Appendix G-4

Aquatic Resources Delineation Report

SEQUOIA
Ecological Consulting, Inc.

Aquatic Resources Delineation Report
Shiloh Resort and Casino Property
Larkfield-Wikiup, Sonoma County, California

April 2022

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1.0 INTRODUCTION AND BACKGROUND

As contracted by Acorn Environmental for the Koi Nation of Northern California (Tribe; Property Owner), Sequoia Ecological Consulting, Inc. (Sequoia) is submitting this preliminary jurisdictional determination request to the U.S. Army Corps of Engineers (USACE) for the proposed Shiloh Resort and Casino (R&C) Project (Project) site, located in Larkfield-Wikiup, Sonoma County, California (Assessor's Parcel Number 059-300-003) (Figures 1 and 2). Sequoia's delineation of "waters of the United States" followed the U.S. Environmental Protection Agency and Department of the Army's 2020 *Navigable Waters Protection Rule* and USACE's 1987 *Wetlands Delineation Manual* and 2008 *Regional Supplement for the Arid West Region*. The Applicant proposes to acquire the Project site into federal trust as the initial reservation for the Koi Nation of Northern California, which will subsequently develop a resort and casino.

This report presents the results of the delineation of potential waters of the United States by Sequoia on February 23 and 24, 2022. Sequoia respectfully requests that USACE confirm whether the areas mapped on the Project site meet criteria as "wetlands" and "other waters" subject to USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA), through the use of a Preliminary Jurisdictional Determination (PJD). Sequoia understands that only USACE can determine the actual acreage of "waters of the United States" pursuant to Section 404 of the CWA.

1.1 Location And Setting

The Project site is located at 222 East Shiloh Road in Larkfield-Wikiup, a census-designated place in Sonoma County, California (Figures 1 and 2). The Project site is bordered by Shiloh Road on the north, existing vineyards on the east, a portion of Pruitt Creek and scattered residences on the south, and Old Redwood Highway on the west. The site is predominately occupied by vineyards bisected by an intermittent drainage, Pruitt Creek, and a single-family residence exists near the eastern property boundary. A gate on the western side of the property provides access from Old Redwood Highway and a paved driveway accessed from East Shiloh Road runs along the eastern edge of the property boundary and leads to the private dwelling.

1.2 Project Description

Sequoia understands that Acorn Environmental is preparing National Environmental Policy Act (NEPA) compliance documentation for the proposed Project on behalf of the Federal Bureau of Indian Affairs (federal Lead Agency). This confidential Project involves the acquisition of an approximately 60-acre site near the Town of Windsor into federal trust as the initial reservation for the Tribe, and the subsequent development of a resort and casino by the Tribe.

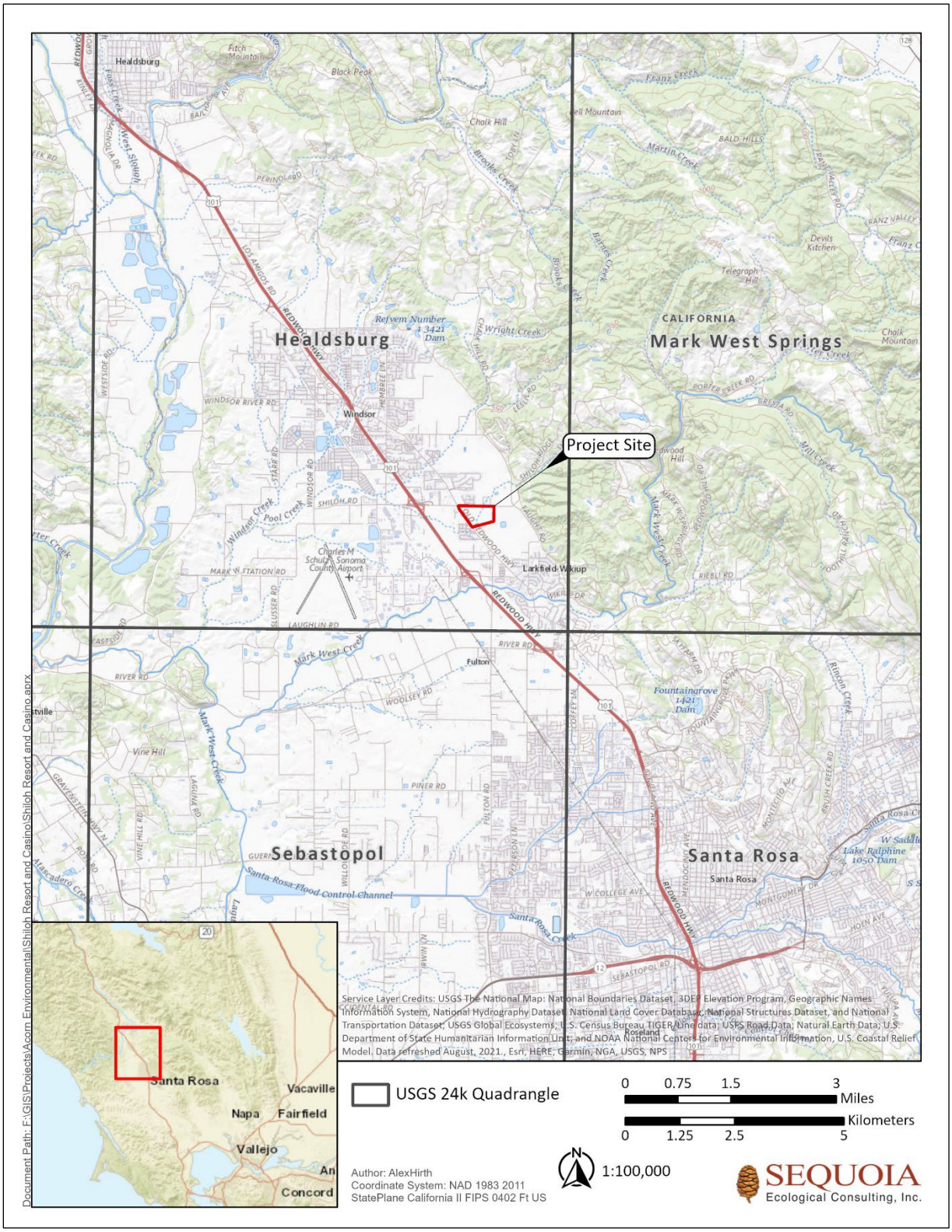


Figure 1. Regional Map of the Shiloh Resort and Casino Project Site.

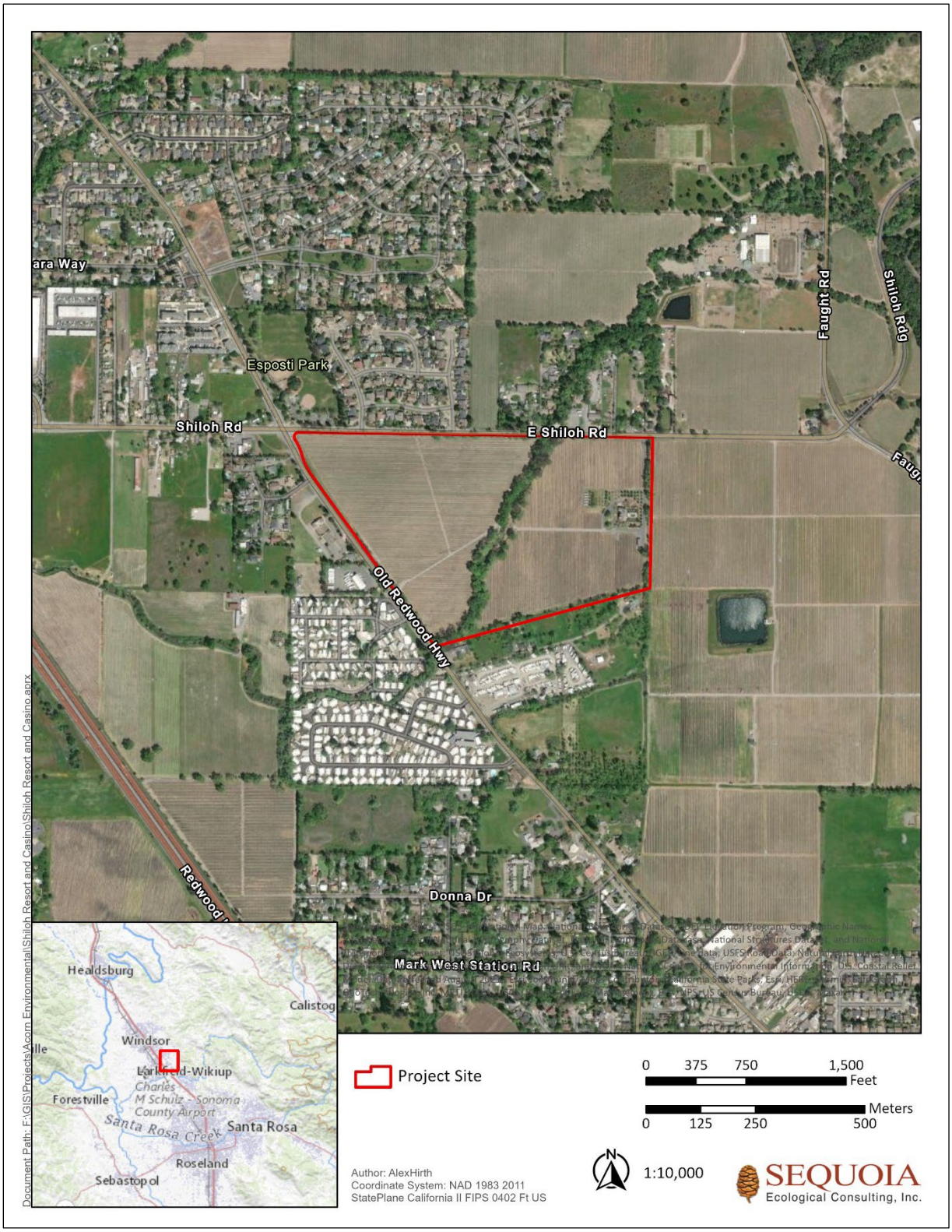


Figure 2. Location Map of the Shiloh Resort and Casino Project Site.

2.0 METHODS

Prior to the field delineation, available reference materials were reviewed, including the Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS 2022a), hydric soils lists (NRCS 2022b), the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI; USFWS 2022), the U.S. Geologic Survey (USGS) National Hydrography Dataset (NHD; USGS 2022), geologic data (California Geological Survey 2010), topographic maps, and aerial imagery. A routine-level aquatic resource delineation was conducted on the Project site on February 23 and 24, 2022.

The Project site was field-checked for indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. During the aquatic resource delineation, six sample points (three pairs) were taken on the Project site and recorded on USACE data forms provided in the *Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Arid West Manual; USACE 2008a). USACE data forms are included in Appendix A.

This aquatic resource delineation was conducted in accordance with the *Arid West Manual* and the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE Manual; Environmental Laboratory 1987). Based on the presence or absence of field indicators—including vegetation, hydrology, and soils—the limits of potential jurisdictional wetlands and other waters of the United States were determined. Potential jurisdictional wetlands and other waters were mapped with a Trimble GPS unit (sub-meter accuracy) and overlain on a digital orthophoto using ArcGIS mapping software (Appendix B).

2.1 Hydrophytic Vegetation

Hydrophytic vegetation is defined as "the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). In order to determine if hydrophytic vegetation is present, each plant species occurring in a sample plot is identified and assigned a wetland indicator status (Table 1) based on the *National Wetland Plant List* (USACE 2020).

Table 1. Wetland Plant Indicator Status.

Wetland Indicator Status	Definition
OBL – Obligate	Occur over 99% of the time in wetlands
FACW – Facultative wetland	Occur 33 to 67% of the time in wetlands
FAC – Facultative	Occur 50% of the time in wetlands
FACU – Facultative upland	Occur 1 to 33% of the time in wetlands
UPL - Upland	Occur less than 1% of the time in wetlands
NI – Non-indicator	No classification given due to lack of information

Plants that have an indicator status of OBL, FACW, and FAC are considered to be typically adapted for life in anaerobic soils conditions, and qualify as hydrophytic species for Section 404 delineations. If more than 50 percent of the dominant plant species present in a sample plot are classified as hydrophytic species (e.g., FAC or wetter), the area has met the hydrophytic vegetation criterion. Dominant species are selected using the "50/20 rule" (USACE 2008a).

2.2 Wetland Hydrology

Wetland hydrology "encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season sufficient to create anaerobic and reducing conditions" (Environmental Laboratory 1987). The jurisdictional wetland hydrology criterion is satisfied if the area supports "*14 or more consecutive days of flooding or ponding, or a water table 12 in. (30 cm) or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability)*" (USACE 2008a). If recorded data—such as stream, tidal gauge, or hydrologic monitoring—are lacking, field indicators are used to determine the presence of wetland hydrology. Field indicators include primary indicators, such as observed inundation or saturation, biotic crust, and oxidized rhizospheres on living roots; or secondary indicators, such as drainage patterns and FAC-neutral test. The presence of one primary indicator, or two secondary indicators, is sufficient to conclude that an area has wetland hydrology (USACE 2008a).

2.3 Hydric Soils

Hydric soils are defined by the Natural Resources Conservation Service as "soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil" (Federal Register 1994). Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation, or both, for more than a few days. Characteristic hydric soil indicators observable in the field include: histic epipedons; sulfidic material; aquic or preaquic moisture regime; reducing conditions; iron and manganese concretions; and soil colors (gleyed soils, soils with mottles and/or low chroma matrix). Color designations are determined by comparing a soil sample with a standard Munsell soil color chart (Munsell 2012). The presence of any one of the above listed field indicators is considered sufficient to meet the hydric soil criterion.

2.4 Other Waters of the U.S.

In addition to potential jurisdictional wetlands, this study evaluated the presence of any "Waters of the U.S." other than wetlands potentially subject to jurisdiction under Section 404 of the CWA. "Other Waters" are seasonal or perennial water bodies, such as lakes, stream channels, drainages, ponds, and other surface water features that exhibit an Ordinary High Water Mark (OHWM) but lack positive indicators of one or more of the three wetland parameters (hydrophytic vegetation, wetland hydrology, hydric soils) (Federal Register 1986). In non-tidal "other waters," USACE jurisdiction extends to the

OHWM, defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressions on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris" (Federal Register 1986; USACE 2005; 2008b).

2.5 Waters of the State

All potential aquatic resources observed on the study area were delineated during the field visits. Areas that may be exempt from USACE jurisdiction (discussed in Section 5.1), but may be included as Waters of the State under the State Water Resources Control Board's (SWRCB) *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (which took effect May 28, 2020) or the Porter-Cologne Water Quality Control Act, were identified during the delineation. Final regulatory jurisdiction would need to be determined by the applicable agencies.

3.0 ENVIRONMENTAL SETTING

3.1 Topography and Hydrology

The Project site is located within the Santa Rosa Plain and accordingly its topography is relatively flat overall, with gradual elevational changes trending from northeast to southwest; elevation is highest in the northeastern corner of the Project site, at 165 feet above sea level, and decreases to 137 feet above sea level in the northwestern corner and 147 feet above sea level in the southeastern corner. This topographic trend is further defined by Pruitt Creek, a blue line stream that enters the Project site from the north via a box culvert below Shiloh Road and flows diagonally south-southwest across the site (Figure 3). The southernmost extent of Pruitt Creek exits the Property boundary and continues above ground on a separate parcel before exiting via a box culvert under Old Redwood Highway. This feature is predominantly fed by offsite water sources but sheet flow runoff from precipitation or other on-site sources may contribute to the creek's hydrology. Additionally, sheet flow from direct precipitation and irrigation runoff feeds a roadside drainage ditch that flows parallel to Old Redwood Highway, along the western boundary of the Project site.

3.2 Soils

Four soil types occur within the Project site, as mapped by the NRCS (Figure 3). The mapped soil units are HtA: Huichica loam 0 to 2 percent slopes, RnA: Riverwash, HuB: Huichica loam, ponded, 0 to 5 percent slopes, and YsA: Yolo silt loam, 0 to 5 percent slopes (NRCS 2022). Test pits dug by Sequoia at each sample site confirmed that soils were consistent with the soil descriptions provided by the NRCS.

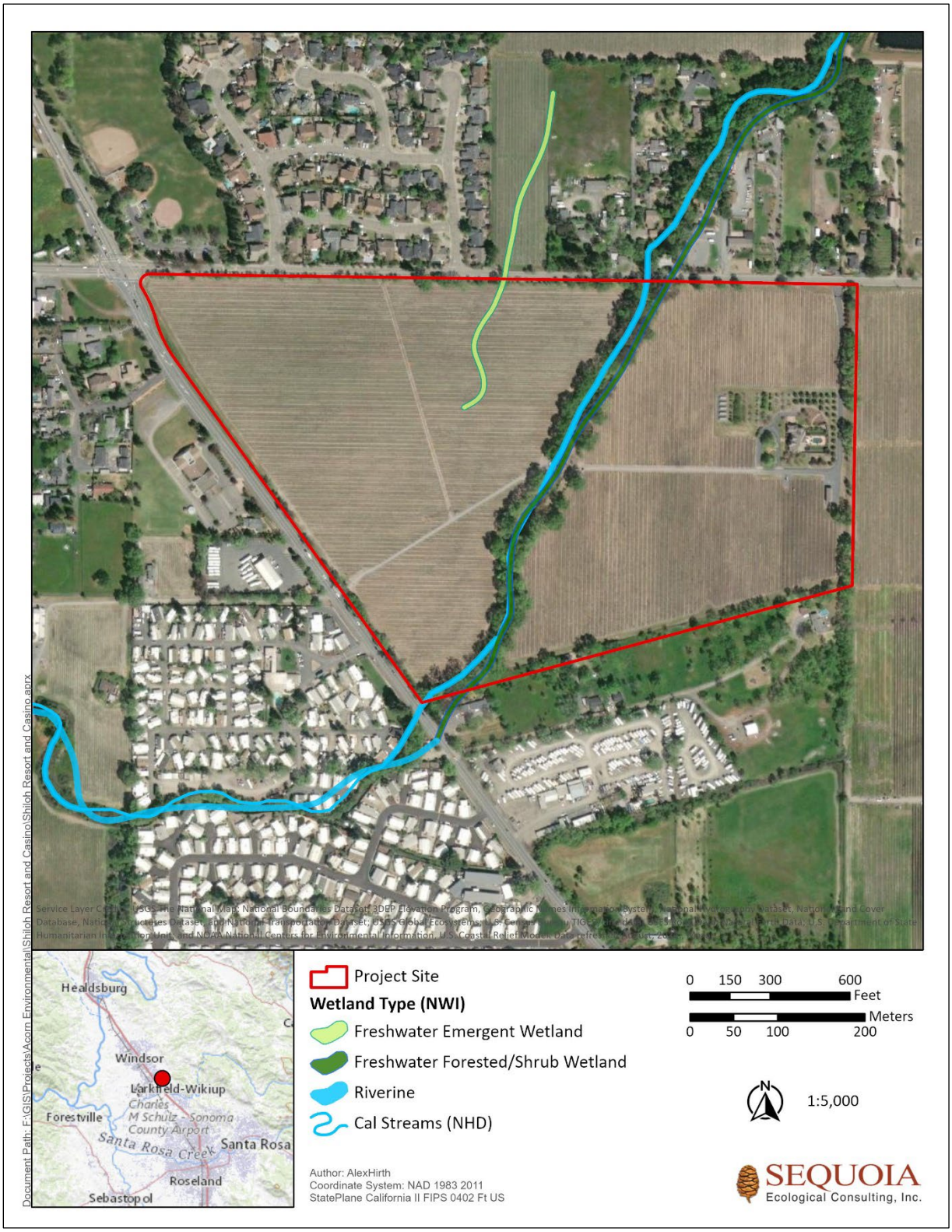


Figure 3. National Wetlands Inventory Map for the Shiloh Resort and Casino Project Site.

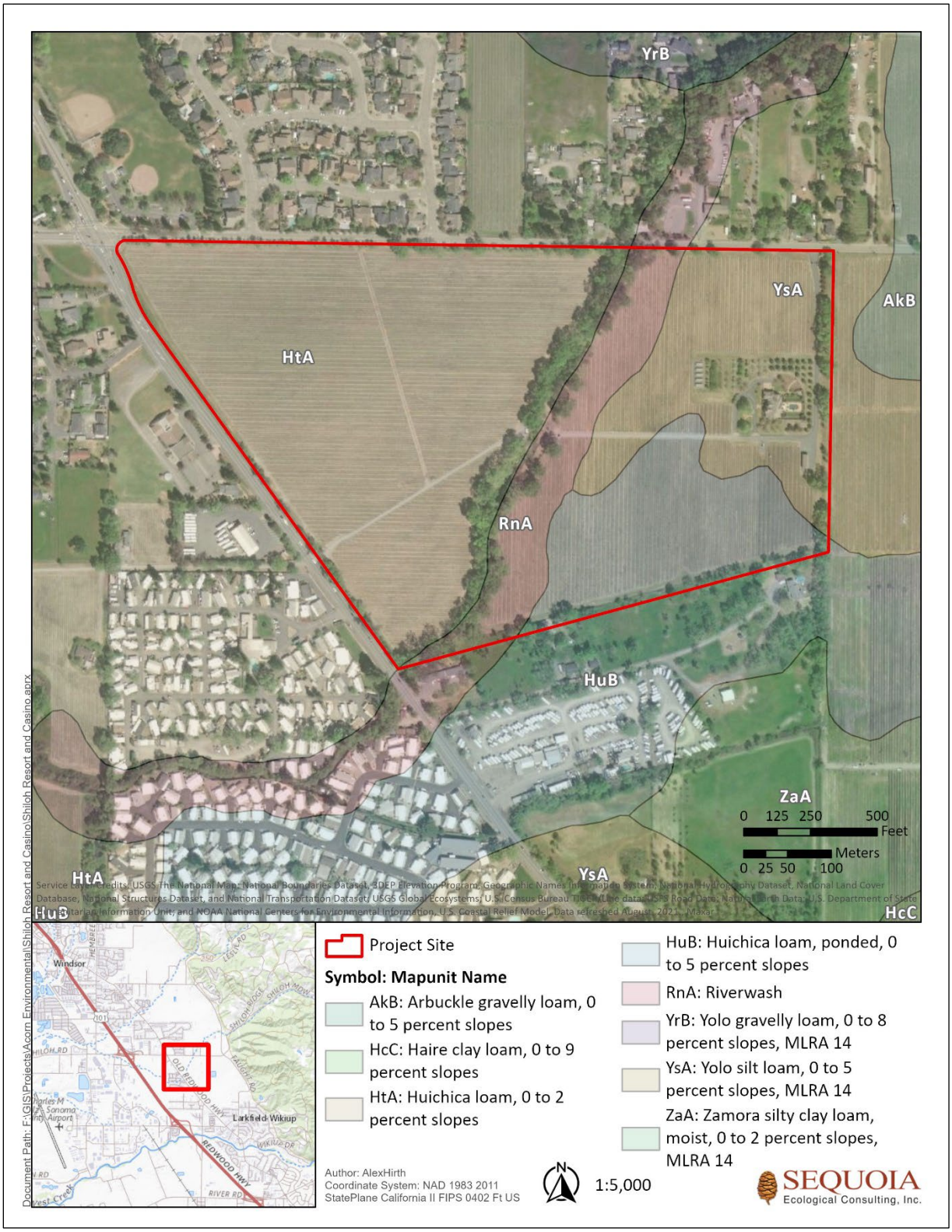


Figure 4. Soil Types Mapped within the Shiloh Resort and Casino Project Site.

3.3 Project Site Vegetation

On February 23 and 24, 2022, Sequoia staff conducted a survey of the Project site and characterized the vegetation present. During the survey, Sequoia biologists also documented plant and wildlife species observed on the Project site. Nomenclature used for plant names follows *The Jepson Manual* Second Edition (Baldwin 2012), while nomenclature used for wildlife follows CDFW's *Complete List of Amphibian, Reptile, Bird, and Mammal Species in California* (2016). Habitat affinities were assigned following the classification of Lichvar et.al (2014), as updated in 2016. Wetland indicator species (i.e., species that can tolerate soil saturation during grow period and/or prolonged inundation) were taken into consideration when classifying vegetation types.

Four plant communities occur on the Project site (Sawyer and Keeler-Wolf 1995) and are further described below. Representative photographs of the Project site are included in Appendix C and a list of all plant species observed during the surveys can be found in Appendix D.

3.3.1 Agricultural Land

The majority of the Project site is characterized by vineyards comprised of grape arbors and associated infrastructure, including dirt roads, piping (irrigation, propane, utility, etc.), propane tanks, wash station, and electrical power poles. While the grape rows themselves are weeded and maintained, ruderal and annual vegetation grows between rows and around the vineyard perimeter; ruderal species are adapted to endure intense and/or long-term disturbance. Ruderal species observed within the Project site include non-native annual grasses such as slender wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceous*), as well as stinking chamomile (*Anthemis cotula*), English plantain (*Plantago lanceolata*), California burclover (*Medicago polymorpha*), common vetch (*Vicia sativa*), and filaree species (*Erodium botrys*, *E. cicutarium*).

3.3.2 Anthropogenic/Developed

Anthropogenic or developed land cover includes areas that have been manipulated, altered, or converted for human use. Vegetation associated with anthropogenic/developed habitat is typically non-native ornamental and landscaping species, as well as agricultural species. This habitat within the Project site consists of dirt access roads, a paved driveway along the eastern property boundary, and the existing private residence. Surrounding the residence are an orchard, various infrastructure such as solar panels and agricultural equipment, and outbuildings, including a large barn or garage located just south of the dwelling. Vegetation within anthropogenic/developed areas on the Project site is dominated by landscaping comprised of agricultural and ornamental species, with interspersed ruderal species and non-native grasses and forbs.

Landscaping surrounding the residence include various landscape trees and shrubs, including rose (*Rosa* sp.), mulberry (*Morus alba*), maple (*Acer* sp.), and purpleleaf plum (*Prunus cerasifera*). A grove of olive (*Olea europaea*) trees occurs on the north side of the dwelling, along with an orchard that supports

varieties of edible fig (*Ficus carica*), citrus (*Citrus* sp.), apple (*Malus domestica*), apricot (*Prunus armeniaca*), pear (*Pyrus* sp.), peach (*Prunus persica*), nectarine (*Prunus persica*), and various species of plum, pluot, and cherry (*Prunus* sp.). Additional small, planted orchard trees and two large valley oaks (*Quercus lobata*) are located the vicinity of the barn. Ruderal species, similar to those found between the vineyard rows, and non-native grasses and forbs also occur around the residence and other anthropogenic/developed areas on site. Non-native annual grasses and forbs are species that mature in spring and early summer, before spreading seed and dying in late summer and fall. Grasses and forb species observed in anthropogenic/developed areas on the Project site include slender wild oat, ripgut brome, soft chess, Mediterranean barley (*Hordeum marianum*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), and filaree species.

3.3.3 Riparian Woodland

Riparian woodlands are diverse habitats that support numerous plant species that can include grasses, annual and perennial forbs, vines, shrubs, and trees. A variety of plants creates a complex layering of understory and overstory, which in turn provides habitat to numerous wildlife species. When found within the bed, channel, or bank of any river, stream, or lake, riparian vegetation is also protected under Section §1602 of the California Fish and Game Code (CFGC); and CDFW has included riparian communities in the California Natural Diversity Database (CNDDB). Accordingly, Sequoia mapped the extent of the riparian woodland, referred to as the riparian dripline, and top-of-bank (TOB) in order to determine the potential limits of CDFW jurisdiction pursuant to CFGC Section §1602.

The extent of this habitat type within the Project site is limited to the riparian corridor surrounding Pruitt Creek, which is bisected by an existing dirt road crossing. The canopy in the portion of the riparian corridor north of the crossing is dominated by eucalyptus (*Eucalyptus sp.*) and valley oak trees, while native trees such as Oregon ash (*Fraxinus latifolia*), buckeye (*Aesculus californica*) and California bay-laurel (*Umbellularia californica*) are more prevalent in the southern half of the riparian corridor. Coast live oak (*Quercus agrifolia*) trees characterize the terrace floodplain adjacent to the creek through the upper extent of the riparian woodland is characterized. Understory riparian vegetation composition is consistent throughout the entire riparian corridor and is comprised of a mix of native and non-native species of shrubs, herbs, and grasses. Native species observed include poison oak (*Toxicodendron diversilobum*), pink honeysuckle (*Lonicera hispidula*), creeping snowberry (*Symphoricarpos mollis*), soap plant (*Chlorogalum pomeridianum*), and miner's lettuce (*Claytonia perfoliata*). Non-native understory species include French broom (*Genista monspessulana*), Himalayan blackberry (*Rubus armeniacus*), black mustard, curly dock (*Rumex crispus*), English ivy (*Hedera helix*), and periwinkle (*Vinca major*). Hydrophytic plant species were also identified within, along the margins of, or directly adjacent to the wetted channel and include bog rush (*Juncus effusus*), tall flatsedge (*Cyperus eragrostis*), three-square bulrush (*Schoenoplectus pungens*), and iris-leaf rush (*Juncus xiphioides*).

Evidence of human use and/or disturbance were observed throughout the riparian corridor, most notably in the area with the dirt low-flow crossing; two pipes embedded in a stone and cement masonry

structure cross the creek from top-of-bank to top-of-bank near a kiosk sign just north of the crossing. Other human infrastructure and debris within the riparian corridor includes pieces of concrete that have been scattered or imbedded in the bed and banks of the creek, pole-mounted bird or bat boxes, a bee swarm box attached to a tree, and a wooden and metal fence that spans the creek on the southern property line.

3.3.4 Seasonal Wetlands

Seasonal wetlands are habitats that dry down in the summer and fall months, but generally in the rainy, winter months become saturated and inundated for several weeks to months. Seasonal wetlands often hold water due to soil permeability and/or the presence of topographically low, depressional areas. Soils with a high clay content or within depressional areas, or soils that have been compacted by human activities, often hold and trap seasonal rainfall over short to long durations of the winter and spring. These areas often become dominated by hydrophytic plant species that are reliant and/or dependent on regular saturation or inundation. Roadside drainage ditches are man-made features that catch sheet flow or convey stormwater flows.

Seasonal wetlands occur on the western edge of the Project site, between the perimeter fencing along Old Redwood Highway and the grape arbors (Appendix B). While cover within these seasonal wetlands was dominated by bare ground and algal matting, the vegetation present consisted almost exclusively of hydrophytic species, including iris-leaf rush (OBL), annual bluegrass (*Poa annua*; FAC), yard knotweed (*Polygonum aviculare*; FAC), and hyssop loosestrife (*Lythrum hyssopifolia*; OBL).

The roadside drainage ditches that flow along Old Redwood Highway is characterized by a mix of hydrophytic species, such as tall flatsedge (FACW), curly dock (FAC), and bog rush (FACW), and ruderal and non-native annual species consistent with the adjacent uplands, such as wild oat, ripgut brome, and common vetch.

4.0 RESULTS

Aquatic resources delineated on the Project site during the February 2022 delineation fall into three categories: (1) Seasonal Wetlands; (2) Intermittent Drainage; and (3) Roadside Drainage Ditches. Seasonal Wetlands were delineated in areas supporting positive indicators of all three wetland parameters. Pruitt Creek, a tributary that contributes surface water flow to a Traditional Navigable Water (TNW; including through culverts)—but lacks at least one wetland parameter and supports a bed, bank, and OHWM—was delineated as an Intermittent Drainage, as field conditions and/or background sources (NWI, NHD, USGS topographic maps, or other sources) indicate intermittent flow during a typical year. Roadside Drainage Ditches were delineated in ditches apparently constructed in uplands for roadside drainage that do not occur in a wetland or replace a natural tributary.

Where observable in the field, culverts were mapped to help determine the hydrologic connections between

aquatic resources and observed or presumed downstream waters which discharge into a TNW. However, some culverts are presumably present but were not mapped during the delineation because they were buried or otherwise not observable, or were located off the Project site. Additionally, the extent of the riparian dripline and TOB contour were mapped.

Aquatic resources identified during the February 2022 delineation are discussed below and are listed in Table 4. Delineation datasheets are included in Appendix A and a map of aquatic resources is included in Appendix B. Photographs of representative aquatic resources and delineation sample points are included in Appendix C. A list of plant species observed on the Project site, and their wetland indicator status, is included in Appendix D.

Table 2. Potential Aquatic Resources Delineated on the Project Site.

Feature Name	Area (ft^2)	Length (ft)	Acre(s)	Avg Width (ft)	Sample Point	Bed/Bank /OHWM	Hydrology/ Observed Outlet	Lat/Long	Potential Agency Jurisdiction
Seasonal Wetlands									
SW-01	73.4	10	0.002	10	1A/1B	Yes	Seasonal	38.521599, -122.775482	USACE (?) /State
SW-02	164.5	15	0.004	12	2A/2B	Yes	Seasonal	38.523142, -122.776893	USACE (?) /State
SW-03	192.8	21	0.004	8.5	NA	Yes	Seasonal	38.523288, -122.777046	USACE (?) /State
SW-04	404.0	25	0.009	17	NA	Yes	Seasonal	38.523451, -122.777169	USACE (?) /State
Intermittent Drainage									
ID-01	28,100	1,790	0.644	15	3A/3B	Yes	Intermittent /Channel and culvert	38.523686, -122.773475	USACE /State
Roadside Ditches									
RD-01	2,870	1,305	0.066	1.5	NA	Yes	Ephemeral/ Culvert	38.52416, -122.777946	State (?)
RD-02	1,460	444	0.033	2	NA	Yes	Ephemeral/ Culvert	38.52191, -122.775839	USACE (?) /State

4.1 Seasonal Wetlands

Four areas were delineated on the study area that have positive indicators of all three wetland parameters and seasonal hydrology (Table 2; Appendix A, B). Seasonal Wetlands primarily occur on hillside seeps and adjacent swales, channels, and ditches that appear to receive hydrologic input from direct precipitation, groundwater discharge, and/or surface runoff from the adjacent slope or contributing drainages.

Seasonal Wetlands, generally classified as Freshwater Emergent Wetlands in the Cowardin Classification System/NWI (USFWS 2022), are dominated by wetland-classified shrubs and herbaceous species. The

Seasonal Wetlands are shallow depressions situated in topographic low spots along a narrow right-of-way used as an access road for vineyard operations. Land cover in Seasonal Wetlands within the Project site was dominated by bare ground and biotic crust, namely algal mats; however, the vegetation present was dominated by hydrophytic species such as iris-leaved rush, hyssop loosestrife, annual bluegrass, and yard knotweed (Sample Points 1B and 2B; Appendix A). Hydric soil indicators are present, including Redox Dark Surface (F6) and Redox Depressions (F8), as well as Group B wetland hydrology indicators, which serve as evidence of recent inundation and include Surface Soil Cracks (B6), Water-Stained Leaves (B9), and Algal Mats/Biotic Crust (B4/B12). Furthermore, topographical trends and patterns in the land cover/vegetation indicate the Seasonal Wetlands are hydrologically connected to, if not a direct water source for the southernmost Roadside Drainage Ditches (RD-02) that flows along Old Redwood Highway into Pruitt Creek, and ultimately the Russian River, Sonoma Creek, or the Petaluma River. Adjacent uplands occur on berms, slopes, and roads or other development above the wetland, are typically dominated by upland-classified plant species, and lack wetland hydrology and hydric soil indicators. Sample points taken within the adjacent uplands (Sample Points 1A and 1B; Appendix A) contained Oxidized Rhizospheres Among Living Roots, a Group C hydrologic indicator serving as evidence of current or recent soil saturation, and hydric soil indicators (Redox Dark Surface) but lacked a dominance of hydrophytic vegetation.

The presence of hydrologic and hydric soil indicators within adjacent uplands is presumably the result of runoff from irrigation infrastructure associated with the vineyard, such as hoses, piping, emitters, and control valves. The presence of this infrastructure, coupled with evidence of recent saturation and/or inundation between and around the grape rows suggests that irrigation runoff is contributing to the hydrology of the general area. The prevalence of redoximorphic features observed within upland soil samples provides further evidence that saturation and/or inundation occurs often and long enough for anerobic conditions to develop ubiquitously within surrounding soils. Therefore, it is presumed that the hydrology of the Seasonal Wetlands is at least partially influenced by agricultural activities.

4.2 Intermittent Drainage

One Intermittent Drainage (i.e., Pruitt Creek) was delineated on the Project site (Table 4; Appendix A, B). Intermittent Drainages are natural tributaries to downstream TNWs (either through direct discharge or culvert/storm drain networks) and support a bed, bank, and OHWM, but lack one or more wetland parameters.

Pruitt Creek is mapped as “Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC)” and “Palustrine, Forested, Emergent, Persistent, Seasonally Flooded (PFO/EM1C) Freshwater Forested/Shrub Wetland” in the NWI (USFWS 2022). The Drainage was considered intermittent because: (1) the channel had pooled and flowing water that appeared to be the result of seasonal and recent rains and not perennial hydrology; (2) the channel had significant OHWM indicators such as natural line impressed on the bank, shelving, changes in soil character, presence of litter and debris, and matted and bent vegetation to indicate seasonal flow; and/or (3) background sources (the NWI, NHD, USGS topographic

maps, and other sources) indicated seasonal flow. A sample point (Sample Point 3B; Appendix A) taken within a vegetated shelf immediately adjacent to the wetted channel contained a dominance of hydrophytic vegetation, namely three-square bulrush (OBL), and primary (Saturation [A6] and Water-Stained Leaves [B9]) and secondary (Drift Deposits [B3] and Drainage Patterns [B10]) indicators of wetland hydrology but lacked hydric soil indicators. The absence of redoximorphic features may be explained by the abundance of sand and gravel in the soil matrix precluding the development of these features, the proximity of flowing water resulting in features being stripped or removed from the matrix, or a combination of these factors. The paired upland sample point (Sample Point 3A; Appendix A) was taken in the adjacent low terrace east of the creek channel and lacked all three wetland criteria.

Pruitt Creek features a defined bed and bank and contained water during the February 2022 survey. The creek's active floodplain is characterized by a gravel- and sand-lined low-flow channel at its center and a mix of vegetated shelves, gravel/sand bars, and cobble point bars along the lateral extents, between TOB and the wetted channel. Width varies between 3 and 10 feet for the wetted channel and approximately 10 to 30 or more feet for the active floodplain. Water depth within the channel ranges from 6 to 8 inches to 3 or 4 feet. Riffles, shallows, and pools were observed throughout the meandering channel but were predominately in the southern portion of the Drainage. Several low terraces, one of which appears to feature a paleo channel or ephemeral swale, are present in the northern portion of the Drainage and are situated at or above OHWM but below TOB. The active floodplain width at TOB ranges between approximately 30 to 60 feet, with the upper extent reaching nearly 100 feet in some areas when including adjacent low terraces. The low-flow channel bed is lined with small cobble, gravel, sand, and dirt, with interspersed vegetation and leafy and woody debris. Creek banks vary from being highly vegetated to bare dirt, and range from heavily incised cut banks to gradual slopes.

Pruitt Creek enters the Project site from the north via a box culvert underneath East Shiloh Road and flows to southwest through the center of the Project site, where it is bisected by a dirt low flow crossing. The Drainage continues to the southwestern corner of the Project site where it flows offsite through an adjacent property to the south and into a box culvert below Old Redwood Highway. Once offsite, Pruitt Creek eventually drains into Pool Creek, which flows into Windsor Creek, then into Mark West Creek, and finally into the Russian River.

4.3 Roadside Drainage Ditches

Two Roadside Drainage Ditches were delineated on the western edge of the Project site, along Old Redwood Highway (Table 4; Appendix B, D). Roadside Drainage Ditches appeared to be excavated in uplands for roadside drainage, and (based on conditions observed in the field and a review of the NWI, NHD, USGS topographic maps, and other sources) are not natural tributaries to downstream TNWs. Roadside Drainage Ditches were dry during the delineation and support a marginal bed and bank in some areas but are generally swale-like, as well as OHWM, including presence of leaf litter, matted or absent vegetation, and scour. These ditches appeared to be excavated in uplands (rather than wetlands) and are not replacing any natural drainages or wetlands, nor did they appear to be fed by seeps or

hydrologic sources other than direct precipitation and runoff from the roadside and Seasonal Wetlands. Group B wetland hydrology indicators, which serve as evidence of recent inundation, were observed in the Roadside Drainage Ditches, and include Water-Stained Leaves (B9) and Algal Mats (B4). Additionally, hydrophytic species such as bog rush (FACW), curly dock (FAC), and tall flatsedge (FACW) were present but not dominant within the Roadside Drainage Ditches.

The drainage ditch is bisected by the western entrance to the Project site located off Old Redwood Highway. The associated driveway embankment does not feature a culvert, drain, or other artificial structure that would convey water between the northern and southern extent of the ditch. Therefore, the Roadside Drainage Ditches are not only physically disjunct, but also lack direct hydrological surface connection. It is presumed that hydrologic connectivity between the Roadside Ditches, if any, would be limited to subsurface water flow or seepage. Two culverts associated with the northern Roadside Drainage Ditch (RD-01) were identified and mapped, one on the northernmost end below the intersection of East Shiloh Road and Old Redwood Highway, and a lateral culvert that enters the western side of the ditch from below Old Redwood Highway (Appendix B). The southern Roadside Drainage Ditch (RD-02) appears to be split by a small berm associated with a Sonoma County bus stop; however, a 12-inch corrugated metal pipe is present below the berm and allows for direct surface connection between the two sections of the southern Roadside Drainage Ditch. The southern Drainage Roadside Ditch appears to lead directly to Pruitt Creek at its outlet below Old Redwood Highway, in the southwestern corner of the Project site.

5.0 AGENCY JURISDICTION

5.1 Potential USACE Jurisdiction

On January 23, 2020, the U.S. Environmental Protection Agency (USEPA) and the USACE finalized the Navigable Waters Protection Rule to define "waters of the U.S." The rule took effect on June 22, 2020. On August 30, 2021, the U.S. District Court for the District of Arizona vacated and remanded the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency.*

According to the EPA (USEPA 2021): "*In light of this order, the agencies have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice. The agencies continue to review the order and consider next steps. This includes working expeditiously to move forward with the rulemakings announced on June 9, 2021, in order to better protect our nation's vital water resources that support public health, environmental protection, agricultural activity, and economic growth. The agencies remain committed to crafting a durable definition of "waters of the United States" that is informed by diverse perspectives and based on an inclusive foundation*.

The agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice … The term waters of the United States means:

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:*
    a. *Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
    b. *From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
    c. *Which are used or could be used for industrial purposes by industries in interstate commerce;*
4. *All impoundments of waters otherwise defined as waters of the United States under this definition;*
5. *Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;*
6. *The territorial sea;*
7. *Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.*

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA" (USEPA 2021).

According to guidance present prior to the pre-2015 regulatory regime (USEPA 2008):

"*The agencies will assert jurisdiction over the following waters:*

- *Traditional navigable waters*
- *Wetlands adjacent to traditional navigable waters*
- *Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)*
- *Wetlands that directly abut such tributaries*

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- *Non-navigable tributaries that are not relatively permanent*
- *Wetlands adjacent to non-navigable tributaries that are not relatively permanent*
- *Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary*

The agencies generally will not assert jurisdiction over the following features:

- *Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow)*
- *Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water*

The agencies will apply the significant nexus standard as follows:

- *A significant nexus analysis 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 ecologic factors"*

Based on current guidance (USEPA 2008; 2021), the Intermittent Drainage delineated on the Project site would presumably qualify as "*non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)"* and therefore fall under USACE jurisdiction.

Four Seasonal Wetlands were delineated on the Project site. Based on current guidance (USEPA 2008; 2021) and an analysis of field and background data, the Seasonal Wetlands do not directly abut "*Non-navigable tributaries of traditional navigable waters that are relatively permanent",* but are hydrologically connected to such tributaries via the Roadside Drainage Ditches, and may qualify as "*Wetlands adjacent to non-navigable tributaries that are not relatively permanent.*" Conversely, pursuant to CWA 33 CFR § 328.3 "*artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease*" are considered non-jurisdictional. Furthermore, the effect of agricultural activities on the jurisdictional status of the Seasonal Wetlands may also be influenced by CWA 33 CFR § 323.4, which exempts "*normal and established farming, silviculture and ranching activities such as plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices*" from USACE regulations and permitting. While these exemptions appear to be applicable to the Seasonal Wetlands, only the USACE can determine their pertinence and jurisdiction.

Therefore, "*The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water.*"

The northern Roadside Drainage Ditch (RD-01) does not appear to have direct surface connection to a TNW or tributary, whereas the southern Roadside Drainage (RD-02) ditch flows directly into Pruitt Creek (Appendix B). The presence/absence of a significant nexus may influence the jurisdictional determination of the Roadside Drainage Ditches but is unlikely to, as these "*Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water"* are specifically excluded from USACE jurisdiction under current guidance (USEPA 2008; 2021).

The regulatory analysis described above is preliminary. Due to recent changes based on Court decisions, regulatory jurisdiction is in flux, and therefore the USACE would need to determine its jurisdiction on the study area based on a verification of this report.

5.2 Potential State Jurisdiction

On April 2, 2019, the SWRCB adopted a *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures), for inclusion in the *Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California*. The Procedures took effect May 28, 2020. The Procedures consist of four major elements: (1) a wetland definition; (2) a framework for determining if a feature that meets the wetland definition is a water of the state; (3) wetland delineation procedures; and (4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. Aquatic resources (such as ephemeral tributaries, some drainage ditches, and isolated wetlands), which may be exempt from federal jurisdiction under the Navigable Waters Protection Rule would likely be considered waters of the State under the Porter-Cologne Water Quality Control Act and/or the Procedures that took effect May 28, 2020.

Based on the Procedures, the Seasonal Wetlands and Intermittent Drainages would likely qualify as "Waters of the State" subject to jurisdiction by the SWRCB, as discussed above. The jurisdictional status of the Roadside Drainage Ditches is unclear. Agricultural ditches are excluded from the Procedures, and while the ditches on the Project site are roadside ditches they also appear to be fed, at least partially, by agricultural runoff from the on-site vineyard. Based on previous delineations conducted by Sequoia within Sonoma County (Sequoia Ecological Consulting, Inc. 2020, 2022), Roadside Drainage Ditches were excluded from State jurisdiction. Roadside Drainage Ditches delineated in this report are similar to those delineated in other reports, and State regulations have not changed since that delineation was conducted, making it unlikely that they would be considered Waters of the State. That said, the jurisdictional status of the Roadside Drainage Ditches and other potential Waters of the State would need to be determined by the SWRCB and local Regional Water Quality Control Board (RWQCB) based on a verification of this report.

Work, such as placement of fill material, occurring within USACE jurisdiction normally requires a permit under Section 404 of the federal CWA. In addition, the USACE, under Section 401 of the federal CWA, is required to meet state water quality regulations prior to granting a Section 404 permit. This is accomplished by application to the local RWQCB for Section 401 certification that requirements have been met. Streams, rivers, and lakes up to the TOB or dripline of riparian vegetation (whichever is greater) also fall within the jurisdiction of the California Department of Fish and Wildlife (CDFW). Work within CDFW jurisdiction normally requires a Streambed Alteration Agreement. These requirements typically apply to public and private projects and the description of potential State jurisdiction has been included for reference; however, in the case of the proposed Project, the property will be taken over into federal trust for the Tribe at which point State jurisdiction would no longer apply.

6.0 LIMITATIONS

The results of this delineation are preliminary. Regulatory agencies, including the USACE, SWRCB, and CDFW, make the final determination about the location and extent of wetlands and other waters on the Project site, and this delineation report should be sent to the USACE for verification. This report does not constitute authorization to conduct the Project, and all necessary permits and approvals should be obtained from regulatory agencies prior to Project implementation.

7.0 REFERENCES

Baldwin D.H, Goldman D.H., Keil D.J., Patterson R, Rosatti T.J., Wilken D.H. (ed.). 2012. The Jepson Manual Vascular Plants of California: Second Edition. University of California Press, Berkeley. 1568 pps.

California Geological Survey. 2010. Geologic map of California. Website at: http://www.conservation.ca.gov/cgs/cgs_history/Pages/2010_geologicmap.aspx.

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. Technical report Y 87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Federal Register. 1986. Department of the Army, Corps of Engineers, 33 CFR Parts 320 through 330, Regulatory Programs of the Corps of Engineers; Final Rule. Vol. 51, No. 219; page 41217, November 13.

_____. 1994. Changes in hydric soils of the United States. Washington, DC, July 13.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2018. The National Wetland Plant List: 2018 wetland ratings. Website at: http://wetland_plants.usace.army.mil/.

Munsell Soil Book of Color. 2012. Munsell Soil Color Charts with Genuine Munsell Color Chips. Grand Rapids, MI: Munsell Color.

Natural Resource Conservation Service (NRCS). 2022a. Web Soil Survey. Website at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

_____. 2022b. Lists of hydric soils. Website at: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/.

Sawyer J.O., Keeler-Wolf T. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, CA.

Sequoia Ecological Consulting, Inc (Sequoia). 2020 and 2022. Aquatic resource delineation report, Sonoma County Pavement Preservation Project, Sonoma County, California.

State Water Resources Control Board (SWRCB). 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. Adopted April 2, 2019.

U.S. Army Corps of Engineers (USACE). 2005. Regulatory guidance letter 05-05: Ordinary high water mark identification. Dated December 7.

_____. 2008a. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28.Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____. 2008b. A field guide to the identification of the ordinary high water mark (OHWM) in the Arid West Region of the Western United States. Dated August.

_____. 2022. National wetland plant list, version 3.5. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.

United States Environmental Protection Agency (USEPA). 2008. Clean Water Act jurisdiction following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. Dated December 2.

_____. 2021. Current implementation of Waters of the United States. Website at: https://www.epa.gov/wotus/current-implementation-waters-united-states

U.S. Geological Survey (USGS). 2022. National hydrography dataset. Website at: https://nhd.usgs.gov/.

U.S. Fish and Wildlife Service (USFWS). 2022. National Wetlands Inventory. Website at: http://www.fws.gov/wetlands

Appendix A

Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 1A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): Mediterranean CA (LRR C) Lat: 38.521638 Long: -122.775493 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent 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:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Vicia sativa	30	x	FACU
2. Medicago polymorpha	30	x	FACU
3. Bromus hordeaceous	10		FACU
4. Ranunculus muricatus	30	x	FACW
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust None

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 30	x 2 = 60
FAC species _____	x 3 = _____
FACU species 70	x 4 = 280
UPL species _____	x 5 = _____
Column Totals: 100 (A)	340 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland species.

SOIL

Sampling Point: 1A

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 3/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Oxidized rhizospheres present among living roots. No soil saturation or other hydrological indicators present. Area is immediately adjacent to vineyard with irrigation system that may be creating runnoff.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 1B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): California Lat: 38.521600 Long: -122.775482 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent 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:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Juncus xiphiodes	10	x	OBL
2. Poa annua	10	x	FAC
3. Medicago polymorpha	2		FACU
4.			
5.			
6.			
7.			
8.			
	22 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 10	x 1 = 10
FACW species _____	x 2 = _____
FAC species 10	x 3 = 30
FACU species 2	x 4 = 8
UPL species _____	x 5 = _____
Column Totals: 22 (A)	48 (B)

Prevalence Index = B/A = 2.18

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Area mostly devoid of vegetation, but what is present is dominated by hydrophytic species. Leaf litter and algal mats abundant.

SOIL

Sampling Point: 1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	96	7.5YR 5/6	5	C	M	loam	Redox distinct and contemporary
			GLEY1 4/N	1	D	M		
10-12	10YR 3/2	100					sandy loam	Inclusions of sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are distinct and contemporary.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Water stained leaves and biotic crust present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/24/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 2A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): California Lat: 38.523176 Long: -122.776926 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent 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:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Poa annua	10	x	FAC
2. Anthemis cotula	60	x	FACU
3. Bromus hordeaceous	10		FACU
4. Medicago polymorpha	15		FACU
5.			
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust None

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 10	x 3 = 30
FACU species 85	x 4 = 340
UPL species _____	x 5 = _____
Column Totals: 95 (A)	370 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland species.

SOIL

Sampling Point: 2A

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 3/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant. Gravel and rocks are present but not restrictive.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Oxidized rhizospheres present among living roots. No soil saturation or other hydrological indicators present. Area is immediately adjacent to vineyard with irrigation system that may be creating runnoff.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/24/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 2B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): California Lat: 38.523176 Long: -122.776926 Datum: NAD83

Soil Map Unit Name: HtA - Huichica loam, 2 to 0 percent 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:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Polygonum aviculare	2	x	FAC
2. Lythrum hyssopifolia	5	x	OBL
3. Poa annua	5		FAC
4.			
5.			
6.			
7.			
8.			
	12 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 5	x 1 = 5
FACW species _____	x 2 = _____
FAC species 7	x 3 = 21
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 12 (A)	26 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Area mostly devoid of vegetation, but species present are hydrophytic indicators. Leaf litter and algal mats abundant.

SOIL

Sampling Point: 2B

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 4/2	80	7.5YR 5/6	15	C	M	loam	Redox distinct and contemporan
			GLEY1 4/N	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Redoximorphic features are abundant. Intrusions of gravel and rocks are present but not restrictive.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): None

Water Table Present? Yes ___ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Multiple primary hydrologic indicators are present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 3A

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): California Lat: 38.523713 Long: -122.773416 Datum: NAD83

Soil Map Unit Name: RnA - Riverwash 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:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Avena sativa	67	x	UPL
2. Bromus hordeaceous	10		FACU
3. Geranium dissectum	5		NL
4. Rumex acetosella	10		FACU
5. Cardamine hirstua	2		FACU
6. Rumex crispus	2		FAC
7. Cerastium glomeratum	2		UPL
8. Erodium botrys	2		FACU
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Vegetation dominated by facultative upland and upland species.

SOIL

Sampling Point: 3A

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
0-5	10YR 2/2	10					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock/gravel

Depth (inches): 5-12

Hydric Soil Present? Yes _____ No ✓

Remarks:

Unable to dig past 5 inches due to restrictive layer of rock and gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): None

Water Table Present? Yes _____ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): None

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Shiloh R&C Project City/County: Larkfield-Wikiup / Sonoma Sampling Date: 2/23/2022

Applicant/Owner: Acorn Environmental State: CA Sampling Point: 3B

Investigator(s): Ari Rogers, Claire Buchanan Section, Township, Range: S20 T8N R8W, Mount Diablo Meridian

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): <1

Subregion (LRR): California Lat: 38.523681 Long: -122.773496 Datum: NAD83

Soil Map Unit Name: RnA - Riverwash NWI classification: Riverine

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:

Soils naturally problematic due to location of sample point on gravel/sandbar adjacent to creek and below top-of bank.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m^2)			
1. Schoenoplectus pungens	55	x	OBL
2. Galium aparine	15		FACU
3. Vicia sativa	10		FACU
4. Avena sativa	8		UPL
5. Geranium robertianum	10		FACU
6. Torilis arvensis	2		NL
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 55	x 1 =	55
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 35	x 4 =	140
UPL species 8	x 5 =	40
Column Totals: 98 (A)		235 (B)

Prevalence Index = B/A = 2.39

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Area dominated by hydrophytic species.

SOIL

Sampling Point: 3B

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
0-8	10YR 2/2	100					sandy loa	
8-9	-						gravel	
9-12	10YR 2/2	100					gravelly l	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ✓ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

Redoximorphic features not observed, possibly because of high sand/gravel content in the matrix and proximity to flowing water.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): None

Water Table Present? Yes ____ No ✓ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0-8

Wetland Hydrology Present? Yes ✓ No ____

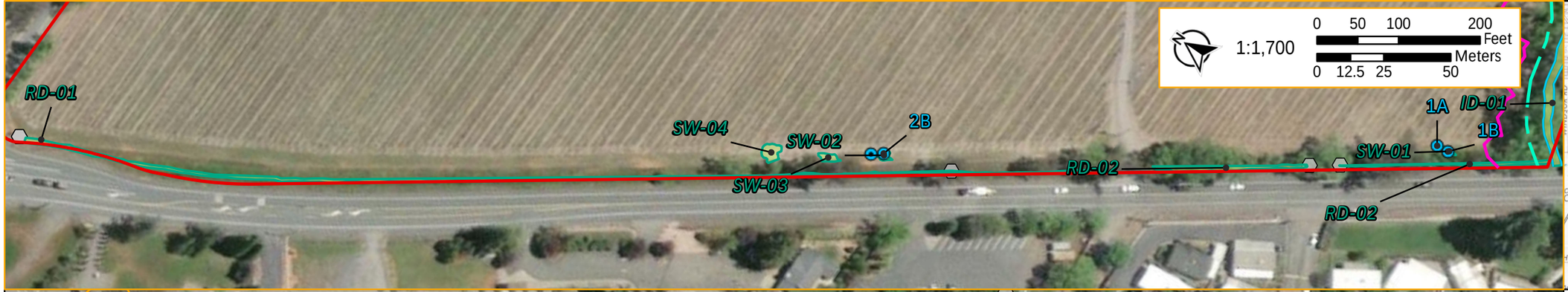
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

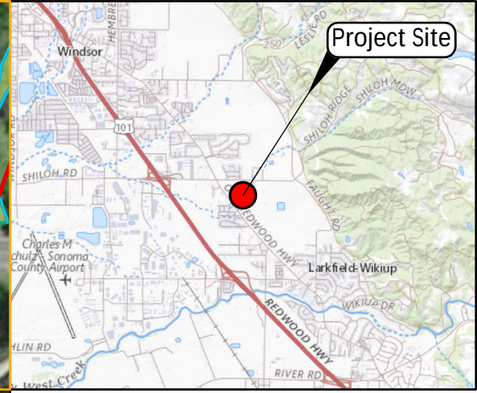
Remarks:

Area immediately adjacent to creek, below top-of-bank but on a small gravel/sand bar.

Appendix B

Draft Aquatic Resources Delineation Map





Project Site
Culvert Opening
Sample Point
Ordinary High Water Mark
Top-of-Bank
Riparian Dripline
Potential Aquatic Resource

Aquatic Feature Name	Area (sq. ft.)	Area (ac.)
ID-01	28,100	0.644
RD-01	2,870	0.066
RD-02	1,460	0.0334
SW-01	73.4	0.00169
SW-02	165	0.00378
SW-03	193	0.00442
SW-04	404	0.00927

Author: AlexHirth
Date Exported: 4/5/2022
Coordinate System: NAD 1983 2011
StatePlane California II FIPS 0402 Ft US

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2021., Maxar, Microsof

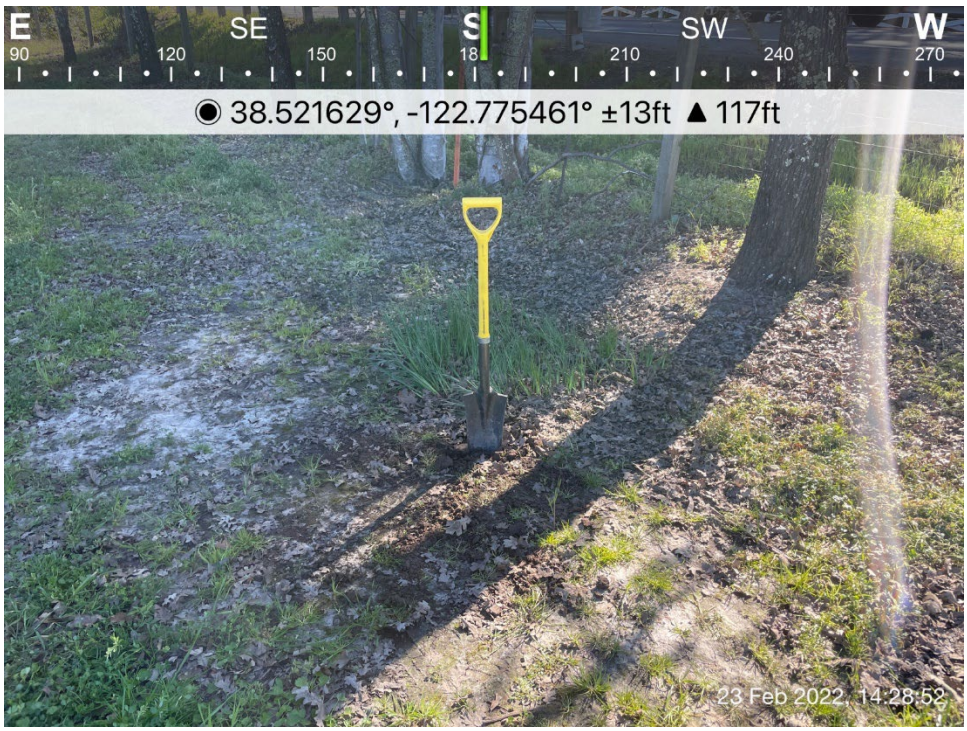
SEQUOIA
Ecological Consulting, Inc.

Document Path: F:\GIS\Projects\Acorn Environmental\Shiloh Resort and Casino\Shiloh Resort and Casino.aprx

Appendix C

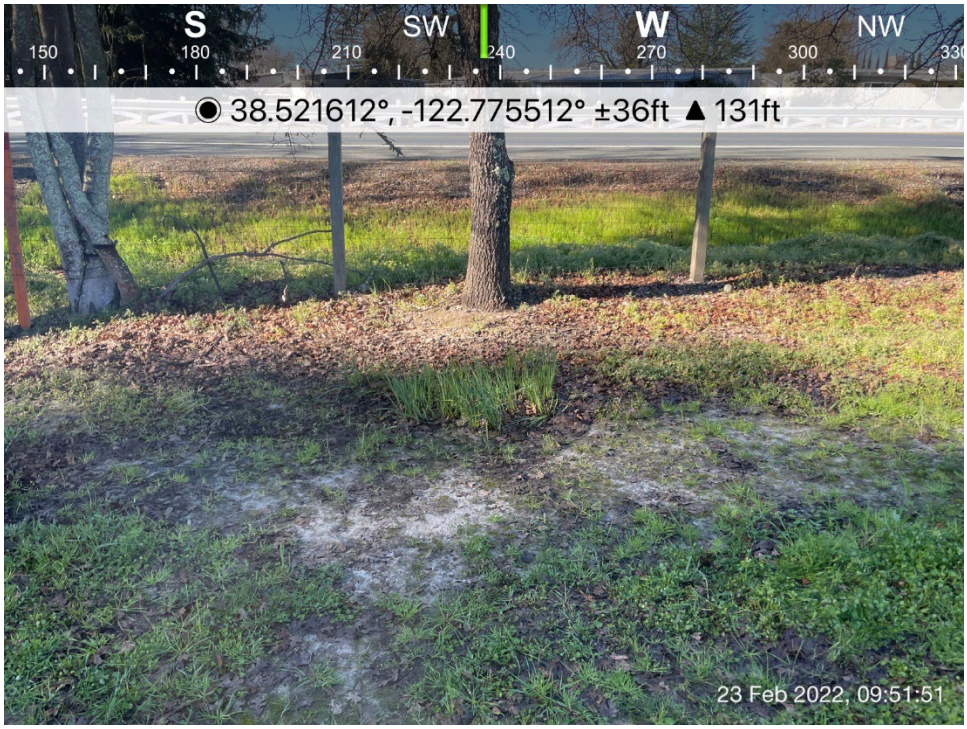
Project Site Representative Photographs

Photograph 1: Photo shows the location of upland Sample Point 1A.



Photograph 2: Photo shows the location of wetland Sample Point 1B within Seasonal Wetland SW-01.

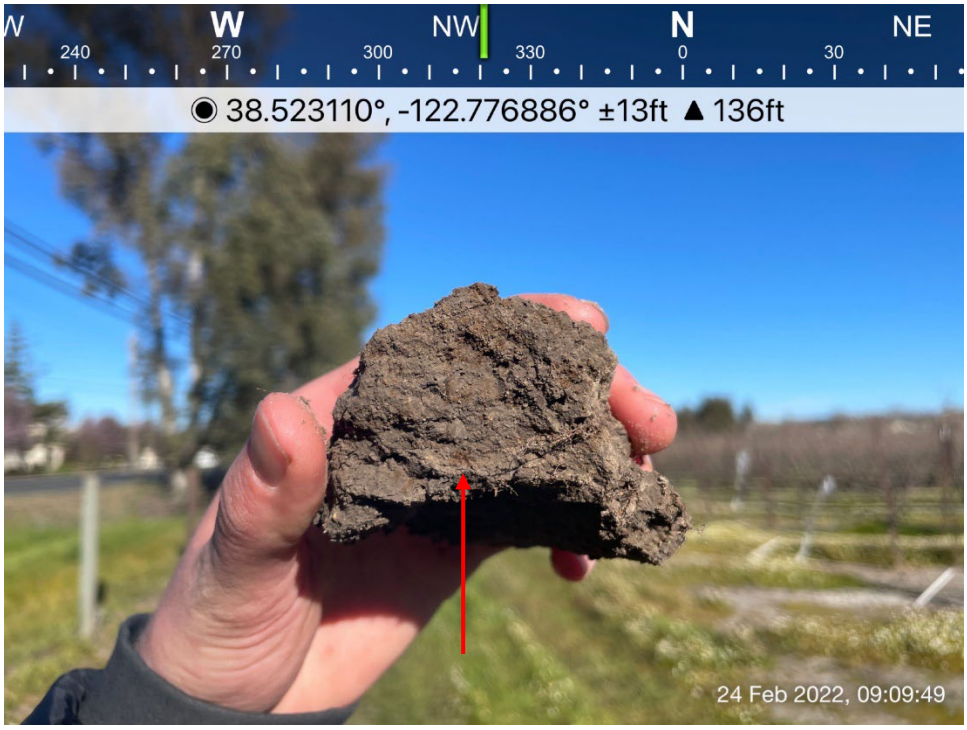
Photograph 3. Photo shows redoximorphic concentrations within the soil matrix and pore linings from Sample Point 1B.



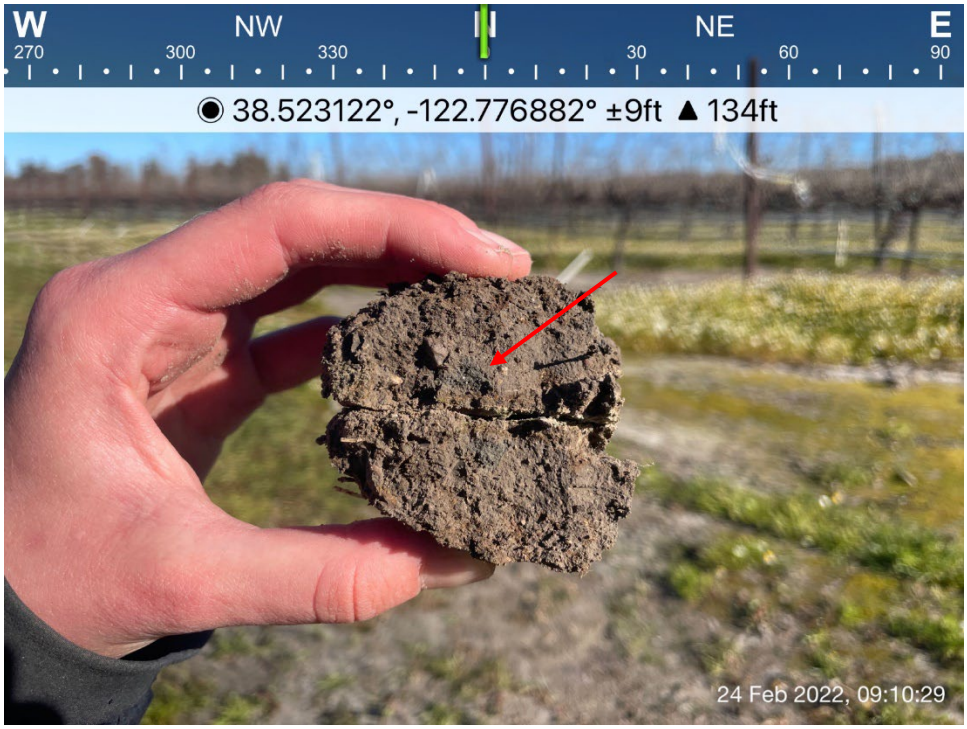
Photograph 4: Photo shows an overview of Seasonal Wetland SW-01.

Photograph 5: Photo shows wetland sample point 2B within Seasonal Wetland SW-02.

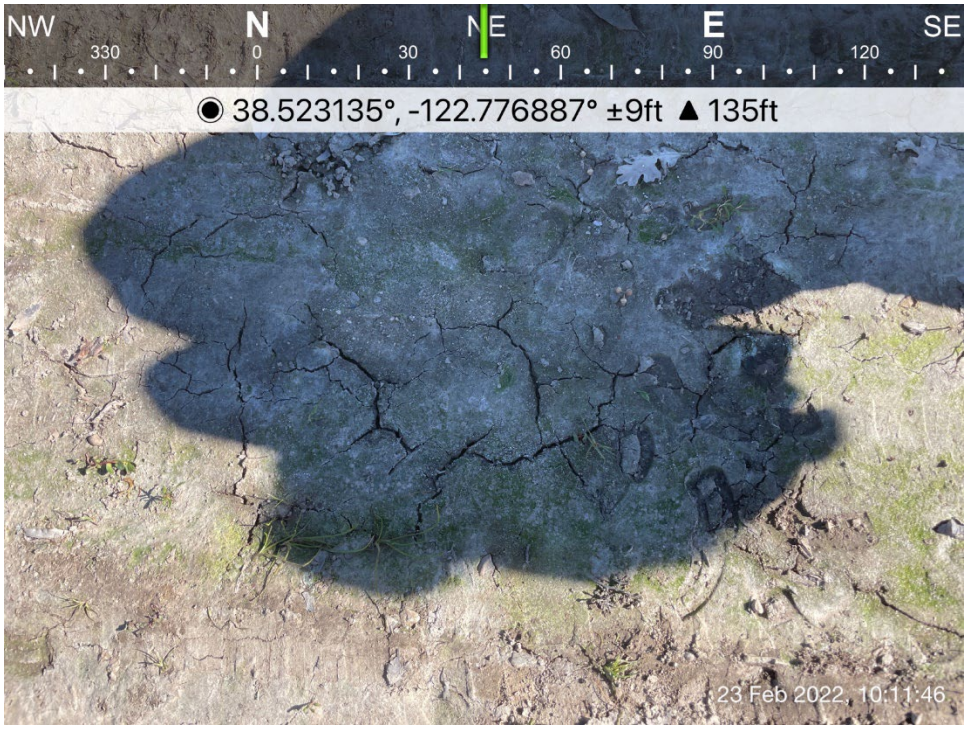
Photograph 6: Photo shows an overview of Seasonal Wetland SW-02.



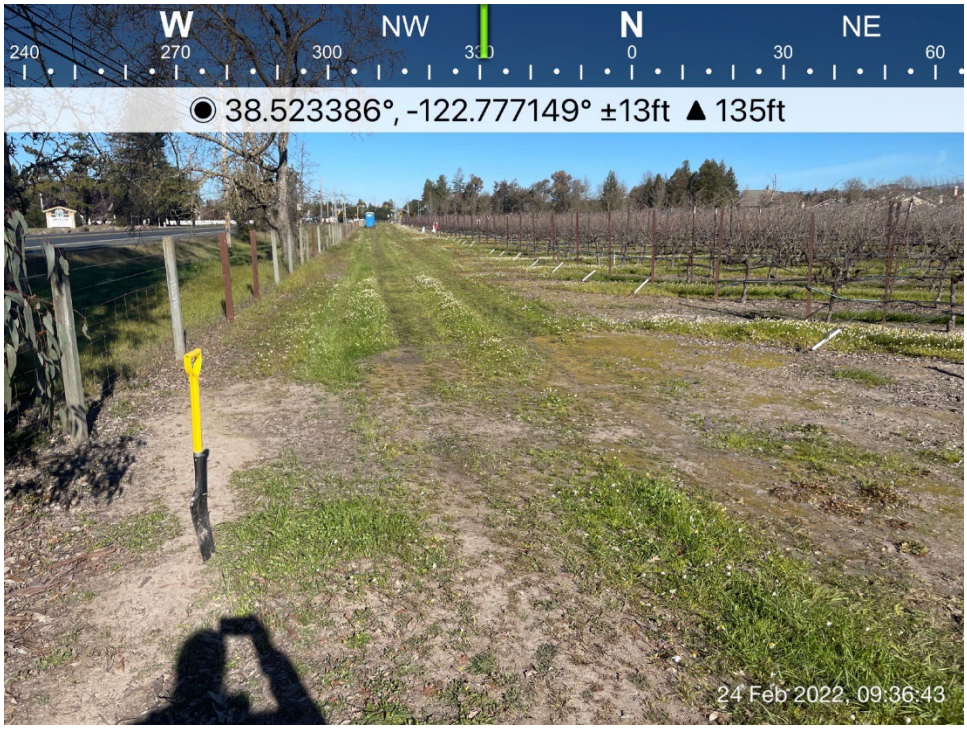
Photograph 7: Photo shows redoximorphic concentrations (red arrow) within soils from wetland Sample Point 2B.



Photograph 8: Photo shows redoximorphic depletions (red arrow) within soils from wetland Sample Point 2B.



Photograph 9: Photo shows hydrologic indicators (Surface Soil Cracks, Biotic Crust) within Seasonal Wetland SW-02.



Photograph 10: Photo shows Seasonal Wetland SW-03.

Photograph 11: Photo shows Sample Point 3B taken within a vegetated shelf adjacent to Pruitt Creek.

Photograph 12: Photo shows the soil profile from Sample Point 3B and evident Saturation, a primary hydrologic indicator.

Photograph 13: Photo shows changes in soil character (red line), an indicator of OHWM, along Pruitt Creek.

Photograph 14: Photo shows an overview of the Pruitt Creek channel and OHWM.

Photograph 13: Photo shows the swale-like roadside drainage ditch (RD-01) and OHWM.

Photograph 14: Photo shows an overview of the southern roadside drainage ditch RD-02.

Appendix D

Plant Species Observed on the Project Site

Scientific Name	Common Name	Family	Indicator Status
Aesculus californica	California buckeye	Sapindaceae	-
Agapanthus africanus	African lily	Amarylidaceae	-
Anthemis cotula	stinking chamomile	Asteraceae	FACU
Arum italicum	Italian arum	Araceae	-
Avena barbata	slender oat	Poaceae	-
Avena fatua	wild oat	Poaceae	UPL
Brassica nigra	black mustard	Brassicaceae	-
Briza minor	little quaking grass	Poaceae	FAC
Bromus diandrus	ripgut brome	Poaceae	-
Bromus hordeaceus	soft chess	Poaceae	FACU
Calandrinia menziesii	red maids	Montiaceae	FACU
Calendula arvensis	field marigold	Asteraceae	-
Cardamine hirstua	bittercress	Brassicaceae	FACU
Carduus pycnocephalus	Italian thistle	Asteraceae	-
Carex spp.	sedges	Cyperaceae	FAC
Cerastium glomeratum	mouse-ear chickweed	Monitaceae	UPL
Chlorogalum pomeridianum	soap plant	Agavaceae	-
Claytonia perfoliata	miner's lettuce	Montiaceae	FAC
Cotoneaster sp.	cotoneaster	Rosaceae	-
Cyperus eragrostis	tall flatsedge	Cyperaceae	FACW
Elymus sp.	wild rye	Poaceae	-
Erodium botrys	cranesbill	Geraniaceae	FACU
Erodium cicutarium	redstem filaree	Geraniaceae	-
Eucalyptus globulus	blue gum	Myrtaceae	-
Festuca myuros	six-weeks fescue	Poaceae	FACU
Festuca perennis	Italian ryegrass	Poaceae	FAC
Fraxinus latifolia	Oregon ash	Fagaceae	FACW
Galium aparine	bedstraw	Rubiaceae	FACU
Genista monspessulana	French broom	Fabaceae	-
Geranium dissectum	cutleaf geranium	Geraniaceae	-
Geranium molle	dove's-foot geranium	Geraniaceae	-
Geranium robertianum	Robert's geranium	Geraniaceae	FACU
Hedera helix	English ivy	Araliaceae	FACU
Hirschfeldia incana	shortpod mustard	Brassicacrae	-
Hordeum murinum	mousetail barley	Poaceae	FAC

Hypochaeris radicata	rough cat's-ears	Asteraceae	FACU
Juncus balticus	Baltic rush	Juncaceae	FACW
Juncus effusus	bog rush	Juncaceae	FACW
Juncus xiphioides	iris-leaf rush	Juncaceae	OBL
Lepidium nitidum	shining pepperweed	Brassicaceae	FAC
Lonicera hispidula	pink honeysuckle	Caprifoliaceae	FACU
Lysimachia arvensis	scarlet pimpernel	Myrsinaceae	FAC
Lythrum hyssopifolia	hyssop loosestrife	Lythraceae	OBL
Malva parviflora	cheeseweed	Malvaceae	-
Medicago polymorpha	California burclover	Fabaceae	FACU
Narcissus pseudonarcissus	daffodil	Amaryllidaceae	-
Nasturtium officinale	watercress	Brassicaceae	OBL
Oxalis pes-caprae	Bermuda buttercup	Oxalidaceae	-
Pinus sp.	pine	Pinaceae	-
Plantago lanceolata	English plantain	Plantaginaceae	FAC
Poa annua	annual bluegrass	Poaceae	FAC
Polygonum aviculare	yard knotweed	Polygonaceae	FAC
Quercus agrifolia	coast live oak	Fagaceae	-
Quercus lobata	valley oak	Fagaceae	FACU
Ranunculus muricatus	spiny fruit buttercup	Ranunculaceae	FACW
Rubus armeniacus	Himalayan blackberry	Rosaceae	FAC
Rumex acetosella	sheep sorrel	Polygonaceae	FACU
Rumex crispus	curly dock	Polygonaceae	FAC
Rumex pulcher	fiddle dock	Polygonaceae	FAC
Schoenoplectus pungens	three-square bulrush	Cyperaceae	OBL
Senecio vulgaris	common groundsel	Asteraceae	FACU
Stachys bullata	hedge nettle	Lamiaceae	-
Symphoricarpos mollis	creeping snowberry	Caprifoliaceae	FACU
Torilis arvensis	field hedge parsley	Apiaceae	-
Toxicodendron diversilobum	Poison oak	Anacardiaceae	FACU
Trifolium spp.	clover	Fabaceae	FAC
Typha spp.	cattails	Typhaceae	OBL
Umbellularia californica	California bay laurel	Lauraceae	FAC
Vicia sativa	common vetch	Fabaceae	FACU
Vinca major	periwinkle	Apocynaceae	FACU