas, view west, 08/22/17.

ATTACHMENT D

Wildlife Species Observed within the Study Area during the 2017 Site Visits

Attachment D

Wildlife Species Observed within the Study Area during the 2017 Site Visits

Species Name	**Scientific Name**
Reptiles	
California alligator lizard	*Elgaria multicarinata multicarinata*
Amphibians	
Sierran tree frog	*Pseudacris sierrae*
Western toad	*Anaxyrus boreas*
Birds	
American Crow	*Corvus brachyrhychos*
American kestrel	*Falco sparverius*
Anna's hummingbird	*Calypte anna*
Barn swallow	*Hirundo rustica*
Black phoebe	*Sayornis nigricans*
Bullock's oriole	*Icterus bullockii*
California scrub jay	*Aphelocoma californica*
European starling	*Sturnus vulgaris*
Great horned owl	*Bubo virginianus*
Green heron	*Butorides virescens*
House finch	*Haemorhous mexicanus*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Prairie falcon	*Falco mexicanus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Say's pheobe	*Sayornis saya*
Swainson's hawk	*Buteo swainsoni*
Tree swallow	*Tachycineta bicolor*
Turkey vulture	*Cathartes aura*
Western bluebird	*Sialia mexicana*
Western kingbird	*Tyrannus verticalis*
Western meadowlark	*Sturnella neglecta*
Mammals	
Black-tailed jackrabbit	*Lepus californicus*
California ground squirrel	*Otospermophilus beecheyi*

ATTACHMENT E

Live Oak and Associates, Inc. Jurisdictional Delineation of Waters of the U.S. for the Project Area

LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

INVESTIGATION OF WATERS OF THE UNITED STATES
COWAN PROPERTY
CONTRA COSTA COUNTY, CALIFORNIA

Live Oak Associates, Inc.

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June 3, 2014 File No. 1852-01

EXECUTIVE SUMMARY

Live Oak Associates, Inc. (LOA) investigated a 546-acre property (i.e., the study area) in Contra Costa County, California for waters of the United States (also referred to as jurisdictional waters) during the spring of 2014. The study area is located west of the intersection of Deer Valley Road and Snodgrass Lane in Contra Costa County, California. Jurisdictional waters generally include navigable waters, interstate drainages, impoundments of jurisdictional waters, tributaries to navigable and interstate waters, and wetlands adjacent to such waters. The Regulatory Branch of the U.S. Army Corps of Engineers (USACE) has jurisdiction over such waters per Section 404 of the Clean Water Act.

The study methodology was consistent with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corp of Engineers Wetland Delineatino Manual, Arid West Region (Version 2.0)* (USACE 2008). LOA plant/wetland/wildlife ecologist Jeff Gurule reviewed two previous wetland delineations verified by the USACE, and conducted a detailed field survey within the entire study area for possible waters of the United States. Mr. Gurule gathered vegetation, soils, and hydrology data at five sampling locations within and adjacent to such waters during field surveys conducted on April 8 and 24, 2014.

LOA delineated 3.948 acres of potentially jurisdictional waters within the study area. Areas of Sand Creek within ordinary high water (OHW) are considered potentially jurisdictional tributary waters to the San Joaquin River, a known water of the United States. Ephemeral tributary channels and their impoundments that are tributary to Sand Creek are also considered potentially jurisdictional waters, as are seasonal wetland pools and seeps adjacent to Sand Creek ephemeral tributary waters. Because these features are tributary to the San Joaquin River, a known water of the United States, these waters appear to meet the USACE regulatory definition of a water of the United States.

Other waters of the study area hydrologically isolated from Sand Creek and its ephemeral tributaries are unlikely to be classified as waters of the United States. These isolated waters, consisting of a wetland drainage, ephemeral drainage, and five seasonal wetland pools, would likely be considered waters of the State of California, and thus subject to the jurisdiction of the RWQCB, but not the USACE. LOA delineated 0.601 acres of isolated waters within the study area. Since these features have no obvious hydrologic connection to downstream waters of the U.S., they do not themselves appear to meet the regulatory definition of such waters.

No other portion of the study area would be considered a water of the United States. The remainder of the study area supported California grassland habitat and a small area of ruderal habitat all containing dominant upland vegetation. These other areas did not meet any of the technical criteria of jurisdictional wetlands.

TABLE OF CONTENTS

1.0 INTRODUCTION

Live Oak Associates, Inc. (LOA) surveyed an approximately 546-acre property in Contra Costa County (hereafter referred to as the study area) for waters of the United States and other jurisdictional waters (hereafter referred to as "jurisdictional waters") in April of 2014. The study area is located west of the intersection of Deer Valley Road and Snodgrass Lane in undeveloped lands located within the city limits of Antioch, California (Figure 1). The study area can be found on the Antioch South U.S. Geological Survey (USGS) 7.5 minute quadrangle in Township 1 North, Range 2 East, Sections 7 and 8 (Figure 2).

1.1 REGULATORY DEFINITION OF WATERS OF THE U.S.

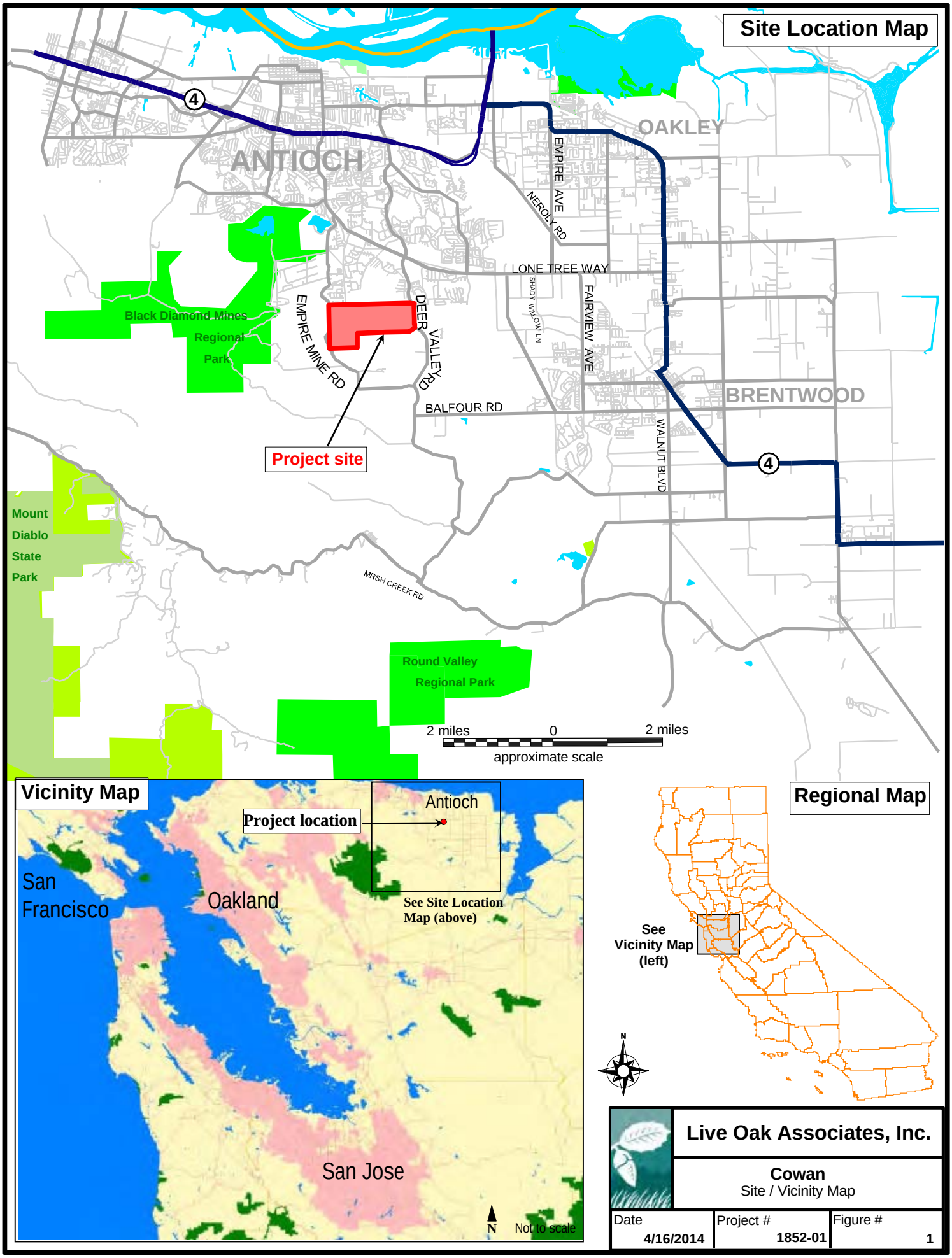
Section 404 of the federal Clean Water Act (CWA) regulates the discharge of dredged or fill material into "navigable waters" (33 U.S.C. §1344), defined in the CWA as "the waters of the United States, including the territorial seas" (33 U.S.C. §1362(7)). By regulation, the U.S. Army Corps of Engineers (USACE) has defined "waters of the United States" to mean:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or



Live Oak Associates, Inc.

Cowan
Site / Vicinity Map

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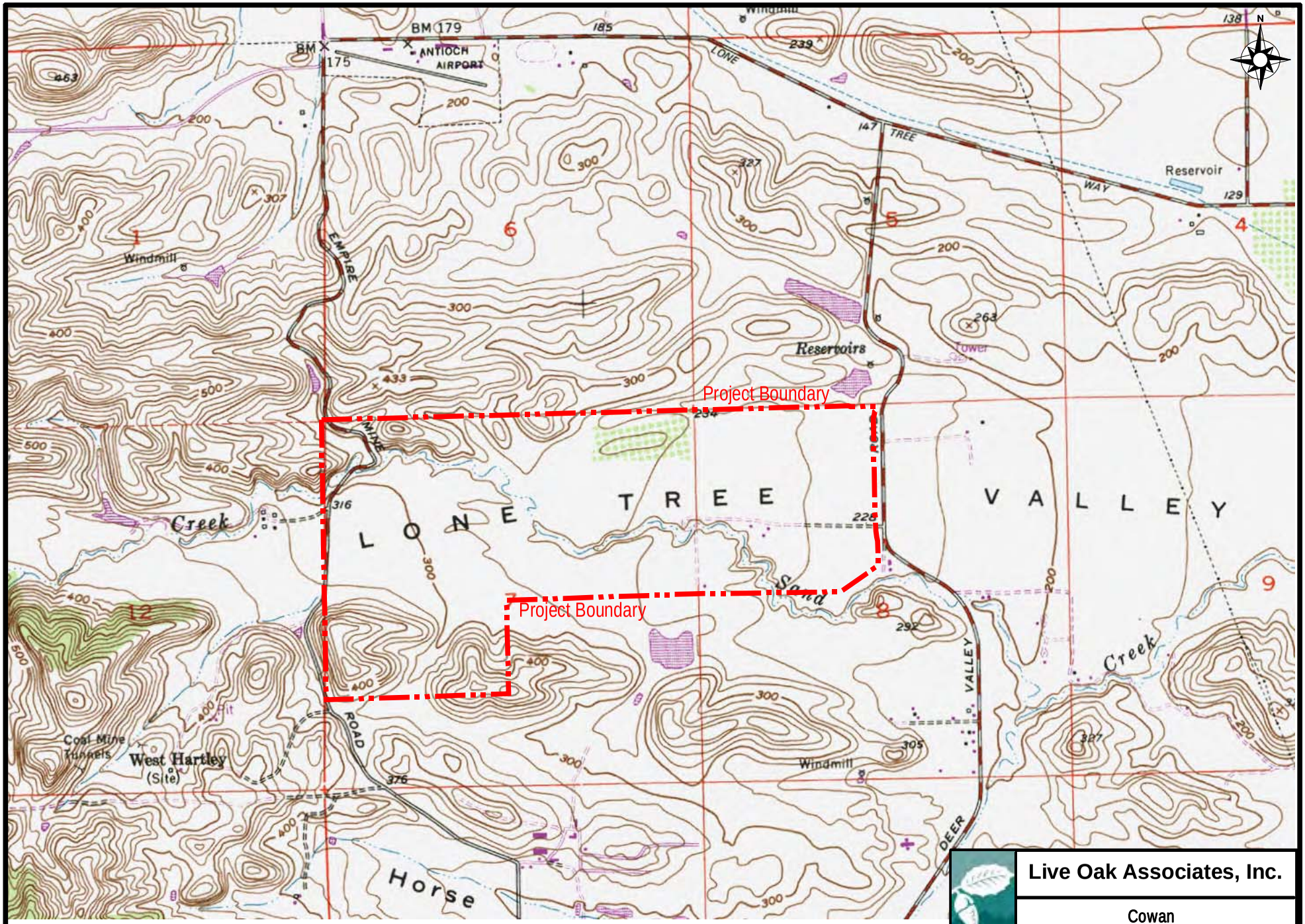

1 mile 0 1 mile

approximate scale

From USGS
Antioch South 7.5' Quadrangle 1980

Live Oak Associates, Inc.

Cowan
U.S.G.S. Quadrangle

Date	Project #	Figure #
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(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(iii) Which are used or could be used for industrial purpose by industries in interstate commerce;

(4) All impoundments of waters otherwise defined as waters of the United States under the definition;

(5) Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;

(6) The territorial seas;

(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section (33 CFR § 328.3(a) (3)).

"Waters of the United States" are subject to the jurisdiction of the USACE and, per provisions of Section 404 of the CWA, the discharge of fill into such waters requires a federal permit issued by the USACE.

1.2 SUPREME COURT DECISIONS AFFECTING THE DEFINITIONS OF WATERS OF THE UNITED STATES

A number of U.S. Supreme Court decisions have attempted to address the jurisdictional status of aquatic features that are not hydrologically connected to navigable waters or their tributaries, or where the hydrologic connection is so insignificant that destruction or modification of the aquatic feature would have little effect on downstream waters of the United States. These Supreme Court decisions are relevant to the analysis of aquatic features within the study area addressed by this report, because these aquatic features are not obviously connected to navigable waters downstream.

1.2.1 SWANCC Decision

In January of 2001, the U.S. Supreme Court ruled in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (the SWANCC decision) that "non-navigable, isolated,

intrastate" waters could not be claimed as jurisdictional by the USACE on the basis of their use by migratory birds. Although the Court did not specifically address the meaning of the word "isolated," it upheld the jurisdictional status of "adjacent" wetlands (and other waters), which are by definition wetlands that are "bordering, contiguous, or neighboring" other jurisdictional waters. Therefore, the term "isolated wetland" has implicitly been defined as 'wetlands that are not bordering, contiguous, or neighboring' other jurisdictional waters. This definition does not, however, address the degree of proximity necessary to establish that one wetland (or other water) is "adjacent" to a known jurisdictional water. As established by the Supreme Court in the *United States v. Riverside Bayview Homes, Inc.* in 1985, "wetlands separated from other waters by man-made dikes or barriers, natural river berms, beach dunes, and the like are 'adjacent wetlands.'"

1.2.2 Consolidated Carabell/Rapanos Decision

In June of 2006 the U.S. Supreme Court ruled in the consolidated cases of *June Carabell v. U.S. Army Corps of Engineers* and *John Rapanos v. United States* that wetlands are waters of the United States "if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.'" When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'

On June 5, 2007, the Environmental Protection Agency (EPA) and the USACE jointly issued guidance in interpreting the Carabell/Rapanos cases as they apply to the extent of federal jurisdiction covered by Section 404 of the Clean Water Act. The agencies revised this guidance memorandum on December 2, 2008. The key points of this guidance are that the EPA and the USACE: 1) will assert jurisdiction over traditional navigable waters, wetlands adjacent to traditional navigable waters, relatively permanent non-navigable tributaries of traditional navigable waters where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months), and wetlands that directly abut such tributaries; 2) will decide jurisdiction over relatively impermanent non-navigable tributaries of navigable waters, wetlands adjacent to such tributaries, and wetlands adjacent to but not directly abutting a relatively permanent non-navigable tributary, based on a fact-specific analysis to determine

whether they have a "significant nexus" with a traditional navigable water; and 3) generally will not assert jurisdiction over swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) or ditches excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water. In applying the "significant nexus" standard, the EPA and USACE will "assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters." "Significant nexus" includes consideration of hydrologic and ecological factors.

1.3 STATE OF CALIFORNIA JURISDICTION OVER AQUATIC FEATURES

The State of California also asserts jurisdiction over certain drainages and wetlands. The limits of jurisdiction vary slightly from those of the USACE. The California Department of Fish and Wildlife (CDFW) and the Regional Water Quality Control Board (RWQCB) are the two state regulatory agencies responsible for implementing state regulations that identify and protect waters of the state.

According to Section 1602 of the California Fish and Game Code, public and private entities may not substantially divert or obstruct the natural flow of any river, stream, or lake within the state. This section of Fish and Game Code establishes the State's interest in regulating construction activities in the "bed, channel, or bank" of a natural drainage or stream. A "stream" subject to the jurisdiction of the CDFW has been defined as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life" (California Code of Regulations, Title 14).

Since its inception, the RWQCB has had regulatory authority over activities affecting water quality in rivers, streams, lakes, and wetlands of the State. Shortly after the U.S. Supreme Court rendered its SWANCC Decision, the State Water Resources Control Board notified the Regional Boards that isolated waters, including wetlands, were subject to the jurisdiction of the State of California per provisions of the Porter-Cologne Water Quality Control Act (California Water

Code, Division 7). The Regional Boards, therefore, now assert jurisdiction over some isolated waters disclaimed as jurisdictional by the USACE.

2.0 METHODS

LOA wildlife/plant/wetland ecologist Jeff Gurule conducted surveys of the study area for jurisdictional waters on April 8 and 24, 2014. The field investigator used current and historical aerial photography, topographic maps, and two previously verified wetland delineation maps to guide the survey effort. The two previous delineation maps were created by two consulting firms other than LOA, one in 1998 and the other in 2003. The 1998 delineation was conducted by May Consulting Services during an El Nino year with above average rainfall amounts for the region. The 2003 delineation was conducted by Thomas Reid Associates during a year of normal to slightly above average rainfall for the region. The USACE verified both of the maps of jurisdictional waters generated at the time of the two previous investigations. Since LOA's jurisdictional waters investigation occurred during the third of three consecutive drought years, LOA deferred to the 2003 delineation in some instances when field indicators of hydrophytic vegetation were questionable. The verified 2003 delineation map prepared by Thomas Reid Associates is presented in Appendix A.

The surveys were consistent with guidelines found in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), *Minimum Standards for Acceptance of Preliminary Wetland Delineations* (USACE 2001), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). These surveys have been described in more detail below.

2.1 SURVEY METHODS FOR AREAS MEETING THE TECHNICAL CRITERIA OF JURISDICTIONAL WETLANDS

Wetlands are defined 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. Wetlands generally include swamps, marshes, bogs and similar areas" (Environmental Laboratory 1987). The diagnostic environmental characteristics of wetlands include hydrophytic vegetation, hydric soils, and a hydrology characterized by an aquic or peraquic moisture regime. Accordingly, LOA surveyed the site for wetland indicator plants, positive indicators of hydric soils and wetland hydrology.

Five sampling locations were selected within the study area to assess and collect vegetation, hydrology, and soils information associated with observed and previously mapped hydrologic features and adjacent upland areas. The location of the sample point within each hydrologic feature was selected to best represent the predominant characteristics of the entire feature. Vegetation, hydrology, and soils data were entered onto standard data sheets patterned after those used by the USACE for the Arid West Region. The data sheet for each numbered sampling location can be found in Appendix B. The numbered sampling locations have been identified on the map depicting the areas meeting the technical criteria of jurisdictional wetlands. Color photographs of each sampling location are presented in Appendix C.

Plants observed within a five foot radius of each sampling location were identified to species using *The Jepson Manual: Vascular Higher Plants of California, Second Edition* (Baldwin et al, 2012). The wetland indicator status of each species was obtained from the *2014 National Wetland Plant List, California* (ERDC/CRREL 2014).

Wetland indicator species are so designated according to their frequency of occurrence in wetlands.

OBLIGATE (OBL)	Probability to occur in wetland is >99%
FACULTATIVE WETLAND (FACW)	Probability to occur in wetland is between 67-99%
FACULTATIVE (FAC)	Probability to occur in wetland is between 33 to 67%
FACULTATIVE UPLAND (FACU)	Probability to occur in wetland is between 1 to <33%.
UPLAND (UPL)	Probability to occur in wetland is <1%

Hydrophytic vegetation is considered present when more than 50% of the dominant species at a given location are composed of obligate, facultative wetland and facultative plant species. However, the Arid West Supplemental Guidelines also incorporate an alternate prevalence index to be calculated in determining the presence of wetland vegetation if the dominance test is not met. A complete list of vascular plants identified on the study area during LOA surveys of the study area can be found in Appendix D.

Each sampling location was also examined for positive indicators of wetland hydrology and hydric soils. Evidence of wetland hydrology consisted of primary indicators such as surface water, watermarks, drift lines, sediment deposits, etc. Secondary indicators of wetland hydrology include drainage patterns in wetlands, watermarks (Riverine), drift lines (Riverine), sediment

deposits (Riverine), etc. In accordance with USACE guidelines, a soil pit 10" to 12" in depth was dug at all sampling locations. The soils excavated from each pit were also examined for low chromas, gleying, mottling, concretions, sulfidic odors, etc.

The boundaries of likely jurisdictional wetlands were mapped using a Trimble Geo XT GPS unit. LOA prepared the maps depicting likely jurisdictional wetlands using information collected in the field plus information generated in the 2003 investigation. This information was then overlaid on a recent aerial photograph from Google Earth.

2.2 SURVEY METHODS FOR TRIBUTARY WATERS

In the absence of adjacent wetlands, the limit of jurisdiction in navigable rivers and their tributaries, whether inter- or intrastate, extends to "ordinary high water" (OHW). OHW refers to "that line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

The term "channel" as used in this report refers to a drainage feature with a bed and defined bank. Where drainage channels are present on a given site, it is customary to walk the channel and take width measurements at a standard interval. Width measurements represent the channel width between OHW marks on opposing banks.

The field investigator visually inspected the site for physical characteristics of OHW in order to determine the extent of possible jurisdiction. Accumulation of leaf litter, debris and sediment along the banks of the drainages provided evidence of OHW.

The boundaries of likely tributary waters, like the boundaries for jurisdictional wetlands, were mapped using a Trimble Geo XT GPS unit. LOA prepared the maps depicting likely tributary waters using information collected in the field plus information generated in the 2003 investigation. This information was then overlaid on a recent aerial photograph from Google Earth.

3.0 RESULTS

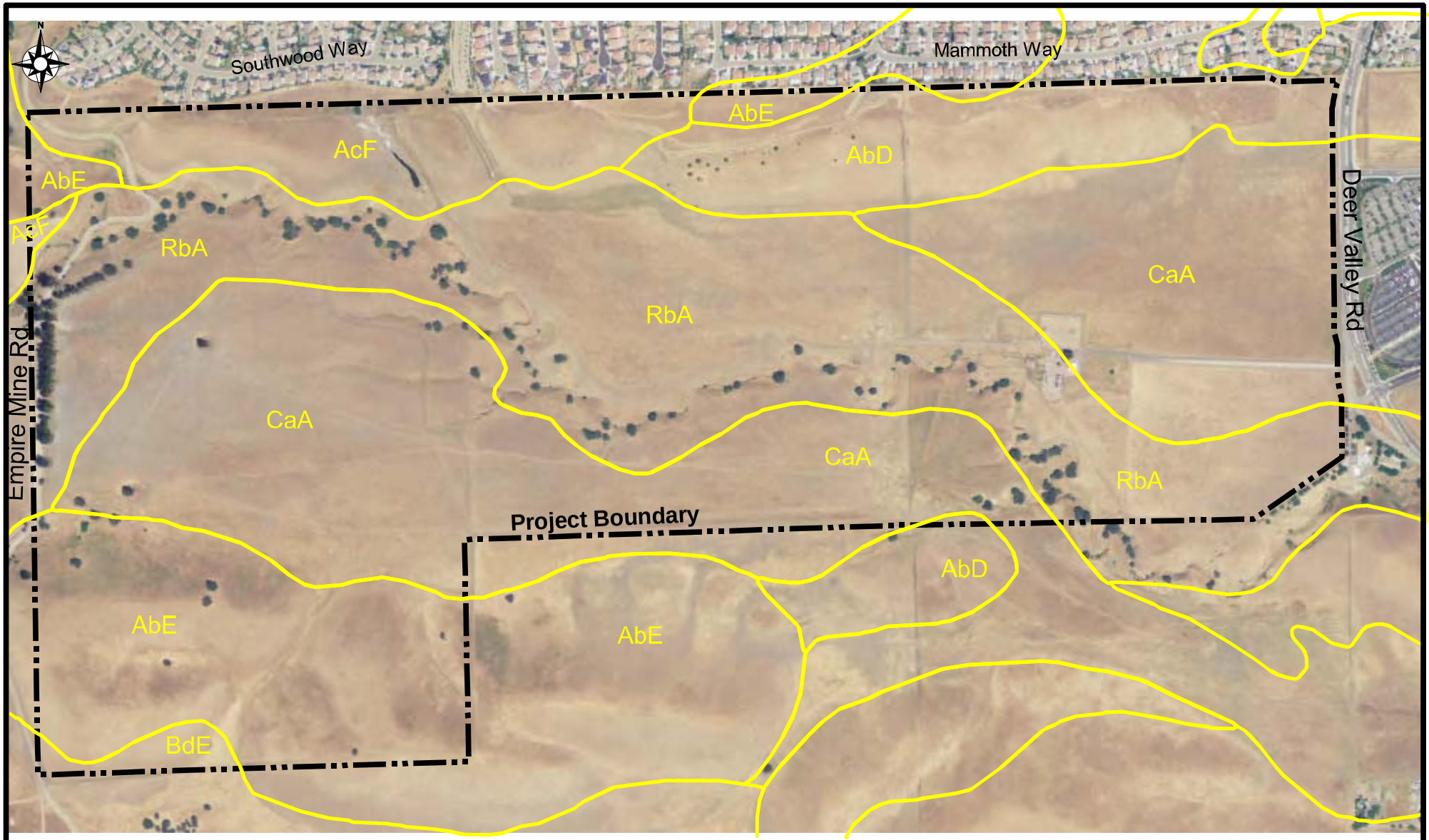
3.1 SETTING

The study area consists of a relatively broad valley containing non-native annual grassland with a few widely scattered trees. Elevations range from approximately 222 to 484 feet National Geodetic Vertical Datum (NGVD) (see Figure 4). The deeply incised Sand Creek channel and ephemeral tributaries occur within the valley floor. Oak trees occur sporadically along these drainage channels. Low hills occur north and south of the valley at the west end of the study area. Ruderal habitat occurs around an onsite ranch house, where soils are compacted and vegetation is limited to sparse weedy vegetation and limited landscape vegetation. A large eucalyptus tree was present in this ruderal area.

Current land use is cattle grazing. Land use directly adjacent to the study area is residential to the north, commercial to the east, and similar ranch land to the south and west.

The climatic conditions of the study area are typical of those found in San Joaquin/Sacramento River Delta region of California, where a Mediterranean climate prevails. Winters are cool and moist. Summers are hot and dry. Precipitation falls in the form of rain between October and May, with the heaviest amounts in December, January, February, and March. Annual precipitation is approximately 13 inches. The 2013/2014 precipitation year yielded only about 50% of average annual rainfall for the region, following two previous years of below average rainfall.

Six soil mapping units, Altamont clay, 9 to 15 percent slopes; Altamont clay, 15 to 30 percent slopes; Altamont-Fontana complex, 30 to 50 percent slopes; Briones loamy sand, 5 to 30 percent slopes; Capay clay, 0 to 2 percent slopes; and Rincon clay loam, 0 to 2 percent slopes, were located within the study area (NRCS 2014) (see Figure 3). Four of these six soils are considered hydric and, within depressions, may support hydrophytic vegetation. Soils at the northern edge of the study area have been modified through the placement of fill material over native soils, presumably during the construction of a large residential development immediately north of the study area (see Photo 6 in Appendix C).



LEGEND

Abd	Altamont clay, 9 to 15% slopes
AbE	Altamont clay, 15 to 30% slopes
AcF	Altamont-Fontana complex, 30 to 50% slopes
BdE	Briones loamy sand, 5 to 30% slopes
CaA	Capay clay, 0 to 2% slopes
RbA	Rincon clay loam, 0 to 2% slopes

Source:
U.S. Dept. of Agriculture, Natural Resources Conservation Service
U.S. Dept. of Agriculture, Aerial Photography Field Office

500' 0 500 feet
approximate scale

Live Oak Associates, Inc.

Cowan
Soils

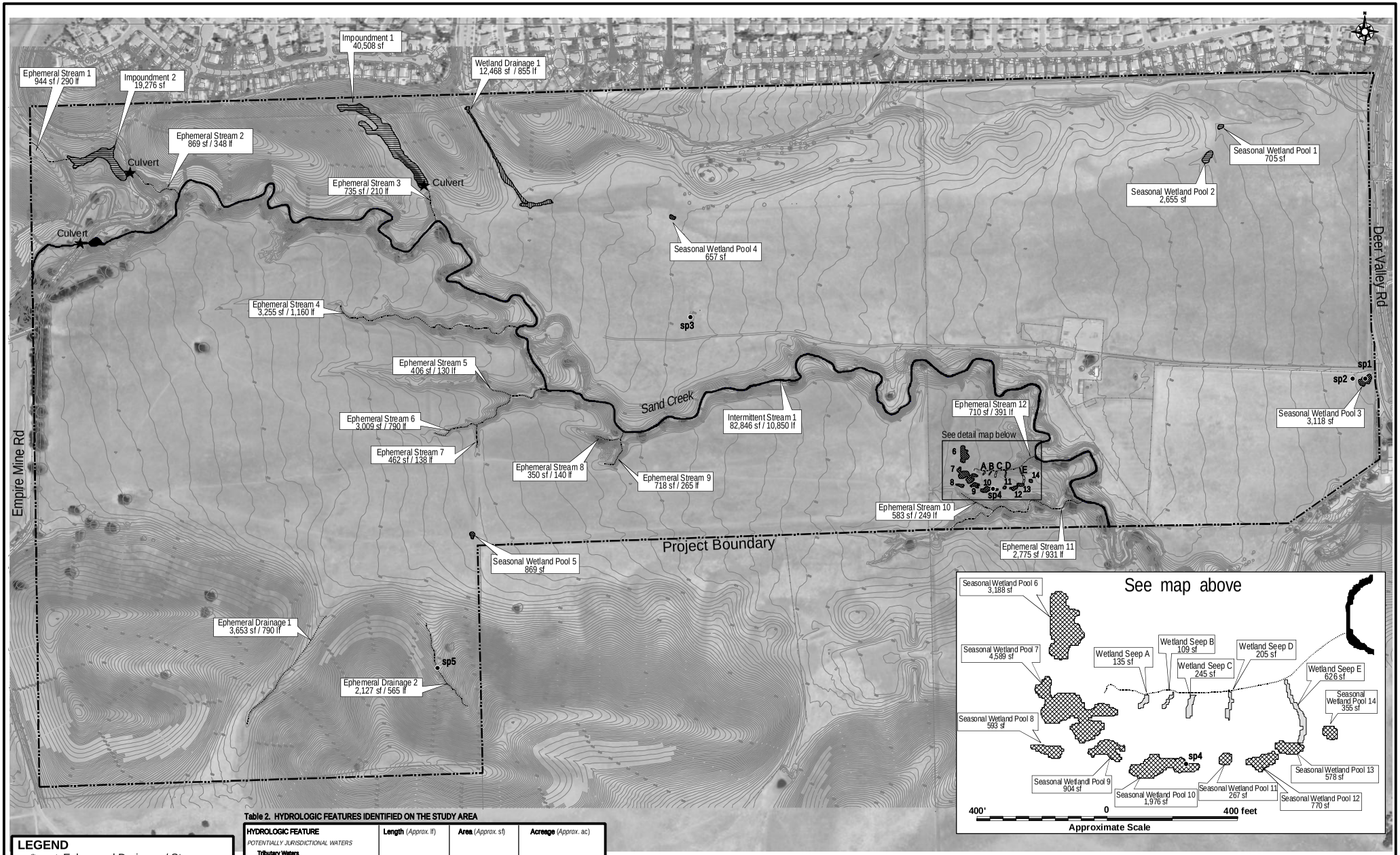
Date	Project #	Figure #
4/14/2014	**1852-01**	**3**

TABLE 1. SOILS OF THE STUDY AREA					
SOIL	**Map Symbol**	**Percent of Study Area**	**Parent Material**	**Drainage Class**	**Hydric**
Altamont clay, 9 to 15 percent slopes	AbD	9.1	Residuum weathered from sandstone and shale	Well drained	No
Altamont clay, 15 to 30 percent slopes	AbE	14.1	Residuum weathered from sandstone and shale	Well drained	Yes
Altamont-Fontana complex, 30 to 50 percent slopes	AcF	7.8	Residuum weathered from sandstone and shale	Well drained	Yes
Briones loamy sand, 5 to 30 percent slopes	BdE	1.1	Residuum weathered from sandstone	Well drained	No
Capay clay, 0 to 2 percent slopes	CaA	37.0	Alluvium derived from sedimentary rock	Moderately well drained	Yes
Rincon clay loam, 0 to 2 percent slopes	RbA	30.9	Alluvium derived from sedimentary rock	Well drained	Yes

Detailed information pertaining to these soils can be found in Appendix E.

3.2 POTENTIAL WATERS OF THE UNITED STATES

Potential waters of the United States within the study area included tributary waters of the San Joaquin River (i.e. Sand Creek and its unnamed ephemeral tributaries and their impoundments) and adjacent wetlands with a hydrologic connection to tributary waters (i.e. vernal pools and wetland seeps) (Figure 4). The total area of potential waters of the United States delineated within the Study Area is 3.948 acres (Table 2).



LEGEND

- Ephemeral Drainage / Stream
- Intermittent Stream (*Sand Creek*)
- Wetland Seep
- Impoundment
- Wetland Drainage
- Seasonal Wetland Pools

Other Features

- Project Boundary 546 Ac
- Culvert
- Sample Point

Table 2. HYDROLOGIC FEATURES IDENTIFIED ON THE STUDY AREA

HYDROLOGIC FEATURE	Length (*Approx.* lf)	Area (*Approx.* sf)	Acreage (*Approx.* ac)
POTENTIALLY JURISDICTIONAL WATERS			
Tributary Waters			
Intermittent Stream (Sand Creek)	10,850	82,846	1.901
Ephemeral Stream (Tributary to Sand Creek)	5,042	14,816	0.340
Impoundment	N/A	59,784	1.372
Adjacent Wetlands			
Seasonal Wetland Pool	N/A	13,220	0.303
Wetland Seep	N/A	1,320	0.030
Sub-Total	15,892	171,986	3.948
POTENTIALLY NON-JURISDICTIONAL WATERS			
Non-Tributary Waters			
Ephemeral Drainage (1 & 2)	1,355	5,780	0.132
Isolated Wetlands			
Wetland Drainage	855	12,468	0.286
Seasonal Wetland Pools (1, 2, 3, 4, & 5)	N/A	8,004	0.183
Sub-Total	2,210	26,252	0.601
Total	18,102	198,238	4.551

Live Oak Associates, Inc.

Cowan Ranch
Potential Jurisdictional Waters

Date	Project #	Figure #
05/15/2014	1852-01	4

TABLE 2. POTENTIAL WATERS OF THE UNITED STATES DELINEATED WITHIN THE STUDY AREA.			
Hydrologic Feature	**Approximate length (lf)**	**Approximate Area ($ft.^2$)**	**Approximate Area (acres)**
Tributary Waters in Form of Channels and Impoundments on Channels			
Intermittent Stream (Sand Creek)	10,850	82,846	1.901
Ephemeral Stream (Tributary to Sand Creek)	5,042	14,816	0.340
Impoundment	N/A	59,784	1.372
Adjacent Wetlands			
Seasonal Wetland Pools	N/A	13,220	0.303
Wetland Seep	N/A	1,320	0.030
Total	**15,892**	**171,986**	**3.948**

Hydrologic features within the study area that meet the regulatory definition of a water of the United States are described below:

3.2.1 Non-Wetland Intermittent Stream (Sand Creek)

This stream channel was narrow with steep banks. The bed of the channel was well below the elevation of the surrounding valley floor. The bed was composed of soil. Cobbles and rocks were absent. Some areas of the channel bed supported upland herbaceous vegetation characteristic of surrounding grasslands. Other areas of the streambed were devoid of vegetation.

No portion of this channel met the technical criteria of jurisdictional wetlands. Wetland vegetation was absent. Herbaceous vegetation observed included barnyard barley (*Hordeum murinum* ssp. *leporinum*) (FACU), ripgut (*Bromus diandrus*) (UPL), and an identified species of mallow (*Malva sp.*) (UPL). Trees associated with Sand Creek primarily consisted of valley oak (*Quercus lobata*) (FACU) and blue oak (*Quercus douglasii*) (UPL). Hydric soils and evidence of wetland hydrology were absent.

The limits of potential jurisdiction were defined by ordinary high water marks on opposing channel banks as identified by shelving, exposed roots, scour marks, water stains, etc.


Incised Channel of Sand Creek

3.2.2 Non-wetland Ephemeral Stream

Twelve narrow ephemeral stream channels were identified within the Study Area that are tributary to Sand Creek. Together these ephemeral features occupy approximately 0.340 acres of the study area. These channels were characterized by a bed and bank, but hydrophytic vegetation was absent. Various vascular plant species were observed that included many of the same species observed in the surrounding non-native grasslands. Soils in one soil pit found the soils to be hydric with a matrix color of 10YR 3/4 across 60% of the soil and redox features with a color of 5YR 4/4 occupying 40% of the soil. Other than the single secondary indicator of "Drainage Patterns", hydrology indicators were absent. See Sample Point 5 datasheets in Appendix B for detailed information.


Ephemeral Stream

3.2.3 Impoundment

Two impoundments of ephemeral drainages occupy 1.372 acres of the study area. Impoundment 1 was created as a stock pond for grazing cattle. Impoundment 2 was created as a result of the construction of the Empire Mine Road and the high placement of a culvert through the road fill. These areas were partially inundated during the 2014 investigation.

Historic aerial photography revealed fluctuating levels of inundation depending on the year and the season the photograph was taken. Seasonally inundated or saturated areas supported little vegetation at Impoundment 1 and a dense covering of saltgrass (*Distichlis spicata*) (FAC) with patches of common spikerush (*Eleocharis macrostachya*) (FACW) at Impoundment 2. These features were delineated by a combination of OHW marks and the limits of dominant wetland vegetation.


Impoundment

3.2.4 Seasonal Wetland Pools

Nine small seasonal pools with a total area of approximately 0.303 acres occupy small topographic depressions of the Study area just south of Sand Creek (Seasonal Wetland Pools 6, 7, 8, 9, 10, 11, 12, 13, 14 on Figure 4). The depressions within which these pools form collect surface runoff during the rainy season, which is discharged into Sand Creek via an ephemeral drainage when the pools are full. These depressions appeared to be mostly human-made. The boundaries of these pools consisted of bermed edges that were created in the past for some unknown reason.

These seasonal wetland pools met the technical criteria of jurisdictional wetlands. Wetland plants observed within these pools included species endemic to vernal pools of the region such as slender popcorn flower (*Plagiobothrys stipitatus*) (OBL), slender woolly marbles (*Psilocarphus tenellus*) (OBL), coyote thistle (*Eryngium vaseyi*) (FACW), spiny buttercup (*Ranunculus muricatus*) (FACW), and perennial ryegrass (*Festuca perennis*) (FAC). Some pools contained little to no vegetation. All of the pools observed were dry at the time of the 2014 field survey, which was not surprising given the drought conditions. Soil pits dug within representative pools revealed low soil matrix chromas and redox features. These soil characteristics met hydric soils

criteria. The presence of reduced iron and/or oxidized root channels were indicators of past inundation. See Sample Point 1 and Sample Point 4 datasheets in Appendix B for detailed information.

3.2.5 Wetland Seep

A few small areas occupying approximately 0.030 acres at the head of Ephemeral Stream 12 were delineated as seeps in 2003. During the 2014 investigation these areas were dry with widely scattered coyote thistle (FACW) as the only wetland vegetation observed. Given the drought conditions at the time of the 2014 survey, the areas delineated for these features in 2003 were used and presumed to be accurate and a much better representation of normal circumstances.

Wetland Seeps

3.3 ISOLATED WATERS

Isolated hydrologic features with no hydrologic connection to downstream waters of the United States included two non-wetland ephemeral streams, one wetland drainage, and 5 seasonal wetland pools. Approximately 0.601 acres of the site was composed of isolated waters.

TABLE 2. ISOLATED WATERS DELINEATED WITHIN THE STUDY AREA.			
Non-Tributary Waters			
Ephemeral Drainage	1,355	5,780	0.132
Isolated Wetlands			
Wetland Drainage	855	12,468	0.286
Seasonal Wetland Pools	N/A	8,004	0.183
Total	**2,210**	**26,252**	**0.601**

Hydrologic features within the study area that were considered to be isolated and not meeting the regulatory definition of a water of the United States are described below:

3.3.1 Ephemeral Drainage

Two ephemeral drainages were identified within the study area that are not tributary to Sand Creek or any other known or potential water of the U.S. Like other ephemeral streams of the site, these did not meet the technical criteria of jurisdictional wetlands.

3.3.2 Wetland Drainage

A relatively steep wetland drainage was present at the north need of the study area. This drainage receives water from a culvert discharging water from the residential development to the north of the study area. It appears that the residential development contains no jurisdictional waters or wetlands that this water could be hydrologically connected to. After exiting the culvert the water travels down a relatively steep drainage until it fans out in an easterly direction as it follows the easterly downgradient topography and completely dissipates in the valley floor. No evidence of any surface or subsurface connection to Sand Creek was observed. This drainage terminates approximately 400 feet upslope from Sand Creek.

This drainage contained a modest flow of water during the 2014 survey that flowed out of the three foot cement culvert emerging from the large residential development to the north. The drainage occupied approximately 0.286 acre of the Study Area. Vegetation within this area was dominated by fringed willowherb (*Epilobium ciliatum*) (FACW). The drainage consisted of a narrow and shallow incised channel that broadened out into an inundated/saturated swale. The

swale followed the contours of the valley floor and headed east away from Sand Creek until it gave way to upland grassland.

Wetland Drainage

3.3.3 Seasonal Wetland Pools

Five seasonal wetland pools were delineated that had no hydrologic connection to downstream waters of the United States. Like the nine seasonal pools described above, which are considered to be potential waters of the United States, these five pools met the technical criteria of jurisdictional wetlands and supported hydrophytic plant species. These five isolated seasonal pools are briefly described below:

Seasonal Wetland Pool 1 is a seasonally inundated area in a field corner where rainwater backs up against the edge of the field that is raised to create the adjacent roadbed. This area functions as a closed basin for rainwater that can escape only through evaporation and percolation.

Seasonal Wetland Pools 2 and 3 capture rainwater that sheet-flows northeast, away from Sand Creek, before it is stopped by low berms that create these two wetland pools.

Seasonal Wetland Pool 4 is a small shallow depression in the valley floor that appears to collect rainwater during normal or above average rainfall years. This pool is approximately 1,000 feet

from Sand Creek with the gradient of the land falling in an easterly direction parallel to Sand Creek.

Seasonal Wetland Pool 5 is also a small shallow depression in the valley floor; however, this pool is regularly disturbed by perimeter discing. It is located approximately 850 feet from the down gradient portion of Sand Creek.


Seasonal Wetland Pool 3.

3.4 OTHER AREAS OF THE STUDY SITE

Hydrophytic vegetation, wetland hydrology, and hydric soils were absent from the remainder of the Study Area, which comprised non-native annual grassland and ruderal habitats surrounding the onsite ranch house. Grasslands were dominated by annual grasses and forbs typical of the extensive non-native grassland habitats found throughout California's Central Valley and surrounding foothills. Most of the annual grasses and forbs are of European origin. Common grass species included ripgut brome (UPL), soft chess (*Bromus hordeaceus*) (FACU), barnyard barley (FACU), and wild oats (*Avena sp.*) (UPL). Typical forbs included bur clover (*Medicago polymorpha*) (FACU), Common gumplant (*Grindelia camporum*) (FACW), common fiddleneck (*Amsinckia intermedia*) (UPL), and red-stemmed filaree (*Erodium cicutarium*) (UPL). Ruderal areas contained compacted soils supporting little vegetation, which primarily consisted of landscaped vegetation and a large blue gum eucalyptus (*Eucalyptus globulus*) tree.

Hydric soil indicators were observed outside of depressions in grassland areas due to the clay soils and the NRCS hydric soils rating of these soils. The soil matrix exhibited Munsell color notations ranging from of 10YR 2/2, 10YR 3/3, and 5YR 5/2, with mottling occurring from 2 to 12 inches. See Sample Point 2 and 3 datasheets in Appendix B for detailed information.

4.0 DISCUSSION

The Cowan Ranch study area was examined for waters of the U.S. in the third year of a drought. The resulting dry conditions rendered the entire site a "problem area" where it was difficult to assess what exactly the vegetation and hydrology would have been in given areas had rainfall during the preceding winter (or winters) been closer to average. Rainfall had actually been approximately 50% of average during the preceding winter, and extreme drought can result in areas that typically support hydrophytic vegetation shifting to upland species. Furthermore, three years of extreme drought can obscure indicators of wetland hydrology. Drought conditions prevailing in the study area in 2014 required LOA to rely heavily on the previous delineations that were prepared based on fieldwork conducted in wetter years (i.e., 1998 and 2003).

LOA's final delineation map of 2014, however, departed from the 2003 delineation map prepared by Thomas Reid and Associates where several areas previously mapped as wetlands failed to meet any of the technical criteria of jurisdictional wetlands. These included three wetland areas previously mapped along the north boundary of the study area and a wetland in the middle of the study area immediately north of the main road through the ranch. Two of these wetlands are accounted for in the acreage table of the 2003 report as Vernal Pools #4 and #5; the other two are unnumbered and not included in the acreage table of the 2003 report. These four areas were found to consist of non-native annual grassland habitat in 2014 that was indistinguishable from surrounding grassland habitat.

In fact, areas mapped as Vernal Pool #4 and the small unnumbered vernal pool north of Vernal Pool #5 actually occur in elevated areas of the study area, not depressions. Vernal Pool #4 occurs in an elevated area at the location of a water well. LOA investigators believe that this pool was mapped on the basis of aerial photo signatures of an elevated area that were mistakenly thought to be a vernal pool in a depression, as the mapped boundaries of Vernal Pool #4 consistently match the signature of the elevated area on multiple historic aerial photographs. Similarly, the small unnumbered vernal pool north of Vernal Pool #5 corresponds to an elevated area consistently avoided during annual perimeter firebreak discing, as is often the practice around wetland depressions; this area may have appeared to the 2003 investigators as a wetland depression because of the discing pattern. The area previously mapped as Vernal Pool #5 lies in

the midst of fill material that was apparently placed along the northern boundary of the study area sometime in the 1990s during construction of the large residential subdivision to the north. No depression was observed in this area and, in fact, the mapped boundary of this vernal pool extends up the slope of a hill to the south and contains a road bed in 2003 aerial photographs (see Photo 4 in Appendix C). The small unnumbered pool along the northern boundary of the study area east of Vernal Pool #5 consists of a depression and remnant culvert that likely drained land within the study area prior to the placement of fill, which has completely disrupted historic drainage patterns in that portion of the study area. This depression was dominated by a dense stand of California brome (*Bromus carinatus*) (UPL) (see Photo 5 in Appendix C).

One previously undelineated wetland area was mapped as a result of LOA's 2014 investigation, which is identified as Seasonal Wetland Pool 3. LOA also mapped a wetland area that was previously delineated on the 1998 map but omitted from the 2003 map. This feature is labeled as Seasonal Wetland Pool 5 on the 2014 map.

Two ephemeral drainages in folds of hills south of Sand Creek are unconnected to any other drainage. Ephemeral flows in these drainages are expected to be extremely modest, even during the heaviest rain events, due to the small size of the watershed they drain. The ends of these drainages are over 1,000 feet from the nearest ephemeral tributary to Sand Creek.

Altogether, these seasonal wetland pools, ephemeral drainages, and wetland drainage total approximately 0.601 acres. LOA's investigation found these 0.601 acres to receive water generated in uplands that drain to uplands. LOA found no evidence of a hydrologic connection or any significant nexus between these features and a known or potential water of the U.S. Therefore, LOA believes these 0.601 acres do not meet the criteria of a water of the U.S.

All potential jurisdictional waters that LOA mapped on the site are hydrologically connected to Sand Creek, which joins Marsh Creek approximately four miles east of the study area. Marsh Creek then flows north until it joins the San Joaquin River, a known water of the U.S. Therefore, LOA believes these 3.948 acres of delineated waters meet the criteria of a water of the U.S.

LITERATURE CONSULTED OR CITED

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

Calflora. 2014. http://www.calflora.org/. Site accessed April and May 2014.

California Department of Fish and Game. 1995. California Fish and Game Code. Gould Publications. Binghamton, N.Y.

Cold Regions Research and Engineering Laboratory (ERDC/CRREL). 2014. *2014 National Wetland Plant List, California*

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Department of the Army. Washington D.C. 100 pp.

Guzy, Gary S. 2001. Memorandum. Supreme Court Ruling Concerning CWA Jurisdiction over Isolated Waters. U.S. Environmental Protection Agency.

May Consulting Services. 1998. *Delineation of waters of the United States of Five Properties in the Sand Creek Specific Plan Area, Antioch, Contra Costa County.*

Natural Resources Conservation Service, United States Department of Agriculture. 2014. Web Soil Survey. Available URL: "http://websoilsurvey.nrcs.usda.gov/app/".

Thomas Reid Associates. 2003. *Sand Creek Adult Community Project Wetland Delineation Report, Contra Costa County, California.*

Sawyer, J.O. and T. Keeler-Wolf. 2001. A Manual of California Vegetation. California Native Plant Society. Sacramento, CA

University of California Berkeley. 2014. Jepson Online Interchange for California floristics. http://ucjeps.berkeley.edu/interchange.html. Site accessed April and May 2014.

USACE. 2001. Minimum Standards for Acceptance of Preliminary Wetland Delineations. Department of the Army.

USACE. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. Department of the Army.

U.S. Department of Agriculture. Web Soil Survey. Internet website. http://websoilsurvey.nrcs.usda.gov/app/ Site accessed May 2014.

Wetland Training Institute, Inc. 1990. Federal Wetland Regulation Reference Manual. B.N. Goode and R.J. Pierce (eds.) WTI 90-1. 281p.

Wetland Training Institute, Inc.1995. Field Guide for Wetland Delineation; 1987 Corps of Engineers Manual, Glenwood, NM. WTI 02-1 143pp.

APPENDIX A: 2003 DELINEATION MAP

SAND CREEK ADULT COMMUNITY PROJECT WETLAND DELINEATION

600 300 0 600 Feet

1 inch equals 300 feet

PREPARED BY THOMAS REID ASSOCIATES, JUNE 21, 2004

APPENDIX B: WETLAND DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cowan Property City/County: Antioch Sampling Date: 4-24-14
Applicant/Owner: Dividend Homes / Richland Development Corp State: CA Sampling Point: 1
Investigator(s): Jeff Gurule Section, Township, Range: S 7+8, T 1N, R 2E
Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): None Slope (%): <2%
Subregion (LRR): C Lat: 607325.96 Long: 4200892.46 Datum: UTM
Soil Map Unit Name: Capay clay, 0 to 2% slopes NWI classification: None
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? No Are "Normal Circumstances" present? Yes ✓ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (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: Investigation occured in the 3rd of three consecutive drought years.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. None			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2. None			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Plagiobothyrus stipitatus	70	✓	FACW
2. Psilocarphus tenellus	4		OBL
3. Ranunculus muricatus	2		FACW
4. Grindelia camporum	1		FACW
5. Hordeum murinum	8		FACU
6.			
7.			
8.			
Total Cover:	85		
Woody Vine Stratum			
1.			
2. None			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

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.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: Dominant wetland veg present

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)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	95	5YR 3/4	5	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soils hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ 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): ~4" on 4-8-14

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation observed on 4-8-14

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cowan Property City/County: Antioch Sampling Date: 4-24-14
Applicant/Owner: Dividend Homes/Richland Development Corp. State: CA Sampling Point: 2
Investigator(s): Jeff Gurule Section, Township, Range: S 7&8, T1N, R2E
Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): None Slope (%): ≤2%
Subregion (LRR): C Lat: 607282.97 Long: 4200892.95 Datum: UTM
Soil Map Unit Name: Capay clay, 0 to 2% slopes NWI classification: None
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: Investigation occured in the 3rd of three consecutive drought years.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. None			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3. None			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Hordeum murinum	69	✓	FACU
2. Bromus hordeaceous	6		FACU
3. Medicago polymorpha	15		FACU
4. Erodium cicutarium	3		UPL
5. Festuca perenne	4		FAC
6. Grindelia camporum	1		FACW
7. Lepidium nitidum	1		FAC
8.			
Total Cover:	99		
Woody Vine Stratum			
1.			
2. None			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 0 (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 N/A	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.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: Dominant hydrophytic veg absent.

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)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	95	5YR 5/8	5	C	RC	clay loam	
3-12	10YR 2/2	100					" "	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soils indicators are present. Sample point within a soil type that is considered hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ 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:

Aside from the oxidized root channels, no other hydrology indicator was present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cowan Property City/County: Antioch Sampling Date: 4-24-14
Applicant/Owner: Dividend Homes/Richland Development Corp. State: CA Sampling Point: 3
Investigator(s): JG Section, Township, Range: S 7+8, T1N, R2E
Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): none Slope (%): <2%
Subregion (LRR): C Lat: 606141.51 Long: 4201009.62 Datum: UTM
Soil Map Unit Name: Rincon clay loam, 0 to 2% slope NWI classification: None
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: Does not meet wetland veg requirement. Investigation occured in the 3rd of three consecutive drought year

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. NA			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3. NA			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Hordeum murinum	59	✓	FACU
2. Festuca perenne	15		FAC
3. Lepidium nitidum	10		FAC
4. Amsinckia menziesii	1		UPL
5. Medicago polymorpha	3		FACU
6. Avena sp.	1		UPL
7. Grindelia camporum	10		FACW
8. Erodium cicutarium	1		UPL
Total Cover:	100		
Woody Vine Stratum			
1. NA			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	25	x 3 =	75
FACU species	62	x 4 =	248
UPL species	3	x 5 =	15
Column Totals:	100 (A)		358 (B)

Prevalence Index = B/A = 358/100 = 3.58

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.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: Dominant wetland veg absent.

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)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	85	5YR 3/4	15	C	M	Clay loam	
7-12	10YR 3/3	97	5YR 3/4	3	C	M	" "	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soils indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ 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:

Tail end of a very broad and shallow swale that contains the same vegetation as outside of swale.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cowan Property City/County: Antioch Sampling Date: 4-24-14
Applicant/Owner: Dividend Homes/Richland Development Corp. State: CA Sampling Point: 4
Investigator(s): JG Section, Township, Range: S 708, T1N, R2E
Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): None Slope (%): ≤2%
Subregion (LRR): C Lat: 606665.12 Long: 4200696.39 Datum: UTM
Soil Map Unit Name: Capay clay, 0 to 2% slopes NWI classification: None
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: Area meets 3 citeria of a wetland.
Investigation occured in the 3rd of three consecutive drought years.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. NA			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3. NA			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Festuca perrenae	60	✓	FAC
2. Bromus hordeaceous	5		FACU
3. Eryngium vaseyi	10		FACW
4. Erodium sicutarium	1		UPL
5. Medicago polymorpha	1		FACU
6. Trifolium hirtum	1		UPL
7.			
8.			
Total Cover: 78			
Woody Vine Stratum			
1. NA			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

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 NA	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.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:
Wetland veg is dominant.

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)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/4	85	5YR 3/4	15	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soils meet hydric criteria

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 Plowed Soils (C6)
- ___ 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)
- ___ Thin Muck Surface (C7)
- ___ 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:

Areas appear to be shallow man-made depressions, surrounded by berms.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Cowan City/County: Antioch Sampling Date: 4-24-14
Applicant/Owner: Dividend Homes/Richland Development Corp. State: CA Sampling Point: 5
Investigator(s): JG Section, Township, Range: S 7&8, T1N, R2E
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): 15
Subregion (LRR): C Lat: 605674.44 Long: 4200384.07 Datum: UTM
Soil Map Unit Name: Altamont Clay, 15 to 30% slopes NWI classification: None
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: Investigation occured in the 3rd of three consecutive drought years. Does not meet wetland veg criteria.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. NA			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2. NA			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Hordeum murinum	40	✓	FACU
2. Festuca perenne	37	✓	FAC
3. Bromus hordeaceous	2		FACU
4. Brassica sp.	20	✓	FACU
5. Amsinckia intermedia	1		UPL
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2. NA			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

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: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	37	x 3 =	111
FACU species	62	x 4 =	248
UPL species	1	x 5 =	5
Column Totals:	100 (A)		364 (B)

Prevalence Index = B/A = 3.64

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.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: Wetland veg not dominant.

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
0-12	10YR 3/4	60	5YR	40	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

Hydric soils indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- __ 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 Plowed Soils (C6)
- __ 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)
- __ Thin Muck Surface (C7)
- __ 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:

Area an ephemeral drainage. Mapped as such on 2003 delination.

APPENDIX C: SELECTED PHOTOGRAPHS OF THE STUDY AREA

Photo 1: Sample Point 1 in middle of seasonal wetland pool Sample Point 2 in grassland beyond to the left of the truck.

Photo 2: Sample Point 4

Photo 3: Sample Point 5

Photo 4: Upland area delineated as a vernal pool in 2003.

Photo 5: Another upland area delineated as a vernal pool in 2003.

Photo 6: Seasonal Wetland Pool 1 at center right is located in native topography and soils. To the left of the pool is a raised grade of fill that has created an earthen dam resulting in the creation of this pool.

APPENDIX D: VASCULAR PLANTS OF THE SAND CREEK STUDY AREA

APPENDIX D: VASCULAR PLANTS OF THE STUDY AREA

The plant species listed below have been observed on the study area during surveys conducted by Live Oak Associates, Inc. The USACE wetland indicator status of each plant has been shown following its common name.

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

APIACEAE – Carrot Family		
Conium maculatum	Poison Hemlock	FACW
Foeniculum vulgare	Fennel	UPL
Sanicula bipinnatifida	Purple Sanicle	UPL
Sanicula crassicaulis	Snake Root	UPL
ASCLEPIADACEAE – Milkweed Family		
Asclepias fascicularis	Narrow-leaved Milkweed	FAC
ASTERACEAE - Sunflower Family		
Achillea millefolium	Yarrow	FACU
Achyrachaena mollis	Blow Wives	FAC
Anthemis cotula	Mayweed	FACU
Artemisia douglasiana	Mugwort	FAC
Baccharis pilularis	Coyote Brush	UPL
*Carduus pycnocephalus*I	Italian Thistle	UPL
Calycadenia multiglandulosa	Sticky Western Rosinweed	UPL
Centaurea calcitrapa	Purple Star-thistle	UPL
Centaurea solstitialis	Yellow Star-thistle	UPL
Centromadia fitchii	Spikeweed	UPL
Centromadia pungens	Common Tarweed	UPL
Chamomilla suaveolens	Pineapple Weed	UPL
Cirsium arvense	Field Thistle	FACU
Cirsium vulgare	Bull Thistle	FACU
Cotula coronopifolia	Brass-buttons	OBL
Cynara cardunculus	Cardoon	UPL
Grindelia camporum	Common Gumplant	FACW
Hemizonia congesta	Hayfield Tarweed	UPL
Hesperevax sparsiflora var. *sparsiflora*	Erect Evax	UPL
Heterotheca grandiflora	Telegraph Weed	UPL
Holocarpha virgata	Virgate Tarweed	UPL
Lactuca serriola	Prickly Lettuce	FACU

Microseris douglasii	Douglas Microseris	FACU
Picris echioides	Bristly Ox-Tongue	FACU
Psilocarphus tenellus	Slender Woolly Marbles	OBL
Salsola tragus	Russian Thistle	FACU
Silybum marianum	Milk Thistle	UPL
Sonchus asper	Prickly Sow-thistle	FAC
Symphyotrichum chilensis	Chilean Aster	FAC
Wyethia helenioides	Gray Mule-ears	UPL
Xanthium spinosum	Spiny Cocklebur	FACU
Xanthium strumarium	Cocklebur	FAC
BORAGINACEAE – Borage Family		
Amsinckia intermedia	Common Fiddleneck	UPL
Cryptantha flaccida	Flaccid Cryptantha	UPL
Plagiobothrys nothofulvus	Rusty Popcornflower	FAC
Plagiobothrys stipitatus	Stipitate Popcornflower	FACW
BRASSICACEAE – Mustard Family		
Brassica nigra	Black Mustard	UPL
Brassica rapa	Field Mustard	FACU
Capsella bursa-pastoris	Shepherd's-purse	FACU
Hirschfeldia incana	Summer Mustard	UPL
Lepidium latifolium	Broad-leaf Peppergrass	FACW
Lepidium nitidum	Common Peppergrass	FAC
Raphanus sativa	Wild Radish	UPL
Sisymbrium officinale	Hedge Mustard	UPL
CARYOPHYLLACEAE – Pink Family		
Silene gallica	Windmill Pink	UPL
Spergularia marina	Saltmarsh Sand-spurry	OBL
Spergularia rubra	Ruby Sand-spurry	FAC
Stellaria media	Common Chickweed	FACU
CHENOPIACEAE – Goosefoot Family		
Chenopodium album	Lamb's-quarters	FACU
CONVOLVULACEAE – Morning Glory Family		
Convolvulus arvensis	Bindweed	UPL
CUCURBITACEAE – Gourd Family		
Marah fabaceus	California Man-Root	UPL
EUPHORBIACEAE – Spurge Family		
Croton setigerus	Dove Weed	UPL
Euphorbia spathulata	Spatulateleaf Spurge	FAC
FABACEAE – Legume Family		
Astragalus gambelianus	Gambel Milkvetch	UPL
Lathyrus vestitis	Woodland Pea	UPL
Lotus humistratus	Hill Lotus	UPL
Lotus scoparius	Deer Weed	UPL
Lotus wrangelianus	Calf Lotus	UPL
Lupinus bicolor	Bicolored Lupine	UPL
Lupinus microcarpus	Gully Lupine	UPL

Lupinus nanus	Sky Lupine	UPL
Lupinus succulentis	Arroyo Lupine	UPL
Medicago polymorpha	Bur Clover	FACU
Melilotus indica	Yellow Sweetclover	FACU
Trifolium albopurpureu	Rancheria Clover	FACU
Trifolium fucatum	Bull Clover	FACU
Trifolium hirtum	Rose Clover	UPL
Trifolium microcephalum	Smallhead Clover	FAC
Trifolium wildenovii	Tomcat Clover	FACW
Vicia benghalensis	Purple Vetch	UPL
Vicia sativa	Spring Vetch	FACU
Vicia villosa	Hairy Vetch	UPL
FAGACEAE – Oak Family		
Quercus agrifoli	Coast Live Oak	UPL
Quercus douglassii	Blue Oak	UPL
Quercus lobata	Valley Oak	FACU
GERANIACEAE – Geranium Family		
Erodium botrys	Broadleaf Filaree	FACU
Erodium cicutarium	Redstem Filaree	UPL
Geranium dissectum	Cutleaf Geranium	UPL
Geranium molle	Dove's-foot Geranium	UPL
HIPPOCASTANACEAE – Buckeye Family		
Aesculus californica	California Buckeye	UPL
IRIDACEAE – Iris Family		
Sisyrinchium bellum	Blue-eyed Grass	FACW
JUNCACEAE – Rush Family		
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	FACW
Juncus effusus	Common Rush	FACW
LAMIACEAE – Mint Family		
Marrubium vulgare	Horehound	UPL
Salvia mellifera	Black Sage	UPL
Trichostema lanceolatum	Vinegar Weed	FACU
LAURACEAE – Laurel Family		
Umbellularia californica	California Bay Laurel	FAC
LILIACEAE – Lily Family		
Brodiaea elegans	Elegant Harvest Brodiaea	FACU
Chlorogalum pomeridianum	Soap Plant	UPL
Dichelostemma capitatum	Bluedicks	FACU
Triteleia hyacinthina	White Triteleia	FAC
Triteleia laxa	Ithuriel's-spear	UPL
MALVACEAE – Mallow Family		
Malacothamnus fremontii	Fremont's Bush Mallow	UPL
Malva parviflora	Cheeseweed	UPL
Malvella leprosa	Alkali Mallow	FACU

MORACEAE – Mulberry Family		
Ficus carica	Fig	FACU
MYRTACEAE – Myrtle Family		
Eucalyptus globulus	Blue Gum	UPL
ONAGRACEAE – Evening Primrose Family		
Clarkia affinis	Small Clarkia	UPL
Clarkia purpurea	Winecup Clarkia	UPL
Epilobium ciliatum	Fringed Willowherb	FACW
PAPAVERACEAE – Poppy Family		
Eschscholzia californica	California Poppy	UPL
PLANTAGINACEAE – Plantago Family		
Plantago erecta	California Plantain	UPL
Plantago lanceolata	English Plantain	FAC
POACEAE - Grass Family		
Aira caryophyllea	Silver Hairgrass	UPL
Avena barbata	Slender Wild Oats	UPL
Avena fatua	Fat Wild Oats	UPL
Avena sativa	Cultivated Oats	UPL
Bromus diandrus	Ripgut	UPL
Bromus hordeaceus	Soft Chess	FACU
Bromus madritensis ssp. *rubens*	Red Brome	UPL
Cynodon dactylon	Bermuda Grass	FACU
Cynosurus echinatus	Hedgehog Dogtail Grass	UPL
Distichlis spicata	Salt Grass	FAC
Elymus caput-medusae	Medusa-head Grass	UPL
Festuca myuros	Rattail Fescue	UPL
Festuca perrene	Ryegrass	FAC
Hordeum marinum	Mediterranean Barley	FAC
Hordeum murinum ssp. *leporinum*	Barnyard Barley	FACU
Nassella pulchra	Purple Needlegrass	UPL
Phalaris paradoxa	Canary Grass	FAC
Polypogon monspeliensis	Rabbitsfoot Grass	FACW
POLEMONIACEAE – Phlox Family		
Navarretia nigelliformis ssp. radians	Shining Navarretia	FACW
POLYGONACEAE - Buckwheat Family		
Polygonum arenastrum	Knotweed	FACW
Rumex crispus	Curly Dock	FAC
POLYPODIACEAE – Polypody Family		
Polypodium californicum	California Polypody	UPL
PORTULACACEAE – Purslane Family		
Calandrinia ciliata	Red Maids	FACU
Claytonia perfoliata	Miner's Lettuce	FAC
PRIMULACEAE – Primrose Family		
Anagallis arvensis	Scarlet Pimpernel	UPL

PTERIDACEAE – Brake Family		
Pellaeaandro medifolia	Coffee Fern	UPL
Pentagramma triangularis	Goldback Fern	UPL
RANUNCULACEAE – Buttercup Family		
Delphinium hesperium	Western Larkspur	UPL
Ranunculus californicus	California Buttercup	NI
RHAMNACEAE – Buckthorn Family		
Rhamnus crocea	Redberry	UPL
ROSACEAE – Rose Family		
Rosa californica	California Wild Rose	FAC
RUBIACEAE – Madder Family		
Galium aparine	Common Bedstraw	FACU
SALICACEAE – Willow Family		
Salix gooddingii	Black Willow	FACW
SAXIFRAGINACEAE – Saxifrage Family		
Lithophragma affine	Woodland Star	UPL
SCROPHULARIACEAE – Snapdragon Family		
Bellardia trixago	Bellardia	UPL
Castilleja attenuata	Valley-tassels	UPL
Castilleja exserta ssp. *exserta*	Purple Owl's-clover	UPL
Mimulus aurantiacus	Sticky Monkeyflower	UPL
Veronica peregrina	Purslane Speedwell	OBL
SOLANACEAE – Nightshade Family		
Nicotiana glauca	Tree Tobacco	FAC
TYPHACEAE – Cattail Family		
Typha angustifolia	Slender Cattail	OBL
URTICACEAE – Nettle Family		
Urtica urens	Dwarf Nettle	UPL

APPENDIX E: SOILS INFORMATION

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Contra Costa County, California

AbD—Altamont clay, 9 to 15 percent slopes

Map Unit Setting

Elevation: 400 to 1,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 260 to 300 days

Map Unit Composition

Altamont and similar soils: 85 percent

Minor components: 15 percent

Description of Altamont

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 26 inches: slightly alkaline, clay
H2 - 26 to 48 inches: moderately alkaline, clay
H3 - 48 to 52 inches: , weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: CLAYEY (R015XD001CA)

Minor Components

Capay

Percent of map unit: 6 percent

Rincon

Percent of map unit: 4 percent

Fontana

Percent of map unit: 4 percent

Linne

Percent of map unit: 1 percent

AbE—Altamont clay, 15 to 30 percent slopes

Map Unit Setting

Elevation: 400 to 1,500 feet

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 260 to 300 days

Map Unit Composition

Altamont and similar soils: 85 percent
Minor components: 15 percent

Description of Altamont

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 26 inches: slightly alkaline, clay
H2 - 26 to 48 inches: moderately alkaline, clay
H3 - 48 to 52 inches: , weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: CLAYEY (R015XD001CA)

Minor Components

Capay

Percent of map unit: 5 percent

Rincon

Percent of map unit: 3 percent

Fontana

Percent of map unit: 3 percent

Unnamed
Percent of map unit: 2 percent

Linne
Percent of map unit: 2 percent

AcF—Altamont-Fontana complex, 30 to 50 percent slopes

Map Unit Setting
Elevation: 400 to 1,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 260 to 300 days

Map Unit Composition
Altamont and similar soils: 50 percent
Fontana and similar soils: 35 percent
Minor components: 15 percent

Description of Altamont

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile
H1 - 0 to 26 inches: slightly alkaline, clay
H2 - 26 to 48 inches: moderately alkaline, clay
H3 - 48 to 52 inches: , weathered bedrock

Properties and qualities
Slope: 30 to 50 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: STEEP CLAYEY (R015XD010CA)

Description of Fontana

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 16 inches: neutral, silty clay loam
H2 - 16 to 22 inches: neutral, silty clay loam
H3 - 22 to 26 inches: , weathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 36 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: STEEP CLAYEY (R015XD010CA)

Minor Components

Millsholm

Percent of map unit: 3 percent

Lodo

Percent of map unit: 3 percent

Capay

Percent of map unit: 3 percent

Rincon

Percent of map unit: 3 percent

Pescadero

Percent of map unit: 3 percent
Landform: Depressions

BdE—Briones loamy sand, 5 to 30 percent slopes

Map Unit Setting

Elevation: 500 to 1,000 feet
Mean annual precipitation: 14 to 20 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Briones and similar soils: 85 percent
Minor components: 14 percent

Description of Briones

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 13 inches: slightly acid, loamy sand
H2 - 13 to 32 inches: moderately acid, loamy sand
H3 - 32 to 36 inches: , weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: SANDY (R015XD055CA)

Minor Components

Gaviato

Percent of map unit: 7 percent

Unnamed

Percent of map unit: 5 percent

San ysidro
Percent of map unit: 2 percent

CaA—Capay clay, 0 to 2 percent slopes

Map Unit Setting
Elevation: 10 to 500 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition
Capay and similar soils: 85 percent
Minor components: 10 percent

Description of Capay

Setting
Landform: Basin floors, benches
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 36 inches: slightly alkaline, clay
H2 - 36 to 51 inches: slightly alkaline, clay
H3 - 51 to 72 inches: slightly alkaline, silty clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.7 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C

Minor Components

Rincon
Percent of map unit: 7 percent

Brentwood
Percent of map unit: 2 percent

Marcuse
Percent of map unit: 1 percent
Landform: Depressions

RbA—Rincon clay loam, 0 to 2 percent slopes

Map Unit Setting
Elevation: 50 to 500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 260 to 300 days

Map Unit Composition
Rincon and similar soils: 85 percent
Minor components: 15 percent

Description of Rincon

Setting
Landform: Benches
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 12 inches: neutral, clay loam
H2 - 12 to 29 inches: slightly alkaline, clay
H3 - 29 to 60 inches: moderately alkaline, silty clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C

Minor Components

Capay
Percent of map unit: 5 percent

Brentwood
Percent of map unit: 5 percent

Unnamed
Percent of map unit: 3 percent
Landform: Depressions

San ysidro
Percent of map unit: 2 percent

Data Source Information

Soil Survey Area: Contra Costa County, California
Survey Area Data: Version 9, Nov 25, 2013

ATTACHMENT F

U.S. Army Corps of Engineers Approved Jurisdictional Determination for the Project Area

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

February 23, 2016

Regulatory Division SPK-2003-00691

EPC Holdings 820 LLC (Richland Planned Communities)
Attn: Mr. Arron Ross-Swain
801 Ygnacio Valley Road
Walnut Creek, California 94596

Dear Mr. Ross-Swain:

We are responding to your January 13, 2016, request for an approved jurisdictional determination for the Ranch Residential Development site. The approximately 548-acre project site is located on Sand Creek, Latitude 37.946124°, Longitude -121.79362°, Antioch, Contra Costa County, California.

Based on available information, we concur with the estimate of waters of the United States, as depicted on the enclosed January 13, 2016, drawing prepared by Live Oak Associates Inc. Approximately 3.948 acres of waters of the United States, including wetlands, are present within the survey area. These waters are regulated under Section 404 of the Clean Water Act, since they are either tributary to Marsh Creek or adjacent to Sand Creek a tributary to Marsh Creek which is tributary to the San Joaquin River a traditionally navigable water.

The 1.111-acre of waters identified as "Ephemeral Drainage 1 and 2 (0.132 acre), Wetland Drainage (0.286 acre), Seasonal Wetland Pools 1, 2, 3, 4, 5, 15, 16, 17, 18, 19, and 20, (totaling 0.588 acre) and Non-wetland Seasonal Pools 1, 2, 3, and 4, (totaling 0.105 acre) " on the above drawing are intrastate isolated waters with no apparent interstate or foreign commerce connection. As such, these waters are not currently regulated by the Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, State, and local laws may apply to your activities. *In particular, you may need authorization from the California State Water Resources Control Board and/or the U.S. Fish and Wildlife Service.*

This determination is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331.

A Notification of Appeal Process (NAP) and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed

RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDO, 1455 Market Street, 2052B, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2003-00691 in any correspondence concerning this project. If you have any questions, please contact me at California Delta Branch, 1325 J Street, Room 1350, Sacramento, California 95814-2922, by email at *William.H.Guthrie@usace.army.mil*, or telephone at 916-557-5269. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

William Guthrie
Acting Chief, California Delta Branch

Enclosures

cc: (w/o encls)

Geoff Monk, Monk and Associates, 1136 Saranap Avenue, Suite Q, Walnut Creek, California 94595, Geoff@monkassociates.com

Ephemeral Tributary 1
944 sf / 290 lf

Impoundment 2
19,276 sf

Impoundment 1
40,508 sf

Wetland Drainage 1
12,468 sf / 855 lf

Non-wetland Seasonal
Pool 4 1,723 sf

Ephemeral Tributary 2
869 sf / 348 lf

Culvert

Seasonal Wetland
Pool 1 1705 sf

Non-wetland Seasonal
Pool 1 1,256 sf

Ephemeral Tributary 3
735 sf / 210 lf

Culvert

Seasonal Wetland
Pool 2 2,655 sf

Seasonal Wetland Pool 15
3,642 sf

Culvert

Deer Valley Rd

Seasonal Wetland Pool 4
657 sf

Seasonal Wetland
Pool 20 427 sf

Seasonal Wetland
Pool 19 594 sf

Seasonal Wetland
Pool 16 6,502 sf

Ephemeral Tributary 4
3,255 sf / 1,160 lf

Non-wetland Seasonal
Pool 3 639 sf

Seasonal Wetland
Pool 17 6,031 sf

sp3

Ephemeral Tributary 5
406 sf / 130 lf

Seasonal Wetland
Pool 18 410 sf

sp1

sp2

Sand Creek

Ephemeral Tributary 6
3,009 sf / 790 lf

Intermittent Tributary 1
82,846 sf / 10,850 lf

Ephemeral Tributary 12
710 sf / 391 lf

Seasonal Wetland Pool 3
3,118 sf

See detail map below

Ephemeral Tributary 7
462 sf / 138 lf

Ephemeral Tributary 8
350 sf / 140 lf

Ephemeral Tributary 9
718 sf / 265 lf

Non-wetland Seasonal
Pool 2 942 sf

Empire Mine Rd

Ephemeral Tributary 10
583 sf / 249 lf

Project Boundary

Ephemeral Tributary 11
2,775 sf / 931 lf

Seasonal Wetland Pool 5
869 sf

Ephemeral Drainage 1
3,653 sf / 790 lf

sp5

Ephemeral Drainage 2
2,127 sf / 565 lf

1,000' 0 1,000 feet
Approximate Scale

See map above

Seasonal Wetland Pool 6
3,188 sf

Seasonal Wetland Pool 7
4,589 sf

Wetland Seep A
135 sf

Wetland Seep B
109 sf

Wetland Seep C
245 sf

Wetland Seep D
205 sf

Wetland Seep E
626 sf

Seasonal
Wetland Pool 14
355 sf

Seasonal Wetland Pool 8
593 sf

sp4

Seasonal Wetlandl Pool 9
904 sf

Seasonal Wetland Pool 10
1,976 sf

Seasonal Wetland Pool 11
267 sf

Seasonal Wetland Pool 12
770 sf

Seasonal Wetland Pool 13
578 sf

400' 0 400 feet
Approximate Scale

LEGEND

- Ephemeral Drainage / Tributary
- Intermittent Tributary (*Sand Creek*)
- Wetland Seep
- Impoundment
- Wetland Drainage
- Seasonal Wetland Pools
- Non-wetland Seasonal Pools

Other Features

- Project Boundary 546 Ac
- Culvert
- Sample Point

Table 2. HYDROLOGIC FEATURES IDENTIFIED ON THE STUDY AREA

HYDROLOGIC FEATURE	Length (*Approx.* lf)	Area (*Approx.* sf)	Acreage (*Approx.* ac)
POTENTIALLY JURISDICTIONAL WATERS			
Tributary Waters			
Intermittent Tributary (Sand Creek)	10,850	82,846	1.901
Ephemeral Tributary (Tributary to Sand Creek)	5,042	14,816	0.340
Impoundment	N/A	59,784	1.372
Adjacent Wetlands			
Seasonal Wetland Pool (6, 7, 8, 9, 10, 11, 12, 13,14)	N/A	13,220	0.303
Wetland Seep	N/A	1,320	0.030
Sub-Total	15,892	171,986	3.948
POTENTIALLY NON-JURISDICTIONAL WATERS			
Non-Tributary Waters			
Ephemeral Drainage (1, 2)	1,355	5,780	0.132
Isolated Wetlands			
Wetland Drainage	855	12,468	0.286
Seasonal Wetland Pools (1, 2, 3, 4, 5, 15, 16, 17, 18, 19, 20)	N/A	25,609	0.588
Sub-Total	2,210	43,857	1.006
OTHER WATERS			
Non-wetland Seasonal Pool (1, 2, 3, 4)	N/A	4,559	0.105
Total	18,102	220,402	5.059

Verified 23-February-2016 WMH

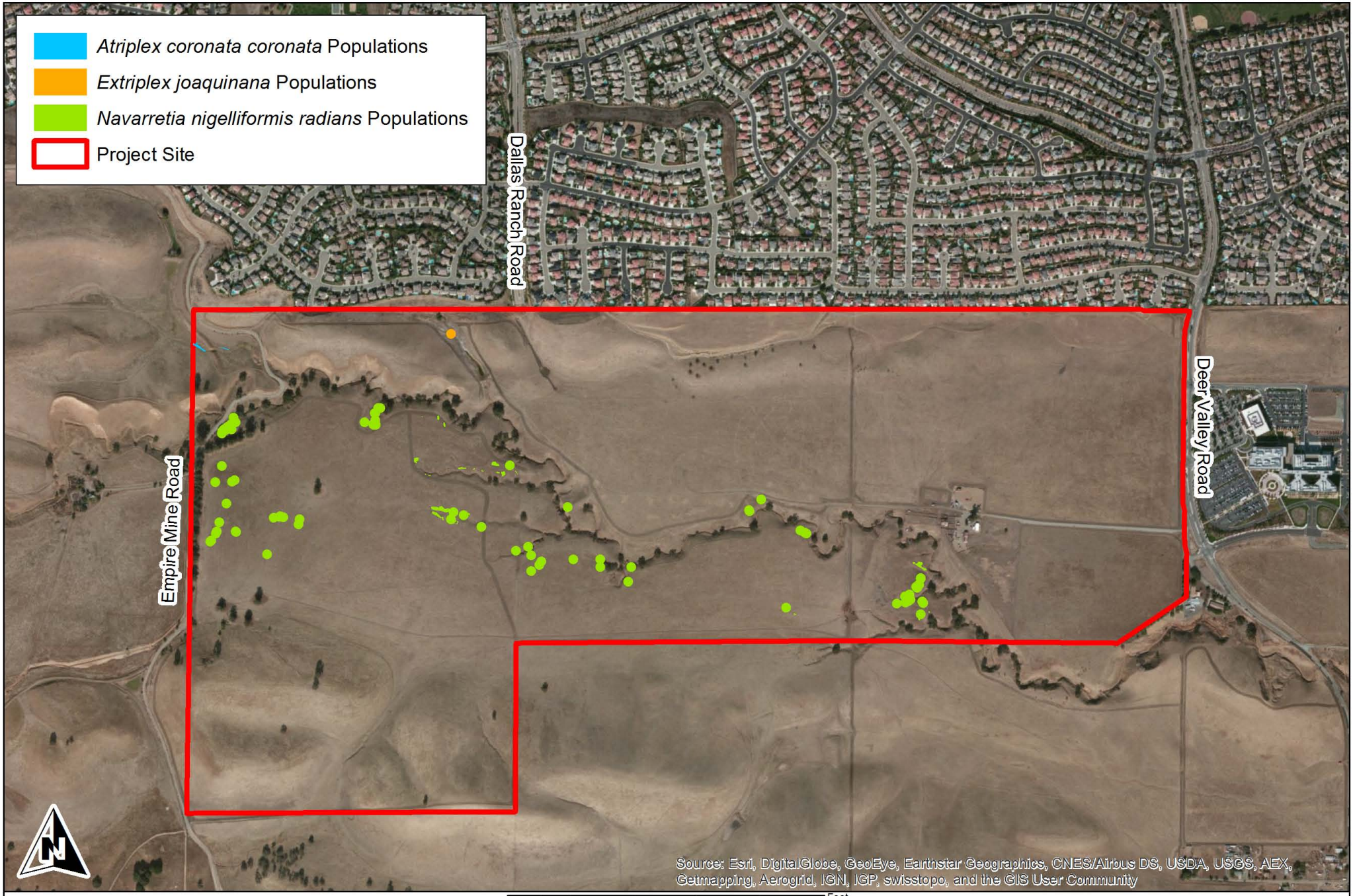
Live Oak Associates, Inc.

Cowan Ranch
Potential Jurisdictional Waters

Date	Project #	Figure #
01/13/2016	1852-01	4

ATTACHMENT G

Monk & Associates' Project Area Rare Plant Survey Results Figure



Monk & Associates
Environmental Consultants
1136 Saranap Avenue, Suite Q
Walnut Creek, California 94595
(925) 947-4867

Special-Status Rare Plant Populations on the
The Ranch Project Site
Antioch, California

Aerial Photograph Source: ESRI
Map Preparation Date: April 30, 2015